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#### APPENDIX G WETLAND FIELD SURVEY REPORTS

The following reports are included in this Appendix.

- G.1. 2014 WETLAND FIELD STUDY REPORT LIVENGOOD (MP 401) TO TRAPPER CREEK (MP 709.5) (USAI-UR-SRZZZ-00-000012-000)
- G.2. 2015 WETLAND FIELD STUDY REPORT (USAI-P1-SRZZZ-00-000002-000)
- G.3. 2016 WETLAND AND VEGETATION FIELD STUDY REPORT (USAI-PE-SRREG-00-000002-007



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#### 1.0 INTRODUCTION

This Wetland Field Study Report provides an interim review of the wetlands that were mapped and field surveyed for the Alaska Liquefied Natural Gas (LNG) Project (Project) during the 2014 field season. This report includes the area of the proposed Project's Mainline corridor (see description below) from Livengood (MP 401) to approximately 43 miles south of Trapper Creek (MP 709.5) (**Figure 1**). This portion of the Project corridor was not part of the previous Alaska Pipeline Project (APP) effort (APP 2011).

#### 1.1 Project Description

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LP (Applicants) plan to construct an integrated Project (the Alaska LNG Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular from the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce. Proposed Project facilities include: a 42-in diameter, 800-mi natural gas pipeline from the North Slope to a Liquefaction Facility near Nikiski. The Liquefaction Facility is comprised of an LNG Plant and marine terminal. The natural gas pipeline would include an offshore section crossing the Cook Inlet. Two pipeline study corridors across the Cook Inlet are being considered, an east pipeline corridor and a west pipeline corridor.

#### 1.2 Purpose

The purpose of wetlands and waterbodies mapping is to identify on aerial imagery potential "waters of the United States (U.S.), including wetlands," that are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (40 Code of Federal Regulations [CFR] Part 230) and Section 10 of the Rivers and Harbors Act (33 CFR Part 328.3[b]) that may be impacted by the Project. As part of the Section 404 permitting process, all projects must avoid impacts to wetlands whenever possible, minimize impacts to wetlands to the maximum extent practicable, and compensate for all unavoidable wetland impacts.

Field surveys were conducted in 2014 to verify the accuracy of wetland types and boundaries as determined in pre-field mapping. Field data will also be used to improve the accuracy of future Project wetland mapping efforts. This information is required for the National Environmental Policy Act process as expected to be administered by FERC and for Section 404 and Section 10 permits administered by the USACE. Additionally, this data will constitute baseline information for the FERC's Resource Report No. 2.



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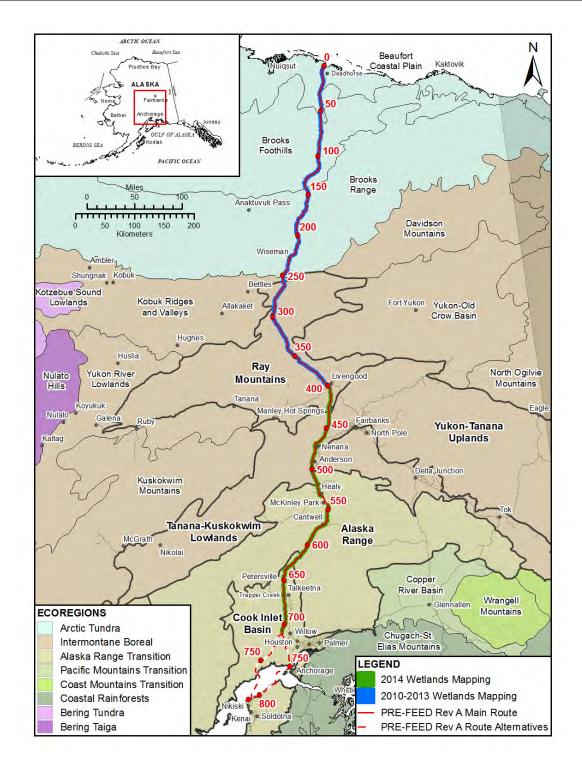


Figure 1. 2014 Project Study Area



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#### 1.3 STUDY AREA

The 2014 field season focused on higher confidence routing areas (90% confidence sections of the March 14, 2014 Focus Study Route) along the Project corridor, approximately from Livengood (MP 401) to 43 miles south of Trapper Creek (MP 709.5). Since the proposed Project route was revised (August 5, 2014) during the 2014 field season, not all sections of the revised 90% confidence areas have been field verified. **Appendix A** lists sections of the proposed route south of Livengood that still need to be mapped and/or field verified. Approximately 49 miles of the revised route will need to be mapped after aerial photography is obtained, and 170 miles will need to be field verified in 2015.

The Project route south of Livengood passes through two ecoregions with five sub-ecoregions, as described by Nowacki et al. (2001):

- Intermontane Boreal Ecoregion
  - o Ray Mountains Sub-Ecoregion
  - Yukon-Tanana Uplands Sub-Ecoregion
  - o Tanana-Kuskokwim Lowlands Sub-Ecoregion
- Alaska Range Transition Ecoregion
  - o Alaska Range Sub-Ecoregion
  - o Cook Inlet Basin Sub-Ecoregion

Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions. The Alaska LNG corridor, south of Livengood, begins in the Ray Mountains, continues south and passes through the Tanana-Kuskokwim Lowlands, briefly passing through the Yukon-Tanana Uplands, and then through the Alaska Range, before ending in the Cook Inlet Basin Sub-Ecoregion. Ecoregion descriptions are presented in the 2014 Vegetation Study Report (Alaska LNG 2014a). The wetlands survey area was divided into two corridors: a wetland mapping corridor and a field survey corridor. The mapping corridor was 2,000 feet wide (1,000 feet on either side of the proposed centerline). All wetlands and waterbodies were mapped within the mapping corridor using aerial photograph interpretation. The smaller field survey corridor was 300 feet wide (150 feet on each side of the proposed centerline) and centered within the mapping corridor. Field work was concentrated within the field survey corridor, ensuring that the wetland field work occurred near areas most likely to be disturbed by the proposed Project. The locations of any facilities outside of the two corridors were not included in the mapping or field survey.

The field survey area south of Livengood was divided into four geographic spreads for planning purposes for all disciplines:

- Livengood to Healy (LH), Pipeline milepost (MP) 401-525;
- Healy to Trapper Creek (HT), MP 525-667;
- Trapper Creek to Cook Inlet (TI), MP 667-767; and
- Cook Inlet to Nikiski (IN), MP 767-804.



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#### 2.0 METHODOLOGY

Wetland Determination Field Survey Protocols (**Appendix B**) were prepared by experienced wetland scientists prior to the 2014 field season. The protocols, summarized below, follow standard methods used to delineate wetlands for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) wetland pre-mapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of the wetland pre-mapping based on the results of the field efforts. The same approach was followed for the Project mapping corridor north of Livengood, as part of the prior APP effort.

Pre-mapping was completed in 2013 and 2014 for the Mainline corridor from Livengood (MP 401) to approximately 43 miles south of Trapper Creek (MP 709.5) (**Appendix A** lists sections of the route that have not been pre-mapped). As noted above, the study effort did not include any off-corridor access roads or facility sites. Initial pre-mapping results were presented in a 2013 Wetland Mapping Report – South of Livengood (Alaska LNG 2013). This 2014 Wetland Field Study Report summarizes the pre-mapping effort and focuses on results of the field data collection. Since data from the Wetland Field Study and the Vegetation Field Study were collected at the same time, some of the vegetation classification data are presented in the appendices of this report. All of the information and methodology used for the Vegetation Study is provided in the 2014 Vegetation Field Study Report (Alaska LNG 2014a). The goal of the Vegetation Study was to identify vegetation cover types according to the Alaska Vegetation Classification System (Viereck et al. 1992).

#### 2.1 DEFINITIONS AND WETLAND NAMING CONVENTIONS

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Most wetlands are considered to be waters of the U.S. and are within the jurisdiction of the USACE (33 CFR Part 328.3[b]). Jurisdictional status is based on connectivity to Traditional Navigable Waters (TNW). Wetlands are considered jurisdictional "if the wetland, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable." (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]) (Stonestreet et al. 2009). Other non-wetland waters of the U.S. under the jurisdiction of the USACE, include deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by the USACE (See Section. 2.9).

#### 2.1.1 Cowardin Classification

All wetlands and other waters of the U.S. in the wetland mapping corridor were classified using the "Classification of Wetlands and Deepwater Habitats of the United Sates" (Cowardin et al., 1979), commonly referred to as the Cowardin classification system. Cowardin classifies wetlands and aquatic habitats by system, subsystem, class, subclass, and water regime and is based on hydrologic setting (riverine, lacustrine, estuarine, palustrine), vegetation structure (forested, scrub-shrub, emergent, aquatic bed), and water regime (saturated, seasonally flooded, semi-permanently flooded, etc.).



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The Cowardin classifications are used as the standard codes in the National Wetland Inventory (NWI). The NWI Program has mapped many of the wetlands across the U.S., including many in the Project's mapping corridor (at a smaller scale than the Alaska LNG mapping). It was developed largely for mapping based on interpretation of high-altitude aerial photography. **Table 1** lists the most common Cowardin classifications found in the 2014 field survey corridor.

Table 1. Wetland Types within the Project Mapping Corridor from Livengood (MP 401) to Trapper Creek (MP 709.5), Alaska

Cowardin Wetland and Deepwater Habitat Types	Description	Example
Disturbed (D) (non-w etland)	Gravel-filled or previously graded areas, man-made structures	Roads, pads, buildings*
Lacustrine Limnetic (L1)	Deepw ater habitats within the lacustrine system	Deepw ater lakes*
Lacustrine Littoral (L2)	Vegetated habitats within the lacustrine system, or shoreward bound to 2 meters below annual low water	Lake fringes with unvegetated shallow water, or submerged or floating vegetation
Palustrine Aquatic Bed (PAB)	Habitats dominated by plants growing on or below the water surface	Ponds with submerged or floating vegetation such as pondw eeds, water lilies
Palustrine Emergent (PEM)	Habitats dominated by erect, rooted, herbaceous species	Emergent wetlands with grasses, sedges, rushes
Palustrine Moss-Lichen (PML)	Habitats dominated by moss or lichen species	Wetlands with mosses or lichens
Palustrine Scrub-Shrub (PSS)	Habitats dominated by woody vegetation less than 6 meters tall/3-inch diameter at breast height (DBH)	Scrub-shrub w etlands w ith w illow or alder thickets, black spruce, tussock tundra, ericaceous bogs
Palustrine Forested (PFO)	Habitats dominated by woody tree species greater than 6 meters tall/3- inch DBH	Forested w etlands w ith black spruce, tamarack
Palustrine Unconsolidated Bottom (PUB)	Habitats containing at least 25% cover of particles smaller than stones, and less than 30% cover by vegetation	Ponds with unvegetated shallow water, or submerged or floating vegetation
Riverine Lower Perennial Unconsolidated Shoreline/Unconsolidated Bottom (R2US/UB)	Low-gradient rivers/streams with slow water velocity	Valley bottom streams*
Riverine Upper Perennial Unconsolidated Shoreline/Unconsolidated Bottom (R3US/UB)	High-gradient rivers/streams with fast water velocity	Mountain streams*
Riverine Intermittent Streambed (R4SB)	Channels containing flow ing water only part of the year	Intermittent streams*

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Upland (U) (non-w etland)	Habitats that do not contain criteria diagnostic of wetlands	Non-wetland communities, ranging from closed spruce forest, mixed woodlands, shrublands to alpine tundra
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<sup>\*</sup> Unvegetated areas

#### 2.1.2 Hydrogeomorphic Classes

Wetlands within the Project mapping corridor were also assigned a hydrogeomorphic (HGM) classification (Smith et al., 1995; and Brinson, 1993) during the mapping process. The HGM classification of wetlands comprises three components: 1) landscape setting; 2) water source (precipitation, surface flow, or groundwater discharge); and 3) hydrodynamics (direction and strength of flow). The three components of the HGM classes are largely responsible for determining a wetland's ecosystem function. The HGM classes in the 2014 field survey corridor are defined below per Smith et al. (1995) and are summarized in **Table 2**.

**Riverine** – Riverine wetlands occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are often overbank flow from the channel or subsurface hydraulic connections between the stream channel and wetlands; however, sources may be interflow and return flow from adjacent uplands, occasional overland flow from adjacent uplands, tributary inflow, and precipitation. At their headwaters, riverine wetlands often are replaced by slope or depressional wetlands where the channel morphology may disappear. They may intergrade with poorly drained flats or uplands. Perennial flow in the channel is not a requirement.

**Depressional** – Depressional wetlands occur in topographic depressions. Dominant water sources are precipitation, groundwater discharge, and both interflow and overland flow from adjacent uplands. The direction of flow is normally from the surrounding uplands toward the center of the depression. Elevation contours are closed, thus allowing the accumulation of surface water. Depressional wetlands may have a combination of inlets and outlets or lack them completely. Dominant hydrodynamics are vertical fluctuations, primarily seasonal. Depressional wetlands may lose water through intermittent or perennial drainage from an outlet, by evapotranspiration, and, if they are not receiving groundwater discharge, may slowly contribute to groundwater. Peat deposits may develop in depressional wetlands.

**Slope** – Slope wetlands normally are found where there is a discharge of groundwater to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes. Slope wetlands are usually incapable of depressional storage because they lack the necessary closed contours. Principal water sources are usually groundwater return flow and interflow from surrounding uplands, as well as precipitation. Hydrodynamics are dominated by downslope unidirectional water flow. Slope wetlands can occur in nearly flat landscapes if groundwater discharge is a dominant source to the wetland surface. Slope wetlands lose water primarily by saturation, subsurface and surface flows, and by evapotranspiration. Slope wetlands may develop channels, but the channels serve only to convey water away from the slope wetland. Fens are a common example of slope wetlands.

**Flat** – There are two types of "flat" wetlands: mineral soil flats and organic soil flats. Mineral soil flats are most common on interfluves, extensive relic lake bottoms, or large floodplain terraces where the main source of water is precipitation. They receive virtually no groundwater discharge which distinguishes them from depressions and slopes. Dominant hydrodynamics are vertical



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fluctuations. They lose water by evapotranspiration, saturation overland flow, and seepage to underlying groundwater. They are distinguished from flat upland areas by their poor vertical drainage, often due to spodic horizons and hardpans, and low lateral drainage, usually due to low hydraulic gradients. Mineral soil flats that accumulate peat can eventually become organic soil flats.

Organic soil flats differ from mineral soil flats, in part, because their elevation and topography are controlled by vertical accretion of organic matter. They occur commonly on flat interfluves, but may also be located where depressions have become filled with peat to form a relatively large flat surface. Water source is dominated by precipitation, while water loss is by saturation, overland flow, and seepage to underlying groundwater. Raised bogs share many of these characteristics, but may be considered a separate class because of their convex upward form and distinct edaphic conditions for plants. Organic flats wetlands over permafrost soils are common in Interior Alaska. These flats can and often occur on slopes up to 20%.

Lacustrine Fringe – Lacustrine fringe wetlands are adjacent to lakes where the water elevation of the lake maintains the water table in the wetland. In some cases, these wetlands consist of a floating mat attached to land. Additional sources of water are precipitation and groundwater discharge, the latter dominating where lacustrine fringe wetlands intergrade with uplands or slope wetlands. Surface water flow is bidirectional, usually controlled by water-level fluctuations such as seiches in the adjoining lake. Lacustrine fringe wetlands are indistinguishable from depressional wetlands where the size of the lake becomes so small relative to fringe wetlands that the lake is incapable of stabilizing water tables. Lacustrine fringe wetlands lose water by flow returning to the lake after flooding, by saturation surface flow, and by evapotranspiration. Organic matter normally accumulates in areas sufficiently protected from shoreline wave erosion.

Table 2. Hydrogeomorphic Classes within the Project Mapping Corridor from Livengood (MP 401) to Trapper Creek (MP 709.5), Alaska

Hydrogeomorphic Class	Dominant Water Source	Dominant Hydrodynamics	Examples
Riverine	Overbank flow from	Unidirectional,	Riparian scrub-shrub
	channel	horizontal	wetlands
Depressional	Groundwater	Vertical	Kettle wetlands
Slope	Groundwater	Unidirectional, horizontal	Avalanche chutes
Flat	Precipitation	Vertical	Peat bogs
Lacustrine Fringe	Overbank flow from lake	Bidirectional, horizontal	Emergent lake edge wetlands

These HGM classes of wetlands have the potential to perform the following eight functions (Magee and Hollands 1998):

- <u>Modification of groundwater discharge:</u> The capacity of a wetland to influence the amount of water moving from the groundwater to surface water.
- <u>Modification of groundwater recharge:</u> The capacity of a wetland to influence the amount of water moving from surface water to groundwater.



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- <u>Storm and flood-water storage:</u> The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface.
- Modification of stream flow: The modification of inflow hydrology by the wetland to produce the outlet stream's hydrology.
- Modification of water quality: Removal of suspended and dissolved solids from surface water and dissolved solids from groundwater and conversion into other forms, plant or animal biomass, or gases. Wetlands with a low slope-angle or location in depressions provide a high level of this function.
- <u>Export of detritus:</u> Export of organic detritus from the wetland to adjacent and downstream aquatic ecosystems.
- Contribution to abundance and diversity of wetland vegetation: The capacity of a wetland to produce an abundance and diversity of hydrophytic plant species individually or as part of a group of wetlands in a local landscape (Tiner 1984).
- Contribution to abundance and diversity of wetland fauna: The capacity of a wetland to support large and / or diverse populations of animal species that spend part or all of their lifecycle in wetlands, individually, or as part of a mosaic of wetlands in a local landscape.

#### 2.2 WETLAND PARAMETERS AND INDICATORS

Wetland determinations were made according to currently accepted methods in Alaska, as described in the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region" (Regional Supplement) (USACE, 2007a), and the "USACE Wetlands Delineation Manual" (USACE Manual) (USACE, 1987). These methods require a three-parameter approach, of which the three essential characteristics of a wetland (hydrophytic vegetation, hydric soils, and wetland hydrology) must be present to have a positive wetland determination.

Wetland indicators are field verifiable and measurable characteristics of vegetation, soil, and hydrology that generally indicate that the parameter in question is present. The absence of an indicator, however, does not always mean that a parameter is not met, or that a wetland is not present. For these "problematic" situations, the Regional Supplement provides procedures to determine if a parameter is present or not. These generally rely on an understanding of the hydrogeomorphology of a site, and the best professional judgment of the wetland scientist. Each parameter, along with select Alaska-specific indicators, is described below.

### 2.2.1 Hydrophytic Vegetation

Hydrophytic vegetation, or a community dominated by plants with special adaptations to survive saturated or anaerobic conditions, is required for a positive wetland determination. The U.S. Fish and Wildlife Service prepared the "National List of Vascular Plant Species That Occur in Wetlands" in 1988 (Reed, 1988), which categorizes species based on their estimated probability of occurring in a wetland. USACE took over the task of updating this plant list (Lichvar, and Gillrich 2011, Lichvar et al. 2014). Indicator ratings and their descriptions are as follows:

• OBL (obligate wetland) – almost always found in wetlands, rarely in uplands;



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- FACW (facultative wetland) usually found in wetlands but occasionally found in uplands;
- FAC (facultative) commonly occurs in either wetlands or uplands;
- FACU (facultative upland) occasionally found in wetlands, but usually occurs in uplands;
- UPL (obligate upland) rarely found in wetlands, almost always in uplands.

Plant species with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions. Such species are referred to as hydrophytic vegetation, or hydrophytes.

The presence of hydrophytic vegetation is determined by satisfying either a Dominance Test or a Prevalence Index. The Dominance Test is generally a quick way to characterize the vegetative community, however, communities with a large number of low cover species are more accurately characterized by the Prevalence Index, a weighted average of the wetland indicator status of all plant species in the community. Both methods were used when collecting field data.

If both of these indicators fail, yet the site exhibits both hydric soil and wetland hydrology (see description below), wetland scientists may examine FACU vegetation within the community for morphological adaptations indicating that it is indeed acting as a hydrophyte. Typical morphological adaptations observed in Alaska wetlands include white spruce (*Picea glauca*) with a narrow growth form, widely spaced needles, and less bushy branching; or resin birch (*Betula neoalaskana*) with multiple trunks, an "apple tree" like growth, smaller size, and a rotten core in the tree trunk. If these morphological adaptations were observed, the species may be considered FAC at the site in question, and the Dominance Test recalculated.

#### 2.2.2 Wetland Soils

Hydric soils are also required for a positive wetland determination. The National Resources Conservation Service (NRCS) has defined a hydric soil as "a soil that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation" The criteria for hydric soils includes certain soil taxonomic groups that are poorly drained during the growing season, or soils that are frequently ponded or frequently flooded for long or very long durations during the growing season.

Due to anaerobic conditions, hydric soils exhibit certain characteristics that can be observed in the field. These characteristics may include the following:

- High organic content representing accumulation and slow decomposition in anaerobic conditions:
- Reduction of ferric (Fe3+) to ferrous iron (Fe2+) and consequent leaching from the soil profile, causing a greenish- or bluish-gray color (gley formation);
- Generation of hydrogen sulfide, noted by characteristic odor:
- Spots or blotches of different color interspersed with the matrix, or dominant color (mottling); and



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Dark soil colors (low soil chroma).

Indicators have been established by USACE to assist with identification of hydric soils. These indicators are found in the Regional Supplement and the "Field Indicators of Hydric Soils in the United States" (USDA, NRCS 2010). The absence of listed indicators, however, does not preclude the soil from being hydric. If indicators of hydrophytic vegetation and wetland hydrology are present, but hydric soils are not evident, the procedure outlined in the Regional Supplement for problematic hydric soils was followed.

### 2.2.3 Wetland Hydrology

Wetland hydrology is the third parameter required for a positive wetland determination. The most ephemeral of the three parameters, surface water or saturation, need not be present throughout the entire year to meet the definition of wetland hydrology. According to the USACE Manual (1987), wetland hydrology is present when there is inundation or soil saturation to the surface continuously for at least five percent of the growing season in most years. Indicators of wetland hydrology include observing ponding or soil saturation, as well as evidence of previous inundation, such as dry algae on bare soil, watermarks on soils or leaves, and drainage patterns. Where positive indicators were observed, it was assumed that wetland hydrology occurs for a sufficient period of the growing season.

#### 2.3 **AERIAL INTERPRETATION (PRE-MAPPING)**

Wetland boundaries for the mapping corridor south of Livengood were delineated on digital ortho-rectified and geo-referenced true color aerial imagery with 1.6-foot pixel resolution using the following aerial imagery:

- Healy Area Orthophoto (U.S. Census Bureau 2006);
- Digital Orthophoto Quarter Quadrangles Anderson Area (Natural Resources Conservation Service, NRCS, 2006);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a):
- Southern Corridor Ortho Mosaic (Digital Globe 2013b):
- Talkeetna Aerial Orthophoto (Matanuska Susitna Borough, MSB, 2011a);
- Caswell Aerial Orthophoto (MSB 2011b); and
- Willow Aerial Orthophoto (MSB 2011c).

Data from the following sources was also used during the mapping process:

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) digital datasets and hardcopy maps;
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging generated topographic contours (TransCanada 2011, MSB 2011d);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;



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- U.S. Geological Survey Digital Raster Graphics (e.g., topographic maps);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

All wetland mapping was created in a GIS platform, using a "heads-up" digitizing effort. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. This is the generally accepted wetland and deepwater habitat mapping technique employed by the U.S. Fish and Wildlife Service personnel as part of the NWI program (Dahl *et al.* 2009). Data sources were overlaid on aerial photography and wetland, non-wetland, and areas of uncertain wetland status were identified by interpreting color, texture, and landscape position, among other elements. Aerial photography clues can include dwarf or stunted trees, topography characteristics (such as swales, toe slopes and depressions), and obvious signs of inundation.

All wetlands were mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer. Lakes, ponds and rivers were mapped at a scale of 1:1,200 (1 inch to 100 feet). Larger rivers and streams were delineated as polygons. Smaller streams, those with bankfull widths of approximately 10 feet or less, were mapped as lines.

Approximately 49 miles of the Project route have not been pre-mapped due to a lack of adequate aerial imagery. There is also a 12 mile gap in the 90% confidence route that has not been pre-mapped (**Appendix A**).

#### 2.4 FIELD TARGET SELECTION

Field targets were selected from the pre-mapping based on changes in the wetlands types, aerial vegetation signatures, NWI classification, and NRCS soil classification. The primary focus of the pre-selected field targets was to characterize specific wetland types which represent all similar wetland types in the region and to identify wetland/upland boundaries by selecting paired plots. Field targets were used to confirm areas where wetland subject matter experts had high confidence in their aerial interpretation, and were used to confirm or correct wetland boundary locations. Field targets were also placed in low-confidence areas to provide field data where the photo signatures or landscape features were not clearly indicative of wetland or upland. Field targets spanned the full range of Cowardin and HGM classes within the Project mapping corridor.

Field targets were evaluated during the field season provided there was land access. If a field target could not be accessed, a new field target was located on a nearby accessible parcel in an area with similar aerial photography vegetation signatures and site conditions as the original field target.

#### 2.5 WETLAND FIELD DATA COLLECTION

The 2014 wetland field study was conducted from early June through early September, and focused on field targets from Livengood (MP 401) to 43 miles south of Trapper Creek (MP 709.5).



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Photo taken by V. Watkins

Figure 2. Field Data Collection by a Wetland Scientist

### 2.5.1 Crew Composition

Two three-person crews collected data in 2014. Each crew consisted of a field crew chief, an assistant wetland scientist / Global Positioning System (GPS) Technician, and a wilderness safety specialist. Each position had defined roles and responsibilities in the field and required a specific level of technical expertise.

Field crew chiefs were required to have proven field experience and a strong familiarity with wetland science. They were in charge of the field crews and ultimately responsible for data collection quantity and quality; daily reporting; crew health and safety; and data submittal on a daily or near-daily basis. Field crew chiefs also planned the workday for the crew, coordinated with Project management, and addressed any technical issues.

Wetland scientists / GPS technicians were required to be experienced in field work, familiar with wetland science principles, and to have attended a wetland delineation training course. They assisted in the wetland field survey (**Figure 2**) with appropriate supervision by the field crew chief. The wetland scientist / GPS technician was also responsible for electronic data collection at each site using a Trimble backpack-mounted GPS instrument. They worked closely with field



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crew chiefs to verify that the data was accurate and complete, and were also responsible for the maintenance and care of the GPS equipment, managing the crew's electronic data, and ensuring data files were uploaded to the Project's SharePoint site on a daily or near-daily basis.

Wilderness safety specialists were professionally trained in firearms proficiency, Alaska wilderness survival, and First Aid / cardiopulmonary resuscitation. They were responsible for protecting the field crew from aggressive wildlife encounters, and assisting the field crew chief in the communication of and compliance with all Project health and safety policies.

#### 2.5.2 Wetland Determination Field Protocols

Wetland Determination Field Survey Protocols are provided in **Appendix B**. As described in the protocols, data was collected as either a Determination Point (DP), where a hard copy Wetland Determination Form was completed, or an Observation Point (OP), in which notes and photographs were used to describe wetland status and the community. All wetlands and waterbodies were classified using Cowardin codes.

The field crew chief examined vegetation and topography to determine appropriate sampling location(s) at each field target. Although field targets were used to guide the location of field crews, field crew chiefs were allowed discretion in the number, type (DP or OP), and final location of data points. This flexible approach allowed scientists to collect data in locations that best described the target community, allowed them to collect additional data as field conditions warranted, and enhanced efficiency by allowing scientists to collect observational data if a similar community was thoroughly described nearby. Wetland scientists used their best professional judgment and collected appropriate field data to adequately revise the wetland premapping.

Field crew chiefs maintained field logbooks and hardcopy field maps with aerial photography, field targets, and pre-mapped wetland boundaries and classifications. The wetland scientist / GPS technician entered some of the data into electronic data forms specific to DPs and OPs. Daily field quality assurance/quality control (QA/QC) procedures are described in Section 2.6. Hardcopy and electronic data forms, field notes, maps, GPS data, and site photos were uploaded daily to the Project SharePoint website.

#### 2.6 QUALITY ASSURANCE/QUALITY CONTROL

The wetland and vegetation technical lead conducted quality audits during the first week of each deployment. These audits ensured data quality and consistency between teams, and provided an opportunity for any problems to be corrected immediately.

Each crew member was responsible for collecting and recording clear and accurate data. The field crew chief reviewed all hardcopy and electronic data forms and completed a QA/QC checklist before leaving each site.

The field crew manager ensured that all data files were uploaded to the Project website. These transmitted files were then downloaded and reviewed by office-based data management staff. The wetland technical lead checked each hardcopy data sheet and electronic data form for quality and consistency, as it was received. If problems arose, the field crew was notified promptly to ensure that any data quality issues were corrected immediately.

Wetland mapping was also reviewed by experienced wetland scientists both after the initial premapping, and after map revisions were complete.



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#### 2.7 WETLAND MAP REVISIONS

The wetland pre-mapping was revised to incorporate the results of the 2014 field studies, including revision of the wetland classifications (e.g., HGM and Cowardin). Map revisions followed procedures outlined in the Wetland Determination Field Survey Protocols (**Appendix B**), and included the 2014 GPS data, Wetland Determination Forms, Vegetation Classification Forms for upland sites, site photographs, logbooks, and field maps as additional data sources. Map revisions were only made with post-processed GPS data and field forms that passed the QA/QC process (Section 2.6).

Generally, the wetland pre-mapping revision process involved:

- Exporting spatial data for all field targets and photo points from the Alaska LNG database:
- Compiling electronic copies of all notes, sketches, and photographs associated with above points; and
- Using this data in a GIS platform to update files through heads-up digitizing, or modifying the initial map on screen as described in Section 3.2 of the Wetland Determination Field Survey Protocols.

Note that, when updating the map for both wetland and upland polygons, changes were not necessarily applied solely to the polygon containing field data. Rather, field data were used to "recalibrate" that portion of the map (generally within one half mile of the data collection site), represented by a particular spectral signature (combination of color, tone, shadow, etc.), and recoded in that area as deemed appropriate. As the aerial imagery used for pre-mapping had seasonal variations (including imagery taken prior to green-up), revisions were most often needed to correct pre-mapping interpretations of vegetation height, percent canopy coverage, and plant species composition.

### 2.8 WETLAND FUNCTIONAL ASSESSMENT

Wetlands are known to provide a variety of ecological functions depending on the location and type of wetland. At sites determined to be wetland, a Wetland Functional Assessment Data Sheet was collected. Information from this data sheet will be incorporated into the functional models described in *A Rapid Procedure for Assessing Wetland Functional Capacity* (Magee and Hollands 1998). Hydrogeomorphic (HGM) classes of wetlands and the eight wetland functions identified by Magee and Hollands are described in Section 2.1.2 and in the Wetland Determination Field Survey Protocols (**Appendix B**). The functional assessment models provide a Functional Capacity Index for each wetland function. The Functional Capacity Index indicates the potential degree to which the wetland performs the function and is only comparable to other wetlands within the same HGM class and region. The results from the models will be extrapolated to the applicable wetlands within the mapping corridor. This information will potentially serve as the basis to determine appropriate compensatory mitigation for the unavoidable impacts of the Project. Wetland functional assessment data will be reported in 2016, after all field data is collected.

#### 2.9 Jurisdictional Determination



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The USACE regulates wetlands and other waters of the U.S. that are under their jurisdiction. Jurisdictional status is based on connectivity to Traditional Navigable Waters (TNW) (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]).

The Project, similar to other large pipeline and energy projects permitted by the USACE, will assume that all delineated wetlands fall under USACE jurisdiction; because the FERC requires that the Project adhere to certain construction requirements in all wetlands, regardless of jurisdiction, it will be assumed that all wetlands fall within USACE jurisdiction for purposes of planning, permitting, mitigation, and construction methods.

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#### 3.0 RESULTS

#### 3.1 WETLAND FIELD DATA COLLECTION

A total of 212 field targets comprising wetlands, non-wetlands, and uncertain areas were sampled by field crews during the 2014 field season (**Table 3**). Wetland crews collected Wetland Determination Data Forms at 192 field targets, Vegetation Classification Data Forms at 10 field targets and OPs at 10 field targets. The 2014 wetland determination data forms and the Wetland and Vegetation Field Data Summary Table are provided in **Appendix C**.

Number of Field Targets **Total Number of Completed Within Spread** Milepost Field Targets Current 90% Confidence Completed Field Survey Corridor 401 - 525 46 28 Livengood to Healy Healy to Trapper Creek 525 - 667 102 84 34 Trapper Creek to Cook 667 - 767 64 Inlet Cook Inlet to Nikiski 767 - 804 0 0 Total: 212\* 146

Table 3. Field Targets Completed in 2014

Since the proposed Project route was revised on August 5, 2014, after pre-mapping and field surveys began, 66 field targets were surveyed in areas that are no longer within the 90% confidence portions of the route. A total of 146 field targets have been completed within the current 90% confidence field survey corridor. Also, some sections that have been rerouted have either (1) only been pre-mapped and not field verified or (2) not been pre-mapped or field verified due to a lack of quality aerial imagery (**Appendix A**).

#### 3.2 WETLAND MAP REVISIONS

The wetland delineation pre-mapping was revised according to the criteria summarized in Section 2.7 of this report. The 2014 final wetland delineation maps are included as **Appendix D**. A summary of wetland acreage per spread within the Project mapping corridor south of Livengood is presented in **Table 4** in which wetlands are organized by HGM (Brinson, 1993) and Cowardin (Cowardin et al.1979) classifications. Of the approximate 71,026 acres in the mapping corridor, wetlands and other waters of the U.S comprise 23,183 acres or 33 percent of the total.

Within the Livengood to Healy spread approximately 42% of the area is wetland. About 78% of the wetlands in this spread are palustrine scrub-shrub and palustrine forested wetlands, the majority of which are dominated by black spruce (*Picea glauca*) plant communities on permafrost soils. About 21% of the wetlands within this reach are higher quality wetlands, such as depressional palustrine emergent, palustrine, aquatic bed, palustrine unconsolidated bottom, and riverine wetlands. These wetlands are mostly semipermanently or permanently flooded wetlands providing aquatic habitats for a variety of species.

Within the Healy to Trapper Creek spread about 22% of the area is wetland. This spread contains far fewer acres of the lower quality permafrost wetlands (about 14% of all wetlands

<sup>\*66</sup> of the field targets completed fall outside of the current proposed route (90% confidence route) (Appendix A).



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within the spread). About 55% of the wetlands within this spread are depressional higher quality wetlands, and about 25% of the wetlands in this spread are within riverine systems.

About one third (36%) of the Trapper Creek to Cook Inlet spread covered by this report is wetland. About 94% of these wetlands are classified as depressional, and 5% are riverine wetlands. About 26% of these depressional and riverine wetlands consist primarily of semipermanently or permanently flooded wetlands, such as palustrine unconsolidated bottom, palustrine aquatic bed, palustrine emergent, and riverine systems.



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Table 4. Wetland Acreage within the Project Mapping Corridor South of Livengood, by Hydrogeomorphic and Cowardin Types

Healy I transpr (reak I inlet (MP /119 5)	19.29 162.19 481.79 2842.28 5983.58
Flat	19.29 162.19 481.79 4.59 2842.28 5983.58
PEM         17.07         2.22         0           PEWSS         79.39         82.80         0           PFO         472.58         8.78         0.43           PFO/EM         0         4.59         0           PFO/SS         2838.10         4.18         0           PSS         5210.34         773.24         0           PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional         1         11.32         0           L1UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEMS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	162.19 481.79 4.59 2842.28 5983.58
PEWSS         79.39         82.80         0           PFO         472.58         8.78         0.43           PFO/EM         0         4.59         0           PFO/SS         2838.10         4.18         0           PSS         5210.34         773.24         0           PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional         1.1UB         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	162.19 481.79 4.59 2842.28 5983.58
PFO         472.58         8.78         0.43           PFO/EM         0         4.59         0           PFO/SS         2838.10         4.18         0           PSS         5210.34         773.24         0           PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional         11.10B         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	481.79 4.59 2842.28 5983.58
PFO/EM         0         4.59         0           PFO/SS         2838.10         4.18         0           PSS         5210.34         773.24         0           PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional         L1UB         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	4.59 2842.28 5983.58
PFO/SS         2838.10         4.18         0           PSS         5210.34         773.24         0           PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional         0         111.32         0           L1UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	2842.28 5983.58
PSS         5210.34         773.24         0           PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional         L1UB         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	5983.58
PSS/EM         1031.67         904.55         0           PSS/FO         116.30         0         0           Depressional           L1UB         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	
PSS/FO         116.30         0         0           Depressional         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	
Depressional           L1UB         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEM/SS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	1936.22
L1UB         0         111.32         0           L2UB         0         7.93         0           PAB         14.93         114.28         183.31           PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	116.30
L2UB       0       7.93       0         PAB       14.93       114.28       183.31         PAB/EM       0       39.07       11.35         PEM       160.68       1025.66       242.85         PEWSS       20.73       713.54       549.73         PFO       1.90       286.49       266.17         PFO/EM       0       0.64       0         PFO/SS       1.13       60.09       254.22         PML       0       0.68       0	11100
PAB       14.93       114.28       183.31         PAB/EM       0       39.07       11.35         PEM       160.68       1025.66       242.85         PEWSS       20.73       713.54       549.73         PFO       1.90       286.49       266.17         PFO/EM       0       0.64       0         PFO/SS       1.13       60.09       254.22         PML       0       0.68       0	111.32
PAB/EM         0         39.07         11.35           PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	7.93
PEM         160.68         1025.66         242.85           PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	312.52
PEWSS         20.73         713.54         549.73           PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	50.42
PFO         1.90         286.49         266.17           PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	1429.19
PFO/EM         0         0.64         0           PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	1284
PFO/SS         1.13         60.09         254.22           PML         0         0.68         0	554.56
PML 0 0.68 0	0.64
	315.44
PSS	0.68
	2330.08
PSS/EM 403.04 328.84 174.19	906.07
PSS/FO 0 0.36 736.03	736.39
PUB 24.60 123.71 80.39	228.70
PUB/AB 0 3.45 8.17	11.62
PUB/EM 0 1.87 0	1.87
Slope	
PEM 0 23.99 0	23.99
PEWSS 0 13.87 0	13.87
PFO/SS 0 62.15 0	62.15
PSS 2.98 12.56 0	15.54
PSS/EM 0 33.86 0	33.86
PUB 0 0.45 0	0.45
Lacustrine Fringe	
PAB 0 0.77 24.61	25.38
Riverine	
PAB 32.63 0.88 1.43	34.94
PEM 30.84 41.23 7.72	79.79
PEWSS 72.84 15.80 56.94	145.58
PFO 296.41 49.37 0	345.78
PFO/SS 633.79 0 0	633.79
PSS 362.16 215.21 73.34	650.71
PSS/EM 456.42 105.85 21.00	583.27
PSS/FO 0 24.79 0	24.79
PSS/US 0 0.21 12.35	12.56
PUB 5.91 25.59 3.30	
PUB/SS 0 1.44 0	34.8
R2UB 134.54 68.97 11.24	34.8 1.44
R2US 0.47 22.33 0	34.8

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R3RB	0	3.18	0	3.18
R3UB	64.34	194.53	7.86	266.73
R3US	21.32	77.81	0	99.13
R3US/PSS	0	11.47	0	11.47
R4SB	7.73	7.01	0	14.74
Wetlands and Waters Total Area	12554.94	6897.87	3730.35	23183.16
No HGM				
Disturbed	163.24	645.74	75.10	884.08
Upland	8421.13	23530.85	6369.55	38321.53
No Aerial Photos	8626.26	10.59	0	8636.85
140 / toriai i flotos				

Waterbody crossings occurring along the Project route are presented in **Table 5.** A total of 132 intermittent, lower perennial and upper perennial stream and river crossings were mapped within the approximately 309-mile length of this portion of the Project route. Nine of these waterbody crossings are major crossings (>100 feet). **Table 6** shows the nine major crossings that were identified during the wetland mapping process. More detailed information on waterbody crossings can be found in the 2014 Stream Hydrology Survey Report (Alaska LNG 2014b).

Table 5. Preliminary Stream Crossings and Flow Regimes, Along the Project Route South of Livengood, by Study Spread

	Stream Classification								
	Lower Perennial (R2) Crossing		Crossing	Upper Perennial (R3) Crossing		Intermittent (R4) Crossing			
Study Spread	M ajor (>100 ft)	Intermediate (10-100 ft)	Minor (<10 ft)	Major (>100 ft)	Intermediate (10-100 ft)	Minor (<10 ft)	Major (>100 ft)	Intermediate (10-100 ft)	Minor (<10 ft)
Livengood to Healy	3	5	1	0	3	0	О	5	24
Healy to Trapper Creek	1	1	0	4	11	12	1	3	33
Trapper Creek to Cook Inlet	0	0	0	0	7	4	0	3	11
Cook Inlet to Nikiski	0	0	0	0	0	0	0	0	0
Total:	4	6	1	4	21	16	1	11	68
Grand Total:									132



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Table 6. Major Waterbody Crossings Along the Project Route South of Livengood

Major Crossings				
Study Spread	Stream Classification	Stream Name	MP	
1:		Chatanika River	438.8	
Livengood to Healy	R2	Tanana River	470.2	
ricary		Nenana River #1	478.9	
		Chulitna River	644.5	
		Yanert Fork	544.9	
Healy to	R3	Nenana River #4	563.1	
Trapper Creek	K3	Jack River	569.0	
		Troublesome Creek	643.3	
	R4	Dry Creek	528.0	

#### 3.3 NEXT STEPS

Some sections of the proposed 90% confidence Project route were revised after the 2014 field studies were underway. Two rerouted segments near Trapper Creek were pre-mapped and field verified in September. The four additional rerouted segments, any alternative segments, and off-corridor areas will need to be pre-mapped, and then field verified in 2015. Sections of the route lacking adequate aerial photography will also need to be pre-mapped and field verified. **Appendix A** lists sections of the proposed route south of Livengood that still need to be mapped and/or field verified. Additional aerial photography is expected to be delivered on 12/23/14.



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#### 4.0 ACRONYMS AND ABBREVIATIONS

APP Alaska Pipeline Project

CFR Code of Federal Regulations

DP Determination Point

FERC Federal Energy Regulatory Commission

GIS Geographic Information System

GPS Global Positioning System

HGM Hydrogeomorphic

LNG Liquefied Natural Gas

MP Milepost

NRCS National Resources Conservation Service

NWI National Wetland Inventory

OP Observation Point

PJD Preliminary Jurisdictional Determination

Project Alaska LNG

QA/QC Quality Assurance/Quality Control

ROW Right-of-Way

TNW Traditional Navigable Water

U.S. United States

USACE U.S. Army Corps of Engineers

A	aska	LNG
	CONC	-1 10

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### 6.0 APPENDICES



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APPENDIX A – SUMMARY OF 2014 WETLAND AND VEGETATION MAPPING AND FIELD TARGETS COMPLETED

### **Summary of Wetland and Vegetation Mapping**

### Livengood (MP 401) to Approximately 43 Miles South of Trapper Creek (MP 709.5)

#### > Unmapped Areas Due To Lack Of Aerial Photography

- MP 405.5 MP 432
- MP 480 MP 500.5 (we have imagery of this section, but it's very poor quality)
- MP 592.4 MP 592.8
- MP 586 MP 587.1

#### > Field Verification Of Rerouted Areas Needed

- MP 407 MP 433
- MP 440 MP 454
- MP 468 MP 516
- MP 585 MP 605

#### > 90% Confidence Area Gaps

- MP 533 MP 545
- > 2014 Field Season Field Data Point Locations

#### Wetland Points

Points Located Within The Most Current 90% Confidence Route		Points Located Outside The Current 90% Confidence Route	
Feature ID	Field Target#	Feature ID	Field Target#
W61LH001	1	W61LH006	6
W61LH002	2	W61LH007	7
W61LH003	3	W61LH010	7
W61LH004	4	W61LH008	8
W61LH005	5	W61LH009	9
W61LH023	23	W61LH011	11
W61LH024	24	W61LH012	12
W61LH025	25	W61LH013	13
W61LH026	26	W61LH014	14
W61LH027	27	W61LH015	15
W61LH028	35	W61LH016	16
W61LH029	36	W61LH017	17
W61LH031	37	W61LH018	18
W61LH032	38	W61LH019	19
W61LH033	39	W61LH020	20
W61LH034	40	W61LH021	21
W61LH035	41	W61LH047	20
W61LH036	42	W61LH022	22
W61LH037	43	W61LH030	34
W61LH038	44	W61HT038	61
W61LH039	45	W61HT032	76
W61LH040	47	W61HT033	77
W61LH041	46	W61HT035	78
W61LH042	48	W61HT034	79
W61LH043	49	W61HT007	80

W61LH044	50	W61HT008	81
W61LH045	51	W61HT009	82
W61LH046	52	W61HT013	83
W61HT001	53	W61HT014	84
W61HT011	54	W61HT015	85
W61HT010	55	W60HT039	100
W61HT012	56	W61HT016	115
W61HT004	58	W61HT017	114
W61HT003	57	W61HT018	113
W61HT005	59	W61HT019	117
W61HT002	60	W60HT054	130
W61HT037	62	W60HT055	132
W61HT036	63	W60HT025	148
W61HT025	64	W60TI051	150
W61HT026	65	W60TI040	151
W61HT024	66	W60TI039	152
W61HT023	67	W60TI046	156
W61HT027	68	W60TI045	155
W61HT028	69	W60TI044	154
W61HT030	70	W60TI042	160
W61HT029	71	W60TI043	159
W61HT006	72	W60TI041	161
W61HT022	73	W60TI047	162
W61HT021	74	W60TI048	162
W61HT031	75	W60TI037	163
W60HT002	86	W60TI036	164
W60HT001	87	W60TI035	165
W60HT003	88	W60TI032	166
W60HT033	89	W60TI034	168
W60HT034	90	W60TI031	167
W60HT015	91	W60TI030	169
W60HT028	92	W60TI027	170
W60HT029	93	W60TI028	171
W60HT030	94	W60TI029	172
W60HT031	95	W60TI023	173
W60HT032	97	W60TI024	174
W60HT035	98	W60TI025	175
W60HT037	99	W60TI020	176
W60HT038	100	W60TI019	177
W60HT040	101	W60TI022	178
W60HT041	102	W60TI017	179
W60HT042	103	W60TI018	180
W60HT024	104	W60TI015	181
W60HT026	106	W60TI016	182
W60HT027	107		
W60HT044	108		
W60HT045	109		
W60HT046	110		
W60HT048	112		
W61HT020	116		
W60HT050	119		
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W60HT049	118	1
W60HT019	122	
W60HT018	121	
W60HT051	123	
W60HT020	125	
W60HT021	126	
W60HT023	128	
W60HT004	133	
W60HT007	134	
W60HT006	135	
W60HT005	136	
W60HT053	138	
W60HT056	139	
W60HT008	142	
W60HT009	141	
W60HT010	143	
W60HT012	145	
W60HT013	146	
W60HT014	147	
W60HT057	202	
W60HT047	149	
W60HT059	203	
W60TI038	153	
W60TI049	157	
W60TI050	158	
W60TI052	205	
W60TI053	206	
W60TI054	207	
W60TI055	208	
W60TI056	209	
W60TI058	210	
W60TI059	212	
W60TI061	214	
W60TI062	215	
W60TI063	216	
W60TI064	217	
W60TI065	218	
W60TI068	220	
W60TI067	221	
W60TI014	183	
W60TI013	184	
W60TI012	185	
W60TI010	186	
W60TI008	187	
W60TI006	188	
W60TI004	190	
W60TI003	191	
W60TI001	193	
W60TI069	223	
W60T1070	224	

### • Vegetation Points

Points Located Within The Most Current			side The Current 90%
90% Confidence Route		Confidence Route	
Feature ID	Field Target #	Feature ID	Field Target #
W60HT016	91	W60TI033	166
W60HT036	98	W60TI026	173
W60HT043	103	W60TI021	176
W60HT017	120		
W60HT052	124		
W60HT022	127		
W60HT011	144		
W60HT058	202		
W60TI072	210		
W60TI057	211		
W60TI060	213		
W60TI066	219		
W60TI011	186		
W60TI009	187		
W60TI007	189		
W60TI005	190		
W60TI002	192		
W60TI071	225		

### • Wetland Observation Points

Points Located Within The Most Current		Points Located Outside The Current 90%	
90% Confidence Route		Confidence Route	
Feature ID	Field Target#	Feature ID	Field Target#
W61LH002_0P	2	W61LH006_0P	6
W61LH005_0P	5	W61LH009_0P	9
W61LH025_0P	25	W61LH011_0P	11
W61LH028_0P	35	W61LH011_0P1	10
W61LH031_0P	37	W61LH012_0P	12
W61LH033_0P	39	W61LH016_0P	16
W61LH034_0P	40	W61LH030_0P	34
W61LH035_0P	41	W61LH030_0P1	34
W61LH037_0P	43	W61HT014_0P	84
W61LH038_0P	44	W61HT015_0P	85
W61LH039_0P	45	W61HT017_0P	114
W61LH041_0P	46	W61HT016_0P	115
W61LH041_0P1	46	W61HT019_0P	117
W61LH042_0P	48	W60HT055_0P1	131
W61LH043_0P	49	W60HT055_0P	131
W61LH046_0P	52	W60TI028_0P	171
W61HT001_0P	53	W60TI023_0P	173
W61HT011_0P	54	W60TI025_0P	175
W61HT010_0P	55	W60TI020_0P	176
W61HT012_0P	56	W60TI015_0P	181
W61HT003_0P	57		

W61HT004_0P	58	
W61HT005_0P	59	
W61HT002_0P	60	
W61HT038_0P	61	
W61HT036_0P	63	
W61HT025_0P	64	
W61HT024_0P	66	
W61HT023_0P	67	
W61HT027_0P	68	
W61HT006_0P	72	
W61HT022_0P1	73	
W61HT022_0P	73	
W61HT031_0P	75	
W60HT015_0P	91	
W60HT028_0P	92	
W60HT030_0P	94	
W60HT031_0P	96	
W60HT026_0P	105	
W60HT045_0P	109	
W60HT046_0P	111	
W60HT023_0P	129	
W60HT053_0P	137	
W60HT053_0P1	140	
W60HT059_0P	203	
W60HT059_0P1	204	
W60TI052_0P	205	
W60TI055_0P	208	
W60TI063_0P	216	
W60TI068_0P	220	
W60TI013_0P	184	 
W60TI012_0P	185	
W60TI010_0P	186	
W60TI008_0P	187	
W60TI001_0P	193	

#### **Alternative Routes - South of MP 709.5**

- Mapping was completed on two alternate routes from MP 709.5 south to Nikiski. The new 90% confidence route from MP 709.5 southwest to Tyonek has also been mapped, but only where aerial imagery is available. This section of the mapping still needs a QA/QC check.
  - Mapping completed from MP 709.5 to 731, and from MP 757 to 767 (Cook Inlet).
  - Mapping not completed from MP 731 to MP 757 (aerial imagery is needed).
- ➤ Field verification is needed for all alternate routes south of MP 709.5.
- ➤ There is no 90% confidence route for any segments on the Kenai Peninsula



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APPENDIX B - 2014 WETLAND DETERMINATION FIELD SURVEY PROTOCOLS

# Alaska LNG

# **2014 Wetland Determination**

# **Field Survey Protocols**

USAKE-UR-SPFLD-00-0008

Rev	Rev date	Description	Prepared By	Checked By	Endorsed By	Approve d By
A	3.20.14	Issued for Review and Comment	VW			
0	4.4.14	Issued for Information				
1	4.16.14	Issued for Information				
2	5.20.14	Issued for Information				

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AL AGICA L NC	FIELD SURVEY PROTOCOLS	April 2014
ALASKA LNG		Revision: 2
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	WETLAND DETERMINATION	USAKE-UR-SPFLD-00-0008
ALAGICA L NC	FIELD SURVEY PROTOCOLS	April 2014
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# REVISION MODIFICATION LOG

Revision	Section	Description
2	3.7, 3.10	Removed information on determining jurisdictional status of wetlands.

	WETLAND DETERMINATION	USAKE-UR-SPFLD-00-0008
A. AOVALNO	FIELD SURVEY PROTOCOLS	April 2014
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#### **FIGURES**

FIGURE 1 PROPOSED ALASKA LNG ROUTE

Note – All pipeline routing and/or facility siting information described in this document should be considered preliminary and subject to change.

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#### **ACRONYMS AND ABBREVIATIONS**

CFR Code of Federal Regulations

FCI Functional Capacity Index

FERC Federal Energy Regulatory Commission

GIS Geographic Information System

GPS Global Positioning System

GTP Gas Treatment Plant

HGM hydrogeomorphic

LNG liquefied natural gas

MP milepost

MSB Matanuska Susitna Borough

NRCS Natural Resources Conservation Service

NWI National Wetland Inventory

PBU Prudhoe Bay Unit
PTU Point Thomson Unit

ROW right-of-way

RPW Relatively Permanent Water

U.S. United States

USACE U.S. Army Corps of Engineers
USFWS U.S. Fish and Wildlife Service

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#### 1.0 PROJECT DESCRIPTION

BP, ConocoPhillips, ExxonMobil, and TransCanada are currently developing a potential project, known as the Alaska LNG Project, to treat, transport, and deliver natural gas from the Alaska's North Slope to a new liquefied natural gas (LNG) plant and marine terminal on Cook Inlet (the "Project"). The proposed Project includes the following major components in Alaska: an LNG Plant, a Gas Pipeline, a Gas Treatment Plant (GTP), a Prudhoe Bay Unit (PBU) Gas Transmission Line, and a Point Thomson Unit (PTU) Gas Transmission Line. In October 2013, the Project selected a site in the Nikiski area on the Kenai Peninsula as the preferred location for a proposed natural gas liquefaction plant and marine terminal. Pipeline routing definition from the Prudhoe Bay Unit to the plant location is ongoing.

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Figure 1. Proposed Alaska LNG Route

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#### 2.0 INTRODUCTION

Alaska LNG will conduct wetland determination surveys to verify the pre-field mapping wetland types and boundaries of all waters of the United States (U.S.), including wetlands, within the defined corridor and in specific areas along the Project route. The 2014 field survey will be conducted on a limited basis focusing portions of the route between Livengood and Trapper Creek, Alaska.

All waters of the U.S. are regulated by the U.S. Army Corp of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. All projects, as part of the Section 404 permitting process, must avoid impacts to wetlands wherever possible, minimize impacts to wetlands to the maximum extent practicable, and compensate for all unavoidable wetland impacts.

Results of the wetland surveys will facilitate the eventual evaluation of project-related direct, indirect, and cumulative impacts under the Federal Energy Regulatory Commission (FERC) Resource Report 2 (Water Use and Quality), the National Environmental Policy Act, and Section 404 and Section 10 permits administered by the USACE.

This document presents the wetland determination field survey protocols that will be used during the 2014 field season. It discusses the protocols used in both the field and office for delineating the boundaries of areas that are regulated by USACE and may be impacted by the proposed project.

#### 2.1 OBJECTIVES

The main objectives for the Alaska LNG 2014 wetland field season are:

- Complete wetland surveys in the vicinity of the pre-selected field targets;
- Collect data at field-selected observation points and at additional wetland determination points where necessary to adequately update the field maps; and
- Update the pre-field wetland mapping based on results of the field data.

#### 2.2 PROJECT AREA

The wetlands survey area for the project is divided into two corridors: A wetland mapping corridor and a field survey corridor. The mapping corridor has been preliminarily established as a 2,000 foot corridor (1,000 feet on either side of the proposed alignment centerline). This mapping corridor width may be modified, with the approval of USACE, to exclude terrain features such as steep mountain slopes or lands on the far side of rivers, which are not under consideration for use. All wetlands and waterbodies will be mapped within the mapping corridor using aerial photograph interpretation. The smaller field survey corridor is 300-feet-wide (150-feet on each side of the proposed alignment centerline) and centered within the mapping corridor. Field work will be concentrated within the field survey corridor, ensuring that the wetland field work occurs near areas most likely to be disturbed by the proposed project.

The Alaska LNG field survey area south of Livengood is divided into four geographic spreads for planning purposes:

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- Livengood to Healy, milepost (MP) 399-520;
- Healy to Trapper Creek, MP 520-660;
- Trapper Creek to Cook Inlet, MP 660-743; and
- Cook Inlet to Nikiski, MP 743-806.

The 2014 field season will focus on areas along this Project corridor, approximately between Livengood and Trapper Creek.

The Alaska LNG project route south of Livengood will pass through two ecoregions, Boreal-Intermontane Boreal and Alaska Range Transition, with five sub-ecoregions, as described by Nowacki et al. (2001). Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions. The Alaska LNG corridor, south of Livengood, begins in the Ray Mountains, continues south and passes through the Tanana-Kuskokwim Lowlands, briefly passing through the Yukon-Tanana Uplands, and then through the Alaska Range, before ending in the Cook Inlet Basin sub-ecoregion.

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#### 3.0 METHODS

#### 3.1 OVERVIEW

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." These wetlands are considered to be waters of the U.S. and are within the jurisdiction of the USACE (33 Code of Federal Regulations (CFR) Part 328.3[b]).

Other non-wetland waters of the U.S. under the jurisdiction of the USACE include deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by the USACE (Federal Register 1982). Unvegetated ponds, lakes, and river channels in the survey area are classified as other waters of the U.S., but not wetlands.

Uplands are non-wetland areas that are neither deepwater aquatic habitats, nor other special aquatic sites.

All wetlands and other waters of the U.S. in the preliminary Alaska LNG corridor will be delineated and classified using standard National Wetland Inventory (NWI) codes as described in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Cowardin classifies wetlands and aquatic habitats by system, subsystem, class, subclass, and water regime and is based on hydrologic setting (riverine, lacustrine, estuarine, palustrine), vegetation structure (forested, scrub-shrub, emergent, aquatic bed), and water regime (saturated, temporarily flooded, seasonally flooded, semi-permanently flooded, etc.).

One deviation from standard NWI protocols for this project will be the use of two non-wetland categories. One category will include all vegetated uplands. The other will be labeled "Disturbed/Fill" and include uplands that have been impacted by human development, including all roads, gravel pads, buildings, and farmland.

Standard methods are used to delineate wetlands for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) wetland pre-mapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of wetland pre-mapping based on results of field efforts.

#### 3.2 WETLAND PRE-MAPPING

The wetland pre-mapping has been completed for the preliminary Alaska LNG route. Wetland boundaries were delineated on digital ortho-rectified and geo-referenced true color aerial photography with 1.6-foot pixel resolution using the following aerial imagery:

- Healy Area Orthophoto (U.S. Census Bureau 2006);
- Digital Orthophoto Quarter Quadrangles Anderson Area (Natural Resources Conservation Service, NRCS, 2006);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a);
- Southern Corridor Ortho Mosaic (Digital Globe 2013b);

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- Talkeetna Aerial Orthophoto (Matanuska Susitna Borough, MSB, 2011a);
- Caswell Aerial Orthophoto (MSB 2011b);
- Willow Aerial Orthophoto (MSB 2011c);
- Point MacKenzie Aerial Orthophoto (MSB 2011d); and
- Nikiski Area Aerial Orthophoto (Kenai Peninsula Borough 2006).

Data from the following sources was also used during the mapping process:

- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) digital datasets and hardcopy maps;
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging (LIDAR) generated topographic contours (TransCanada 2011, MSB 2011e);
- Kenai Watershed Forum Cook Inlet Wetlands for the Kenai Peninsula and the Matanuska Susitna Boroughs (Gracz 2011);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;
- U.S. Geological Survey Digital Raster Graphics (e.g., topographic maps);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

All wetland mapping was created in a GIS geodatabase, using a "heads-up" digitizing effort. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. This is the generally accepted wetland and deepwater habitat mapping technique employed by the U.S. Fish and Wildlife Service personnel as part of the NWI program (Dahl *et al.* 2009). Data sources were overlaid on aerial photography and wetland, non-wetland, and areas of uncertain wetland status were identified by interpreting color, texture, and landscape position, among other elements. Aerial photography clues can include dwarf or stunted trees, topography characteristics (such as swales, toe slopes and depressions), and obvious signs of inundation.

All wetlands were mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer. Lakes, ponds and rivers were mapped at a scale of 1:1,200 (1 inch to 100 feet). Larger rivers and streams were delineated as polygons. Smaller streams, those with bankfull widths of approximately 10 feet or less, were mapped as vector lines.

#### 3.3 FIELD TARGET SELECTION

Field targets were selected based on changes in the wetlands types, aerial vegetation signatures, NWI classification, and NRCS soil classification. The primary focus of the pre-

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selected field targets will be to characterize specific wetland types which represent all similar wetland types in the region and to identify wetland/upland boundaries by selecting paired plots. Field targets will be used to confirm areas where wetland Subject Matter Experts have high confidence in their aerial interpretation, and will be used to confirm or correct wetland boundary locations. Field targets were also placed in low-confidence areas to provide field data where the photo signatures or landscape features were not clearly indicative of wetland or upland. The USACE may want to review and approve the 2014 field target locations that are selected to ensure that an appropriate range of representative wetlands are sampled.

Field targets may be re-evaluated based on the status of land access permissions. When necessary, new field targets will be located on nearby accessible parcels in areas with similar aerial photography vegetation signatures and site conditions as the original field targets.

#### 3.4 WETLAND FIELD DATA COLLECTION

Wetland determinations will be made using the USACE Wetlands Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Regional Supplement) (2007a).

In order for an area to be identified as a wetland, the following three parameters must be present:

- Hydrophytic vegetation: The prevalent vegetation must be adapted to areas of saturated or inundated soils.
- <u>Hydric soils:</u> The soil must be classified as hydric or possess characteristics that are associated with reducing soil conditions.
- <u>Wetland hydrology:</u> The area must be inundated or saturated at some time during the growing season.

Field targets will be accessed via existing highways and secondary roads where available. A helicopter will be required to access remote sites. A Global Positioning System (GPS) device will be used to locate sites and to collect coordinates. At each field target, a USACE Wetland Determination Data Form – Alaska Region (Appendix A) will be used to determine if the site is a wetland, other water of the U.S., or upland. All wetlands and waterbodies will be delineated and classified using NWI codes. The GPS device will also be used to collect limited field data on an electronic form that will be developed for the Project.

Field crews will also collect qualitative wetland data at observation points and establish additional field targets and complete *Wetland Determination Data Forms* where necessary, and will not be limited by the pre-selected field targets. The field crews will identify changes in wetland types or wetland/upland boundaries not easily identified on the aerial photography. Wetland scientists will use their best professional judgment and collect appropriate field data to adequately revise the wetland pre-mapping. A detailed wetland field survey gear list is provided in **Appendix B**.

#### 3.5 MAP REVISIONS

As wetlands field data becomes available, the field data will be downloaded in the office and plotted on the base maps of the corridor. The location of each plot will be attributed with the

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information collected in the field. This allows the creation of a reference dataset linking an aerial photography signature to a wetland status and vegetation type. This reference dataset will be used to finalize the mapping of the 2,000-foot corridor.

#### 3.6 WETLAND FUNCTIONAL ASSESSMENT

Wetlands are known to provide a variety of ecological functions depending on the location and type of wetland. At sites determined to be wetland, a *Wetland Functional Assessment Data Sheet* (**Appendix A**) will be collected. Information from this data sheet will be incorporated into the functional models described in *A Rapid Procedure for Assessing Wetland Functional Capacity* (Magee and Hollands 1998). Magee and Hollands have identified five hydrogeomorphic (HGM) classes of wetland that occur in Alaska.

- <u>Depressional wetlands:</u> Depressional wetlands occur in a topographic depression. Predominant water sources are direct precipitation, surface water runoff, and groundwater (Brinson 1976).
- <u>Slope wetlands:</u> Slope wetlands generally occur on a hillside and water flow is predominantly unidirectional parallel to the slope. The water source is primarily groundwater and occasionally precipitation (Brinson 1976).
- <u>Lacustrine fringe wetlands:</u> A lacustrine fringe wetland borders a lake and lacks any topographic features. The water source is surface water and flow is bidirectional.
- <u>Flat wetlands</u>: There are two types of flats wetlands: organic and mineral flats. Flat wetlands in Alaska are primarily organic flats. Organic flats "can occur on relatively gentle to moderate slopes up to 20% in steepness. In relatively undisturbed conditions and without significant human alteration, the dominant hydrodynamics are vertical, even on relatively gentle to moderate slopes (i.e. slopes < 20%). Specifically, the main hydrologic input to wetlands within the organic soil flat class in interior Alaska is precipitation" (ADEC/USACE 1999).
- <u>Riverine wetlands:</u> Riverine wetlands are adjacent to rivers and are dominated by overbank flooding. Water flow is bidirectional locally with an overall regional flow down the river valley.

Magee and Hollands use these HGM classes to compare the functions of wetlands within a particular HGM class. Each HGM class represents a separate functional model, which is used to define the Functional Capacity Index (FCI) of eight functions. The eight functions identified by Magee and Hollands are listed below.

- Modification of groundwater discharge: The capacity of a wetland to influence the amount of water moving from the groundwater to surface water.
- <u>Modification of groundwater recharge:</u> The capacity of a wetland to influence the amount of water moving from surface water to groundwater.
- <u>Storm and flood-water storage:</u> The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface.
- Modification of stream flow: The modification of inflow hydrology by the wetland to produce the outlet stream's hydrology.

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- Modification of water quality: Removal of suspended and dissolved solids from surface water and dissolved solids from groundwater and conversion into other forms, plant or animal biomass, or gases. Wetlands with a low slope-angle or location in depressions provide a high level of this function.
- Export of detritus: Export of organic detritus from the wetland to adjacent and downstream aquatic ecosystems.
- Contribution to abundance and diversity of wetland vegetation: The capacity of a wetland to produce an abundance and diversity of hydrophytic plant species individually or as part of a group of wetlands in a local landscape (Tiner 1984).
- Contribution to abundance and diversity of wetland fauna: The capacity of a wetland to support large and / or diverse populations of animal species that spend part or all of their lifecycle in wetlands, individually, or as part of a mosaic of wetlands in a local landscape.

The Magee and Hollands functional assessment method requires site-specific information to be entered into a model that will produce a FCI for each wetland function. The FCI indicates the potential degree to which the wetland performs the function and is only comparable to other wetlands within the same HGM class and region. The FCI scale is from 0.0 to 1.0. Most of the model inputs will be collected in the field, with the remaining variables taken from available GIS datasets (such as wetland size and land ownership). The results from the functional assessment models will be extrapolated to the applicable wetlands within the mapping corridor. This information will potentially serve as the basis to determine appropriate compensatory mitigation for the unavoidable impacts of the project. The Wetland Functional Assessment Data Sheet will be reviewed and adjusted as necessary to collect appropriate data for the different ecoregions.

#### 3.7 JURISDICTIONAL DETERMINATION

USACE regulates wetlands and other waters of the U.S. that are under their jurisdiction. Jurisdictional status is based on connectivity to Traditional Navigable Waters (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]). Field visits by USACE, the Federal Energy Regulatory Commission, the Environmental Protection Agency, and the Owner's Representative could also be conducted (with minimal notice) to observe field survey teams while they are conducting wetland delineations, and to review protocols and any data collected.

The Project, similar to other large pipeline and energy projects permitted by the USACE, will assume that all wetlands found fall under USACE jurisdiction. Because the FERC requires that the Project adhere to certain construction requirements in all wetlands, regardless of jurisdiction, the Project will assume that all wetlands found will be within the USACE jurisdiction for permitting, mitigation, and construction method purposes.

#### 3.8 DATA RECORDING AND PROCESSING

Data will be recorded on hardcopy field forms (**Appendix A**), and some of the data will be entered into an electronic data form. Electronic data files will be uploaded to a Project website

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through an internet connection or by a satellite link, and will include GPS locations, electronic data form, site photos, site sketches, and field notes.

#### 3.9 QUALITY ASSURANCE/QUALITY CONTROL

The Wetlands Technical Lead will conduct quality audits during the first week of each deployment. These audits will ensure data quality and consistency between teams, and will provide an opportunity for any problems to be corrected immediately.

Each crew member is responsible for collecting clear and accurate data according to the sampling protocol. The Field Crew Chief will review all hardcopy and electronic data forms and complete a quality assurance/quality control (QA/QC) checklist (**Appendix C**) before leaving each site.

The Field Crew Manager will ensure that all data files, hardcopy and electronic, are uploaded to the Project website. These transmitted files will then be downloaded and reviewed by office-based data management staff. The Wetland Technical Lead will check each hardcopy data sheet and electronic data form for quality and consistency, as it is received. If problems arise, the field crew will be notified promptly to ensure that any data quality issues are corrected immediately.

#### 3.10 REPORTING

The results of the 2014 field work will be compiled into a field survey report at the end of the season. The report will include a GIS dataset comprised of field-verified wetland mapping, field sample locations, and data collected at each site. It will also outline the field survey methods and identify all wetland types found throughout the corridor describing common plant species, hydrology indicators, and hydric soil indicators.

After the 2015 wetland field season, a report on the Wetland Functional Assessment for all wetlands surveyed will be provided. The Wetland Functional Assessment will be submitted to USACE for review and concurrence. Once USACE concurs, the wetland boundaries delineated will be used to calculate project impacts for Section 404 permitting. The Wetland Functional Assessment will help USACE characterize the impacted wetlands to determine appropriate compensatory mitigation for the unavoidable project impacts to wetlands and other waters of the U.S.

Results of this survey will be provided in the FERC Resource Report 2.

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#### 4.0 FIELD STUDIES EXECUTION

Field study execution details are currently being developed. **Appendix D** will include field execution details consisting of: field crew composition, schedule and march charts, field target maps, and general project-wide permits and approvals. Field safety will also be discussed and a specific Job Safety Analysis (JSA) developed for wetland surveys will be included.

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# 6.0 APPENDICES

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# APPENDIX A – WETLAND DETERMINATION DATA FORM

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Date: Investigators: State: Alaska Latitude: Logbook No SITE PARAMETERS Subregion: Slope (%): Pre-mapped Alaska LNG/NWI classificat Are climatic/hydrologic conditions on the YesNo(if no expla Are Vegetation, Soil or Hydi Are Vegetation, Soil or Hydi SUMMARY OF FINDINGS Hydrophytic Vegetation Present? Yes	site typical for this time on in Notes) rology Significantly rology Naturally Pr	Longitude of year? ly Disturbed?	Milepost:  Picture No.:  Landform (hill Local relief (or Soil Map Unit Are "No Yes  No No	ormal Circumstances"	Datum:  Datum:  pocks, etc.):  present: explain in (Noles.)
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Welland Hydrology Present? Yes_	Ñŏ				

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VEGETATION (use scientific	names of plant	5)			
Tree Stratum (Plot sizes: _ 1. 2.		Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:(A  Total Number of Dominant Species Across All Strate:(B  % Dominant Species that are OBL, FACW, or FAC:(A/
3.					
4:	211000				Prevalence Index worksheet:
	Total Cover				Total % Cover of: Multiply by:
Sapling/Shrub Stratum (	0% of total cove	Absolute	Dominant	Indicator	OBL species:X ( = FACW species:X 2 =
Saping/Sirub Statum (		% Cover	Species? (Y/N)	Status	FAC speciesX3 =  FACU speciesX4 =
۹.					UPL speciesX 5 =
2.					Column Totals: (A) (B)
3.					PI = B/A =
4.					
5.					
6.					
7.					
8.					
9.					
5	Total Cover 0% of total cover		0% of total cov	er:	
VEGETATION (use scientific	names of plant	5)		-	
Herb Stratum (	_1	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1.					Prevalence Index is ≤ 3.0
2.					Morphological Adaptations' (Provide supporting data in Notes)
3					Problematic Hydrophytic Vegetation (Explain)
4.					Indicators of hydric soil and wetland hydrology must be present unless
5.					disturbed or problematic.
6.				1	
7.					% Bare Ground
8.					% Cover of Wetland Bryophytes
9.					Total Cover of Bryophytes
10.					% Cover of Water
	Total Corre		1		Hydrophytic Vegetation Present (Y/N):
5	0% of total cover		0% of total cov	ert	Notes: (If observed, list morphological adaptations below).

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epth	Matrix		Redox Features				
nches)	Color (moist)	%	Color (moist) %	Type'	Loc2	Texture	Notes
						1	
_		-			1	1	
	1	-			+	1	1
	1						
Type: C=Co	ncentration, D=Depl	etion, RN	#=Reduced Matrix, CS=Cover	ed or Co	ated Sand G	rains. <sup>2</sup> Locatio	n: PL=Pore Lining, M=Matrix.
	LINDICATORS						FOR PROBLEMATIC HYDRIC SOIL
listosol or Hi	stel (A1)		Alaska Redox (A14)			Alaska Color	Change (TA4) <sup>4</sup>
listic Epipedo	on (A2)		Álaska Gleyed Pores (A	15)			: Swales (TA5)
lydrogen Sul	fide (A4)					1 0000000000000000000000000000000000000	x with 2.5Y Hue
hick Dark Su	urface (A12)		1 2			Alaska Gleye Layer	d without 5Y Hue or Redder Underlying
Alaska Gleyer						Other (Explai	n in Notes)
One indicator disturbed or p Give details	r of hydrophytic vego problematic of color change in No	otes.					cape position must be present unless
				to a sale			
Restrictive La	yer (if present): Typ	e:	Depth (inc	nes)			
				nes)			
Hydric Soil P	Present (Y/N):			nes):			
Hydric Soil P Notes:	Present (Y/N):					Y INDICATORS	(2 or more required)
Hydric Soil P Notes: HYDROLOGY	Present (Y/N):	ITORS (				d	(2 or more required) Stunted or Stressed Plants (D1)
Hydric Soil P Notes: HYDROLOG Surface Wate	Present (Y/N):	Su Inu	ny one indicator is sufficient) rface Soil Cracks (B6) indation Visible on Aerial Imag		SECONDAR Water-staine eaves (B9)	d	Stunted or Stressed
Hydric Soil P Notes: HYDROLOG Surface Water High Water Ti	Present (Y/N): Y PRIMARY INDICA	Su Inu	iny one indicator is sufficient) rface Soil Cracks (B6) indation Visible on Aerial Imag	lery [	SECONDAR Water-stained eaves (B9) Drainage Pat Oxidized Rhi	4	Stunted or Stressed Plants (D1)
Hydric Soil P Notes:  HYDROLOG Surface Wate High Water To	Present (Y/N):  Y PRIMARY INDICA  r (A1)  able (A2)	Su Inu	ny one indicator is sufficient) rface Soil Cracks (B6) indation Visible on Aerial Imag	ery (	SECONDAR Water-stained eaves (B9) Drainage Pat Oxidized Rhi	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Hydric Soil P Notes:  HYDROLOG Surface Wate High Water Ti Saturation (A: Water Marks	Present (Y/N):  Y PRIMARY INDICA  F (A1)  able (A2)  3)	Su Inu (B) Sp Go	iny one indicator is sufficient) iface Soil Cracks (B8) indation Visible on Aerial Imag i) arsely Vegetated incave Surface (B8)	lety (	SECONDAR  Water-staine, eaves (B9) Drainage Pat Dxidized Rhi Living Roots Presence of I ron (C4) Salt Deposits	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil P Notes:  HYDROLOG Surface Water To Saturation (A: Water Marks of	Present (Y/N):	Su Inu (Br Sp Co Ma	iny one indicator is sufficient)  rface Soil Cracks (B6)  indation Visible on Aerial Imag  r)  arsely Vegetated incave Surface (B8)  rl Deposits (B15)  drogen Sulfide	lety (	SECONDAR Water-staine, eaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4)	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG Surface Water High Water To Saturation (A: Water Marks of Sediment Deposits	Y PRIMARY INDICA  (A1)  able (A2)  (B1)  possits (B2)	Su Inu (Br Sp Co	any one indicator is sufficient)  face Soil Cracks (B6)  modation Visible on Aerial Imag  t)  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)	lety (	SECONDAR  Water-staine, eaves (B9) Drainage Pat Dxidized Rhi Living Roots Presence of I ron (C4) Salt Deposits	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG Surface Water High Water Ti Saturation (AC Water Marks of Sediment Deposits Algal Mat or C	Present (Y/N):	Su Inu (Br Sp Co	iny one indicator is sufficient) inface Soil Cracks (B6) indation Visible on Aerial Imag i) arsely Vegetated incave Surface (B8) irl Deposits (B15) drogen Sulfide or (C1) /-Season iter Table (C2)	lety (	SECONDAR  Water-staine, eaves (B9) Drainage Pat Dxidized Rhi Living Roots Presence of I ron (C4) Salt Deposits	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG Surface Water High Water Ti Saturation (AS Water Marks of Sediment Deposits Algal Mat or C ron Deposits	Present (Y/N):	Su Inu (Br Sp Co	iny one indicator is sufficient) inface Soil Cracks (B6) indation Visible on Aerial Imag i) arsely Vegetated incave Surface (B8) irl Deposits (B15) drogen Sulfide or (C1) /-Season iter Table (C2)	ery (	SECONDAR Water-stainer, eaves (B9) Drainage Pat Dxidized Rhis Living Roots Fesence of it ron (C4) Fall Deposits Notes:	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Hydric Soil P Notes:  HYDROLOG Surface Water To Saturation (A: Water Marks of Sediment Deposits Algal Mat or C ron Deposits Surface Wate	Present (Y/N):	Su Inu (Br Sp Co	any one indicator is sufficient)  riace Soil Cracks (B6)  Indation Visible on Aerial Image arsely Vegetated Incave Surface (B8)  In Deposits (B15)  Indrogen Suffice In (C1)  In Season Iter Table (C2)  Inter (Explain in Notes):	ery (	SECONDAR Water-stainer, eaves (B9) Drainage Pat Dxidized Rhis Living Roots Fesence of it ron (C4) Fall Deposits Notes:	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG Surface Water High Water To Saturation (AC Water Marks of Sediment Deposits Algal Mat or Co Iron Deposits Surface Wate	Present (Y/N):  Y PRIMARY INDICA  (A1)  able (A2)  (B1)  Crust (B4)  (B5)  Present (Y/N):  esent (Y/N):	Su Inu (Br Sp Co	iny one indicator is sufficient)  riface Soil Cracks (B6)  indation Visible on Aerial Imag  r)  arsely Vegetated incave Surface (B8)  rl Deposits (B15)  drogen Sulfide  or (C1)  -> Season iter Table (C2)  iner (Explain in Notes):  Depth (in):	ery (	SECONDAR Water-stainer, eaves (B9) Drainage Pat Dxidized Rhis Living Roots Fesence of it ron (C4) Fall Deposits Notes:	tems (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

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VEGETATION VARIABLES P= Pic	ot, N= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	or Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m to Dwarf shrub (<0.5m) Tall herb	all) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) (≥1m) Short herb (<1m) Moss-Lichen Floating Submerged
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
	arse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60
Interspersion of Cover & Open Water ( Peripheral Cover26-75% Scat	P): 100% Cover or Open Water <25% Scattered/Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 pl	ant species) Medium (5-25 species) High (>25)
	e) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (	P): No Veg Solitary, Scattered Stems 1 or More Large Patches Parts of Site   Continuous Cover
Dead Woody Material (P) Low Abundar Abundant (>50% of surface)	nce (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (la High (small groupings, diverse and inters	arge patches, concentric rings) Moderate (broken irregular rings)
HGM Class (P): Slope Flat	Lacustrine Fringe Depréssional Rivenine Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P) Soil Lacking	Histosol:Fibric Histosol;Hemic Histosol: Sapric hdy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No ttent Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenn
Wetland Water Regime (P): Drier: \$ Wet: Perm. Flooded, Intermittently Expos	Seasonally Flooded, Temporarily Flooded, Saturated ed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evi	
	sentPoorly Developed (6in.)Well Developed (6-18in.)Pronounced (>18in.)
Frequency of Overbank Flooding (P): N Return Interval >5 yrs	lo Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No On	
a at camer castriation (i.). No co	tflow Restricted Outflow Unrestricted Outflow
Water pH (P): No water Circui	tflow
Water pH (P): No water Circui	mneutral (5.5-7.4) Akaline (>7.4) Acid (<5.5) pH Reading  d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Water pH (P): No water Circur Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable Basin Topographic Gradient (M): L	mneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Water pH (P): No water Circur Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable Basin Topographic Gradient (M): L Evidence of Seeps and Springs (P): No	mneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Ow Gradient (<2%) High Gradient (≥2%)
Water pH (P): No water Circur Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable Basin Topographic Gradient (M): L Evidence of Seeps and Springs (P): No LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Wetland Is	mneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Ow Gradient (<2%) High Gradient (≥2%)
Water pH (P): No water Circuit Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable Basin Topographic Gradient (M): L Evidence of Seeps and Springs (P): No LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Wetland Isonly Connected Above Conn	mneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Ow Gradient (<2%) High Gradient (≥2%) Perennial Spring Perennial Spring  Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring  Olated Wetlands within 400m, Not Connected Only Connected Below
Water pH (P): No water Circuit Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable Basin Topographic Gradient (M): L Evidence of Seeps and Springs (P): No LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Wetland Iso Only Connected Above Connected Above High Intensity (i	mneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Water pH (P): No water Circuit Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable Basin Topographic Gradient (M): L Evidence of Seeps and Springs (P): No  LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Wetland Iso Only Connected Above Connected Above High Intensity (i) Watershed Land Use: 0-5% Rural	meutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading d (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits

Alaska LNG	WETLAND DETERMINATION	USAKE-UR-SPFLD-00-0008
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# APPENDIX B - WETLAND SURVEY GEAR LIST

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Wetland and Vegetation Gear	Communication
1 – Sharp shooter shovel (fiberglass, not wood handle)	1 - VHF Radio
1 – U-Dig-it (Hand shovel)	1 - charger for vhf radio
1 – Compass	1 - Iridium Satellite Phone
1 – Hand lens	1 charger for satellite phone
1 – Leatherman/sample knife (folding) 4" serrated	Safety/Survival Pack (Need for 2teams)
1 – Digital camera	2 – Sleeping Bags
1 - calculator	1 – Tent
1 – extra batteries for digital camera	1- Wilderness First Aid Kit
1 – pH meter (pen kind) with storage solution	1 - Flare gun kit
1 – Pocket rod (measuring tape)	1 - Emergency procedures Manual
1-Opaque small spray bottle filled with alpha-alpha dipyridyl	1 - Iodine Tablets/Filter
2 packages – gallon Ziploc bags	1 - 50' Nylon Rope/Parachute cord
1 package- pint Ziploc bags	1 – small Flashlight/headlamp (for soil pit)
1- Squirt Water bottle (for moistening soil to color)	2 - Space Blankets
200+ – USACE Wetland Determination Form – Alaska Region (on Rite-in-	2 - Space Blankets
the-Rain) with functional assessment	1 Poor Sproy
,	1 – Bear Spray 1 – Tarp (10' x 12')
1 set – Field Maps on Rite-in-the-Rain	1 - Tarp (10 x 12 ) 1 - Gloves - Work/Latex/Insulated rubber
4+ - Rite-in-the-Rain Field notebooks (spiral with lines)	
12+- Mechanical Pencils w/ extra lead	matches
12+- Sharpies (red and black)	1 – Roll of duct tape
1- Laptop Computer (for downloading data every night)	Flagging tape (1 bright color per team)
2 – Clipboards	BPA-free water jug
Extra Rite-in-the-Rain paper	Personal Gear
1 – 12 inch file (for shovel sharpening) with handle	1 - Xtratuffs
1 – scissors	1 – Felt insoles for Xtratuffs
1 – tape	1 - Blaze Orange Surveyor Field Vest
2 – post it notes	1 - Mosquito Head Net
2 – toilet paper	1 – Rain Jacket/Pants
1-Roll of duct tape	2 - Bug Spray
1 – (see through) small dry bag for soil kit	2 – Sunblock
1 – (see through) medium dry bag for field reference materials	1 – Sun Glasses
1 – dry erase board (for pictures)	1 - Water Bottle
1 – plant press	1 - Backpack
Books	1 - Hat
1 – Munsell Soil Color charts	Cell phone and charger
1 – Flora of Alaska and Neighboring Territories – Eric Hulten	1 – umbrella
1 – Trees and Shrubs – Viereck	Boot dryers
1 – Western Boreal Forest and Aspen Parkland – MacKinnon and Pojar	
1 – Wetland Sedges of Alaska – Tande and Lipkin	
1 – Willows of Interior Alaska – Collett	
1 – National List of Plant Species that Occur in Wetlands – Alaska Region -	
Reed 1988 (print)	
1 – Field Guide to Alaskan Wildflowers – Verna Pratt	
1 – Field Guide to Alaskan Wildriowers – Verna Fratt  1 – Wildflowers along the Alaskan Highway – Verna Pratt	
1 – Rapid Procedure for Assessing Wetland Functional Capacity: Based on	
HGM Classification – Hollands and Magee (print)	
1 – 1987 Wetland Delineation Manual (print)	
1 – 1987 Wetland Defineation Manual (print)  1 – 2007 Regional Supplement to the Corps of Engineers Wetland Delineation	
Manual – Alaska Region (print)  1 – Classification of Wetlands and Deepwater Habitats – Cowardin (print)	
1	
1 – Hydric soils in Alaska (print)	

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# APPENDIX C - QA/QC CHECKLIST

Alaska LNG	WETLAND DETERMINATION	USAKE-UR-SPFLD-00-0008
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# Wetland Determination Data Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID:	Field Target:	Date:	
For all	item	ns not checked, please provide detailed explanation	in the notes section of data form.	
1.	Sit	e Description		
		Site description, site parameters and summa A detailed site sketch is included?	ry of findings are complete?	
2.	Ve	getation		
		At least 80% of onsite vegetation has been kidentification?  Vegetation names are entered legibly for all so Cover calculations are complete and correct?  All dominant species have been determined a Indicator status is correct for each species?  Dominance Test and Prevalence Index have	etrata present?  and recorded per strata?	er
3.	So	il		
		Soil profile is complete? Appropriate hydric soil indicators are marked	?	
4.	Ну	drology		
		Appropriate hydrology indicators are marked Surface water, water table, and saturation de		
5.	Fu	nctions and Values		
		Vegetation, soil, hydrologic variables, and lar wetland?	ndscape variables complete if site is	а
6.	Fie	eld Logbook		
		Notes have been recorded at each site, inclu accuracy of pre-mapped wetland boundary a		d

Y	Y	
Wetland Scientist (p	nt) Signature / Date	
X	X	
soil p	photos were taken for each Wetland Determina t, 1 soil plug)? hotos were taken for each Observation Point (	
8. Photos		
	nd boundaries have been corrected if necessa are initialed and dated?	ry?
7. Maps		
□ Each	ogbook page is initialed and dated?	
	CONCEPT INFORMATION - CONFIDENTIAL	
Alaska LNG	FIELD SURVEY PROTOCOLS	APRIL 2014 REVISION: 2
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Signature / Date

Field Crew Chief (print)

	WETLAND DETERMINATION	USAKE-UR-SPFLD-00-0008
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# APPENDIX D - FIELD STUDIES EXECUTION



# 2014 WETLAND STUDY REPORT – LIVENGOOD (MP 401) TO TRAPPER CREEK (MP 709.5)

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# APPENDIX C – 2014 WETLANDS FIELD DATA SUMMARY TABLE AND U.S. ARMY CORPS OF ENGINEERS ALASKA DISTRICT WETLAND DETERMINATION FORMS

(Provided in a Digital Format)



# 2015 WETLAND FIELD STUDY REPORT

USAI-P1-SRZZZ-00-000002-000

Rev		Date	Revision [	Description	Originate	or	Reviewer / Endorser	Respo Cod		Ар	prover
Α	11/	24/15	Issued for Review and Comment		V. Watkins						
0	12/17/15		Issued for Us	эe	V. Watkins						
Docur	ment	Country	Facility	Originator	Discipline	Type	Sub-Type	Location	Sec	quence	Identifier
Contro	l No.	US	Al	P1	S	R	ZZZ	00	00	00002	000



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**DATE: DECEMBER 17, 2015** 

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#### **A**UTHORIZATION

**ENDORSED BY:** 

NAME: MIKE GRAY

TITLE: AECOM PROGRAM MANAGER

**REVIEW** 

REVIEWED BY: DATE: DECEMBER 17, 2015

NAME: DAVID ERIKSON TITLE: SENIOR BIOLOGIST

**PREPARATION** 

PREPARED BY: NAME: VALERIE WATKINS

TITLE: WETLAND AND VEGETATION LEAD

**DATE: DECEMBER 17, 2015** 



## 2015 WETLAND FIELD STUDY REPORT

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# **REVISION MODIFICATION LOG**

Revision	Section	Description
	1.2	Figure 1-1 was revised. Eastern route alternative was removed.
	1.3	Added information about sampling within both the 2000 ft and 300 ft corridors.
	2.0	Added reference information concerning USACE approval of protocols and data.
	2.1	Added FERC definitions for wetlands and waterbodies.
	2.1.3	Figure 2-1 was revised. Eastern route alternative was removed.
	2.3	Added pixel resolution to aerial imagery sources.
	2.5.2	Added references that protocols were provided to USACE and FERC
	2.8	Added statement that we received guidance from USACE.
	2.9	Added reference concerning the USACE review of our data.
	3.3	Added clarification for next steps.
	4.0	Added acronyms.
	5.0	Five references were added.
	6.0	Appendix A, C, and E were embedded in document.

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#### 1.0 PURPOSE AND SCOPE

This 2015 Wetland Field Study Report provides a review of the wetlands that were mapped and field surveyed for the Alaska Liquefied Natural Gas (LNG) Project (Project) during the 2015 field season. The 2015 field verification data was combined with field data collected in 2010, 2011, and 2014, and was used to further refine the wetland mapping. The area that was surveyed in 2015 includes the proposed Project's Revision (Rev) B route from Nikiski milepost (MP) 804, northwest across Cook Inlet to Beluga (MP 764) then continuing north along the Rev B route into the Brooks Range foothills where the northern extent of field data collection occurred (approximately milepost, MP, 86) (Figure 1-1). Results presented in this report include the entire Rev B route and off right-of-way (ROW) roads and facilities. It is anticipated that the 2016 Wetland and Vegetation Field Study Report will provide results for the final route, including data on additional off-ROW areas.

#### 1.1 PROJECT DESCRIPTION

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, and ExxonMobil Alaska LNG LLC, (Applicants) plan to construct one integrated LNG Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and opportunity for in-state deliveries of natural gas.

The Natural Gas Act (NGA), 15 U.S.C. § 717a(11) (2006), and Federal Energy Regulatory Commission (FERC) regulations, 18 C.F.R. § 153.2(d) (2014), define "LNG terminal" to include "all natural gas facilities located onshore or in State waters that are used to receive, unload, load, store, transport, gasify, liquefy, or process natural gas that is ... exported to a foreign country from the United States." With respect to this Project, the "LNG terminal" includes the following: a liquefaction facility (Liquefaction Facility) in Southcentral Alaska; an approximately 800-mile, large diameter gas pipeline (Mainline); a gas treatment plant (GTP) on the North Slope; a gas transmission line connecting the GTP to the PTU gas production facility (PTU Gas Transmission Line or PTTL); and a gas transmission line connecting the GTP to the PBU gas production facility (PBU Gas Transmission Line or PBTL). All of these facilities are essential to export natural gas in foreign commerce.

#### 1.2 Purpose

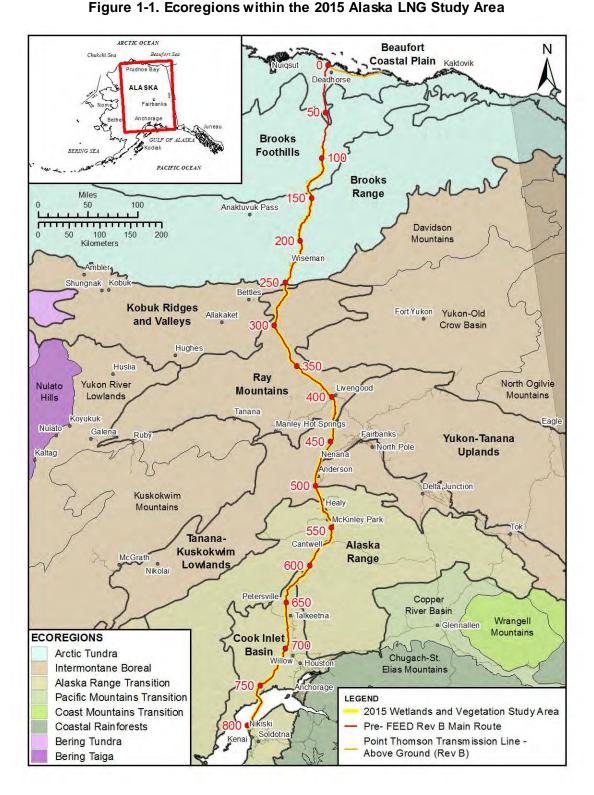
The purpose of wetlands and waterbodies mapping is to identify on aerial imagery potential "Waters of the United States (U.S.), including wetlands," that are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (40 Code of Federal Regulations [CFR] Part 230) and Section 10 of the Rivers and Harbors Act (33 CFR Part 328.3[b]) that may be impacted by the Project. As part of the Section 404 permitting process, all projects must avoid impacts to wetlands whenever possible, minimize impacts to wetlands to the maximum extent practicable, and compensate for all unavoidable wetland impacts.

Field surveys were conducted in 2015 to verify the accuracy of wetland types and boundaries as determined in pre-field mapping using aerial photo interpretation. Field data will be used to improve the accuracy of future Project wetland mapping efforts. This information is required for the National Environmental Policy Act (NEPA) process as expected to be administered by FERC and for Section 404 and Section 10 permits administered by the USACE. Additionally, this data will constitute baseline information for the FERC's Resource Report No. 2 and to comply with requirements in FERC's Wetland and Waterbody Construction and Mitigation Procedures (FERC 2013).

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Figure 1.1 Fooragions within the 2015 Alaska I NG Study Area



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#### 1.3 STUDY AREA

The 2015 field season focused on the Project's proposed Rev B route, which contains numerous centerline modifications from what was reported in the 2014 Wetland Field Study Report (Rev A 90% confidence route). Field verification during the 2015 season occurred from the southern terminus of the route at Nikiski, Alaska, (MP 804) to Cook Inlet at MP 792, then from the west side of Cook Inlet (MP 764), along the Rev B route to the Brooks Range foothills near MP 86.

The Project route passes through three ecoregions with nine sub-ecoregions (Figure 1-1), as described by Nowacki et al. (2001):

- Alaska Range Transition Ecoregion
  - o Cook Inlet Basin Sub-Ecoregion
  - Alaska Range Sub-Ecoregion
- Intermontane Boreal Ecoregion
  - Tanana-Kuskokwim Lowlands Sub-Ecoregion
  - Yukon-Tanana Uplands Sub-Ecoregion
  - Ray Mountains Sub-Ecoregion
  - o Kobuk Ridges and Valleys Sub-Ecoregion
- Arctic Tundra Ecoregion
  - Brooks Range Sub-Ecoregion
  - Brooks Foothills Sub-Ecoregion
  - o Beaufort Coastal Plain Sub-Ecoregion

Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions (World Wildlife Fund 2015). The Alaska LNG corridor studied during the 2015 field season begins in the Cook Inlet Basin, continues through the Alaska Range, and then continues through the Tanana-Kuskokwim Lowlands, Yukon-Tanana Uplands, Ray Mountains, Kobuk Ridges and Valleys, then up through the Brooks Range before ending in the Brooks Foothills (near MP 86). No field work was completed north of the Brooks Foothills ecoregion in 2015, since data was previously collected in this area. However, the study area corridor continues north into the Beaufort Coastal Plain reaching Deadhorse, Alaska before bearing east to Point Thompson and the PTU production fields. Ecoregion descriptions are presented in the 2015 Vegetation Study Report (Alaska LNG 2015).

The wetlands survey area was divided into two corridors: a wetland mapping corridor and a field survey corridor. The mapping corridor was 2,000 feet wide (1,000 feet on either side of the proposed centerline). All wetlands and waterbodies were mapped within the mapping corridor using aerial photograph interpretation. The smaller field survey corridor was 300 feet wide (150 feet on each side of the proposed centerline) and centered within the mapping corridor. Field work was primarily concentrated within the field survey corridor, ensuring that the wetland field work occurred near areas most likely to be disturbed by the proposed Project, while representative of the wider corridor. If specific wetland signatures on aerial photos or unique wetlands types occurred outside of the 300-foot field survey corridor, field targets would be established and sampled. Approximately 35 percent of the sampling occurred outside of the 300-foot field survey corridor. Proposed off-ROW access roads and facilities footprints (those added to the route prior to September 9, 2015) were also included in the field survey and mapping. The distribution of field plots collected in the two corridors during the 2015 field season is summarized in Section 3.1 of this report.



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While the 2015 field data is organized and analysed by ecoregion in this report, the field survey area was also divided into eight geographic areas or spreads for planning purposes. Field identification numbers (plot numbers) include a two letter code identifying the geographical spread where a field point is located. Field identification numbers begin with the field team identifier (e.g., W84) followed by the two letter geographical spread code (e.g., Tl) and concludes with a field plot number (e.g., 001). The geographical spreads and two letter codes are summarized by project milepost below:

- Cook Inlet to Nikiski (IN), Mainline MP 792-804;
- Trapper Creek to Cook Inlet (TI), MP 664.5-765;
- Healy to Trapper Creek (HT), MP 525-664.5;
- Livengood to Healy (LH), MP 403.5-525;
- Yukon River to Livengood (YL), MP 357-403.5;
- Atigun Pass to Yukon River (AY), MP 169-357;
- Prudhoe Bay to Atigun Pass (PA), MP 0-169; and
- Point Thomson to Prudhoe Bay (PP), PT Pipeline milepost (MP) 0-58.

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#### 2.0 METHODOLOGY

Wetland Determination Field Survey Protocols (**Appendix A**) were prepared by experienced wetland scientists prior to the 2015 field season. These protocols have been provided to the USACE and FERC, and have been approved by the USACE (USACE 2010). The protocols, summarized below, follow standard methods used to delineate wetlands for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) wetland premapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of the wetland pre-mapping based on the results of the field efforts.

Pre-mapping was completed in 2013, 2014 and early 2015 for the Mainline corridor from Nikiski, across Cook Inlet and north to Livengood. In addition, pre-mapping was also completed in 2015 for numerous Rev B route adjustments and off-ROW access roads and facility sites from Livengood to the Brooks Range foothills. This 2015 Wetland Field Study Report summarizes the pre-mapping effort and focuses on results of the field data collection in 2015. Since data from the Wetland Field Study and the Vegetation Field Study were collected at the same time, some of the vegetation classification data are presented in the appendices of this report. All information and methodology used for the Vegetation Study is provided in the 2015 Vegetation Field Study Report (Alaska LNG 2015). The goal of the Vegetation Study was to identify vegetation cover types according to the Alaska Vegetation Classification System (Viereck et al. 1992).

The 2015 field data will be shared with the USACE for approval. The USACE has already reviewed and approved the 2014 field data north of Livengood (USACE 2015).

#### 2.1 DEFINITIONS AND WETLAND NAMING CONVENTIONS

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Most wetlands are considered to be Waters of the U.S. and are within the jurisdiction of the USACE (33 CFR Part 328.3[b]). Jurisdictional status is based on connectivity to Traditional Navigable Waters (TNW). Wetlands are considered jurisdictional "if the wetland, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable." (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]) (Stonestreet et al. 2009). Other aquatic habitats under the jurisdiction of the USACE, include deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by the USACE (See Section. 2.9).

For projects under FERC's authority, the definitions for waterbodies and wetlands are further clarified in the FERC's *Wetland and Waterbody Construction and Mitigation Procedures* (FERC 2013) as follows:

- "Waterbody" includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes:
  - "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing:
  - o "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and

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- "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.
- "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current federal methodology for identifying and delineating wetlands.

#### 2.1.1 Cowardin Classification

All wetlands and other Waters of the U.S. in the wetland mapping corridor were classified using the "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al., 1979), commonly referred to as the Cowardin classification system. Cowardin classifies wetlands and aquatic habitats by system, subsystem, class, subclass, and water regime and is based on hydrologic setting (riverine, lacustrine, estuarine, palustrine), vegetation structure (forested, scrub-shrub, emergent, aquatic bed), and water regime (saturated, seasonally flooded, semi-permanently flooded, etc.).

The Cowardin classifications are used as the standard codes in the National Wetland Inventory (NWI), and are required by the FERC's Wetlands and Waterbody Construction and Mitigation Procedures (FERC 2013). The NWI Program has mapped many of the wetlands across the U.S., including many in the Project's mapping corridor (at a smaller scale than the Alaska LNG mapping). It was developed largely for mapping based on interpretation of high-altitude aerial photography. Table 2-1 lists the most common Cowardin classifications found in the 2015 field survey corridor.

Table 2-1. Wetland and Deepwater Habitats within the Project Rev B Mapping Corridor and Off-ROW Areas

Cowardin Wetland and Other Aquatic Habitat Types	Description	Example
Estuarine Subtidal (E1)	Permanently flooded deepwater brackish or saline tidal habitatstypically semi-enclosed by land. Water salinity exceeds 0.5 ppt. and typically does not exceed 30 ppt.	Cook Inlet*
Estuarine Intertidal (E2)	Aquatic habitats with substrates that are exposed at low tide and flooded at high tide with less than 30% of the surface covered with vegetation; includes the splash zone. Water salinity exceeds 0.5 ppt and typically does	Salt marsh, CookInlet mud flats
Riverine Freshwater Tidal Unconsolidated Bottom (R1UB)	Low-gradient freshwater tidal rivers with water velocity dependent on tidal fluctuations	Coastal Rivers
Riverine Lower Perennial Unconsolidated Shoreline/Unconsolidated Bottom (R2US/UB)	Low-gradient rivers/streams with slow water velocity	Valley bottom streams*
Riverine Upper Perennial Rock Bottom (R3RB)	High-gradient river/stream with substrate dominated by stones, boulders, or bedrock	Mountain Streams*
Riverine Upper Perennial Unconsolidated Shoreline/Unconsolidated Bottom (R3US/UB)	High-gradient rivers/streams with fast water velocity	Mountain streams*
Riverine Intermittent Streambed (R4SB)	Channels containing flowing water only part of the year	Intermittent streams*
Lacustrine Limnetic (L1)	Unvegetated deepwater habitats within the lacustrine system	Deepwaterlakes*



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Lacustrine Littoral (L2)	Vegetated habitats within the lacustrine system, or shoreward bound to 2 meters below annual low water	Lake fringes with unvegetated shallow water, or submerged or floating vegetation
Palustrine Unconsolidated Bottom (PUB)	Potential aquatic habitats and deepwater habitats that are inundated throughout the year in most years. These ponded depressions are less than 20 acres in size and typically have a depth less than 2 meters at annual low water. Substrates have at least 25% cover of particles smaller than stones, and less than 30% vegetative cover	Pondswith unvegetated shallow water, or submerged or floating vegetation
Palustrine Unconsolidated Shore (PUS)	Potential aquatic habitats with less than 30% vegetative cover that are inundated for only a portion of the growing season in most years	Unvegetated seasonally flooded ponds
Palustrine Aquatic Bed (PAB)	Potential aquatic habitats that have a predominance of rooted vascular aquatic plants growing on or below the water surface	Pondswith submerged or floating vegetation such as pondweeds, water lilies
Palustrine Emergent (PEM)	Habitats dominated by erect, rooted, herbaceous species	Emergent wetlands with grasses, sedges, rushes
Palustrine Moss-Lichen (PML)	Moss or lichen dominated wetlands with less than 30% cover vascular vegetation.	Wetlands dominated by mosses or lichens
Palustrine Scrub-Shrub (PSS)	Habitats dominated by woody vegetation less than 6 meters tall/3-inch diameter at breast height (DBH)	Scrub-shrub wetlands with willow or alder thickets, mixed shrub-tussock tundra, ericaceous bogs
Palustrine Forested (PFO)	Habitats dominated by woody tree species greater than 6 meters tall/3-inch DBH	Forested wetlands with black spruce, tamarack
Upland (U) (non-wetland)	Habitats that do not contain criteria diagnostic of wetlands	Non-wetland communities, ranging from closed spruce forest, mixed woodlands, shrublands to alpine tundra
Disturbed (D) (non-wetland)	Gravel-filled, excavated or previously graded areas, man-made structures	Roads, pads, buildings*

<sup>\*</sup> Unvegetated areas

#### 2.1.2 Hydrogeomorphic Classes

Wetlands within the Project mapping corridor were also assigned a hydrogeomorphic (HGM) classification (Smith et al., 1995; and Brinson, 1993) during the mapping process. The HGM classification of wetlands comprises three components: 1) landscape setting; 2) water source (precipitation, surface flow, or groundwater discharge); and 3) hydrodynamics (direction and strength of flow). The three components of the HGM classes are largely responsible for determining a wetland's ecosystem function. The HGM classes in the 2015 field survey corridor are defined below per Smith et al. (1995) and are summarized in Table 2-2.

Riverine - Riverine wetlands occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are often overbank flow from the channel or subsurface hydraulic connections between the stream channel and wetlands; however, sources may be interflow and return flow from adjacent uplands, occasional overland flow from adjacent uplands, tributary inflow, and precipitation. At their headwaters, riverine wetlands often are replaced by slope or depressional wetlands where the channel morphology may disappear. They may intergrade with poorly drained flats or uplands. Perennial flow in the channel is not a requirement.

**Depressional** – Depressional wetlands occur in topographic depressions. Dominant water sources are precipitation, groundwater discharge, and both interflow and overland flow from adjacent uplands. The direction of flow is normally from the surrounding uplands toward the



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center of the depression. Elevation contours are closed, thus allowing the accumulation of surface water. Depressional wetlands may have a combination of inlets and outlets or lack them completely. Dominant hydrodynamics are vertical fluctuations, primarily seasonal. Depressional wetlands may lose water through intermittent or perennial drainage from an outlet, by evapotranspiration, and, if they are not receiving groundwater discharge, may slowly contribute to groundwater. Peat deposits may develop in depressional wetlands.

**Slope** – Slope wetlands normally are found where there is a discharge of groundwater to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes. Slope wetlands are usually incapable of depressional storage because they lack the necessary closed contours. Principal water sources are usually groundwater return flow and interflow from surrounding uplands, as well as precipitation. Hydrodynamics are dominated by downslope unidirectional water flow. Slope wetlands can occur in nearly flat landscapes if groundwater discharge is a dominant source to the wetland surface. Slope wetlands lose water primarily by saturation, subsurface and surface flows, and by evapotranspiration. Slope wetlands may develop channels, but the channels serve only to convey water away from the slope wetland. Fens are a common example of slope wetlands.

**Flat** – There are two types of "flat" wetlands: mineral soil flats and organic soil flats. Mineral soil flats are most common on interfluves, extensive relic lake bottoms, or large floodplain terraces where the main source of water is precipitation. They receive virtually no groundwater discharge which distinguishes them from depressions and slopes. Dominant hydrodynamics are vertical fluctuations. They lose water by evapotranspiration, saturation overland flow, and seepage to underlying groundwater. They are distinguished from flat upland areas by their poor vertical drainage, often due to spodic horizons and hardpans, and low lateral drainage, usually due to low hydraulic gradients. Mineral soil flats that accumulate peat can eventually become organic soil flats

Organic soil flats differ from mineral soil flats, in part, because their elevation and topography are controlled by vertical accretion of organic matter. They occur commonly on flat interfluves, but may also be located where depressions have become filled with peat to form a relatively large flat surface. Water source is dominated by precipitation, while water loss is by saturation, overland flow, and seepage to underlying groundwater. Raised bogs share many of these characteristics, but may be considered a separate class because of their convex upward form and distinct edaphic conditions for plants. Organic flats wetlands over permafrost soils are common in Interior Alaska. These flats can and often occur on slopes up to 20 percent.

Lacustrine Fringe – Lacustrine fringe wetlands are adjacent to lakes where the water elevation of the lake maintains the water table in the wetland. In some cases, these wetlands consist of a floating mat attached to land. Additional sources of water are precipitation and groundwater discharge, the latter dominating where lacustrine fringe wetlands intergrade with uplands or slope wetlands. Surface water flow is bidirectional, usually controlled by water-level fluctuations such as seiches (oscillating standing waves) in the adjoining lake. Lacustrine fringe wetlands are indistinguishable from depressional wetlands where the size of the lake becomes so small relative to fringe wetlands that the lake is incapable of stabilizing water tables. Lacustrine fringe wetlands lose water by flow returning to the lake after flooding, by saturation surface flow, and by evapotranspiration. Organic matter normally accumulates in areas sufficiently protected from shoreline wave erosion.



Table 2-2. Hydrogeomorphic Classes within the Project Rev B Mapping Corridor, and Off-ROW Areas

Hydrogeomorphic Class	Dominant Water Source	Dominant Hydrodynamics	Examples
Riverine	Overbankflow from channel	Unidirectional, horizontal	Riparian scrub-shrub wetlands
Depressional	Groundwater	Vertical	Kettle wetlands
Slope	Groundwater	Unidirectional, horizontal	Avalanche chutes
Flat	Precipitation	Vertical	Peat bogs
Lacustrine Fringe	Overbank flow from lake	Bidirectional, horizontal	Emergent lake edge wetlands

These HGM classes of wetlands have the potential to perform the following eight functions (Magee and Hollands 1998):

- 1. <u>Modification of groundwater discharge:</u> The capacity of a wetland to influence the amount of water moving from the groundwater to surface water.
- 2. <u>Modification of groundwater recharge:</u> The capacity of a wetland to influence the amount of water moving from surface water to groundwater.
- 3. <u>Storm and flood-water storage:</u> The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface.
- 4. <u>Modification of stream flow:</u> The modification of inflow hydrology by the wetland to produce the outlet stream's hydrology.
- 5. <u>Modification of water quality:</u> Removal of suspended and dissolved solids from surface water and dissolved solids from groundwater and conversion into other forms, plant or animal biomass, or gases. Wetlands with a low slope-angle or location in depressions provide a high level of this function.
- 6. <u>Export of detritus:</u> Export of organic detritus from the wetland to adjacent and downstream aquatic ecosystems.
- Contribution to abundance and diversity of wetland vegetation: The capacity of a wetland to
  produce an abundance and diversity of hydrophytic plant species individually or as part of a
  group of wetlands in a local landscape (Tiner 1984).
- 8. <u>Contribution to abundance and diversity of wetland fauna:</u> The capacity of a wetland to support large and/or diverse populations of animal species that spend part or all of their lifecycle in wetlands, individually, or as part of a mosaic of wetlands in a local landscape.

#### 2.1.3 Study Area Watersheds

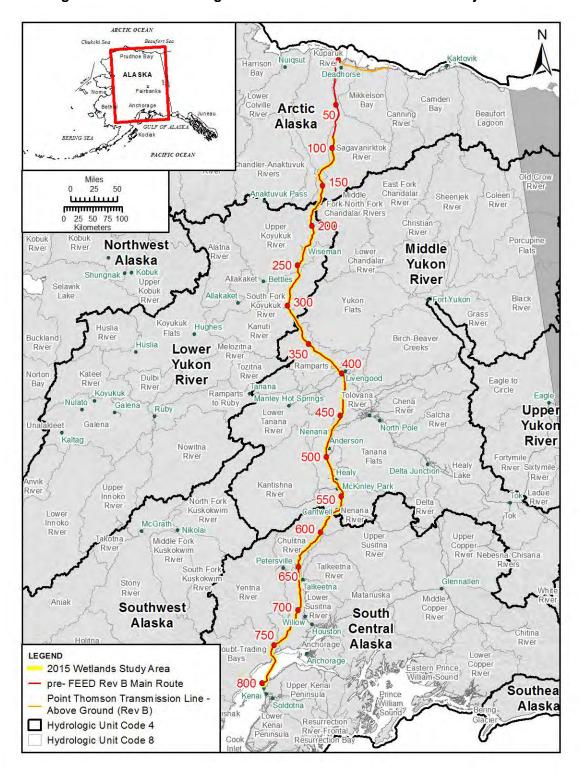
The U.S. Geological Survey (USGS) has mapped hydrologic units (drainage basins and watersheds) throughout the study area. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to twelve digits based on the six levels of classification in the hydrologic unit system (USGS, 2015). Alaska falls into hydrologic unit region 19 (2 digit HUC) comprising 8 Sub-regions (4 digit HUC), 38 Basins (6 digit HUC), 159 Sub-basins (8 digit HUC), 20,345 Watersheds (10 digit HUC) and 13,921 Sub-watersheds (12 digit HUC). The project study area crosses 20 "HUC 4" Sub-regions (4 digit HUC), and four "HUC 8" Sub-basins (8 digit HUC). In this report, project analysis accounting for wetland acreages is based on HUC 8 Sub-basins. HUC 4 Sub-regions and HUC 8 Sub-basins of the project area are shown below (Figure 2-1).

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Figure 2-1. HUC 4 Sub-regions and HUC 8 Sub-basins of the Project Area





#### 2.2 WETLAND PARAMETERS AND INDICATORS

Wetland determinations were made according to the USACE accepted methods in Alaska, as described in the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region" (Regional Supplement) (USACE, 2007a), and the "USACE Wetlands Delineation Manual" (USACE Manual) (USACE, 1987). These methods require a three-parameter approach, of which the three essential characteristics of a wetland (hydrophytic vegetation, hydric soils, and wetland hydrology) must be present to have a positive wetland determination.

Wetland indicators are field verifiable and measurable characteristics of vegetation, soil, and hydrology that generally indicate that the parameter in question is present. The absence of an indicator, however, does not always mean that a parameter is not met, or that a wetland is not present. For these "problematic" situations, the Regional Supplement provides procedures to determine if a parameter is present or not. These generally rely on an understanding of the hydrogeomorphology of a site, and the best professional judgment of the wetland scientist. Each parameter, along with select Alaska-specific indicators, is described below.

#### 2.2.1 Hydrophytic Vegetation

Hydrophytic vegetation, or a community dominated by plants with special adaptations to survive saturated or anaerobic conditions, is required for a positive wetland determination. The U.S. Fish and Wildlife Service (USFWS) prepared the "National List of Vascular Plant Species That Occur in Wetlands" in 1988 (Reed, 1988), which categorizes species based on their estimated probability of occurring in a wetland. USACE took over the task of updating this plant list (Lichvar, and Gillrich 2011, Lichvar et al. 2014). The USACE 2014 updated wetlands plant list was used for field data collection in 2015. Indicator ratings and their descriptions are as follows:

- OBL (obligate wetland) almost always found in wetlands, rarely in uplands;
- FACW (facultative wetland) usually found in wetlands but occasionally found in uplands;
- FAC (facultative) commonly occurs in either wetlands or uplands;
- FACU (facultative upland) occasionally found in wetlands, but usually occurs in uplands;
- UPL (obligate upland) rarely found in wetlands, almost always in uplands.

Plant species with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions. Such species are referred to as hydrophytic vegetation, or hydrophytes.

The presence of hydrophytic vegetation is determined by satisfying either a Dominance Test or a Prevalence Index. The Dominance Test is generally a quick way to characterize the vegetative community, however, communities with a large number of low cover species are more accurately characterized by the Prevalence Index, a weighted average of the wetland indicator status of all plant species in the community. Both methods were used when collecting field data.

If both of these indicators fail, yet the site exhibits both hydric soil and wetland hydrology (see description below), wetland scientists may examine FACU vegetation within the community for morphological adaptations indicating that it is indeed acting as a hydrophyte. Typical morphological adaptations observed in Alaska wetlands include white spruce (*Picea glauca*) with a narrow growth form, widely spaced needles, and less bushy branching; or Alaska paper birch (*Betula neoalaskana*) with multiple trunks, an "apple tree" like growth, smaller size, and a rotten core in the tree trunk. If these morphological adaptations were observed, the species may be considered FAC at the site in guestion, and the dominance test recalculated.



#### 2.2.2 Wetland Soils

Hydric soils are also required for a positive wetland determination. The National Resources Conservation Service (NRCS) has defined a hydric soil as "a soil that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation" The criteria for hydric soils includes certain soil taxonomic groups that are poorly drained during the growing season, or soils that are frequently ponded or frequently flooded for long or very long durations during the growing season.

Due to anaerobic conditions, hydric soils exhibit certain characteristics that can be observed in the field. These characteristics may include the following:

- High organic content representing accumulation and slow decomposition in anaerobic conditions:
- Reduction of ferric (Fe3+) to ferrous iron (Fe2+) and consequent leaching from the soil profile, causing a greenish- or bluish-gray color (gley formation):
- Generation of hydrogen sulfide, noted by characteristic odor;
- Spots or blotches of different color interspersed with the matrix, or dominant color (mottling);
   and
- Dark soil colors (low chroma).

Indicators have been established by USACE to assist with identification of hydric soils. These indicators are found in the Regional Supplement and the "Field Indicators of Hydric Soils in the United States" (USDA, NRCS 2010). The absence of listed indicators, however, does not preclude the soil from being hydric. If indicators of hydrophytic vegetation and wetland hydrology are present, but hydric soils are not evident, the procedure outlined in the Regional Supplement for problematic hydric soils was followed.

#### 2.2.3 Problematic Soils

Procedures for dealing with problematic hydric soils, that are encountered while conducting field surveys, are described in Chapter 5 of the Regional Supplement (USACE, 2007a). Few potentially problematic hydric soils were encountered within the study area. These situations are discussed in **Appendix B** of the report. This section describes instances where problems may be encountered.

#### 2.2.4 Wetland Hydrology

Wetland hydrology is the third parameter required for a positive wetland determination. The most ephemeral of the three parameters, surface water or saturation, need not be present throughout the entire year to meet the definition of wetland hydrology. According to the USACE Manual (1987), wetland hydrology is present when there is inundation or soil saturation to the surface continuously for at least five percent of the growing season in most years. Indicators of wetland hydrology include observing ponding or soil saturation, as well as evidence of previous inundation, such as dry algae on bare soil, watermarks on soils or leaves, and drainage patterns. Where positive indicators were observed, it was assumed that wetland hydrology occurs for a sufficient period of the growing season.

# 2.3 Aerial Interpretation (Pre-Mapping)

Wetland boundaries for the mapping corridor were delineated on digital ortho-rectified and georeferenced true color aerial imagery with 1.6-foot pixel resolution using the following aerial imagery:



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- Alaska LNG Imagery. (0.5-foot resolution) (Paragon 2013);
- Nikiski Area Aerial Orthophoto. (2.5-foot resolution) (Kenai Peninsula Borough 2006);
- Kenai Peninsula Borough Aerial Imagery. (2.5-foot resolution) (Kenai Peninsula Borough 2013);
- Point MacKenzie Aerial Orthophoto (0.5-meter resolution) (Matanuska Susitna Borough, MSB 2011d);
- Willow Aerial Orthophoto (1.0-foot resolution) (MSB 2011c);
- Caswell Aerial Orthophoto (1.0-foot resolution) (MSB 2011b);
- Talkeetna Aerial Orthophoto (1.0-foot resolution) (MSB 2011a);
- Healy Area Orthophoto (1.0-meter resolution) (U.S. Census Bureau 2006);
- Digital Orthophoto Quarter Quadrangles Anderson Area (0.6-meter resolution) (NRCS 2006):
- Southern Corridor Ortho Mosaic (1.6-foot resolution) (Digital Globe 2013b);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a);
- Quantum Aerial Imagery. (1.6-foot resolution) (Quantum Spatial 2014);
- iCubed Satellite Imagery. (1.0-meter resolution) (iCubed 2014);
- ExxonMobil aerial imagery for the Alaska Pipeline Project (0.5-meter pixel resolution; summer 2008, 2009, 2010, and 2011) (ExxonMobil 2008, ExxonMobil 2009b, ExxonMobil 2011);
- BP Exploration Alaska Inc. aerial imagery for Prudhoe Bay, Endicott, and Badami (1.0-foot pixel resolution; July 2012) (BPX 2012a, BPX 2012b, BPX 2012c); and
- ExxonMobil aerial imagery for Point Thomson (2.0 and 0.5-foot pixel resolution; July 2001/2006, and July 2009) (ExxonMobil 2001-6, ExxonMobil 2009a).

Data from the following sources was also used during the mapping process:

- USFWS, NWI digital datasets and hardcopy maps;
- Kenai Watershed Forum Cook Inlet Wetlands for the Kenai Peninsula and the Matanuska Susitna Boroughs (Gracz 2011);
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging generated topographic contours (TransCanada 2011, MSB 2011d);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;
- USGS Digital Raster Graphics (e.g., topographic maps);
- Point Thomson Project wetlands mapping between Point Thomson and Badami (USACE 2012);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

All wetland mapping was created in a GIS platform, using a "heads-up" digitizing effort. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. This is the generally accepted wetland and deepwater habitat mapping technique employed by the USFWS personnel as part of the NWI program (Dahl et al. 2009). Data sources were overlaid on aerial photography and wetland, non-wetland, and areas of uncertain wetland



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status were identified by interpreting color, texture, and landscape position, among other elements. Aerial photography clues can include dwarf or stunted trees, topography characteristics (such as swales, toe slopes and depressions), and obvious signs of inundation.

All wetlands were mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer. Lakes, ponds and rivers were mapped at a scale of 1:1,200 (1 inch to 100 feet). Larger rivers and streams were delineated as polygons. Smaller streams, those with bankfull widths of approximately 10 feet or less, were mapped as lines.

#### 2.4 FIELD TARGET SELECTION

Field targets (FTs) were selected from the pre-mapping based on changes in the wetlands types, aerial vegetation signatures, Cowardin classification, and NRCS soil classification. The primary focus of the pre-selected FTs was to characterize specific wetland types which represent all similar wetland types in the region and to identify wetland/upland boundaries by selecting paired plots. Field targets were used to confirm areas where wetland subject matter experts had high confidence in their aerial interpretation, and were used to confirm or correct wetland boundary locations. Field targets were also placed in low-confidence areas to provide field data where the photo signatures or landscape features were not clearly indicative of wetland or upland. Field targets spanned the full range of Cowardin and HGM classes within the Project mapping corridor.

Field targets were evaluated during the field season provided there was land access. If a FT could not be accessed, a new FT was located on a nearby accessible parcel in an area with similar aerial photography vegetation signatures and site conditions as the original FT.

#### 2.5 WETLAND FIELD DATA COLLECTION

The 2015 wetland field study was conducted from early June through mid-September, and focused on field targets from Nikiski (MP 804) to the northern most field target (MP 86) in the Brooks Range foothills.

#### 2.5.1 Crew Composition

Two three-person crews collected data in 2015. Each crew consisted of a field crew chief, an assistant wetland scientist / Global Positioning System (GPS) technician, and a wilderness safety specialist. Each position had defined roles and responsibilities in the field and required a specific level of technical expertise.

Field crew chiefs were required to have proven field experience and a strong familiarity with wetland science. They were in charge of the field crews and ultimately responsible for data collection quantity and quality; daily reporting; crew health and safety; and data submittal on a daily or near-daily basis. Field crew chiefs also planned the workday for the crew, coordinated with Project management, and addressed any technical issues.

Wetland scientists / GPS technicians were required to be experienced in field work, familiar with wetland science principles, and to have attended a wetland delineation training course. They assisted in the wetland field survey with appropriate supervision by the field crew chief. The wetland scientist / GPS technician was also responsible for electronic data collection at each site using a Panasonic tablet with Trimble R1 GPS receiver. They worked closely with field crew chiefs to verify that the data was accurate and complete, and were also responsible for the maintenance and care of the GPS equipment, managing the crew's electronic data, and ensuring data files were uploaded to the Project's SharePoint site on a daily or near-daily basis.

Wilderness safety specialists were professionally trained in firearms proficiency, Alaska wilderness survival, and first aid / cardiopulmonary resuscitation. They were responsible for



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protecting the field crew from aggressive wildlife encounters, and assisting the field crew chief in the communication of and compliance with all Project health and safety policies.

#### 2.5.2 Wetland Determination Field Protocols

Wetland Determination Field Survey Protocols (**Appendix A**) have been developed and were provided to the USACE and the FERC (USACE 2010, FERC 2015). As described in the protocols, data was collected as a Determination Point (DP), where a hard copy Wetland Determination Form (WDF) was completed, or an Observation Point (OP), in which notes and photographs were used to describe wetland status and the community. All wetlands and waterbodies were classified using Cowardin codes.

The field crew chief examined vegetation and topography to determine appropriate sampling location(s) at each FT. Although FTs were used to guide the location of field crews, field crew chiefs were allowed discretion in the number, type (DP or OP), and final location of data points. This flexible approach allowed scientists to collect data in locations that best described the target community, allowed them to collect additional data as field conditions warranted, and enhanced efficiency by allowing scientists to collect observational data if a similar community was thoroughly described nearby. Wetland scientists used their best professional judgment and collected appropriate field data to adequately revise the wetland pre-mapping.

Field crew chiefs maintained field logbooks and hardcopy field maps with aerial photography, field targets, and pre-mapped wetland boundaries and classifications. The wetland scientist / GPS technician entered some of the data into electronic data forms specific to DPs and OPs. Daily field quality assurance/quality control (QA/QC) procedures are described in Section 2.6. Hardcopy and electronic data forms, field notes, maps, GPS data, and site photos were uploaded daily to the Project SharePoint website.

#### 2.6 QUALITY ASSURANCE / QUALITY CONTROL

Each crew member was responsible for collecting and recording clear and accurate data. The field crew chief reviewed all hardcopy and electronic data forms and completed a QA/QC checklist before leaving each site.

The field crew manager ensured that all data files were uploaded to the Project website. These transmitted files were then downloaded and reviewed by office-based data management staff. A wetland subject matter expert checked each hardcopy data sheet and electronic data form for quality and consistency, as it was received. If problems arose, the field crew was notified promptly to ensure that any data quality issues were corrected immediately.

Wetland mapping was also reviewed by experienced wetland scientists both after the initial premapping, and after map revisions were complete.

#### 2.7 WETLAND MAP REVISIONS

The wetland pre-mapping was updated based on field reference data collected throughout the 2015 field season. Map revisions included refinement of wetland boundaries and classifications (HGM, Cowardin, Viereck, Inlet/outlet) following procedures outlined in the 2015 Wetland Determination Field Survey Protocols (**Appendix A**). Map updates referenced 2015 GPS data (field plot locations), Wetland Determination Data Forms, Vegetation Classification Data Forms (for upland sites), site photographs, logbook field notes, and notated field maps as primary data sources. Map revisions were made with post-processed GPS data to ensure positional accuracy of the field data and field data forms that passed the QA/QC process (Section 2.6).

Generally, the wetland pre-mapping revision process involved:



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- Overlaying exported spatial data for all field reference data points on an ortho-rectified photographic base layer in the GIS environment;
- Compiling electronic copies of all field notes, sketches, and photographs associated with above points; and
- Using this data to update polygon attributes (wetland/non-wetland classifications) and refine
  map delineations as needed in the GIS environment. This process is described in detail in
  Section 3.2 of the 2015 Wetland Determination Field Survey Protocols (Appendix A).

In the process of incorporating field reference data into the wetlands mapping, updates were not necessarily limited to the polygon intersected by the field reference data point. Rather, field data were used to "recalibrate" the mapper's understanding of photo signatures in context with landscape position in that portion of the map (generally within one half mile of the data collection site). Extrapolating field reference data to adjacent areas is a process that incorporates information derived from field notes (concerning the surrounding area) in addition to a recalibration of the mapper's eye to a particular spectral signature (combination of color, tone, shadow, texture, etc.) when viewed in context with contour data and landscape position.

Examples of extrapolating field reference data to adjacent areas in the wetlands mapping are included in **Appendix D**.

#### 2.8 WETLAND FUNCTIONAL ASSESSMENT

Wetlands are known to provide a variety of ecological functions depending on the location and type of wetland. At sites determined to be wetland, an Aquatic Site Assessment (ASA) Data Form was collected. Information from this data sheet will be incorporated into the functional models described in *A Rapid Procedure for Assessing Wetland Functional Capacity* (Magee and Hollands 1998). On May 14, 2015, Alaska LNG wetland scientists met with the USACE and USFWS representatives to discuss field data collection methods for the ASA. In July, 2015, the USACE provided comments on wetland delineation and functional assessment protocols, and guidance for submitting data (USACE 2015b). The Project will incorporate agency guidance into the ASA.

Hydrogeomorphic (HGM) classes of wetlands and the eight wetland functions identified by Magee and Hollands are described in Section 2.1.2 and in the Wetland Determination Field Survey Protocols (**Appendix A**). The functional assessment models provide a Functional Capacity Index for each wetland function. The Functional Capacity Index indicates the potential degree to which the wetland performs the function and is only comparable to other wetlands within the same HGM class and region. The results from the models will be extrapolated to the applicable wetlands within the mapping corridor. This information will potentially serve as the basis to determine appropriate compensatory mitigation approaches for the unavoidable impacts of the Project. Wetland functional assessment data will be reported in 2016, after all field data is collected.

#### 2.9 Jurisdictional Determination

The USACE regulates wetlands and other Waters of the U.S. that are under their jurisdiction. Jurisdictional status is based on connectivity to Traditional Navigable Waters (TNW) (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]).

The Project, similar to other large pipeline and energy projects permitted by the USACE, will assume that all delineated wetlands fall under USACE jurisdiction; because the FERC requires that the Project adhere to certain construction requirements in all wetlands, it will be assumed that all wetlands fall within USACE jurisdiction for purposes of planning, permitting, mitigation, and construction methods.



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In January, 2015, the USACE reviewed the Project's identification and delineation of Waters of the U.S. from Point Thompson to Prudhoe Bay to Livengood, Alaska, and determined that there were no obvious errors in the methodology or determinations (USACE 2015).

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## 3.0 RESULTS

## 3.1 WETLAND FIELD DATA COLLECTION

A total of 333 FTs were selected for the 2015 field season to investigate a representative assemblage of wetlands, non-wetlands and areas of uncertainty. Criteria used in the selection of FTs are discussed in section 2.4. Due to land access issues, 23 of the FTs were deleted while others were moved to accommodate land access restrictions as needed. A total of 310 FTs were surveyed during the 2015 field season. Table 3-1 shows the number of FTs completed within each of the sub-ecoregions. The 2015 Wetland Determination Data Forms and the Wetland and Vegetation Field Data Summary Table are provided in **Appendix C**.

Table 3-1. 2015 Completed Field Targets by Ecoregion

Ecoregion	Sub-Ecoregion Milepo		Total Number of Field Targets Completed			
Alaska Range Transition	Cook Inlet Basin	804-616	103			
	Alaska Range	616-516	59			
Intermontane Boreal	Tanana-Kuskokwim Lowlands	516-455, 443-430	66			
	Yukon-Tanana Uplands	455-443	11			
	Ray Mountains	430-257	39			
	Kobuk Ridges and Valleys	257-252	1			
Arctic Tundra	Brooks Range	252-143	16			
	Brooks Foothills	143-62	15			
	Beaufort Coastal Plain	62-0	0			
Total: 310						

A total of 456 field reference data points were sampled at or near the pre-selected field targets during the 2015 field season. Table 3-2 summarizes the distribution of field plots sampled in the 300 foot construction corridor, 2000 foot mainline study area and off-ROW areas outside the 2000 foot study area corridor.

Table 3-2. Field Plot Distributions in the Study Area

Plot Type	300 ft Corridor	2000 ft Corridor	Off-ROW*	Total Number of Field Plots Completed
Wetland Determination Data Form Plot	185	185 73 46		304
Observation Point (no data form)	0/ 00		23	143
Vegetation Classification Data Form Plot	ssification Data 6		0	9
Total	253	134	69	456

<sup>\*</sup>Off-ROW targets outside of the 2000 foot mainline comdor.



#### 3.2 WETLAND MAPPING SUMMARY

The wetland delineation pre-mapping was revised according to the criteria summarized in Section 2.7 of this report. The 2015 final wetland delineation maps are included as **Appendix E**. A summary of wetland acreage per ecoregion within the 2000 foot Rev B mapping corridor and off-ROW footprint is presented in Tables 3-3 to 3-5. These tables present all the wetland acreages within the 2000 foot Rev B mapping corridor from 2010 to 2015. Wetland acreages are organized by HUC 8 Sub-basins, HGM (Brinson, 1993) and Cowardin (Cowardin et al.1979) classifications. Of the approximate 217,364 acres in the 2000 foot mapping corridor and off-ROW footprint, wetlands and other Waters of the U.S comprise 120,334 acres or 55 percent of the total.

Within the Alaska Range Transition Ecoregion approximately 34% of the Project corridor is wetland and Waters of the U.S. About 50% of these wetlands have been classified as palustrine scrub-shrub (PSS) and palustrine forested (PFO) wetlands. In this ecoregion, about 31% of the wetlands were identified as having a depressional HGM, 17% as flat, 15% as slope and 4% riverine. Waters of the U.S. and Potential Waters of the U.S comprised approximately 32% of the wetlands habitat mapped in the 2000 foot study area corridor and off-ROW footprints in the Alaska Range Transition Ecoregion.

Within the Intermontane Boreal Ecoregion about 43% of the Project corridor is wetland and Waters of the U.S. This ecoregion supports a large component of precipitation driven wetlands (flat HGM) associated with shallow permafrost (about 83% of all wetlands within this ecoregion). Approximately 6% of the Project corridor in this ecoregion has been classified as having riverine HGM while nearly 6% of the wetlands were identified as depressional. Palustrine scrub-shrub (PSS) and forested (PFO) wetlands comprise approximately 83% of the wetlands and Waters of the U.S. in this ecoregion. Waters of the U.S. and Potential Waters of the U.S accounted for approximately 2% of the wetlands habitat mapped in the 2000 foot study area corridor and off-ROW footprints in the Intermontane Boreal Ecoregion.

About 84% of the Project corridor in the Arctic Tundra Ecoregion is wetland and Waters of the U.S. Approximately 77% of all wetlands in the Arctic Tundra Ecoregion are classified as having flat HGM while about 9% are classified as depressional, and nearly 8% identified as riverine. Nearly 90% of all wetlands in this ecoregion are classified as palustrine scrub-shrub (PSS) or emergent herbaceous (PEM). About 6% of the ecoregion was classified as Waters of the U.S. or Potential Waters of the U.S in the 2000 foot study area corridor and off-ROW footprints in the Arctic Tundra Ecoregion.



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Table 3-3. Wetland Acreage within the Project Rev B Mapping Corridor and off-ROW Footprint, within the Alaska Range Transition Ecoregion, by HUC 8, Hydrogeomorphic and Cowardin Types

	Hydrologic Unit Code (HUC) 8 Name							
HGM and Cowardin Classification	Upper Kenai Peninsula (acres)	Cook Inlet (acres)	Redoubt Trading Bays (acres)	Lower Susitna River (acres)	Yentna River (acres)	Chulitna River (acres)	Nenana River (acres)	Grand Total (acres)
Flat								
PFO	-	-	126.6	269.9	-	149.9	3.4	549.9
PFO/SS	-	-	67.0	232.8	-	0.9	192.0	492.7
PSS/FO	-	-	8.2	305.4	-	1.2	79.8	394.5
PSS	-	-	63.6	175.1	-	20.2	1,675.9	1,934.8
PSS/EM	-	-	4.8	130.6	-	3.3	578.4	717.0
PEM/SS	-	-	-	6.0	-	19.6	70.9	96.5
PEM	-	-	-	-	-	-	0.2	0.2
Depressional								
PFO	13.6	-	11.1	249.0	-	69.8	21.8	365.3
PFO/SS	1.3	-	-	221.0	-	35.8	0.7	258.8
PFO/EM	-	-	-	0.2	-	0.6	-	0.9
PSS/FO	-	_	-	447.7	-	29.7	8.5	485.9
PSS	2.3	-	69.8	831.7	-	715.8	362.7	1,982.4
PSS/EM	34.1	-	158.8	727.0	-	302.2	59.1	1,281.2
PSS/ML	-	-	-	4.3	-	-	-	4.3
PEM/SS	5.8	-	44.7	578.9	-	470.4	38.0	1,137.8
PEM	57.6	_	19.1	301.1	4.4	829.1	160.4	1,371.7
PEM/ML	-	-	-	-	-	6.7	-	6.7
PAB/EM	-	_	_	11.4	-	_	-	11.4
PAB	2.2	-	10.2	188.0	-	77.2	29.1	306.7
PUB/AB	-	-	1.6	8.9	-	0.4	-	10.8
PUB/EM	-	-	-	-	-	1.4	0.3	1.7
PUB	121.1	_	3.2	100.7	-	74.7	48.5	348.2
Slope								
PFO	- 1	-	347.1	643.7	-	58.7	0.1	1,049.5
PFO/SS	-	-	-	461.9	-	114.1	-	575.9
PFO/EM	-	-	5.1	77.2	-	-	-	82.2
PSS/FO	-	-	-	109.3	-	26.3	192.0	327.6
PSS	-	-	6.7	284.0	-	376.9	60.5	728.1
PSS/EM	-	-	-	345.2	-	53.3	344.5	742.9
PEM/FO	-	-	-	32.8	4.7	-	-	37.5
PEM/SS	-	-	-	59.5	-	105.9	-	165.3
PEM	-	-	-	9.0	-	16.9	7.0	32.9
PUB	-	-	-	-	-	0.7	-	0.7
Lacustrine Fringe								
PEM	5.6	-	0.7	-	-	-	-	6.2
PAB	1.2	-	-	1.9	-	0.8	-	3.9
Riverine								
PFO	-		11.3	15.4		1.0	5.2	32.9
PFO/SS	-	-	12.1	15.9	-	12.7	14.1	54.8



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	Hydrologic Unit Code (HUC) 8 Name							
HGM and Cowardin Classification	Upper Kenai Peninsula (acres)	Cook Inlet (acres)	Redoubt Trading Bays (acres)	Lower Susitna River (acres)	Yentna River (acres)	Chulitna River (acres)	Nenana River (acres)	Grand Total (acres)
PSS/FO	-	-	-	1.7	-	1.6	-	3.3
PSS	0.8	-	4.1	90.0	-	132.2	210.6	437.6
PSS/EM	-	-	43.7	111.9	-	28.9	73.4	257.8
PSS/US	-	-	-	-	-	-	11.1	11.1
PEM/FO	-	-	-	5.6	-	-	-	5.6
PEM/SS	-	-	-	60.6	-	23.7	33.7	118.0
PEM	0.2	-	0.9	35.4	-	18.2	5.1	59.8
PEM/AB	-	-	-	0.2	-	-	-	0.2
PAB	-	-	-	1.4	-	-	-	1.4
PAB/UB	-	-	-	-	-	1.8	-	1.8
PUB/EM	-	-	-	-	-	-	4.4	4.4
PUB	-	ı	ı	3.7	1	9.7	23.7	37.1
PUB/US	-	1	1	1	-	1.0	-	1.0
Wetlands Total Area	245.6	0.0	1,020.2	7,155.7	9.0	3,793.3	4,315.2	16,539.0
Waters and Potential Wa								
L1UB	40.8	-	47.6	-	-	21.9	77.0	187.2
L2UB	-	-	-	-	-	9.3	-	9.3
E1UB	133.8	6,361.1	-	-	-	-	-	6,494.9
E2US	126.5	47.2	212.8	-	-	-	-	386.5
R2UB	-	-	25.0	28.2	46.8	68.5	-	168.4
R2US	-	-	19.0	15.9	17.1	22.3	0.9	75.2
R3UB	-	-	3.9	6.7	-	45.2	243.6	299.4
R3US	-	-	-	-	-	21.6	52.3	73.9
R3UB/US	-	-	16.3	28.9	-	6.9	-	52.1
R4SB	-	-	2.3	-	-	1.2	34.6	38.1
Waters Total Area	301.1	6,408.3	326.8	79.7	63.9	196.8	408.4	7,784.9
No HGM								
Disturbed	332.4	-	66.5	118.1	-	507.3	426.3	1,450.6
Upland	2,157.7	1	3,408.9	13,434.0	253.6	15,514.5	10,334.1	45,102.8
No HGM Total Area	2,490.1	0.0	3,475.4	13,552.1	253.6	16,021.9	10,760.4	46,553.4
Grand Total Area (acres)	3,036.8	6,408.3	4,822.3	20,787.5	326.5	20,012.1	15,484.0	70,877.4



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Table 3-4. Wetland Acreage within the Project Rev B Mapping Corridor and off-ROW Footprint, within the Intermontane Boreal Ecoregion, by HUC 8, Hydrogeomorphic and Cowardin Types

within the intermon	Lane Dore	nne Boreal Ecoregion, by HUC 8, Hydrogeomorphic and Cowardin Types  Hydrologic Unit Code (HUC) 8 Name							
HGM and Cowardin Classification	Nenana River (acres)	Lower Tanana River (acres)	Tolovana River (acres)	Ramparts (acres)	Yukon Flats (acres)	Kanuti River (acres)	South Fork Koyukuk River (acres)	Upper Koyukuk River (acres)	Grand Total (acres)
Flat									
PFO	85.8	21.3	274.5	11.8	10.7	-	62.2	4.5	470.8
PFO/SS	1,309.3	9.1	2,183.6	510.9	473.0	1.3	92.3	-	4,579.5
PSS/FO	548.5	5.5	934.5	-	-	1	1	-	1,488.4
PSS	1,418.7	30.2	1,635.8	2,250.2	907.7	141.0	3,918.7	523.6	10,825.9
PSS/EM	664.7	166.4	689.4	576.8	62.3	1,120.2	1,909.2	290.7	5,479.7
PEM/SS	1.4	7.7	15.6	16.7	0.6	110.6	871.9	315.5	1,340.0
PEM	1.2	15.7	4.5	27.1	-	-	10.2	1.5	60.3
Depressional		ı			L				
PFO	-	13.0	0.8	-	-	-	-	-	13.7
PFO/SS	-	0.4	-	2.0	-	-	1.4	-	3.9
PFO/EM	-	0.5	-	-	-	-	-	-	0.5
PSS/FO	2.2	-	0.3	-	-	-	-	-	2.5
PSS	15.4	15.3	98.8	59.6	6.2	27.1	86.6	0.3	309.4
PSS/EM	108.3	18.0	81.7	258.2	15.7	-	75.8	3.8	561.4
PEM/FO	-	0.4	-	-	-	-	-	-	0.4
PEM/SS	51.6	20.6	85.6	58.7	-	-	69.6	55.1	341.2
PEM	12.2	26.1	190.7	44.0	1.9	0.4	34.7	15.9	325.8
PEM/ML	-	-	0.2	-	-	-	-	-	0.2
PAB	-	-	0.1	12.3	-	-	0.4	0.5	13.3
PUB/EM	-	0.9	-	-	-	-	-	-	0.9
PUB/AB	-	4.3	7.4	-	-	-	-	-	11.7
PUB	4.5	10.2	37.2	8.6	0.1	0.2	25.6	13.3	99.9
PUS	-	-	-	-	-	-	4.4	-	4.4
Slope									
PFO	3.1	0.1	0.3	-	-	-	-	-	3.5
PFO/SS	4.3	92.2	38.1	-	-	-	-	-	134.6
PSS/FO	17.9	14.9	6.0	-	9.5	-	-	-	48.2
PSS	99.4	38.9	75.2	-	-	-	-	-	213.5
PSS/EM	111.7	64.0	24.4	-	-	-	24.7	-	224.8
PEM/SS	61.4	12.7	40.3	6.4	-	-	-	-	120.8
PEM	-	29.9	7.4	-	-	-	-	-	37.3



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			Hydro	ologic Uni	t Code	(HUC) 8	Name		
HGM and Cowardin Classification	Nenana River (acres)	Lower Tanana River (acres)	Tolovana River (acres)	Ramparts (acres)	Yukon Flats (acres)	Kanuti River (acres)	South Fork Koyukuk River (acres)	Upper Koyukuk River (acres)	Grand Total (acres)
PAB	-	20.5	-	-	-	-	-	-	20.5
PUB/AB	-	-	0.4	-	-	-	-	-	0.4
PUB	0.9	0.1	-	-	-	-	-	-	1.0
Lacustrine Fringe	_								
PEM	-	-	5.9	7.3	-	-	0.5	-	13.7
PAB	-	-	-	0.8	-	-	-	-	0.8
Riverine						T		1	T
PFO	12.2	-	-	3.4	-	-	13.7	-	29.3
PFO/SS	51.3	-	51.7	40.7	-	-	10.4	-	154.0
PSS/FO	20.8	-	-	-	-	-	-	-	20.8
PSS	184.7	8.3	30.5	280.3	78.1	57.2	216.6	13.6	869.3
PSS/EM	108.8	15.3	12.9	101.9	4.7	5.2	133.1	36.7	418.6
PSS/U	-	-	-	3.0	-	-	-	-	3.0
PEM/SS	24.6	0.7	6.0	67.0	27.5	-	18.9	3.6	148.4
PEM	6.4	18.2	11.9	37.1	0.4	-	5.3	2.3	81.6
PEM/U	-	-	-	3.9	-	-	-	-	3.9
PUB/EM	1.2	-	-	-	-	-	-	-	1.2
PUB/AB	-	1.2	0.1	-	-	-	-	-	1.4
PUB	7.8	-	4.4	1.9	-	-	6.4	0.9	21.3
PUS	2.8	-	-	-	-	-	-	-	2.8
Wetlands Total Area	4,943.1	682.7	6,556.1	4,390.7	1,598.3	1,463.3	7,592.8	1,281.8	28,508.6
Waters and Potential Waters	of the U.S.								
L1UB	-	-	-	-	-	-	16.7	-	16.7
L2UB	-	-	8.3	25.9	-	-	-	-	34.2
R2UB	49.1	123.6	25.9	97.4	-	-	-	-	296.0
R2US	2.8	2.5	-	-	-	0.3	-	-	5.6
R3UB	60.3	-	12.5	13.0	-	5.3	32.1	-	123.2
R3US	9.5	-	2.2	7.4	-	-	29.7	-	48.8
R4SB	20.3	-	1.0	-	-	-	2.8	-	24.1
Waters Total Area	142.0	126.1	50.0	143.7	0.0	5.6	81.2	0.0	548.6
No HGM	140.	50.0		0.1= 0	400.0		450.0	4000	0.000 :
Disturbed	113.4	53.2	297.7	917.2	129.2 589.5	204.8	458.6	108.2	2,282.4
Upland  No HGM Total Area	5,399.6 <b>5,512.9</b>	788.9 <b>842.1</b>	12,302.6 <b>12,600.3</b>	11,641.8 <b>12,559.0</b>	718.7	1,230.1 <b>1,434.9</b>	3,391.0 <b>3,849.6</b>	169.3 <b>277.5</b>	35,512.7 <b>37,795.1</b>
Grand Total Area (acres)	10,598.0	1,651.0	19,206.4	17,093.3	2,317.0	2,903.7	11,523.7	1,559.3	66,852.4



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Table 3-5. Wetland Acreage within the Project Rev B Mapping Corridor and off-ROW Footprint, within the Arctic Tundra Ecoregion\*, by HUC 8, Hydrogeomorphic and Cowardin Types

	Fundra Ecoregion*, by HUC 8, Hydrogeomorphic and Cowardin Types Hydrologic Unit Code (HUC) 8 Name								
HGM and Cowardin Classification	Upper Koyukuk River (acres)	Middle Fork- North Fork Chandalar River	Sagavanirktok River (acres)	Lower Colville River (acres)	Kuparuk River (acres)	Mikkelson Bay (acres)	Canning River (acres)	Grand Total (acres)	
		(acres)							
PFO PFO	67.1			T			ı	67.1	
PFO/SS	496.3			-		-	-	496.3	
				_	_	_	_		
PSS/FO	46.9	-	-	-	-	-	-	46.9	
PSS	6,306.5	35.8	510.4	-	152.4	0.3	-	7,005.3	
PSS/EM	1,968.8	310.5	5,503.6	143.7	2,784.8	39.2	12.3	10,762.9	
PSS/ML	-	8.5	-	-	-	-	-	8.5	
PEM/SS	259.0	60.3	15,891.9	69.3	8,448.7	6,145.3	165.8	31,040.3	
PEM	67.6	-	988.0	-	844.0	269.7	8.6	2,177.9	
PEM/UB	-	-	-	-	5.5	-	-	5.5	
Depressional									
PSS	113.2	-	3.4	-	-	-	-	116.6	
PSS/EM	121.4	-	278.3	-	87.9	-	-	487.6	
PEM/SS	78.4	0.1	529.2	_	217.6	21.1	_	846.3	
PEM	35.5	0.1	765.7	0.3	849.0	644.7	22.2	2,317.4	
PEM/UB	-	_		_	0.6	1.5	_	2.1	
PAB	-	-	89.8	-	557.0	40.6	-	687.4	
PUB/EM	-	-	-	-	-	2.0	_	2.0	
PUB	88.9	0.1	546.3	0.0	233.2	560.8	50.1	1,479.4	
PUS	-	-	-	-	1.1	-	-	1.1	
Slope							l		
PSS	1.5	-	15.4	-	-	-	-	16.9	
PSS/EM	48.0	2.7	12.9	2.3	-	-	-	65.9	
PSS/US	4.6	-	1	-	1	1	-	4.6	
PEM/SS	-	-	184.3	-	-	-	-	184.3	
PEM	14.7	3.1	109.3	-	2.5	-	-	129.5	
PAB	0.5	-	-	-	-	-	-	0.5	
Lacustrine Fringe									
PEM/SS	2.5	-	1.0	-	1.4	-	-	4.9	
PEM	1.7	-	89.1	-	49.3	45.8	-	185.9	
PAB	-	-	-	-	1.0	8.7	-	9.7	
PUB	-	-	2.3	-	0.5	-	-	2.8	
Riverine									
PFO (00	58.3	-	-	-	-	-	-	58.3	
PFO/SS	86.0	-	-	-	-	-	-	86.0	
PSS/FO PSS	2.2	88.9	742.8	-	40.0	20.4	-	2.2	
PSS/EM	541.1 143.7	196.6	1,208.4	2.0	49.3 125.4	30.4 32.6	-	1,452.5 1,708.7	
PEM/SS	13.3	0.2	802.7	4.9	98.0	75.1	-	994.2	
PEM PEM		0.2		4.9			0.7		
Γ ĽIVI	17.5	_	426.3	·	16.4	94.6	0.7	555.5	



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	Hydrologic Unit Code (HUC) 8 Name							
HGM and Cowardin Classification	Upper Koyukuk River (acres)	Middle Fork- North Fork Chandalar River (acres)	Sagavanirktok River (acres)	Lower Colville River (acres)	Kuparuk River (acres)	Mikkelson Bay (acres)	Canning River (acres)	Grand Total (acres)
PEM/UB	-	•	16.0	-	1	0.6	-	16.6
PEM/U	-	1	71.5	-	1	-	-	71.5
PAB	-	-	2.9	-	-	-	-	2.9
PUB	0.5	1	48.5	-	2.6	7.4	-	59.0
PUS	-	-	0.2	-	-	-	-	0.2
Wetlands Total Area	10,585.5	706.9	28,840.0	222.6	14,528.3	8,020.4	259.7	63,163.3
Waters and Potential Wa	ters of the U	.S.						
E1UB	-	-	-	-	181.0	-	-	181.0
E2SB	-	-	3.6	-	-	-	-	3.6
E2US	-	-	-	-	13.1	-	35.5	48.7
L1UB	34.3	-	360.7	-	409.7	189.4	0.1	994.2
L2UB	10.2	-	104.0	-	52.0	0.0	-	166.2
R1UB	-	-	2.4	-	20.7	1.0	-	24.1
R2UB	-	-	111.6	-	22.4	46.6	1.2	181.9
R2UB/US	-	-	2.3	-	-	2.5	-	4.9
R2US	0.2	-	330.6	-	29.7	82.7	-	443.1
R2US/UB	-	-	-	-	-	42.9	-	42.9
R3UB	12.4	-	25.4	-	3.9	-	-	41.7
R3UB/US	936.8	90.9	170.0	-	-	-	-	1,197.7
R3US	19.5	-	0.9	-	0.5	-	-	20.9
R3US/UB	-	-	127.2	-	-	-	-	127.2
R4SB	75.3	25.8	196.9	-	2.1	11.1	-	311.2
Waters Total Area	1,088.8	116.7	1,435.6	0.0	735.1	376.3	36.8	3,789.3
No HGM								
Disturbed	781.3	121.6	1,292.8	4.7	416.4	4.0	-	2,620.8
Upland	5,728.6	865.9	3,059.5	18.2	308.5	79.6	-	10,060.3
No HGM Total Area	6,509.9	987.5	4,352.3	22.9	725.0	83.6	0.0	12,681.1
Grand Total Area (acres) *Acreages presented in	18,184.1	1,811.1	34,627.9	245.5	15,988.3	8,480.3	296.5	79,633.8

<sup>\*</sup>Acreages presented in the Arctic Tundra Ecoregion include the Rev B Prudhoe to Point Thomson comdor.



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Waterbody crossings occurring along the Project Rev B centerline are presented in Table 3-6, organized by ecoregion and HUC 8 Sub-basin name. A total of 1,344 tidal, intermittent, lower perennial, and upper perennial stream and river crossings were mapped within the approximately 804 mile length of the Project route.

Table 3-6. Preliminary Stream Crossings, Along the Project Route, by Ecoregion

	Total Number of Streams by Stream Classification								
Ecoregion/HUC 8 Name	Tidal (R1) Crossing	Lower Perennial (R2) Crossing	Upper Perennial (R3) Crossing	Intermittent (R4) Crossing					
Alaska Range Transition	Ecoregion			_					
Upper Kenai Peninsula	1	0	0	7					
Redoubt-Trading Bays	0	3	9	27					
Lower Susitna River	0	10	23	98					
Yentna River	0	1	0	4					
Chulitna River	0	3	59	86					
Nenana River	0	0	57	66					
Intermontane Boreal Ecor	egion								
Nenana River	0	5	35	53					
Lower Tanana River	0	2	0	0					
Tolovana River	0	8	4	77					
Ramparts	0	2	11	198					
Yukon Flats	0	0	1	17					
Kanuti River	0	0	2	11					
South Fork Koyukuk River	0	0	15	44					
Upper Koyukuk River	0	0	0	10					
Arctic Tundra Ecoregion									
Upper Koyukuk River	0	0	32	94					
Middle Fork-North Fork Chandalar Rivers	0	0	10	13					
Sagavanirktok River	1	11	32	138					
Lower Colville River	0	0	0	1					
Kuparuk River	2	5	1	21					
Mikkelson Bay	0	11	0	21					
Canning River	0	2	0	0					
Total:	4	63	291	986					
Grand Total:			ı	1,344					

# 3.3 NEXT STEPS

Any changes or additions to the Rev B Project corridor or off-ROW areas made after the 2015 field season will be reviewed and field verified if necessary in 2016. Off-ROW areas presented in this report include areas added to the route prior to September 9, 2015, but not all of the areas added have been field verified. A total of 100 field targets located in off-ROW areas are planned for field verification in 2016.



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## 4.0 ACRONYMS AND ABBREVIATIONS

ASA Aquatic Site Assessment CFR Code of Federal Regulations

DP Determination Point

FAC Facultative

FACU Facultative upland FACW Facultative wetland

FERC Federal Energy Regulatory Commission

FT Field Target

GIS Geographic Information System
GPS Global Positioning System
GTP Gas Treatment Plant
HGM Hydrogeomorphic
HUC Hydrologic Unit Code
LNG Liquefied Natural Gas

MP Milepost

MSB Matanuska Susitna Borough

NRCS National Resources Conservation Service
NTCHS National Technical Committee for Hydric Soils

NWI National Wetland Inventory

OBL Obligate wetland OP Observation Point Alaska LNG Project PBU Prudhoe Bay Unit Palustrine emergent PEM**PFO** Palustrine forested PSS Palustrine scrub shrub PTU Point Thompson Unit

QA/QC Quality Assurance/Quality Control

Rev Revision ROW Right-of-Way

TNW Traditional Navigable Water

U.S. United States

USACE U.S. Army Corps of Engineers
USDA U.S. Department of Agriculture
USFWS U.S, Fish and Wildlife Service
USGS U.S. Geological Survey
WDF Wetland Determination Form



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# 6.0 APPENDICES



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# APPENDIX A - 2015 WETLAND DETERMINATION FIELD SURVEY PROTOCOLS



# 2015 WETLAND DETERMINATION FIELD SURVEY PROTOCOLS

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Rev	[	Date	Revision Description		Originator		Reviewer / Endorser				
Α	3/2	21/15	Issued for Review and Comment		J. Brownlee						
0	4/2	23/15	Issued for A	pproval	V. Watkir	าร					
Docur	ment	Country	Facility	Originator	Discipline	Туре	Sub-Type	Location	Sec	quence	Identifier
Contro	l No.	US	Al	UR	S	Р	FLD	00	00	00002	000



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# **A**UTHORIZATION

APPROVED BY:

NAME: MIKE GRAY

TITLE: PROJECT MANAGER

DATE: APRIL 23, 2015

**DATE: APRIL 23, 2015** 

REVIEW

REVIEWED BY: / ALL WATKINS
NAME: VALERIE WATKINS

TITLE: ENVIRONMENTAL SCIENTIST/BIOLOGIST

**PREPARATION** 

PREPARED BY: JESSIE BROWNLEE

TITLE: WILDLIFE SCIENTIST

DATE: APRIL 23, 2015



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# **REVISION MODIFICATION LOG**

Revision	Section	Description



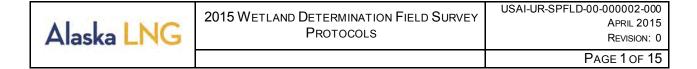
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### 1.0 PURPOSE AND SCOPE

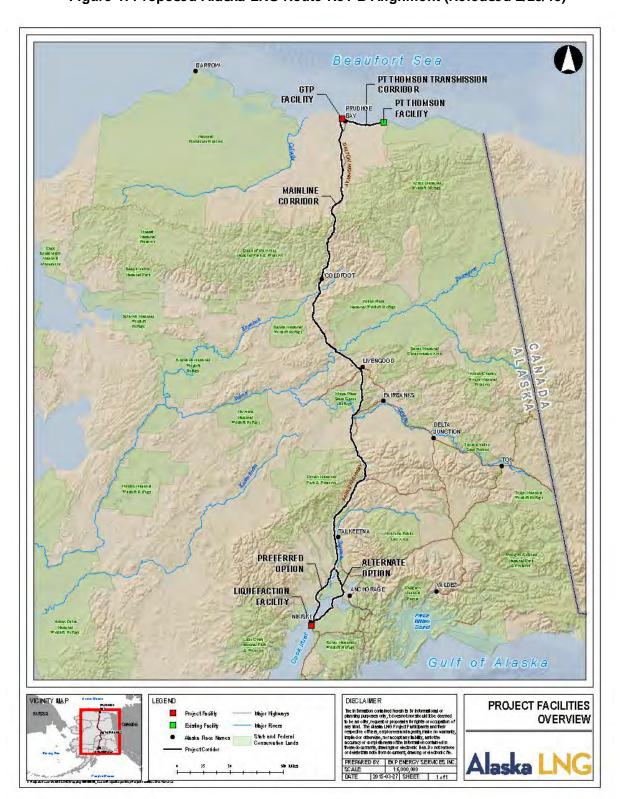
### 1.1 PROJECT DESCRIPTION

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LP (Applicants) plan to construct one integrated LNG Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and opportunity for in-state deliveries of natural gas.

The Natural Gas Act (NGA), 15 U.S.C. § 717a(11) (2006), and FERC regulations, 18 C.F.R. § 153.2(d) (2014), define "LNG terminal" to include "all natural gas facilities located onshore or in State waters that are used to receive, unload, load, store, transport, gasify, liquefy, or process natural gas that is ... exported to a foreign country from the United States." With respect to this Project, the "LNG terminal" includes the following: a liquefaction facility (Liquefaction Facility) in Southcentral Alaska; an approximately 800-mile, large diameter gas pipeline (Mainline); a gas treatment plant (GTP) on the North Slope; a gas transmission line connecting the GTP to the PTU gas production facility (PTU Gas Transmission Line or PTTL); and a gas transmission line connecting the GTP to the PBU gas production facility (PBU Gas Transmission Line or PBTL). All of these facilities are essential to export natural gas in foreign commerce.



Figure 1: Proposed Alaska LNG Route Rev B Alignment (Released 2/25/15)





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### 2.0 INTRODUCTION

Wetland determination surveys will be conducted for Alaska LNG to verify the pre-field mapping wetland types and boundaries of all waters of the United States (U.S.), including wetlands, within the defined corridor and in specific areas along the Project route. The 2015 field surveys will focus on rerouted sections of the Rev B alignment as well as previously unmapped or field verified areas where aerial imagery has recently been acquired. Field targets are anticipated along the entire length of the project route from Prudhoe Bay to Nikiski, Alaska.

All waters of the U.S. are regulated by the U.S. Army Corp of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. All projects, as part of the Section 404 permitting process, must avoid impacts to wetlands wherever possible, minimize impacts to wetlands to the maximum extent practicable, and compensate for all unavoidable wetland impacts.

Results of the wetland surveys will facilitate the eventual evaluation of project-related direct, indirect, and cumulative impacts under the Federal Energy Regulatory Commission (FERC) Resource Report 2 (Water Use and Quality), the National Environmental Policy Act (NEPA), and Section 404 and Section 10 permits administered by the USACE.

This document presents the wetland determination field survey protocols that will be used during the 2015 field season. It discusses the protocols used in both the field and office for delineating the boundaries of areas that are regulated by USACE and may be impacted by the proposed project.

#### 2.1 OBJECTIVES

The main objectives for the Alaska LNG 2015 wetland field season are:

- Complete wetland surveys in the vicinity of the pre-selected field targets;
- Collect data at field-selected observation points and at additional wetland determination points where necessary to adequately update the field maps; and
- Update the pre-field wetland mapping based on results of the field data.

### 2.2 PROJECT AREA

The Alaska LNG route passes through three ecoregions with nine sub-ecoregions, as described by Nowacki et al. (2001). Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions.

- Arctic Tundra Ecoregion
  - o Beaufort Coastal Plain Sub-Ecoregion (milepost [MP] 0 to 62) (PMP MP 0 to 58)
  - o Brooks Foothills Sub-Ecoregion (MP 62 to 143)
  - o Brooks Range Sub-Ecoregion (MP 143 to 252)
- Intermontane Boreal Ecoregion
  - Kobuk Ridges and Valleys (MP 252 to 257)
  - o Ray Mountains Sub-Ecoregion (MP 257 to 430)
  - Tanana-Kuskokwim Lowlands Sub-Ecoregion (MP 430 to 443; 455 to 517)
  - Yukon-Tanana Uplands Sub-Ecoregion (MP 443 to 455)



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- Alaska Range Transition Ecoregion
  - Alaska Range Sub-Ecoregion (MP 517 to 616)
  - o Cook Inlet Basin Sub-Ecoregion (MP 616 to 804)

The Alaska LNG corridor crosses the Beaufort Coastal Plain Sub-Ecoregion along the Point Thomson Pipeline route and the northern portion of Alaska Mainline south of Prudhoe Bay. The route then traverses the Brooks Foothills Sub-Ecoregion before it winds though the Brooks Range Sub-Ecoregion. South of the Brooks Range, the route crossed into the Intermontane Boreal Ecoregion, where it briefly traverses the Kobuk Ridges and Valleys Sub-Ecoregion; before entering into the Ray Mountains Sub-Ecoregion, continues south and passes through the Tanana-Kuskokwim Lowlands, briefly passing through the Yukon-Tanana Uplands to the Alaska Range Sub-Ecoregion. South of the Alaska Range, the route traverses though the very large Cook Inlet Basin Sub-Ecoregion south to its terminus at the LNG Facility at Nikiski, on the Kenai Peninsula.

The wetlands survey area for the Project is divided into two corridors: A wetland mapping corridor and a field survey corridor. The mapping corridor has been preliminarily established as a 2,000 foot corridor (1,000 feet on either side of the proposed alignment centerline). This mapping corridor width may be modified, with the approval of USACE, to exclude terrain features such as steep mountain slopes or lands on the far side of rivers, which are not under consideration for use. All wetlands and waterbodies will be mapped within the mapping corridor using aerial photograph interpretation. The smaller field survey corridor is 300-feet-wide (150-feet on each side of the proposed alignment centerline) and centered within the mapping corridor. Field work will be concentrated within the field survey corridor, ensuring that the wetland field work occurs near areas most likely to be disturbed by the proposed project.

The Alaska LNG field survey area is divided into eight geographic spreads for planning purposes:

- Point Thomson to Prudhoe Bay, PT Pipeline MP 0-58
- Prudhoe Bay to Atigun Pass, MP 0-170
- Atigun Pass to Yukon River, MP 170-358
- Yukon River to Livengood, MP 358-401
- Livengood to Healy, MP 401-525
- Healy to Trapper Creek, MP 525-665
- Trapper Creek to Cook Inlet, MP 665-764
- Cook Inlet to Nikiski, MP 764-804

The 2015 field season will focus on areas along the Project route from Prudhoe Bay to Nikiski, Alaska.

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### 3.0 METHODS

### 3.1 OVERVIEW

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Wetlands are considered jurisdictional "if the wetland, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable." (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]) (Stonestreet et al. 2009). Other non-wetland waters of the U.S. under the jurisdiction of the USACE include deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by the USACE. Uplands are non-wetland areas that are neither deepwater aquatic habitats, nor other special aquatic sites.

All wetlands and other waters of the U.S. in the preliminary Alaska LNG corridor will be delineated and classified using standard National Wetland Inventory (NWI) codes as described in Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Cowardin classifies wetlands and aquatic habitats by system, subsystem, class, subclass, and water regime and is based on hydrologic setting (riverine, lacustrine, estuarine, palustrine), vegetation structure (forested, scrub-shrub, emergent, aquatic bed), and water regime (saturated, temporarily flooded, seasonally flooded, semi-permanently flooded, etc.).

One deviation from standard NWI protocols for this project will be the use of two non-wetland categories. One category will include all vegetated uplands. The other will be labeled "Disturbed/Fill" and include uplands that have been impacted by human development, including all roads, gravel pads, buildings, and farmland.

Standard methods are used to delineate wetlands for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) wetland pre-mapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of wetland pre-mapping based on results of field efforts.

#### 3.2 WETLAND PRE-MAPPING

The wetland pre-mapping has been completed for the preliminary Alaska LNG route corridor. Wetland boundaries were delineated on digital ortho-rectified and geo-referenced true color aerial photography with 1.6-foot pixel resolution using the following aerial imagery:

- BP Exploration Alaska Inc. aerial imagery for Prudhoe Bay, Endicott, and Badami (1.0-foot pixel resolution; July 2012) (BPX 2012a, BPX 2012b, BPX 2012c);
- ExxonMobil aerial imagery for Point Thomson (2.0 and 0.5-foot pixel resolution; July 2001/2006, and July 2009) (ExxonMobil 2001-6, ExxonMobil 2009a);
- ExxonMobil aerial imagery for the Alaska Pipeline Project (0.5-meter pixel resolution; summer 2008, 2009, 2010, and 2011) (ExxonMobil 2008, ExxonMobil 2009b, ExxonMobil 2011);
- Healy Area Orthophoto (U.S. Census Bureau 2006);
- Digital Orthophoto Quarter Quadrangles Anderson Area (Natural Resources Conservation Service [NRCS] 2006);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a);



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- Southern Corridor Ortho Mosaic (Digital Globe 2013b);
- Talkeetna Aerial Orthophoto (Matanuska Susitna Borough [MSB] 2011a);
- Caswell Aerial Orthophoto (MSB 2011b);
- Willow Aerial Orthophoto (MSB 2011c);
- Point MacKenzie Aerial Orthophoto (MSB 2011d); and
- Nikiski Area Aerial Orthophoto (Kenai Peninsula Borough 2006).

Data from the following sources was also used during the mapping process:

- U.S. Fish and Wildlife Service (USFWS) NWI digital datasets and hardcopy maps;
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging generated topographic contours (TransCanada 2011, MSB 2011e);
- Kenai Watershed Forum Cook Inlet Wetlands for the Kenai Peninsula and the Matanuska Susitna Boroughs (Gracz 2011);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;
- U.S. Geological Survey Digital Raster Graphics (e.g., topographic maps);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

All wetland mapping was created in a GIS geodatabase, using a "heads-up" digitizing effort. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. This is the generally accepted wetland and deepwater habitat mapping technique employed by the U.S. Fish and Wildlife Service personnel as part of the NWI program (Dahl et al. 2009). Data sources were overlaid on aerial photography and wetland, non-wetland, and areas of uncertain wetland status were identified by interpreting color, texture, and landscape position, among other elements. Aerial photography clues can include dwarf or stunted trees, topography characteristics (such as swales, toe slopes, and depressions), and obvious signs of inundation.

All wetlands were mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer. Lakes, ponds and rivers were mapped at a scale of 1:1,200 (1 inch to 100 feet). Larger rivers and streams were delineated as polygons. Smaller streams, those with bankfull widths of approximately 10 feet or less, were mapped as vector lines.

### 3.3 FIELD TARGET SELECTION

Field targets were selected from the pre-mapping based on changes in the wetlands types, aerial vegetation signatures, NWI classification, and NRCS soil classification. The primary focus of the pre-selected field targets will be to characterize specific wetland types which represent all similar wetland types in the region and to identify wetland/upland boundaries by selecting paired plots. Field targets will be used to confirm areas where wetland subject matter experts have high confidence in their aerial interpretation, and will be used to confirm or correct wetland boundary locations. Field targets were also placed in low-confidence areas to provide field data where the photo signatures or landscape features were not clearly indicative of wetland or upland. The USACE may want to review and approve the 2015 field target locations that are selected to ensure that an appropriate range of representative wetlands are sampled.



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Field targets may be re-evaluated based on the status of land access permissions. When necessary, new field targets will be located on nearby accessible parcels in areas with similar aerial photography vegetation signatures and site conditions as the original field targets.

### 3.4 WETLAND FIELD DATA COLLECTION

Wetland determinations will be made using the USACE Wetlands Delineation Manual (1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Regional Supplement) (2007a).

In order for an area to be identified as a wetland, the following three parameters must be present:

- 1. <u>Hydrophytic vegetation:</u> The prevalent vegetation must be adapted to areas of saturated or inundated soils.
- 2. <u>Hydric soils:</u> The soil must be classified as hydric or possess characteristics that are associated with reducing soil conditions.
- 3. <u>Wetland hydrology:</u> The area must be inundated or saturated at some time during the growing season.

Field targets will be accessed via existing highways and secondary roads where available. A helicopter will be required to access remote sites. A Global Positioning System (GPS) device will be used to locate sites and to collect coordinates. At each field target, a USACE *Wetland Determination Data Form – Alaska Region* (**Appendix A**) will be used to determine if the site is a wetland, other water of the U.S., or upland. All wetlands and waterbodies will be delineated and classified using NWI codes. The GPS device will also be used to collect limited field data on an electronic form that will be developed for the project.

Field crews will also collect qualitative wetland data at observation points and establish additional field targets and complete *Wetland Determination Data Forms* where necessary, and will not be limited by the pre-selected field targets. The field crews will identify changes in wetland types or wetland/upland boundaries not easily identified on the aerial photography. Wetland scientists will use their best professional judgment and collect appropriate field data to adequately revise the wetland pre-mapping. A detailed wetland field survey gear list is provided in **Appendix B**.

#### 3.5 MAP REVISIONS

As wetlands field data (i.e., GPS data, Wetland Determination Forms, Vegetation Classification Forms for upland sites, site photographs, logbooks, field maps) becomes available, the field data will be downloaded in the office and plotted on the base maps of the route. The location of each plot will be attributed with the information collected in the field. This allows the creation of a reference dataset linking an aerial photography signature to a wetland status and vegetation type. This reference dataset will be used to finalize the mapping of the 2,000-foot corridor which could include adjusting boundaries and wetland classifications such as hydrogeomorphic (HGM) and Cowardin codes.

Generally, the wetland pre-mapping revision process involves:

- Exporting spatial data for all field targets and photo points from the Alaska LNG database;
- Compiling electronic copies of all notes, sketches, and photographs associated with above points; and
- Using this data in a GIS platform to update files through heads-up digitizing, or modifying the initial map on screen as described in Section 3.2 of the Wetland Determination Field Survey Protocols.



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### 3.6 WETLAND FUNCTIONAL ASSESSMENT

Wetlands are known to provide a variety of ecological functions depending on the location and type of wetland. At sites determined to be wetland, functional assessment data (**Appendix A**) will be collected. Information from this data sheet will be incorporated into the functional models described in *A Rapid Procedure for Assessing Wetland Functional Capacity* (Magee and Hollands 1998). Magee and Hollands have identified five HGM classes of wetland that occur in Alaska.

- 1. <u>Depressional wetlands:</u> Depressional wetlands occur in a topographic depression. Predominant water sources are direct precipitation, surface water runoff, and groundwater (Brinson 1976).
- 2. <u>Slope wetlands:</u> Slope wetlands generally occur on a hillside and water flow is predominantly unidirectional parallel to the slope. The water source is primarily groundwater and occasionally precipitation (Brinson 1976).
- 3. <u>Lacustrine fringe wetlands:</u> A lacustrine fringe wetland borders a lake and lacks any topographic features. The water source is surface water and flow is bidirectional.
- 4. <u>Flat wetlands</u>: There are two types of flats wetlands: organic and mineral flats. Flat wetlands in Alaska are primarily organic flats. Organic flats "can occur on relatively gentle to moderate slopes up to 20% in steepness. In relatively undisturbed conditions and without significant human alteration, the dominant hydrodynamics are vertical, even on relatively gentle to moderate slopes (i.e., slopes < 20%). Specifically, the main hydrologic input to wetlands within the organic soil flat class in interior Alaska is precipitation" (ADEC/USACE 1999).
- 5. <u>Riverine wetlands</u>: Riverine wetlands are adjacent to rivers and are dominated by overbank flooding. Water flow is bidirectional locally with an overall regional flow down the river valley.

Magee and Hollands use these HGM classes to compare the functions of wetlands within a particular HGM class. Each HGM class represents a separate functional model, which is used to define the Functional Capacity Index (FCI) of eight functions. The eight functions identified by Magee and Hollands are listed below.

- 1. <u>Modification of groundwater discharge:</u> The capacity of a wetland to influence the amount of water moving from the groundwater to surface water.
- 2. <u>Modification of groundwater recharge:</u> The capacity of a wetland to influence the amount of water moving from surface water to groundwater.
- 3. <u>Storm and flood-water storage:</u> The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface.
- 4. <u>Modification of stream flow:</u> The modification of inflow hydrology by the wetland to produce the outlet stream's hydrology.
- Modification of water quality: Removal of suspended and dissolved solids from surface water and dissolved solids from groundwater and conversion into other forms, plant or animal biomass, or gases. Wetlands with a low slope-angle or location in depressions provide a high level of this function.
- 6. <u>Export of detritus</u>: Export of organic detritus from the wetland to adjacent and downstream aquatic ecosystems.
- 7. Contribution to abundance and diversity of wetland vegetation: The capacity of a wetland to produce an abundance and diversity of hydrophytic plant species individually or as part of a group of wetlands in a local landscape (Tiner 1984).
- 8. <u>Contribution to abundance and diversity of wetland fauna:</u> The capacity of a wetland to support large and/or diverse populations of animal species that spend part or all of their lifecycle in wetlands, individually, or as part of a mosaic of wetlands in a local landscape.



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The Magee and Hollands's functional assessment method requires site-specific information to be entered into a model that will produce a FCI for each wetland function. The FCI indicates the potential degree to which the wetland performs the function and is only comparable to other wetlands within the same HGM class and region. The FCI scale is from 0.0 to 1.0. Most of the model inputs will be collected in the field, with the remaining variables taken from available GIS datasets (such as wetland size and land ownership). The results from the functional assessment models will be extrapolated to the applicable wetlands within the mapping corridor. This information will potentially serve as the basis to determine appropriate compensatory mitigation for the unavoidable impacts of the project. Wetland functional assessment data will be reported in 2016, after all field data is collected. The Wetland Determination Data Form (**Appendix A**) will be reviewed and adjusted as necessary to collect appropriate functional assessment data for the different ecoregions.

### 3.7 JURISDICTIONAL DETERMINATION

USACE regulates wetlands and other waters of the U.S. that are under their jurisdiction. Jurisdictional status is based on connectivity to Traditional Navigable Waters (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]). Field visits by USACE, the Federal Energy Regulatory Commission, the Environmental Protection Agency, and the Owner's Representative could also be conducted (with minimal notice) to observe field survey teams while they are conducting wetland delineations, and to review protocols and any data collected.

The project, similar to other large pipeline and energy projects permitted by the USACE, will assume that all wetlands found fall under USACE jurisdiction. Because the FERC requires that the Project adhere to certain construction requirements in all wetlands, regardless of jurisdiction, the Project will assume that all wetlands found will be within the USACE jurisdiction for permitting, mitigation, and construction method purposes.

#### 3.8 Data Recording and Processing

Data will be recorded on hardcopy field forms (**Appendix A**), and some of the data will be entered into an electronic data form. Electronic data files will be uploaded to a project website through an internet connection or by a satellite link, and will include GPS locations, electronic data form, site photos, site sketches, and field notes.

### 3.9 QUALITY ASSURANCE / QUALITY CONTROL

The wetlands technical lead will conduct quality audits during the first week of each deployment. These audits will ensure data quality and consistency between teams, and will provide an opportunity for any problems to be corrected immediately.

Each crew member is responsible for collecting clear and accurate data according to the sampling protocol. The field crew chief will review all hardcopy and electronic data forms and complete a quality assurance/quality control (QA/QC) checklist (**Appendix C**) before leaving each site.

The field crew manager will ensure that all data files, hardcopy and electronic, are uploaded to the Project website. These transmitted files will then be downloaded and reviewed by office-based data management staff. The wetlands technical lead will check each hardcopy data sheet and electronic data form for quality and consistency, as it is received. If problems arise, the field crew will be notified promptly to ensure that any data quality issues are corrected immediately.

Wetland mapping will be reviewed by experienced wetland scientists both after the initial premapping, and after map revisions are complete.



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### 3.10 REPORTING

The results of the 2015 field work will be compiled into a field survey report at the end of the season. The report will include a GIS dataset comprised of field-verified wetland mapping, field sample locations, and data collected at each site. It will also outline the field survey methods and identify all wetland types found throughout the corridor describing common plant species, hydrology indicators, and hydric soil indicators.

After all wetland field data is finalized, a report on the Wetland Functional Assessment for all wetlands surveyed will be provided. The Wetland Functional Assessment will be submitted to USACE for review and concurrence. Once USACE concurs, the wetland boundaries delineated will be used to calculate project impacts for Section 404 permitting. The Wetland Functional Assessment will help USACE characterize the impacted wetlands to determine appropriate compensatory mitigation for the unavoidable project impacts to wetlands and other waters of the U.S.

Results of this survey will be provided in the FERC Resource Report 2.



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### 4.0 FIELD STUDIES EXECUTION

Field study execution details are currently in the process of being developed and will include: field crew composition, schedule and march charts, field target maps, and general project-wide permits and approvals. Field safety will also be discussed and a specific Job Safety Analysis (JSA) developed for wetland surveys will be included.



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### 5.0 ACRONYMS AND ABBREVIATIONS

FCI Functional Capacity Index

FERC Federal Energy Regulatory Commission

GIS Geographic Information System

GPS Global Positioning System

GTP Gas Treatment Plant

HGM hydrogeomorphicJSA Job Safety Analysis

LNG liquefied natural gas

MP milepost

MSB Matanuska Susitna Borough

NEPA National Environmental Policy Act

NRCS Natural Resources Conservation Service

NWI National Wetland Inventory

PBU Prudhoe Bay Unit
PTU Point Thomson Unit

U.S. United States

USACE U.S. Army Corps of Engineers
USFWS U.S. Fish and Wildlife Service



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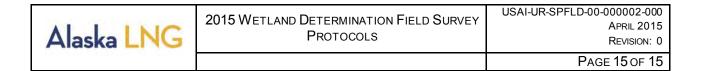


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### 7.0 APPENDICES



USAI-UR-SPFLD-00-000002-000 APRIL 2015

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### APPENDIX A - WETLAND DETERMINATION DATA FORM - ALASKA REGION



USAI-UR-SPFLD-00-000002-000

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### WETLAND DETERMINATION DATA FORM

SITE DESCRIPTION						0.0
Survey Type: Centerline A	ccess Road (explain)	Other (expli	ain)	Field Tar	get:	Map #:Map Date:
Date:	Project Name & No.:	Alaska LNG	26221163		Feature I	d:
Investigators:						Team No.:
State: Alaska	Region: Alaska		Milepost:			
Latitude:		Longitude	:			Datum:
Logbook No.:	Logbook Page No.:		Picture No.:			
SITE PARAMETERS						
Subregion			Landform (hil	Ilslope, terra	ce, hummoo	cks, etc.):
Slope (%):			Local relief (d	concave, con	vex, none):	
Pre-mapped Alaska LNG/NWI class	sification:		Soil Map Unit	t Name:		
Are climatic/hydrologic conditions o		of year?		ormal Circur		
To produce the second second	explain in Notes)	tly Disturbed?	Yes		(If no, e	explain in Notes.)
			- 17/-			
Are Vegetation, Soil, or SUMMARY OF FINDINGS	r Hydrology Naturally I	Problematic?	No	_ (If yes, ex	plain in Noti	es.)
Hydrophytic Vegetation Present? Y	es No	T w	etland Type:	_		
				CONTROL NO.	da karana da	- 40
Hydric Soil Present? You	esNo	_ Is	the Sampled A	Area within	a Wetland?	YesNo
Wetland Hydrology Present? Y	es No	-				
corridor.						



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### WETLAND DETERMINATION DATA FORM

Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1.				Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC;(A
3.				
4.				Prevalence Index worksheet:
Total Cove	r:			Total % Cover of: Multiply by:
50% of total cove	er: 20	% of total cov	er:	OBL species:X 1 =
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 =  FAC species X 3 =  FACU species X 4 =
1,				UPL species X 5 =
2.			11	Column Totals: (A) (B)
3.				PI = B/A =
4).				
5.	()			
6.				
7				
8.				
9.				
50% of total cove		0% of total cov	er:	
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1.		- 15		Prevalence Index is ≤ 3.0  Morphological Adaptations (Provide supporting data in
2.				Notes)
3.				Problematic Hydrophytic Vegetation (Explain)
4.				Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.		-		
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
A.	+			% Cover of Water
10.				
				Hydrophytic Vegetation Present (Y/N):



Depth (inches)

### 2015 WETLAND DETERMINATION FIELD SURVEY **PROTOCOLS**

SOIL PROFILE DESCRIPTION: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

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Soil Pit Required (Y/N)\_

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#### WETLAND DETERMINATION DATA FORM

Redox Features

Test Co-Ossanshirit							
Section Concession and Concession an			-1-1		-		
lane. CoCenandrolion							
Tomas CaCananatastics							
type. G=Concentration,	)=Depletion, R	M=Reduced Matri	c, CS=Covere	ed or Co	ated Sand G	Frains. Location	n: PL=Pore Lining, M=Matrix.
YDRIC SOIL INDICATO	RS						S FOR PROBLEMATIC HYDRIC SOILS
istosol or Histel (A1)			lox (A14)			Alaska Color	Change (TA4) <sup>4</sup>
ístic Epipedon (A2)		Alaska Gle	yed Pores (A	15)		Alaska Alpine	Swales (TA5)
ydrogen Sulfide (A4)							x with 2.5Y Hue
hick Dark Surface (A12)						Alaska Gleye Layer	d without 5Y Hue or Redder Underlying
Alaska Gleyed (A13)						Other (Explai	in in Notes)
		one primary indica	tor of wetland	d hydrold	gy, and an a		cape position must be present unless
Restrictive Layer (if preser			Depth (inc	hes):	~~~		
			- 4-27				
lydric Soil Present (Y/N)							
lotes:							
YDROLOGY PRIMARY	NDICATORS	any one indicator	is sufficient)	13	ECONDAR	Y INDICATORS	12 or more required
5	T	Town A AME			Carlo and Said and	CONTRACTOR DE LA CONTRA	(2 or more required) Stunted or Stressed
5.07 1. 5.13	s	urface Soil Cracks	(B6)	_ \\	ECONDAR Vater-staine eaves (B9)	d	(2 or more required) Stunted or Stressed Plants (D1)
Surface Water (A1)	S	urface Soil Cracks	(B6)	- L	Vater-staine eaves (B9)	d	Stunted or Stressed Plants (D1)
Surface Water (A1)	Si	urface Soil Cracks	(B6)	ery [	Vater-staine eaves (B9) Prainage Pat	d	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Surface Water (A1)	Si	urface Soil Cracks undation Visible o (7)	(B6)	ery C	Vater-stainer eaves (B9) Prainage Pat Oxidized Rhiz Iving Roots	d terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Surface Water (A1) High Water Table (A2) Saturation (A3)	In (E	urface Soil Cracks undation Visible of (7) parsely Vegetated	(B6) n Aerial Imag 8)	ery C	Vater-stainer eaves (B9) Prainage Pat Exidized Rhiz Iving Roots	tems (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water (A1)	In (E	urface Soil Cracks undation Visible of (7) parsely Vegetated produce Surface (B arl Deposits (B15)	(B6) n Aerial Imag 8)	ery C	Vater-staine eaves (B9) trainage Pat exidized Rhiz lying Roots tresence of I on (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)	In (E S) C	urface Soil Cracks undation Visible on 17) parsely Vegetated pncave Surface (B arl Deposits (B15) ydrogen Sulfide dor (C1)	(B6) n Aerial Imag 8)	ery C	Vater-stained eaves (B9) vainage Pat exidized Rhiz lying Roots resence of I con (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water (A1)	In (E S) C C	urface Soil Cracks undation Visible or parsely Vegetated oncave Surface (B arl Deposits (B15) ydrogen Sulfide dor (C1) y-Season	(B6) n Aerial Imag 8)	ery C	Vater-staine eaves (B9) trainage Pat exidized Rhiz lying Roots tresence of I on (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)	In (E S) C C	urface Soil Cracks undation Visible or (7) parsely Vegetated pncave Surface (B arl Deposits (B15) udrogen Sulfide dor (C1) y-Season ater Table (C2)	(B6)	ery C	Vater-stained eaves (B9) vainage Pat exidized Rhiz lying Roots resence of I con (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)	In (E S) C C	urface Soil Cracks undation Visible or parsely Vegetated oncave Surface (B arl Deposits (B15) ydrogen Sulfide dor (C1) y-Season	(B6)	ery C	Vater-stained eaves (B9) vainage Pat exidized Rhiz lying Roots resence of I con (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	In (E S) C C	urface Soil Cracks undation Visible or (7) parsely Vegetated pncave Surface (B arl Deposits (B15) udrogen Sulfide dor (C1) y-Season ater Table (C2)	(B6)	ery C	Vater-stained eaves (B9) vainage Pat exidized Rhiz lying Roots resence of I con (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Vater Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	In (E S) C C	urface Soil Cracks undation Visible or (7) parsely Vegetated pncave Surface (B arl Deposits (B15) udrogen Sulfide dor (C1) y-Season ater Table (C2)	(B6)	ery C	Vater-stained eaves (B9) vainage Pat exidized Rhiz lying Roots resence of I con (C4)	d terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
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Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  ron Deposits (B5)  Surface Water Present (Y/	Sin (E   Sin   C   C   C   C   C   C   C   C   C	urface Soil Cracks undation Visible or possessity Vegetated possessity V	(B6)	L C C C C C C C C C C C C C C C C C C C	Vater-staine eaves (B9) Prainage Pat exidized Rhis iving Roots resence of ion (C4) salt Deposits	d  tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY PRIMARY  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 Water Present (Y/N)  Saturation Present (Y/N): Includes capillary fringe)	Sin (E   Sin   C   C   C   C   C   C   C   C   C	urface Soil Cracks undation Visible or (7) parsely Vegetated porcave Surface (B arl Deposits (B15) ydrogen Sulfide dor (C1) y-Season ater Table (C2) ther (Explain in No	(B6)	L C C C C C C C C C C C C C C C C C C C	Vater-staine eaves (B9) Prainage Pat exidized Rhis iving Roots resence of ion (C4) salt Deposits	d  tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

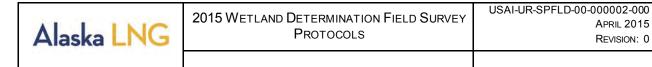


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### WETLAND DETERMINATION DATA FORM

	VARIABLES P= Plot, M= Matrix
Forested-Everg Scrub Shrub-Ev	ation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-Aquatic Bed
Percent Cover Dwarf shrub (<0	(P): Tree (>5 dbh, >6m tail)         Sapling (<5 dbh, <6m tail)         Tall shrub (2-6m)         Short shrub (0.5-2m)           0.5m)         Tall herb (≥1m)         Short herb (<1m)
Number of We	itand Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
	nsity/Dominance (P). Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60- Very High Density (80-100%)
Interspersion of Peripheral Cove	of Cover & Open Water (P): 100% Cover or Open Water <a href="25% Scattered/Peripheral Cover">75% Scattered or 26-75% Scattered or Peripheral Cover" N/A</a>
Plant Species	Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Is	ands (M): Absent (none) One or Few Several to Many N/A
Cover Distribu Open	tion of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Small Scattered Patches Continuous Cover 1
	laterial (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Inte	rspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) upings, diverse and interspersed)
HGM Class (P)	Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABL	
Soll Factors (P Mineral: Gravel	
HYDROLOGIC	VARIABLES
Inlet/Outlet Cla	iss (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No
Inlet/Outlet Cla Outlet Inlet/Intermitten Wetland Water	iss (P): No Inlet/Outlet No Inlet/intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Pe
Inlet/Outlet Cla Outlet Inlet/Intermitten Wetland Water Wet: Perm. Floo Evidence of Se	iss (P): No Inlet/OutletNo Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
inlet/Outlet Cla Outlet_ Inlet/Intermitten Wetland Water Wet: Perm. Floo Evidence of Se Created	iss (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet In
Inlet/Outlet Cla Outlet Inlet/Intermitten Wetland Water Wet: Perm. Flor Evidence of Se Created Microrellef of N Frequency of C	Intermittent Untermittent Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/N
Inlet/Outlet Cla Outlet Inlet/Intermitten Wetland Water Wet: Perm. Flor Evidence of Se Created Microrellef of N Frequency of C Return Interval	Intermittent Untermittent Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Inlet/N
Inlet/Outlet Cla Outlet Inlet/Intermitten Wetland Water Wet: Perm. Flor Evidence of Se Created Microrellef of N Frequency of C Return Interval	Intermittent Untermittent Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Inlet/N
Inlet/Outlet Cia Outlet_ Inlet/Intermitten Wetland Water Wet: Perm. Floot Evidence of Se Created Microrellef of N Frequency of ( Return Interval Degree of Outl Water pH (P): I	Intermittent Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Inte
Inlet/Outlet Cla Outlet Inlet/Intermitten Wetland Water Wet: Perm. Flot Evidence of Se Created Microrellef of N Frequency of G Return Interval Degree of Outl Water pH (P): I Surficial Glacia Glacial Till/Not Basin Topogra	Intermittent Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Inte
inlet/Outlet Cia Outlet Inlet/Intermitten Wetland Water Wet: Perm. Floot Evidence of Se Created Microrellef of N Frequency of ( Return Interval Degree of Outl Water pH (P): I Surficial Glacial Glacial Till/Not Basin Topogra	Intermittent Unterwittent Unterwittent Outlet
inlet/Outlet Cia Outlet Inlet/Intermitten Wetland Water Wet: Perm. Flot Evidence of Se Created Microrellef of N Frequency of C Return Interval Degree of Outl Water pH (P): 1 Surficial Glacia Glacial Till/Not Basin Topogra Evidence of Se LANDSCAPE N Wetland Juxta	Intermittent Inlet/No Inlet/Intermittent Outlet
inlet/Outlet Cia Outlet Inlet/Intermitten Wetland Water Wet: Perm. Flot Evidence of Se Created Microrellef of N Frequency of C Return Interval Degree of Outl Water pH (P): 1 Surficial Glacia Glacial Till/Not Basin Topogra Evidence of Se LANDSCAPE N Wetland Juxta	No Inlet/Outlet
inlet/Outlet Cia Outlet Inlet/Intermitten Wetland Water Wet: Perm. Floot Evidence of Se Created Microrellef of N Frequency of C Return Interval Degree of Outl Water pH (P): I Surficial Glacia Glacial Till/Not Basin Topogra Evidence of Se LANDSCAPE N Wetland Juxta Only Connected	Intermittent Inlet/Note Intermittent Outlet Intermittent Outlet Intermittent Inlet/No Outlet Intermittent Inlet/No Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/No Out
inlet/Outlet Cla Outlet Outlet Inlet/Intermitten Wetland Water Wetl Perm. Floo Evidence of Se Created Microrellef of V Frequency of 6 Return Interval Degree of Outl Water pH (P): I Surficial Glacia Glacial Till/Not Basin Topogra Evidence of Se LANDSCAPE V Wetland Juxta Only Connected Wetland Land Watershed Land	Intermittent Inlet/Outlet



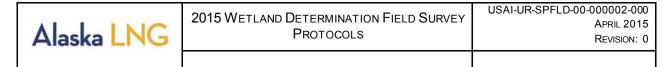
### APPENDIX B - WETLAND SURVEY GEAR LIST



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Wetland and Vegetation Gear	Communication
1 - Sharp shooter shovel (fiberglass, not wood handle)	1 - VHF Radio
1 - U-Dig-it (Hand shovel)	1 - charger for vhf radio
1 - Compass	1 - Iridium Satellite Phone
1 - Hand lens	1 - charger for satellite phone
1 - Leatherman/sample knife (folding) 4" serrated	Safety/Survival Pack (Need for 2 teams)
1 - Digital camera	2 - Sleeping Bags
1 - calculator	1 - Tent
1 - extra batteries for digital camera	1 - Wilderness First Aid Kit
1 - pH meter (pen kind) with storage solution	1 - Flare gun kit
1 - Pocket rod (measuring tape)	1 - Emergency procedures Manual
1 - Opaque small spray bottle filled with alpha-alpha dipyridyl	1 - Iodine Tablets/Filter
2 - packages – gallon Ziploc bags	1 - 50' Nylon Rope/Parachute cord
1 - package- pint Ziploc bags	1 - small Flashlight/headlamp (for soil pit)
Squirt Water bottle (for moistening soil to color)	2 - Space Blankets
200+ - USACE Wetland Determination Form – Alaska Region (on Rite-in-the-	2 - Space Blatinets
Rain) with functional assessment	1 - Bear Spray
1 set - Field Maps on Rite-in-the-Rain	1 - Tarp (10' x 12')
4+ - Rite-in-the-Rain Field notebooks (spiral with lines)	1 - Gloves – Work/Latex/Insulated rubber
12+ - Mechanical Pencils w/ extra lead	matches
12+ - Sharpies (red and black)	1 - Roll of duct tape
1 - Laptop Computer (for downloading data every night)	Flagging tape (1 bright color per team)
2 - Clipboards	BPA-free water jug
Extra Rite-in-the-Rain paper	Personal Gear
1 - 12 inch file (for shovel sharpening) with handle	1 - Xtratuffs
1 - scissors	1 - Felt insoles for Xtratuffs
1 - tape	1 - Blaze Orange Surveyor Field Vest
2 - post it notes	1 - Mosquito Head Net
2 - toilet paper	1 - Rain Jacket/Pants
1 - Roll of duct tape	2 - Bug Spray
1 - (see through) small dry bag for soil kit	2 - Sunblock
1 – (see through) medium dry bag for field reference materials	1 - Sun Glasses
1 – dry erase board (for pictures)	1 - Water Bottle
1 – plant press	1 - Backpack
Books	1 - Hat
1 - Munsell Soil Color charts	Cell phone and charger
1 - Flora of Alaska and Neighboring Territories – Eric Hulten	1 - umbrella
1 - Trees and Shrubs – Viereck	Boot dryers
1 - Western Boreal Forest and Aspen Parkland – MacKinnon and Pojar	Doct dryolo
1 - Wetland Sedges of Alaska – Tande and Lipkin	
1 - Willows of Interior Alaska – Collett	
1 - National List of Plant Species that Occur in Wetlands – Alaska Region -	
Reed 1988 (print)	
1 - Field Guide to Alaskan Wildflowers – Verna Pratt	
4. Weldflaware along the Alaskar High	
1 - Wildflowers along the Alaskan Highway – Verna Pratt	
- Wildflowers along the Alaskan Highway – Verna Pratt     - Rapid Procedure for Assessing Wetland Functional Capacity: Based on HGM Classification – Hollands and Magee (print)	
Rapid Procedure for Assessing Wetland Functional Capacity: Based on HGM Classification – Hollands and Magee (print)     1 - 1987 Wetland Delineation Manual (print)	
Rapid Procedure for Assessing Wetland Functional Capacity: Based on HGM Classification – Hollands and Magee (print)	
Rapid Procedure for Assessing Wetland Functional Capacity: Based on HGM Classification – Hollands and Magee (print)     1 - 1987 Wetland Delineation Manual (print)     1 - 2007 Regional Supplement to the Corps of Engineers Wetland Delineation	



### APPENDIX C - QA/QA CHECKLIST



USAI-UR-SPFLD-00-000002-000

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### Wetland Determination Data Form QA/QC Checklist

This form to be completed before leaving the field site.

-eature	e ID:	D: Field Target:	Date:
For all	item	ms not checked, please provide detailed explanation in the notes sec	ction of data form.
1.	Sit	Site Description	
		Site description, site parameters and summary of findings are con A detailed site sketch is included?	nplete?
2.	Ve	egetation egetation	
		identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strational indicator status is correct for each species?	
3.	So	oil	
4.	Ну	lydrology	
		FF - F	present?
5.	Fu	unctions and Values	
		Vegetation, soil, hydrologic variables, and landscape variables co	mplete if site is a wetland?
6.	Fie	ield Logbook	
		<ul><li>Notes have been recorded at each site, including general descript of pre-mapped wetland boundary as appropriate?</li><li>Each logbook page is initialed and dated?</li></ul>	tion, sketch, and accuracy
7.	Ма	laps	
		Wetland boundaries have been corrected if necessary?  Mans are initialed and dated?	



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soil plug)?	en for each Wetland Determination Data Form (2 en for each Observation Point (vegetation/site ov	
X	X	
Wetland Scientist (print)	Signature / Date	
X	X	
Field Crew Chief (print)	Signature / Date	



### APPENDIX B - PROBLEMATIC SOILS



#### 2015 WETLAND FIELD STUDY REPORT

USAI-P1-SRZZZ-00-000002-000 DECEMBER 17, 2015

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#### 1.1 PROBLEMATIC HYDRIC SOIL DETERMINATIONS

Few potentially problematic hydric soils were encountered within the study area. This section describes instances where problems may be encountered.

#### 1.1.1 Low Chroma Soil Parent Material

Low chroma soil matrix colors inherited from parent materials are not uncommon in the study area. In many places in the project area, silty loess and coarse-loamy eolian deposits blanket hillsides and terraces, particularly in areas close to major rivers. Fine-textured silty loess develops into soil with relatively slow permeability and is susceptible to erosion (NRCS 2006). These soils tend to be inherently low chroma or light gray colored due to the properties of the parent material. Attention to soil horizons, landscape position, vegetation, macro and microtopography, and hydrology are needed to properly describe or classify these soils as hydric.

#### 1.1.2 Unsaturated Thick Organic Surfaces (Folistic Epipedons)

In Interior Alaska, acidic near surface conditions, low evapotranspiration rates, and cold climate promote the formation of thick organic surfaces on imperfectly drained sites as well as well drained sites. Organic mat depths can also change rapidly over very short distances. A number of non-wetland field plots throughout the project area have organic horizons that range from 6 to 9 inches deep, while some may extend to 15 inches and more.

Black spruce forests on hillsides and higher landscape positions tend to have a dense cover of mosses, to include feather-mosses and sphagnum. In lower landscape positions sphagnum often dominates the bryophyte stratum, and the soils tend to be imperfectly drained and classified as hydric. On steeper slopes soils tend to be moderately well drained, and the feather-moss coverage tends to be much higher. On these higher hillslope positions, organic materials are more likely to be poorly decomposed (fibric) and often do not exhibit evidence of extended saturation characteristic of histic epipedons. These non-saturated thick organic surfaces are considered folistic epipedons and are not an indicator of a hydric soil (NRCS 2006).

In the example below (Figure B-1), a nine-inch organic mat showing no evidence of saturation has formed over low chroma silty loess parent material with a permafrost table at 16 inches. The soil has developed on a slightly convex interfluve with a west aspect.

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Figure B-1. A Nine-Inch Folistic Epipedon over Low Chroma Parent Material. Permafrost Table at 16 inches. West aspect; 5% Slope. (Field Site W84LH016).



Photo by Jennifer Anderson

#### 1.1.3 Fire Affected Soils

Forest fire is an ecological factor that can have significant influence on soils in the study area-particularly in the Interior. The alteration of vegetation, hydrology and soil morphological characteristics can result in problematic wetland situations following a fire. By thinning or removing the insulating organic mat and vegetative cover, fire can significantly warm permafrost affected soils causing a thickening of the active layer and a drop in depth to permafrost. Where permafrost recedes following a fire, saturation may no longer occur within the upper part of the soil resulting in a drier soil moisture regime. This hydrological shift may effectively alter the wetland status of a site or make the identification of remaining hydric soil indicators problematic. The hydrological alteration may be permanent or, may be temporary if the permafrost table rises again in response to the reestablishment of vegetation and the insulating organic mat over time. Permafrost affected soils in warmer and drier landscape positions (southeast through southwest aspects) are most susceptible to significant changes in temperature and hydrology following a fire. Soils in colder and wetter landscape positions will often have higher soil moisture and be more resilient to major shifts in hydrology and permafrost dynamics following fire.

Common problems that may be encountered when identifying hydric soil indicators in fire affected areas include: the thinning or removal of histic epipedons; organic thicknesses of eight inches or more remain but saturation is absent or lessened in the upper part of the soil profile; and low chroma matrix colors and redoximorphic features persist but saturation is absent or lessened. Care must be taken in the delineation of fire affected areas and interpretation must be made in context with landscape position. The presence of charcoal in any soil is evidence of fire history and cause for close examination of all soil and hydrological properties.



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In the example below (Figure B-2), the 200

In the example below (Figure B-2), the 2005 North Bonanza Fire burned black spruce forest on a west facing slope. With seasonal frost observed at 22 inches, pronounced frost heaves, frost boils, and hummocky microtopography, this site has likely experience a subsidence of the permafrost table and subsequent loss of hydrological conditions necessary to support a wetland. The plant community hosts species commonly occurring at early successional sites following a forest fire as well as hydrophytes suggesting the plant community is transitioning from a wet phase toward a drier phase.

Figure B-2. A Field Site (formerly black spruce forest) Where the Permafrost Table may have Receded Following a Wildfire Possibly Changing the Wetland Status. 2005 North Bonanza Fire; West Aspect; 7% Slope (Field site W84AY026).



Photo by Abigayle Fisher

#### 1.1.4 Andic Parent Material

South of the Alaska Range volcanic ash becomes an increasingly common parent material in the Project area. Andic materials (volcanic ash and ejecta) have distinct chemical and morphological properties that can cause difficulties in the field identification of hydric soil indicators and aquic conditions. Andisols and andic materials in the project area tend to exhibit low bulk densities; dark, organic enriched surface horizons (umbric/mollic epipedons); and high-chroma matrix colors with hues of 10YR and redder, even in the wettest landscape positions. Andic materials contain significant quantities of vitreous material (volcanic glass) containing aluminum (Al), Silica (Si) and Iron (Fe) compounds in non-crystalline (amorphous) forms that may be largely insoluble and recalcitrant to reduction (McDaniel et al, SSSA, 1997). These amorphous Al and Fe compounds will also form chemical complexes with humic compounds (organic carbon) resulting in over thickened dark surfaces. The high organic content of these soils may mask redoximorphic features in some cases. In some areas, the influence of oxygenated shallow groundwater or periodic influxes of oxygen enriched precipitation may help foster oxygenic conditions in these soils. Often, the only distinct indicator of hydric soils in these areas is the presence of a histic epipedon. This can be a problematic indicator because the depth of the organic mat can change significantly over very short distances.



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In the example below (Figure B-3), an andisol has a high water table (2 inches) and reducing conditions (positive reaction to alpha alpha dipiridyl) but, shows no National Technical Committee on Hydric Soils (NTCHS) approved hydric soil indicators.

Figure B-3. Andic Soil Profile with High Watertable and Reducing Conditions Lacking Approved NTCHS Hydric Soil Indicators. (Field site W84TI014\_OP)



Photo by Abigayle Fisher



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# APPENDIX C – 2015 WETLAND FIELD DATA SUMMARY TABLE AND US ARMY CORPS OF ENGINEERS ALASKA DISTRICT WETLAND DETERMINATION FORMS

(Provided in a Digital Format)

ALASKA LNG PROJECT	DOCKET NO. CP17000	Doc No: USAI-EX-SRREG-00-
	RESOURCE REPORT NO. 2	000004-000
	APPENDIX G – WETLAND FIELD SURVEY	DATE: APRIL 14, 2017
	REPORTS	REVISION: 0
	PRIVILEGED AND CONFIDENTIAL	

# APPENDIX G.3 2016 WETLAND AND VEGETATION FIELD STUDY REPORT (USAI-P1-SRZZZ-00-000016-000)



# 2016 WETLAND AND VEGETATION FIELD STUDY REPORT

USAI-P1-SRZZZ-00-000016-000

Rev	С	Date	Revision Description		Originate	or	Reviewer / Endorser	Respo Cod			prover
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0	16-9	Sep-16	Issued for Use		V. Watkir	Vatkins					
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DATE: SEPTEMBER 16, 2016



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### REVISION MODIFICATION LOG

Revision	Section	Description
Α	Global	Initial release for 2016 review and comment.
0	Global	Made updates per minor comments received.

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## 1.0 PURPOSE AND SCOPE

This 2016 Wetland and Vegetation Field Study Report provides a review of the wetlands and vegetation that were mapped and field surveyed for the Alaska Liquefied Natural Gas (LNG) Project (Project) during the 2016 field season. The 2016 field verification data was combined with field data collected in 2010, 2011, 2014, and 2015, and was used to further refine the wetland and vegetation mapping. The area that was surveyed in 2016 includes the proposed Project's Revision (Rev) C route from the west side of Cook Inlet (MP 760) to the Beaufort Coastal Plain where the northern extent of field data collection occurred (approximately milepost, MP, 56) (Figure 1-1). Results presented in this report include the entire Rev C route and off right-of-way (ROW) roads and facilities.

### 1.1 Project Description

The Alaska Gasline Development Corporation (AGDC), BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, and ExxonMobil Alaska LNG LLC (Applicants) plan to construct one integrated liquefied natural gas (LNG) Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular from the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and for in-state deliveries of natural gas.

The Natural Gas Act (NGA), 15 U.S.C. § 717a(11) (2006), and Federal Energy Regulatory Commission (FERC) regulations, 18 C.F.R. § 153.2(d) (2014), define "LNG terminal" to include "all natural gas facilities located onshore or in State waters that are used to receive, unload, load, store, transport, gasify, liquefy, or process natural gas that is ... exported to a foreign country from the United States." With respect to this Project, the "LNG terminal" includes the following: a liquefaction facility (Liquefaction Facility) in Southcentral Alaska; an approximately 804-mile gas pipeline (Mainline); a gas treatment plant (GTP) within the PBU on the North Slope; an approximately 62-mile gas transmission line connecting the GTP to the PTU gas production facility (PTU Gas Transmission Line or PTTL); and an approximately 1-mile gas transmission line connecting the GTP to the PBU gas production facility (PBU Gas Transmission Line or PBTL). All of these facilities are essential to export natural gas in foreign commerce and will have a nominal design life of 30 years.

## 1.2 Purpose

The purpose of wetlands and waterbodies mapping is to identify on aerial imagery potential "Waters of the United States (U.S.), including wetlands," that are regulated by the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act (40 Code of Federal Regulations [CFR] Part 230) and Section 10 of the Rivers and Harbors Act (33 CFR Part 328.3[b]) that may be impacted by the Project. As part of the Section 404 permitting process, all projects must avoid impacts to wetlands whenever possible, minimize impacts to wetlands to the maximum extent practicable, and compensate for all unavoidable wetland impacts.

Pre-field mapping, using aerial photo interpretation, was completed in 2013, 2014, 2015, and 2016 for the Project's Mainline corridor from Nikiski, across Cook Inlet and north to Livengood, and for numerous route adjustments and off-ROW access roads and facility sites from Livengood to the Beaufort Coastal Plain. Approximately 223,100 acres have been mapped along the Project corridor for the current alignment. This 2016 Wetland and Vegetation Field Study Report summarizes the pre-mapping effort and focuses on results of the field data collection in 2016.

Field surveys were conducted in 2016 to verify the accuracy of wetland and vegetation cover types and boundaries as determined in the pre-mapping. Field data are used to improve the



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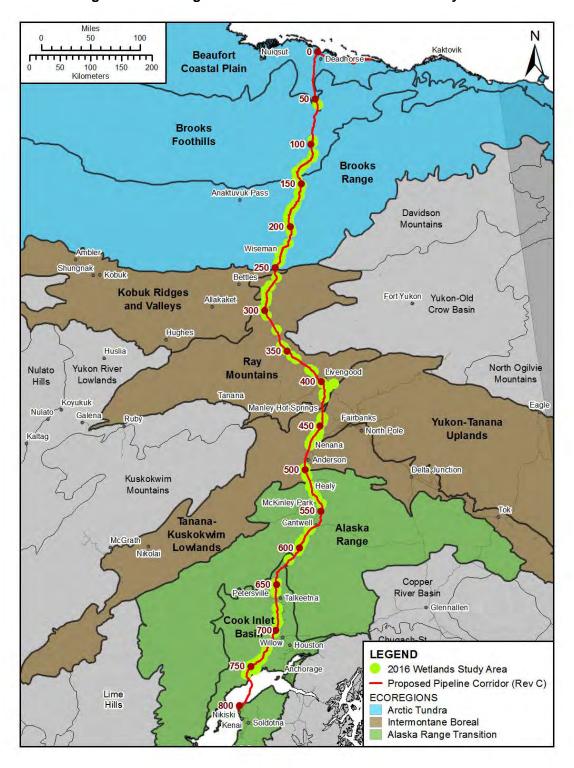
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accuracy of Project wetland and vegetation mapping efforts. This information is required for the National Environmental Policy Act (NEPA) process as expected to be administered by FERC and for Section 404 and Section 10 permits administered by the USACE. Additionally, these data will constitute baseline information for the FERC's Resource Reports No. 2 and No. 3.

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Figure 1-1. Ecoregions within the 2016 Alaska LNG Study Area





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## 1.3 STUDY AREA

The 2016 field season focused on the Project's proposed Rev C off-ROW areas and pipeline route adjustments. Field verification during the 2016 season occurred from the west side of Cook Inlet (MP 760), north along the Rev C route to the Beaufort Coastal Plain near MP 56.

The wetlands and vegetation survey area was divided into two corridors: a mapping corridor and a field survey corridor. The mapping corridor was 2,000 feet wide (1,000 feet on either side of the proposed centerline). All wetlands and waterbodies, and vegetation were mapped within the mapping corridor using aerial photograph interpretation. The smaller field survey corridor was 300 feet wide (150 feet on each side of the proposed centerline) and centered within the mapping corridor. Previous field work has primarily been concentrated within the field survey corridor, ensuring that the wetland and vegetation field work occurred near areas most likely to be disturbed by the proposed Project, while representative of the wider corridor. If unique wetland and vegetation signatures on aerial photos occurred outside of the 300-foot field survey corridor, field targets would be established and sampled. In 2016, approximately 75 percent of the sampling occurred outside of the 300-foot field survey corridor. Proposed off-ROW access roads and facilities footprints were included in the field survey and mapping efforts. The distribution of field plots collected in the two corridors during the 2016 field season is summarized in Section 3.1 of this report.

While the 2016 field data is organized and analysed by ecoregion in this report, the field survey area was also divided into eight geographic areas for planning purposes. Field identification numbers (plot numbers) include a two letter code identifying the geographical area where a field point is located. Field identification numbers begin with the field team identifier (e.g., W84) followed by the two letter geographical area code (e.g., TI) and concludes with a field plot number (e.g., 001). The geographical areas and two letter codes are summarized by project milepost below:

- Cook Inlet to Nikiski (IN), Mainline MP 792-804;
- Trapper Creek to Cook Inlet (TI), MP 664.5-765;
- Healy to Trapper Creek (HT), MP 525-664.5;
- Livengood to Healy (LH), MP 403.5-525;
- Yukon River to Livengood (YL), MP 357-403.5;
- Atigun Pass to Yukon River (AY), MP 169-357;
- Prudhoe Bay to Atigun Pass (PA), MP 0-169; and
- Point Thomson to Prudhoe Bay (PP), PT Pipeline milepost (MP) 0-58.

The Project route passes through three ecoregions with nine sub-ecoregions (Figure 1-1), as described by Nowacki et al. (2001):

- Alaska Range Transition Ecoregion
  - o Cook Inlet Basin Sub-Ecoregion
  - o Alaska Range Sub-Ecoregion
- Intermontane Boreal Ecoregion
  - Tanana-Kuskokwim Lowlands Sub-Ecoregion
  - o Yukon-Tanana Uplands Sub-Ecoregion
  - Ray Mountains Sub-Ecoregion
  - o Kobuk Ridges and Valleys Sub-Ecoregion



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- Arctic Tundra Ecoregion
  - o Brooks Range Sub-Ecoregion
  - Brooks Foothills Sub-Ecoregion
  - o Beaufort Coastal Plain Sub-Ecoregion

Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions (World Wildlife Fund 2015). The Alaska LNG corridor studied during the 2016 field season begins in the Cook Inlet Basin, continues north through the Alaska Range, and then continues through the Tanana-Kuskokwim Lowlands, Yukon-Tanana Uplands, Ray Mountains, Kobuk Ridges and Valleys, then north through the Brooks Range and Brooks Foothills, before ending in the Beaufort Coastal Plain (near MP 56). No field work was completed north MP 56 in 2016, since data was previously collected in this area. However, the study area corridor continues north through the Beaufort Coastal Plain reaching Deadhorse, Alaska before bearing east to Point Thomson and the PTU production fields. Each ecoregion is described below.

## 1.3.1 Alaska Range Transition Ecoregion

The mountains of the Alaska Range are very high and steep. Much of the area on steep mountain slopes is barren of vegetation, but high elevation valley bottoms contain dwarf scrub communities on windswept sites. The Alaska Range has a cold subarctic continental climate. With elevations ranging from 2000 feet to 13,000 feet, and some peaks as high as 20,000 feet, the area experiences a wide range of climatic conditions. The region was heavily glaciated in the late Pleistocene, and glaciers still occupy many valleys. Streams are generally glacial fed, swift and braided with heavy sediment loads. Dwarf and low scrub communities are common and open needleleaf forests and woodlands occur primarily on well drained sites at lower elevations.

## 1.3.1.1 Cook Inlet Basin Sub-Ecoregion

The Cook Inlet Basin Sub-Ecoregion is located in Southcentral Alaska, adjacent to Cook Inlet. The project begins within the Cook Inlet Basin at Nikiski (MP 804) and exits this sub-ecoregion at MP 616.5 in Denali State Park. The area is dominated primarily by spruce and birch, with cottonwood and willow along riparian habitats and thick alder on upland slopes. The terrain is level to rolling with an elevation range from sea level to 2,000 feet. The basin is generally permafrost free.

According to Gallant et al. (1995), needleleaf forests are widespread and dominated by white spruce (Picea glauca), black spruce (P. mariana), and Sitka spruce (P. sitchensis). Broadleaf forests are dominated by quaking aspen (Populus tremuloides), balsam poplar (P. balsamifera), black cottonwood (P. trichocarpa), and Alaska paper birch (Betula neoalaskana). Mixed forests are co-dominated by combinations of these needle-leaf and broadleaf tree species with alders (Alnus spp.) often providing a tall shrub layer under the forest canopy. Low growing shrubs commonly include resin birch (Betula glandulosa), dwarf birch (B. nana), prickly rose (Rosa acicularis), willow (Salix spp.), bog Labrador-tea (Rhododendrum groenlandicum), and other ericaceous species. Dry to mesic sites support a variety of grasses including rough fescue (Festuca altaica), red fescue (F. rubra), Bering's tufted hairgrass (Deschampsia beringensis), large-flower blue grass (Poa eminens), and purple reedgrass (Calamagrostis purpurascens). Forbs associated with these dry to mesic sites include larkspur-leaf monkshood (Aconitum delphinifolium) and tall bluebells (Mertensia paniculata) with low shrubs such as lingonberry (Vaccinium vitis-idaea), black crowberry (Empetrum nigrum), net-vein willow (Salix reticulata) and woolly willow (S. lanata). Feathermosses (Pleurozium schreberi and Hylocomium splendens) sometimes form a patchy to continuous moss layer. Sphagnum mosses may occur. Mesic to moist sites support graminoid communities dominated by bluejoint grass (C. Canadensis), with



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herbs such as narrow-leaf fireweed (*Chamerion angustifolium*), seacoast angelica (*Angelica lucida*), western lady fern (*Athyrium cyclosorum*), field horsetail (*Equisetum arvense*) and water horsetail (*E. fluviatile*).

## 1.3.1.2 Alaska Range Sub-Ecoregion

The corridor enters the Alaska Range Sub-Ecoregion at approximately MP 616.5 in Denali State Park and exits to the north at MP 516 north of Healy. Nowacki et al. (2001) states that because of the Alaska Range's high elevation, "a cold continental climate prevails and much of the area is barren of vegetation". However, the corridor passes through valley bottoms in this sub-ecoregion that are typically dominated by willow, shrub birch (Betula spp.), and alder communities. According to Gallant et al. (1995) dwarf scrub communities are most common where vegetation does occur, growing on well drained, windswept sites. More protected slopes provide moist to mesic conditions that support low or tall scrub communities. Open needleleaf forests and woodlands occur primarily on well drained sites in the lower valleys along the route, and on lower hillslopes. Dwarf scrub communities are typically dominated by mountain-avens (Dryas spp.), ericaceous species (such as, lingonberry, bog blueberry (V. uliginosum), white arctic mountainheather (Cassiope tetragona), black torpedoberry (Arctous alpina), and red topedoberry (A. rubra), or combinations of these species. Graminoid species, such as Canadian single-spike sedge (Carex scirpoidea) and Bigelow's sedge (C. bigelowii) and alpine holygrass (Anthoxanthum monticola), may be present and may even codominate with shrubs. Low scrub communities are dominated by resin and dwarf birch, and ericaceous shrubs or by willows. Common herbs are rough fescue, alpine holygrass, Bigelow's sedge, arctic sweet coltsfoot (Petasites frigidus), and arctic wormwood (Artemisia norvegica). Tall scrub communities occur at the altitudinal treeline. along streambanks, in drainages, and on floodplains. These communities are dominated by feltleaf willow (S. alaxensis), little-tree willow (S. arbusculoides), diamond-leaf willow (S. pulchra), and woolly willow, alder, a mixture of willow and alder, or a mixture of willow and shrub birch. Low shrubs, such as Alaska bog willow (S. fuscescens), Beauverd spirea (Spiraea stevenii), narrowleaf Labrador-tea (*R. decumbens*), and bog blueberry, occur in the more open stands.

## 1.3.2 Intermontane Boreal Ecoregion

The vegetation of the Intermontane Boreal Forest Ecoregion is a complex array of plant communities shaped by fire, soil temperature, drainage, aspect and exposure (Alaska Department of Natural Resources [ADNR], 2011). Throughout this ecoregion, expanses of boreal forests of both needleleaf and deciduous species are dissected by broad, flat river floodplains and a diversity of wetlands. This ecoregion spans most of the central portion of the state, east to the border (Nowacki et al., 2001).

A continental subarctic climate prevails, marked by short, warm summers and long, cold winters (Wiken et al., 2011). The mean annual temperature for the area is approximately 10.4°F, with a summer and winter mean temperature of 50.9°F and -9.4°F, respectively. The frost-free period ranges from 20 to 70 days. The western part of the region is generally wetter; there, mean annual precipitation ranges from between 11.8 to 35.4 inches on the higher mountains (Wiken et al., 2011).

### 1.3.2.1 Tanana-Kuskokwim Lowlands Sub-Ecoregion

The route enters the Tanana-Kuskokwim Lowlands north of Healy (MP 516) and approaches the boundary with the Yukon-Tanana Uplands near MP 454.8 where it weaves along the boundary, in and out until MP 430.2. The route passes through a large alluvial plain along the Tanana and Nenana rivers and tributaries, and extends through the lower-lying areas north of Nenana to Livengood. In this area, undifferentiated sediments of fluvial and glaciofluvial origin are capped by varying thicknesses of eolian silts and organic soils (Nowacki et al., 2001). Surface moisture is rather abundant due to the gentle topography, patches of impermeable shallow permafrost, and



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poor soil drainage in fine textured eolian deposits. Permafrost is thin and discontinuous, and temperatures are near the melting point. Collapse-scar bogs and fens caused by subsiding permafrost are frequent (Nowacki et al., 2001).

The region has a dry sub-arctic, continental-influenced climate, marked by cool to mild summers and long, cold winters. Summer temperatures can be relatively warm. The mean annual temperature for the area is approximately 14.5°F, with a summer and winter mean temperature of 45.5°F and -14.8°F, respectively. Mean annual precipitation ranges between 7.9 to 31.5 inches and mostly occurs during summer convective storms (Wiken et al., 2011).

Boreal forest communities of needleleaf, deciduous, and mixed forest occur as a result of the interplay of permafrost, surface water, fire, local elevation relief, and hill slope aspect. Lightning fires are very frequent. Black spruce woodland and dwarf tree communities occur in bogs, with tamarack (*Larix laricina*) in low, wet areas. White spruce and balsam poplar are common along rivers. Active floodplains and river bars support stands of tall alders and willows. South-facing slopes support stands of white spruce, Alaska paper birch, and aspen (Nowacki et al., 2001). The coldest, wettest areas tend to occur on permafrost flats that support birch, ericaceous shrubs and sedge (*Carex spp.*) and tussock cottongrass (*Eriophorum vaginatum*). Wet sedge meadows and aquatic vegetation occur in sloughs and oxbow ponds. Tall willow, resin birch, and alder communities are scattered throughout (Nowacki et al., 2001).

## 1.3.2.2 Yukon-Tanana Uplands Sub-Ecoregion

A small section of the Project (MP 454.8 to 442.2) passes through the Yukon-Tanana Uplands. Within this region, the hillsides adjacent to the Tanana River are within the Yukon-Tanana Uplands, whereas the lower elevations along the Tanana River are within the Tanana-Kuskokwim Lowlands. Several acres of off-corridor access routes identified east of the route are also within the Yukon-Tanana Uplands.

The vegetation is dominated by black spruce woodlands, especially on north-facing slopes, while white spruce, Alaska paper birch, and aspen usually are restricted to warm, south-facing slopes. Black spruce grows in muskegs, lowlands, and on north-facing slopes where the annual thaw is shallow and permafrost is close to the surface (Nowacki et al., 2001). The largest black spruce trees generally reach diameters of seven inches at breast height and heights of 56 feet, but many are no larger than four inches diameter at breast height and 30 feet tall (ADNR, 2011). Black spruce stands are the most widespread of all stand types in the interior, and some stands contain tamarack and Alaska paper birch. The black spruce trees in muskegs and woodlands are typically scattered and stunted, and the understory is dominated by mosses, sedges, the tussock-forming cottongrass, ericaceous shrubs, and herbs such as roundleaf sundew (*Drosera rotundifolia*) (ADNR, 2011). Bogs, fens, shrub swamps, and other wetlands are also common in this region. Scrub-graminoid herbaceous communities, including willow, dwarf birch, Labrador-tea, and shrubby cinquefoil (*Dasiphora fruticosa*) occupy lowland bogs and other very wet areas (ADNR, 2011).

Floodplains are dominated by white spruce, balsam poplar, alders, and willows (Nowacki et al., 2001). Resin birch and Dryas-lichen tundra prevail at higher elevations. Black spruce woodlands, sedge-tussock communities, and scrub bogs are common in valley bottoms. Above the tree line, dwarf birch, ericaceous shrubs, and Dryas-lichen tundra are the dominants. The highest elevations are mostly barren (Nowacki et al., 2001).

This region has one of the highest incidences of lightning strikes in Alaska and wildfires are common (Nowacki et al., 2001).



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## 1.3.2.3 Ray Mountains Sub-Ecoregion

The route enters the Ray Mountains about 25 miles south of Livengood (MP 430.2) and exits the sub-ecoregion at MP 256.7, which is about four miles north of the South Fork Koyukuk River. This sub-ecoregion consists of an overlapping series of compact, east-west trending ranges underlain by the Ruby terrane that includes low hills both north and south of the Yukon River. The Ray Mountains consist of metamorphic bedrock usually covered with rubble, and soils are subsequently shallow and rocky. Permafrost is generally discontinuous and ranges from thin to moderately thick (Nowacki et al., 2001). The climate is strongly continental, with dry, cold winters and somewhat moist, warm summers. Precipitation increases with elevation (Wiken et al., 2011).

The vegetation throughout this region is dominated by black spruce woodlands and dwarf tree communities, while closed and open mixed needleleaf and deciduous forests of white spruce, Alaska paper birch, and aspen usually are restricted to warm, south-facing slopes (Nowacki et al. 2001). Floodplains are dominated by white spruce, balsam poplar, alders, and willows. Forest understory varies greatly with stand density and the amount of moisture on the forest floor. Common tall shrubs found in various mixtures in white spruce forests include green alder (*Alnus viridis ssp. fruticosa*) and Bebb willow (*Salix bebbiana*), common low shrubs include narrowed-leaved Labrador-tea (*Rhododendrum tomentosum*), bog blueberry, and especially lingonberry. In mixed forest stands on floodplains, horsetail (*Equisetum spp.*) is a major ground cover, with feathermosses and foliose lichens prominent in the moist habitats (Nowacki et al., 2001). Resin birch and Dryas-lichen tundra prevail at higher elevations. Forest fires only occasionally occur in the summer in the Ray Mountains Sub-Ecoregion (Nowacki et al., 2001).

## 1.3.2.4 Kobuk Ridges and Valleys Sub-Ecoregion

The route passes briefly through the east tip of the Kobuk Ridges and Valleys (MP 256.7 to 251.5). Forests and woodlands dominate much of the valley bottoms and mountainsides of the Kobuk Ridges and Valleys Sub-Ecoregion with black spruce in wetland bogs, white spruce and balsam poplar along rivers, and white spruce, Alaska paper birch, and aspen on well-drained uplands. Tall and short shrublands of willow, birch, and alder communities occur on ridges. Trees become increasingly sparse, less robust, and restricted to lower elevations in the west – here forests are slowly invading along rivers and streams (e.g., lower Noatak River) (Nowacki et al., 2001).

Needleleaf, broadleaf, and mixed forests occur over a variety of sites. Tall shrub communities which may include felt-leaf willow (S. alaxensis), gray-leaf willow (S. glauca), woolly willow, green alder (Alnus viridis ssp. Fruticose), and Sitka alder (Alnus viridis ssp. sinuata) grow in areas of newly exposed alluvium, such as floodplains, streambanks, drainageways, and lake margins, on burned or otherwise disturbed areas, and near timberline. Low scrub communities (gray-leaf willow, diamond-leaf willow, woolly willow, resin birch, dwarf birch, green alder, high-bush cranberry (Viburnum edule), Vaccinium spp., Arctous spp., and Rhododendrum spp.) occur in moist areas and on north-facing slopes. The wettest sites support tall scrub swamps (thin-leaf alder (Alnus incana ssp. tenuifolia), green alder, diamond-leaf willow and woolly willow), low scrub bogs (leatherleaf (Chamaedaphne calyculata), sweet gale (Myrica gale), and Beauverd spirea), or scrub-graminoid communities (diamond-leaf willow, net-vein willow, Barclay's willow (S. barclayi), under-green willow (S. commutata), Alaska bog willow, resin birch, dwarf birch, Labrador-tea, bog blueberry, lingonberry, small cranberry (V. oxycoccos), shrubby cinquefoil, sweet gale, thin-leaf alder, and bog rosemary (Andromeda polifolia), with tussock cottongrass, Bigelow's sedge, water sedge (C. aquatilis), several flower sedge (C. pluriflora) and bluejoint grass). Recently burned areas display a succession of recovery stages that include mesic forb herbaceous communities (narrow-leaf fireweed), mesic graminoid herbaceous communities (blueioint grass), scrub communities (little-tree willow, Barclay's willow, Bebb willow, and Scouler's willow (S. scouleriana) and broadleaf, needleleaf, and mixed forests (Gallant et al. 1995).



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## 1.3.3 Arctic Tundra Ecoregion

As the northernmost ecoregion in Alaska, the Arctic Tundra Ecoregion is bounded by the Arctic Ocean to the north and includes the Brooks Range to the south. The poorly drained, treeless coastal plain rises very gradually from sea level across the Arctic Coastal Plain, to the Brooks Range Foothills and then abruptly into the Brooks Range. The region has an arctic climate, and the entire area is underlain by thick permafrost. Because of poor soil drainage, wet graminoid herbaceous communities are the predominant vegetation cover, and numerous thaw lakes dot the region (Gallant et al.1995).

The Ecoregion has very low mean annual temperatures (average winter low of -22°F and average summer maximum of 46.4°F) and very low annual precipitation (5.5 inches annually). Winds are generally persistent and strong (Gallant et al.1995).

## 1.3.3.1 Brooks Range Sub-Ecoregion

Entering the Brooks Range at MP 251.5 the route exits this sub-ecoregion at MP 143. The dry polar climate of the Brooks Range Sub-Ecoregion has short, cool summers and long, cold winters; and air temperatures decrease rapidly with rising elevation. Valleys and lower mountain slopes on the north side of the range are covered by mixed shrub-sedge tussock tundra with willow thickets along rivers and streams. Alpine tundra and barrens dominate at higher elevations along the entire crest of the range. On the south side, lower mountain slopes and valleys possess sedge tussocks and shrubs. The arctic tree line skirts across the range in Canada and is restricted to the south side of the range in Alaska. Here, sparse conifer-birch forests and tall shrublands occur in larger valleys (Nowacki et al., 2001).

Because of the shallow soils, high winds, and harsh climate in this ecoregion, vegetation cover is sparse and generally limited to valleys and lower hillslopes. Drier sites support dwarf scrub communities. Wet to mesic sites support mesic graminoid herbaceous communities. Dwarf scrub communities are dominated by ericaceous species (e.g., black torpedoberry, red topedoberry, *Vaccinium spp.*, narrow-leaf Labrador-tea, black crowberry, and white arctic mountain-heather), mountain-avens, and willow (round-leaf willow (S. rotundifolia), arctic willow (S. arctica), and polar willow (S. polaris)). Herbaceous species (Carex spp.) and fruticose lichens (Cladina spp. and Cetraria spp.) may co-dominate with shrubs in some areas. Graminoid herbaceous communities are dominated by sedges (water sedge and Bigelow's sedge) and willows (diamond-leaf willow and woolly willow). Mosses (Tomenthypnum nitens, Distichium capillaceum, Drepanocladus spp., and Campylium stellatum) are often abundant (Gallant et al. 1995).

## 1.3.3.2 Brooks Range Foothills Sub-Ecoregion

Entering the Brooks Range Foothills at MP 143 the route passes through mesic graminoid herbaceous and dwarf scrub communities, before entering the Beaufort Coastal Plain at MP 62. (Gallant et al. 1995). Open low scrub occurs along drainages. Mesic graminoid herbaceous communities dominated by tussock-forming sedges are widespread. Typical species are tussock cottongrass and Bigelow's sedge. Low shrubs, such as dwarf birch, black crowberry, narrow-leaf Labrador-tea, and lingonberry often occur and may co-dominate with sedges. Mosses (e.g., *Hylocomium splendens and Sphagnum spp.*), and lichens (e.g., *Cetraria cucullata, Cladonia spp.*, and *Cladina rangiferina*) are common between tussocks. Dwarf scrub communities (*Vaccinium spp.*) are dominated by mat-forming mountain-avens, white arctic mountain-heather, and *Arctous spp.* accompanied by ericaceous species and prostrate willows (net-vein willow and skeleton-leaf willow [*S. phlebophylla*]). Open low scrub communities are co-dominated by alders and willows (e.g., woolly willow, diamond-leaf willow, and gray-leaf willow). Mosses (e.g., *Tomenthypnum nitens* and *Drepanocladus spp.*) are usually abundant (Gallant et al. 1995).



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## 1.3.3.3 Beaufort Coastal Plain Sub-Ecoregion

Leaving the Brooks Range Foothills at MP 62 the route enters the Beaufort Coastal Plain. Vegetation within the Beaufort Coastal Plain is dominated by wet sedge tundra in drained lake basins, swales, and floodplains, and by tussock tundra and sedge-*Dryas* tundra on gentle ridges. Low willow thickets grow on well-drained riverbanks (Nowacki et al. 2001).

Gallant et al. 1995 describes the distribution of vegetation communities in relation to microtopographic features that affect soil drainage. Sedge communities are generally dominated by water sedge and tall cottongrass (*E. angustifolium*). Mosses (usually *Scorpidium spp.* or *Drepanocladus spp.*) are common. Grass communities are generally dominated by Fisher's tundragrass (*Dupontia fischeri*) and alpine meadow-foxtail (*Alopecurus alpinus*), but pendantgrass (*Arctophila fulval*) dominates where surface water is 6 to 79 inches deep. Dwarf scrub communities are common, which include entireleaf mountain-avens (*Dryas integrifolia*), lingonberry, white arctic mountain-heather, black torpedoberry and red topedoberry, and net-vein willow and skeleton-leaf willow.



## 2.0 METHODOLOGY

Wetland Determination Field Survey Protocols (**Appendix A**) and Vegetation Field Study Protocols (**Appendix B**) were prepared by experienced scientists prior to the 2016 field season. These protocols have been provided to the USACE and FERC, and have been approved by the USACE (USACE 2010). The protocols, summarized below, follow standard methods used to delineate wetlands and vegetation for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) wetland and vegetation pre-mapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of the wetland and vegetation pre-mapping based on the results of the field efforts.

The goal of the Vegetation Study was to identify vegetation cover types according to the Alaska Vegetation Classification System (Viereck et al. 1992). Vegetation was classified using Level I, II, and III of the hierarchical Alaska Vegetation Classification System (Viereck et al. 1992). Level I classifies vegetation using the dominant growth form, as either forest (tree), scrub, or herbaceous. Level II further classifies vegetation based on vegetation type (e.g., needleleaf, broadleaf, graminoid, forb) and vegetation height (e.g., tall or low scrub). The most detailed level of classification for this study, Level III, classifies the canopy cover of the community into either woodland with 10-25% canopy cover, open forest with 25-60% cover or closed with a canopy cover between 60-100%. Level III can also be used to classify a community's composition (e.g., ericaceous or willow dwarf scrub). Classification to Level III of the Viereck system provides the detail necessary to characterize plant communities for the purpose of assessing habitat type.

The 2016 field data will be shared with the USACE. The USACE has already reviewed the 2014 field data north of Livengood (USACE 2015), and is in the process of reviewing the 2015 data.

### 2.1 DEFINITIONS AND WETLAND NAMING CONVENTIONS

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Most wetlands are considered to be Waters of the U.S. and are within the jurisdiction of the USACE (33 CFR Part 328.3[b]). Jurisdictional status is based on connectivity to Traditional Navigable Waters (TNW). Wetlands are considered jurisdictional "if the wetland, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable." (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]) (Stonestreet et al. 2009). Other aquatic habitats under the jurisdiction of the USACE, include deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by the USACE (See Section. 2.9).

For projects under FERC's authority, the definitions for waterbodies and wetlands are further clarified in the FERC's *Wetland and Waterbody Construction and Mitigation Procedures* (FERC 2013) as follows:

- "Waterbody" includes any natural or artificial stream, river, or drainage with perceptible flow at the time of crossing, and other permanent waterbodies such as ponds and lakes:
  - "minor waterbody" includes all waterbodies less than or equal to 10 feet wide at the water's edge at the time of crossing;
  - o "intermediate waterbody" includes all waterbodies greater than 10 feet wide but less than or equal to 100 feet wide at the water's edge at the time of crossing; and



- "major waterbody" includes all waterbodies greater than 100 feet wide at the water's edge at the time of crossing.
- "Wetland" includes any area that is not in actively cultivated or rotated cropland and that satisfies the requirements of the current federal methodology for identifying and delineating wetlands.

#### 2.1.1 Cowardin Classification

All wetlands and other Waters of the U.S. in the wetland mapping corridor were classified using the "Classification of Wetlands and Deepwater Habitats of the United States" (Cowardin et al., 1979), commonly referred to as the Cowardin classification system. Cowardin classifies wetlands and aquatic habitats by system, subsystem, class, subclass, and water regime and is based on hydrologic setting (riverine, lacustrine, estuarine, palustrine), vegetation structure (forested, scrub-shrub, emergent, aquatic bed), and water regime (saturated, seasonally flooded, semi-permanently flooded, etc.).

The Cowardin classifications are used as the standard codes in the National Wetland Inventory (NWI), and are required by the FERC's Wetlands and Waterbody Construction and Mitigation Procedures (FERC 2013). The NWI Program has mapped many of the wetlands across the U.S., including many in the Project's mapping corridor (at a smaller scale than the Alaska LNG mapping). It was developed largely for mapping based on interpretation of high-altitude aerial photography. Table 2-1 lists the most common Cowardin classifications found in the 2016 field survey corridor.

Table 2-1. Wetland and Deepwater Habitats within the Project Rev C Mapping Corridor and Off-ROW Areas

Cowardin Wetland and Other Aquatic Habitat Types	Description	Exam ple
Estuarine Subtidal (E1)	Permanently flooded deepwater brackish or saline tidal habitatstypically semi-enclosed by land. Water salinity exceeds 0.5 ppt. and typically does not exceed 30 ppt.	Cook Inlet*
Estuarine Intertidal (E2)	Aquatic habitats with substrates that are exposed at low tide and flooded at high tide with less than 30% of the surface covered with vegetation; includes the splash zone. Water salinity exceeds 0.5 ppt and typically does	Salt marsh, CookInlet mud flats
Riverine Freshwater Tidal Unconsolidated Bottom (R1UB)	Low-gradient freshwater tidal rivers with water velocity dependent on tidal fluctuations	Coastal Rivers
Riverine Lower Perennial Unconsolidated Shoreline/Unconsolidated Bottom (R2US/UB)	Low-gradient rivers/streams with slow water velocity	Valley bottom streams*
Riverine Upper Perennial Rock Bottom (R3RB)	High-gradient river/stream with substrate dominated by stones, boulders, or bedrock	Mountain Streams*
Riverine Upper Perennial Unconsolidated Shoreline/Unconsolidated Bottom (R3US/UB)	High-gradient rivers/streams with fast water velocity	Mountain streams*
Riverine Intermittent Streambed (R4SB)	Channels containing flowing water only part of the year	Intermittent streams*
Lacustrine Limnetic (L1)	Unvegetated deepwater habitats within the lacustrine system	Deepwaterlakes*



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Lacustrine Littoral (L2)	Vegetated habitats within the lacustrine system, or shoreward bound to 2 meters below annual low water	Lake fringes with unvegetated shallow water, or submerged or floating vegetation
Palustrine Unconsolidated Bottom (PUB)	Potential aquatic habitats and deepwater habitats that are inundated throughout the year in most years. These ponded depressions are less than 20 acres in size and typically have a depth less than 2 meters at annual low water. Substrates have at least 25% cover of particles smaller than stones, and less than 30% vegetative cover	Ponds with unvegetated shallow water, or submerged or floating vegetation
Palustrine Unconsolidated Shore (PUS)	Potential aquatic habitats with less than 30% vegetative cover that are inundated for only a portion of the growing season in most years	Unvegetated seasonally flooded ponds
Palustrine Aquatic Bed (PAB)	Potential aquatic habitats that have a predominance of rooted vascular aquatic plants growing on or below the water surface	Ponds with submerged or floating vegetation such as pondweeds, water lilies
Palustrine Emergent (PEM)	Habitats dominated by erect, rooted, herbaceous species	Emergent wetlands with grasses, sedges, rushes
Palustrine Moss-Lichen (PML)	Moss or lichen dominated wetlands with less than 30% cover vascular vegetation.	Wetlands dominated by mosses or lichens
Palustrine Scrub-Shrub (PSS)	Habitats dominated by woody vegetation less than 6 meters tall/3-inch diameter at breast height (DBH)	Scrub-shrub wetlands with willow or alder thickets, mixed shrub-tussock tundra, ericaceous bogs
Palustrine Forested (PFO)	Habitats dominated by woody tree species greater than 6 meters tall/3-inch DBH	Forested wetlands with black spruce, tamarack
Upland (U) (non-wetland)	Habitats that do not contain criteria diagnostic of wetlands	Non-wetland communities, ranging from closed spruce forest, mixed woodlands, shrublands to alpine tundra
Disturbed (D) (non-wetland)	Gravel-filled, excavated or previously graded areas, man-made structures	Roads, pads, buildings*

<sup>\*</sup> Unvegetated areas

## 2.1.2 Hydrogeomorphic Classes

Wetlands within the Project mapping corridor were also assigned a hydrogeomorphic (HGM) classification (Smith et al., 1995; and Brinson, 1993) during the mapping process. The HGM classification of wetlands comprises three components: 1) landscape setting; 2) water source (precipitation, surface flow, or groundwater discharge); and 3) hydrodynamics (direction and strength of flow). The three components of the HGM classes are largely responsible for determining a wetland's ecosystem function. The HGM classes in the 2016 field survey corridor are defined below per Smith et al. (1995) and are summarized in Table 2-2.

**Riverine** — Riverine wetlands occur in floodplains and riparian corridors in association with stream channels. Dominant water sources are often overbank flow from the channel or subsurface hydraulic connections between the stream channel and wetlands; however, sources may be interflow and return flow from adjacent uplands, occasional overland flow from adjacent uplands, tributary inflow, and precipitation. At their headwaters, riverine wetlands often are replaced by slope or depressional wetlands where the channel morphology may disappear. They may intergrade with poorly drained flats or uplands. Perennial flow in the channel is not a requirement.

**Depressional** – Depressional wetlands occur in topographic depressions. Dominant water sources are precipitation, groundwater discharge, and both interflow and overland flow from adjacent uplands. The direction of flow is normally from the surrounding uplands toward the



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center of the depression. Elevation contours are closed, thus allowing the accumulation of surface water. Depressional wetlands may have a combination of inlets and outlets or lack them completely. Dominant hydrodynamics are vertical fluctuations, primarily seasonal. Depressional wetlands may lose water through intermittent or perennial drainage from an outlet, by evapotranspiration, and, if they are not receiving groundwater discharge, may slowly contribute to groundwater. Peat deposits may develop in depressional wetlands.

**Slope** – Slope wetlands normally are found where there is a discharge of groundwater to the land surface. They normally occur on sloping land; elevation gradients may range from steep hillsides to slight slopes. Slope wetlands are usually incapable of depressional storage because they lack the necessary closed contours. Principal water sources are usually groundwater return flow and interflow from surrounding uplands, as well as precipitation. Hydrodynamics are dominated by downslope unidirectional water flow. Slope wetlands can occur in nearly flat landscapes if groundwater discharge is a dominant source to the wetland surface. Slope wetlands lose water primarily by saturation, subsurface and surface flows, and by evapotranspiration. Slope wetlands may develop channels, but the channels serve only to convey water away from the slope wetland. Fens are a common example of slope wetlands.

**Flat** – There are two types of "flat" wetlands: mineral soil flats and organic soil flats. Mineral soil flats are most common on interfluves, extensive relic lake bottoms, or large floodplain terraces where the main source of water is precipitation. They receive virtually no groundwater discharge which distinguishes them from depressions and slopes. Dominant hydrodynamics are vertical fluctuations. They lose water by evapotranspiration, saturation overland flow, and seepage to underlying groundwater. They are distinguished from flat upland areas by their poor vertical drainage, often due to spodic horizons and hardpans, and low lateral drainage, usually due to low hydraulic gradients. Mineral soil flats that accumulate peat can eventually become organic soil flats.

Organic soil flats differ from mineral soil flats, in part, because their elevation and topography are controlled by vertical accretion of organic matter. They occur commonly on flat interfluves, but may also be located where depressions have become filled with peat to form a relatively large flat surface. Water source is dominated by precipitation, while water loss is by saturation, overland flow, and seepage to underlying groundwater. Raised bogs share many of these characteristics, but may be considered a separate class because of their convex upward form and distinct edaphic conditions for plants. Organic flats wetlands over permafrost soils are common in Interior Alaska. These flats can and often occur on slopes up to 20 percent.

Estuarine Fringe – estuarine fringe wetlands occur along coasts and estuaries and are under the influence of sea level. They intergrade landward with riverine wetlands where tidal currents diminish and river flow becomes the dominant water source. Additional water sources may be groundwater discharge and precipitation. The interface between the estuarine fringe and riverine classes is where bidirectional flows from tides dominate over unidirectional ones controlled by floodplain slope of riverine wetlands. Because they frequently flood and water table elevations are controlled mainly by sea surface elevation, estuarine fringe wetlands seldom dry for significant periods. Estuarine fringe wetlands lose water by tidal exchange, by saturation overland flow to tidal creek channels, and by evapotranspiration. Organic matter normally accumulates in higher elevation marsh areas where flooding is less frequent and they are isolated from shoreline wave erosion by intervening areas of low marsh.

Lacustrine Fringe – Lacustrine fringe wetlands are adjacent to lakes where the water elevation of the lake maintains the water table in the wetland. In some cases, these wetlands consist of a floating mat attached to land. Additional sources of water are precipitation and groundwater discharge, the latter dominating where lacustrine fringe wetlands intergrade with uplands or slope wetlands. Surface water flow is bidirectional, usually controlled by water-level fluctuations such as seiches (oscillating standing waves) in the adjoining lake. Lacustrine fringe wetlands are indistinguishable from depressional wetlands where the size of the lake becomes so small



relative to fringe wetlands that the lake is incapable of stabilizing water tables. Lacustrine fringe wetlands lose water by flow returning to the lake after flooding, by saturation surface flow, and by evapotranspiration. Organic matter normally accumulates in areas sufficiently protected from shoreline wave erosion.

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Table 2-2. Hydrogeomorphic Classes within the Project Rev C Mapping Corridor, and Off-ROW Areas

Hydrogeom orphic Class	Dominant Water Source	Dominant Hydrodynamics	Examples
Riverine	Overbank flow from channel	Unidirectional, horizontal	Riparian scrub-shrub wetlands
Depressional	Groundwater	Vertical	Kettle wetlands
Slope	Groundwater	Unidirectional, horizontal	Avalanche chutes
Flat	Precipitation	Vertical	Peat bogs
Estuarine Fringe	Overbank flow from estuary	Bidirectional, horizontal	Salt-tolerant coastal marshes
Lacustrine Fringe	Overbank flow from lake	Bidirectional, horizontal	Emergent lake edge wetlands

These HGM classes of wetlands have the potential to perform the following eight functions (Magee and Hollands 1998):

- 1. Modification of groundwater discharge: The capacity of a wetland to influence the amount of water moving from the groundwater to surface water.
- 2. Modification of groundwater recharge: The capacity of a wetland to influence the amount of water moving from surface water to groundwater.
- 3. Storm and flood-water storage: The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface.
- 4. Modification of stream flow: The modification of inflow hydrology by the wetland to produce the outlet stream's hydrology.
- 5. Modification of water quality: Removal of suspended and dissolved solids from surface water and dissolved solids from groundwater and conversion into other forms, plant or animal biomass, or gases. Wetlands with a low slope-angle or location in depressions provide a high level of this function.
- 6. Export of detritus: Export of organic detritus from the wetland to adjacent and downstream aquatic ecosystems.
- 7. Contribution to abundance and diversity of wetland vegetation: The capacity of a wetland to produce an abundance and diversity of hydrophytic plant species individually or as part of a group of wetlands in a local landscape (Tiner 1984).
- 8. Contribution to abundance and diversity of wetland fauna: The capacity of a wetland to support large and/or diverse populations of animal species that spend part or all of their lifecycle in wetlands, individually, or as part of a mosaic of wetlands in a local landscape.

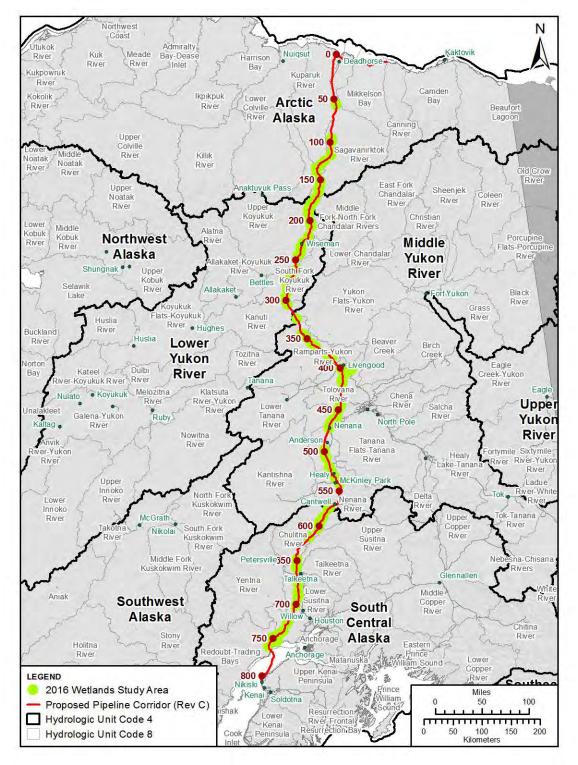
## 2.1.3 Study Area Watersheds

The U.S. Geological Survey (USGS) has mapped hydrologic units (drainage basins and watersheds) throughout the study area. Each hydrologic unit is identified by a unique hydrologic unit code (HUC) consisting of two to twelve digits based on the six levels of classification in the hydrologic unit system (USGS, 2015). Alaska falls into hydrologic unit region 19 (2 digit HUC) comprising 8 Sub-regions (4 digit HUC), 38 Basins (6 digit HUC), 159 Sub-basins (8 digit HUC), 20,345 Watersheds (10 digit HUC) and 13,921 Sub-watersheds (12 digit HUC). The project study area crosses 20 "HUC 4" Sub-regions (4 digit HUC), and four "HUC 8" Sub-basins (8 digit HUC). HUC 4 Sub-regions and HUC 8 Sub-basins of the project area are shown below (Figure 2-1).

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Figure 2-1. HUC 4 Sub-regions and HUC 8 Sub-basins of the Project Area





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## 2.2 WETLAND PARAMETERS AND INDICATORS

Wetland determinations were made according to the USACE accepted methods in Alaska, as described in the "Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region" (Regional Supplement) (USACE, 2007a), and the "USACE Wetlands Delineation Manual" (USACE Manual) (USACE, 1987). These methods require a three-parameter approach, of which the three essential characteristics of a wetland (hydrophytic vegetation, hydric soils, and wetland hydrology) must be present to have a positive wetland determination.

Wetland indicators are field verifiable and measurable characteristics of vegetation, soil, and hydrology that generally indicate that the parameter in question is present. The absence of an indicator, however, does not always mean that a parameter is not met, or that a wetland is not present. For these "problematic" situations, the Regional Supplement provides procedures to determine if a parameter is present or not. These generally rely on an understanding of the hydrogeomorphology of a site, and the best professional judgment of the wetland scientist. Each parameter, along with select Alaska-specific indicators, is described below.

## 2.2.1 Hydrophytic Vegetation

Hydrophytic vegetation, or a community dominated by plants with special adaptations to survive saturated or anaerobic conditions, is required for a positive wetland determination. The U.S. Fish and Wildlife Service (USFWS) prepared the "National List of Vascular Plant Species That Occur in Wetlands" in 1988 (Reed, 1988), which categorizes species based on their estimated probability of occurring in a wetland. USACE took over the task of updating this plant list (Lichvar, and Gillrich 2011, Lichvar et al. 2014). The USACE 2014 updated wetlands plant list was used for field data collection in 2016. Indicator ratings and their descriptions are as follows:

- OBL (obligate wetland) almost always found in wetlands, rarely in uplands;
- FACW (facultative wetland) usually found in wetlands but occasionally found in uplands;
- FAC (facultative) commonly occurs in either wetlands or uplands;
- FACU (facultative upland) occasionally found in wetlands, but usually occurs in uplands;
- UPL (obligate upland) rarely found in wetlands, almost always in uplands.

Plant species with an indicator status of OBL, FACW, or FAC are considered adapted for life in saturated or anaerobic soil conditions. Such species are referred to as hydrophytic vegetation, or hydrophytes.

The presence of hydrophytic vegetation is determined by satisfying either a Dominance Test or a Prevalence Index. The Dominance Test is generally a quick way to characterize the vegetative community, however, communities with a large number of low cover species are more accurately characterized by the Prevalence Index, a weighted average of the wetland indicator status of all plant species in the community. Both methods were used when collecting field data.

If both of these indicators fail, yet the site exhibits both hydric soil and wetland hydrology (see description below), wetland scientists may examine FACU vegetation within the community for morphological adaptations indicating that it is indeed acting as a hydrophyte. Typical morphological adaptations observed in Alaska wetlands include white spruce (*Picea glauca*) with a narrow growth form, widely spaced needles, and less bushy branching; or Alaska paper birch (*Betula neoalaskana*) with multiple trunks, an "apple tree" like growth, smaller size, and a rotten core in the tree trunk. If these morphological adaptations were observed, the species may be considered FAC at the site in guestion, and the dominance test recalculated.



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#### 2.2.2 Wetland Soils

Hydric soils are also required for a positive wetland determination. The National Resources Conservation Service (NRCS) has defined a hydric soil as "a soil that in its undrained condition is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation" The criteria for hydric soils includes certain soil taxonomic groups that are poorly drained during the growing season, or soils that are frequently ponded or frequently flooded for long or very long durations during the growing season.

Due to anaerobic conditions, hydric soils exhibit certain characteristics that can be observed in the field. These characteristics may include the following:

- High organic content representing accumulation and slow decomposition in anaerobic conditions:
- Reduction of ferric (Fe3+) to ferrous iron (Fe2+) and consequent leaching from the soil profile, causing a greenish- or bluish-gray color (gley formation);
- Generation of hydrogen sulfide, noted by characteristic odor;
- Spots or blotches of different color interspersed with the matrix, or dominant color (mottling);
   and
- Dark soil colors (low chroma).

Indicators have been established by USACE to assist with identification of hydric soils. These indicators are found in the Regional Supplement and the "Field Indicators of Hydric Soils in the United States" (USDA, NRCS 2010). The absence of listed indicators, however, does not preclude the soil from being hydric. If indicators of hydrophytic vegetation and wetland hydrology are present, but hydric soils are not evident, the procedure outlined in the Regional Supplement for problematic hydric soils was followed.

#### 2.2.3 Problematic Soils

Procedures for dealing with problematic hydric soils, that are encountered while conducting field surveys, are described in Chapter 5 of the Regional Supplement (USACE, 2007a). Few potentially problematic hydric soils were encountered within the study area. These situations are discussed in Appendix B of the 2015 Wetland Field Study Report (Alaska LNG 2015).

## 2.2.4 Wetland Hydrology

Wetland hydrology is the third parameter required for a positive wetland determination. The most ephemeral of the three parameters, surface water or saturation, need not be present throughout the entire year to meet the definition of wetland hydrology. According to the USACE Manual (1987), wetland hydrology is present when there is inundation or soil saturation to the surface continuously for at least five percent of the growing season in most years. Indicators of wetland hydrology include observing ponding or soil saturation, as well as evidence of previous inundation, such as dry algae on bare soil, watermarks on soils or leaves, and drainage patterns. Where positive indicators were observed, it was assumed that wetland hydrology occurs for a sufficient period of the growing season.

## 2.3 Aerial Interpretation (Pre-Mapping)

Wetland and vegetation cover type boundaries for the mapping corridor were delineated on digital ortho-rectified and geo-referenced true color aerial imagery with 1.6-foot pixel resolution using the following aerial imagery:

Alaska LNG Imagery. (0.5-foot resolution) (Paragon 2013);



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Nikiski Area Aerial Orthophoto. (2.5-foot resolution) (Kenai Peninsula Borough 2006);

- Kenai Peninsula Borough Aerial Imagery. (2.5-foot resolution) (Kenai Peninsula Borough 2013);
- Point MacKenzie Aerial Orthophoto (0.5-meter resolution) (Matanuska Susitna Borough, MSB 2011d);
- Willow Aerial Orthophoto (1.0-foot resolution) (MSB 2011c);
- Caswell Aerial Orthophoto (1.0-foot resolution) (MSB 2011b);
- Talkeetna Aerial Orthophoto (1.0-foot resolution) (MSB 2011a);
- Healy Area Orthophoto (1.0-meter resolution) (U.S. Census Bureau 2006);
- Digital Orthophoto Quarter Quadrangles Anderson Area (0.6-meter resolution) (NRCS 2006);
- Southern Corridor Ortho Mosaic (1.6-foot resolution) (Digital Globe 2013b);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a);
- Quantum Aerial Imagery. (1.6-foot resolution) (Quantum Spatial 2014);
- iCubed Satellite Imagery. (1.0-meter resolution) (iCubed 2014);
- ExxonMobil aerial imagery for the Alaska Pipeline Project (0.5-meter pixel resolution; summer 2008, 2009, 2010, and 2011) (ExxonMobil 2008, ExxonMobil 2009b, ExxonMobil 2011);
- BP Exploration Alaska Inc. aerial imagery for Prudhoe Bay, Endicott, and Badami (1.0-foot pixel resolution; July 2012) (BPX 2012a, BPX 2012b, BPX 2012c); and
- ExxonMobil aerial imagery for Point Thomson (2.0 and 0.5-foot pixel resolution; July 2001/2006, and July 2009) (ExxonMobil 2001-6, ExxonMobil 2009a).

Data from the following sources was also used during the mapping process:

- USFWS, NWI digital datasets and hardcopy maps;
- Kenai Watershed Forum Cook Inlet Wetlands for the Kenai Peninsula and the Matanuska Susitna Boroughs (Gracz 2011);
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging generated topographic contours (TransCanada 2011, MSB 2011d);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;
- USGS Digital Raster Graphics (e.g., topographic maps);
- Point Thomson Project wetlands mapping between Point Thomson and Badami (USACE 2012);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

Preliminary wetland and vegetation maps were created in a Geographic Information System (GIS) platform, using a "heads-up" digitizing effort that utilized Light Detection and Ranging (LiDAR) generated topographic contours and other ancillary data such as National Wetland Inventory (NWI) and soil survey datasets. The pre-mapping process is described further in **Appendix A**. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. Data sources were overlaid on aerial photography and wetland and



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vegetation cover types were identified by interpreting color, texture, and landscape position, among other elements. Aerial photography clues can include dwarf or stunted trees, topography characteristics (such as swales, toe slopes and depressions), and obvious signs of inundation. This is the generally accepted wetland and deepwater habitat mapping technique employed by the USFWS personnel as part of the NWI program (Dahl et al. 2009).

The wetland and vegetation mapping effort resulted in the classification of mapping polygons as either wetland (i.e., meeting the U.S. Army Corps of Engineers and FERC's wetland delineation criteria as a wetland), other aquatic habitats (including deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by USACE), or non-wetland. The dominant vegetation structure (trees, shrubs, herbaceous vegetation) in wetland polygons was classified using both the Cowardin (1979) classification system and the Alaska Vegetation Classification System (Viereck et al., 1992). Within non-wetland polygons, the vegetation was classified using only the Viereck system. Both wetland and upland polygons can have up to three Viereck codes depending on the complexity of the vegetation communities and size of the polygon. For this vegetation field study, the term "upland" refers to any non-wetland polygon. It should be noted that although a polygon was classified as "upland" during wetland mapping, that does not mean that the vegetation within the polygon is upland vegetation. Mesic vegetation communities are common in polygons that do not meet the wetland criteria, as defined by the U.S. Army Corps of Engineers methods. Upland polygon vegetation classification was done within the same 2000 foot field survey corridor used for wetland mapping.

All wetlands and vegetation were mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer. Lakes, ponds and rivers were mapped at a scale of 1:1,200 (1 inch to 100 feet). Larger rivers and streams were delineated as polygons. Smaller streams, those with bankfull widths of approximately 10 feet or less, were mapped as lines.

## 2.4 FIELD TARGET SELECTION

Field targets (FTs) were selected from the pre-mapping based on changes in the wetlands types, aerial vegetation signatures, Cowardin classification, and NRCS soil classification. The primary focus of the pre-selected FTs was to characterize specific wetland and vegetation types which represent all similar types in the region and to identify wetland/upland boundaries by selecting paired plots. Field targets were used to confirm areas where wetland subject matter experts had high confidence in their aerial interpretation, and were used to confirm or correct wetland boundary locations. Field targets were also placed in low-confidence areas to provide field data where the photo signatures or landscape features were not clearly indicative of wetland or upland. Field targets spanned the full range of Cowardin and HGM classes within the Project mapping corridor.

Field targets were evaluated during the field season provided there was land access. If a FT could not be accessed, a new FT was located on a nearby accessible parcel in an area with similar aerial photography vegetation signatures and site conditions as the original FT.

### 2.5 WETLAND AND VEGETATION FIELD DATA COLLECTION

The 2016 wetland and vegetation field studies were conducted from mid-May through late July, and focused on field targets from the west side of Cook Inlet (MP 760) to the northern most field target (MP 56) in the Beaufort Coastal Plain.

#### 2.5.1 Crew Composition

Two three-person crews collected data in 2016. Each crew consisted of a field crew chief, an assistant wetland scientist / Global Positioning System (GPS) technician, and a wilderness safety



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specialist. Each position had defined roles and responsibilities in the field and required a specific level of technical expertise.

Field crew chiefs were required to have proven field experience and a strong familiarity with wetland science. They were in charge of the field crews and ultimately responsible for data collection quantity and quality; daily reporting; crew health and safety; and data submittal on a daily or near-daily basis. Field crew chiefs also planned the workday for the crew, coordinated with Project management, and addressed any technical issues.

Wetland scientists / GPS technicians were required to be experienced in field work, familiar with wetland science principles, and to have attended a wetland delineation training course. They assisted in the wetland field survey with appropriate supervision by the field crew chief. The wetland scientist / GPS technician was also responsible for electronic data collection at each site using a Panasonic tablet with Trimble R1 GPS receiver. They worked closely with field crew chiefs to verify that the data was accurate and complete, and were also responsible for the maintenance and care of the GPS equipment, managing the crew's electronic data, and ensuring data files were uploaded to the Project's SharePoint site on a daily or near-daily basis.

Wilderness safety specialists were professionally trained in firearms proficiency, Alaska wilderness survival, and first aid / cardiopulmonary resuscitation. They were responsible for protecting the field crew from aggressive wildlife encounters, and assisting the field crew chief in the communication of and compliance with all Project health and safety policies.

## 2.5.2 Wetland and Vegetation Field Protocols

Wetland Determination Field Survey Protocols (**Appendix A**), and Vegetation Field Survey Protocols (**Appendix B**) have been developed and were provided to the USACE and the FERC (USACE 2010, FERC 2015). As described in the protocols, data was collected as a Determination Point (DP), where a hard copy Wetland Determination Form (WDF) was completed, or an Observation Point (OP), in which notes and photographs were used to describe wetland and vegetation status and the community. All wetlands and waterbodies were classified using Cowardin codes, and vegetation was classified using Viereck codes. Vegetation classification data (Level I, II, and III of the Alaska Vegetation Classification System, Viereck et al., 1992) were recorded on each Wetland Determination Data Form.

The field crew chief examined vegetation and topography to determine appropriate sampling location(s) at each FT. Although FTs were used to guide the location of field crews, field crew chiefs were allowed discretion in the number, type (DP or OP), and final location of data points. This flexible approach allowed scientists to collect data in locations that best described the target community, allowed them to collect additional data as field conditions warranted, and enhanced efficiency by allowing scientists to collect observational data if a similar community was thoroughly described nearby. Wetland scientists used their best professional judgment and collected appropriate field data to adequately revise the wetland and vegetation pre-mapping. Typically, a DP was completed at each pre-determined field target, and OPs, and additional DPs if needed, were completed in the surrounding area.

Field crew chiefs maintained field logbooks and hardcopy field maps with aerial photography, field targets, and pre-mapped wetland and vegetation boundaries and classifications. The wetland scientist/GPS technician entered some of the data into electronic data forms specific to DPs and OPs. Daily field quality assurance/quality control (QA/QC) procedures are described in Section 2.6. Hardcopy and electronic data forms, field notes, maps, GPS data, and site photos were uploaded daily to the Project SharePoint website.

Regional vegetation guides were used to identify plants including: Flora of Alaska and Neighboring Territories (Hulten 1968), Wetland Sedges of Alaska (Tande and Lipkin 2003), Alaska Trees and Shrubs (Viereck and Little 2007), and Willows of Interior and Southcentral Alaska (Collet 2004, 2010). Non-vascular plants (lichens, mosses, liverworts) and fungi were not



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surveyed or recorded as part of this effort. Rare and sensitive plants and invasive species were recorded when encountered, but there was no specific effort to search for them.

## 2.6 QUALITY ASSURANCE / QUALITY CONTROL

Each crew member was responsible for collecting and recording clear and accurate data. The field crew chief reviewed all hardcopy and electronic data forms and completed a QA/QC checklist before leaving each site.

The field crew manager ensured that all data files were uploaded to the Project website. These transmitted files were then downloaded and reviewed by office-based data management staff. A wetland and vegetation subject matter expert checked each hardcopy data sheet and electronic data form for quality and consistency, as it was received. If problems arose, the field crew was notified promptly to ensure that any data quality issues were corrected immediately.

Wetland and vegetation mapping was also reviewed by experienced scientists both after the initial pre-mapping, and after map revisions were complete.

### 2.7 MAP REVISIONS

The wetland and vegetation pre-mapping was updated based on field reference data collected throughout the 2016 field season. Map revisions included refinement of wetland/non-wetland boundaries and classifications (HGM, Cowardin, Viereck, Inlet/outlet) following procedures outlined in the 2016 Wetland Determination Field Survey Protocols (**Appendix A**) and Vegetation Field Survey Protocols (**Appendix B**). Map updates referenced 2016 GPS data (field plot locations), Wetland Determination Data Forms, site photographs, logbook field notes, and notated field maps as primary data sources. Map revisions were made with post-processed GPS data to ensure positional accuracy of the field data and field data forms that passed the QA/QC process (Section 2.6).

Generally, the wetland and vegetation pre-mapping revision process involved:

- Overlaying exported spatial data for all field reference data points on an ortho-rectified photographic base layer in the GIS environment;
- Compiling electronic copies of all field notes, sketches, and photographs associated with above points; and
- Using this data to update polygon attributes (wetland/non-wetland classifications) and refine map delineations as needed in the GIS environment. This process is described in detail in the 2016 Wetland and Vegetation Field Survey Protocols (Appendix A and B).

In the process of incorporating field reference data into the wetlands and vegetation mapping, updates were not necessarily limited to the polygon intersected by the field reference data point. Rather, field data were used to "recalibrate" the mapper's understanding of photo signatures in context with landscape position in that portion of the map (generally within one half mile of the data collection site). Extrapolating field reference data to adjacent areas is a process that incorporates information derived from field notes (concerning the surrounding area) in addition to a recalibration of the mapper's eye to a particular spectral signature (combination of color, tone, shadow, texture, etc.) when viewed in context with contour data and landscape position.

Examples of extrapolating field reference data to adjacent areas in the wetlands mapping are included in Appendix D of the 2015 Wetland Determination Field Study Report (Alaska LNG 2015).



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## 2.8 JURISDICTIONAL DETERMINATION

The USACE regulates wetlands and other Waters of the U.S. that are under their jurisdiction. Jurisdictional status is based on connectivity to Traditional Navigable Waters (TNW) (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]).

In January, 2015, the USACE reviewed the Project's identification and delineation of Waters of the U.S. from Point Thomson to Prudhoe Bay to Livengood, Alaska, and determined that there were no obvious errors in the methodology or determinations (USACE 2015). The USACE concurred that the wetland boundaries north of Livengood have been established in accordance with the USACE Manual (1987), and the 2007 Regional Supplement for Alaska (USACE 2007a) (J. Post, personal communication, January 30, 2015). This year, Alaska LNG will be requesting the USACE's concurrence for the wetland boundaries south of Livengood.

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## 3.0 RESULTS

## 3.1 WETLAND AND VEGETATION FIELD DATA COLLECTION

A total of 155 FTs were selected for the 2016 field season to investigate a representative assemblage of wetlands, non-wetlands and areas of uncertainty. Criteria used in the selection of FTs are discussed in section 2.4. Due to land access restrictions, 3 of the FTs were deleted while others were moved to areas that did not have restricted access. An additional 2 FTs were added in the field, by a crew waiting for helicopter support. A total of 154 FTs were surveyed during the 2016 field season. Table 3-1 shows the number of FTs completed within each of the sub-ecoregions. Approximately 212 miles of the alignment are either physically inaccessible, or do not have an authorized right of entry agreement with the landowner. The 2016 Wetland Determination Data Forms and the Wetland and Vegetation Field Data Summary Table are provided in **Appendix C**. No data forms were collected for observation points.

Table 3-1. 2016 Completed Field Targets by Ecoregion

Ecoregion	Sub-Ecoregion	Milepost	Total Number of Field Targets Completed	Inaccessible/ No Right of Entry (miles)
Alaska Range	Cook Inlet Basin	804-616	44	89.79
Transition	Alaska Range	616-516	23	19.93
Intermontane Boreal	eal Tanana-Kuskokwim 516-455, 4 Lowlands 430		13	12.40
	Yukon-Tanana Uplands	455-443	4	43.59
	Ray Mountains	430-257	29	24.95
	Kobuk Ridges and Valleys	257-252	0	0
Arctic Tundra	tic Tundra Brooks Range		32	0
Brooks Foothills		143-62	8	7.12
	Beaufort Coastal Plain 62-0			14.57
	Total:		154	212.35

A total of 346 field reference data points were sampled at or near the pre-selected field targets during the 2016 field season. Table 3-2 summarizes the distribution of field plots sampled in the 300 foot construction corridor, 2000 foot mainline study area and off-ROW areas outside the 2000 foot study area corridor.

Table 3-2. Field Plot Distributions in the Study Area

Plot Type	300 ft Corridor	2000 ft Corridor	Off-ROW <sup>1</sup>	Total Number of Field Plots Completed
Wetland Determination Data Form Plot <sup>2</sup>	46	83	68	151
Observation Point (no data form)	39	108	87	195
Total	85	191	155	346

Off-ROW targets outside of the 2000 foot mainline corridor.

<sup>&</sup>lt;sup>2</sup>Wetland Determination Data Forms also include vegetation classifications.



## 3.2 WETLAND AND VEGETATION MAPPING SUMMARY

The wetland and vegetation pre-mapping was revised according to the criteria summarized in Section 2.7 of this report. The 2016 final wetland delineation maps are included as **Appendix D**. The wetland acreages per ecoregion within the 2000 foot Rev C mapping corridor and off-ROW footprint will be presented in the FERC Resource Reports. Table 3-3 presents a summary of wetlands and uplands by ecoregion. Of the approximate 223,100 acres in the 2000 foot mapping corridor and off-ROW footprint, wetlands and other Waters of the U.S. comprise 122,599.3 acres or 55 percent of the total. Results are based on the Alaska Albers NAD 83 map projection.

Table 3-3. Wetlands and Waters of the U.S. by Ecoregion

Cover Type	Alaska Range Transition Ecoregion (acres)	Intermontane Boreal Ecoregion (acres)	Arctic Tundra Ecoregion (acres)	Total (acres)
Wetlands and Waters of the U.S.	26,279.6	29,222.5	67,097.2	122,599.3
Uplands	47,316.6	39,676.1	13,430.8	100,423.5
No Imagery	76.8	0	0	76.8
Total	73,673.0	68,898.6	80,528.0	223,099.6

Table 3-4 presents a summary of Level I Viereck cover types by ecoregion and **Appendix E** contains vegetation classification maps of the corridor.

Table 3-4. Vegetation Cover Types by Ecoregion

Cover Type	Alaska Range Transition Ecoregion (acres)	Intermontane Boreal Ecoregion (acres)	Arctic Tundra Ecoregion (acres)	Total (acres)
Forest <sup>1</sup>	43,677.6	33,861.6	5,301.3	82,840.5
Scrub <sup>1</sup>	15,919.8	27,385.2	26,104.6	69,409.5
Herbaceous <sup>1</sup>	4,325.5	4,754.8	40,433.1	49,513.4
No Vegetation (Disturbed <sup>2</sup> )	1,636.6	2,200.1	2,573.2	6,409.9
No Vegetation (Water³)	7,960.1	690.6	5,984.7	14,635.6
No Vegetation (Uplands)	76.6	6.3	131.1	214
No Imagery	76.8	0	0	76.8
Total	73,673.0	68,898.6	80,528.0	223,099.6

<sup>1 -</sup> Based on The Alaska Vegetation Classification (Viereck et al., 1992).

The study area contains all 30 of the Level III cover types described by Viereck et al. (1992). Table 3-5 provides a summary of the cover types, including representative species.

<sup>2 -</sup> Areas of human disturbance.

<sup>3 -</sup> Includes Waters and Probable Waters of the U.S.



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Table 3-5. Vegetation Cover Types Occurring within the Study Area

Cover Type	Code	General Location	Representative Plants
Forest			
Closed needleleaf (conifer) forest; 60 to 100% canopy	I A 1	Closed white and black spruce forests are found on floodplain terraces and uplands throughout interior Alaska.	White spruce ( <i>Picea glauca</i> ) and blackspruce ( <i>P. mariana</i> ).
Open needleleaf (conifer) forest; 25 to 60% canopy	I A 2	Open white and black spruce forest is very common in lowland and upland areas of interior Alaska. White spruce forest also occurs near the tree line in the Brooks Range.	Tamarack( <i>Larix Iaricina</i> ), white spruce, blackspruce, <i>Vaccinium</i> spp., and feathermosses.
Needleleaf (conifer) woodland; 10- to 25% canopy	I A 3	Blackspruce woodland is common on floodplains, slopes, and ridges throughout interior Alaska. White spruce and mixed spruce woodland is common at the tree lines of interior Alaska and the Brooks Range.	White spruce, black spruce, Alaska paper birch ( <i>Betula neoalaskana</i> ), <i>Vaccinium</i> spp., and feathermoss.
Closed broadleaf forest; 60 to 100% canopy	I B 1	Typically occurs in interior Alaska. Balsam poplar communities occur frequently in the floodplains and in isolated stands on the north slope of the Brooks Range. Alaska paper birch and quaking aspen are common in uplands, especially on south-facing slopes.	Balsam poplar ( <i>Populus balsamifera</i> ), Alaska paper birch, and quaking aspen ( <i>P. tremuloides</i> ).
Open broadleaf forest; 25 to 60% canopy	I B 2	Typically occurs in interior and northem Alaska. Alaska paper birch and quaking aspen forest can be found on well-drained, steep sites. Balsam poplar occurs as open clumps near the tree line and as isolated groves on the north slope of the Brooks Range.	Alaska paper birch, quaking aspen, balsam poplar, and ericaceous shrubs.
Broadleaf woodland; 10 to 25% canopy	I B 3	Alaska paper birch woodland typically occurs on dry sites in northern interior Alaska.	Alaska paper birch.
Closed mixed forest; 60 to 100% canopy	I C 1	Typically occurs in Interior Alaska. White spruce mixed forests favor warmer, dry slopes and floodplains while black spruce mixes more commonly occur in colder, wetter sites.	White spruce, black spruce, Alaska paper birch, quaking aspen, and balsam poplar.
Open mixed forest; 25 to 60% canopy	I C 2	Typically occurs in upland sites in Interior Alaska.	White spruce, black spruce, and Alaska paper birch.
Mixed woodland, 10 to 25% canopy	I C 3	Occurs in dry upland sites in Interior Alaska.	White spruce, black spruce, and Alaska paper birch.



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Cover Type	Code	General Location	Representative Plants
Scrub			
Closed dwarf tree scrub; trees <3 meters (m) tall; 60 to 100% canopy	II A 1	Closed dwarf black spruce scrub is uncommon but may occur in very cold and wet soils in interior Alaska.	Blackspruce.
Open dwarf tree scrub; trees <3 m tall; 25 to 60% canopy	II A 2	Dwarf blackspruce scrub is typically found in very cold and wet soils in Interior Alaska.	Blackspruce, Alaska paper birch, bog Labrador-tea ( <i>Rhododendrum</i> groenlandicum), and cloudberry ( <i>Rubus chamaemorus</i> ).
Dwarf tree scrub woodland; trees <3 m tall; 10 to 25% canopy	II A 3	Dwarf blackspruce scrub woodland is typically found in wet sites near tree line in Interior Alaska.	Blackspruce.
Closed tall scrub; shrubs ≥1.5 m tall at maturity with 75 to 100% canopy	II B 1	Occur throughout most of Alaska on stream banks and floodplains.	Willow (Salix spp.), alder (Alnus spp.), resin birch (Betula glandulosa), and soapberry (Sheperdia canadensis).
Open tall scrub; shrubs ≥1.5 m tall at maturity with 25 to 75% canopy	II B 2	Typically occur on floodplains, drainages, and near and above the tree line in Interior Alaska.	Willow, alder, resin birch, and soapberry.
Closed low scrub; shrubs 20 centimeters (cm) to 1.5 meters tall at maturity	II C 1	Typically occur on floodplains and river terraces and steep slopes near the tree line in Interior and northern Alaska. Low willow shrub communities also occur in moist protected drainages and around lakes and ponds on the Arctic Coastal Plain.	Willow, alder, resin birch, and dwarf birch ( <i>Betula nana</i> ).
Open low scrub; shrubs 20 cm to 150 cm tall at maturity	II C 2	Shrubby tussock wetlands and tundra occupy vast areas of northem Alaska and also occur in lowlands and alpine areas of the Interior. Low willow communities occur in the uplands of northern and Interior Alaska.	Willow, alder, birch ( <i>Betula spp.</i> ), sedge, and ericaceous shrubs.
Dryas dwarf scrub; <20 cm tall at maturity	II D 1*	Common on windswept alpine sites throughout the northern two-thirds of the state and occasionally is present on well-drained, exposed arctic lowland sites.	Willow, sedge, and lichen
Ericaceous dwarf scrub; < 20 cm tall at maturity	II D 2*	Commonly occur in alpine areas and on slopes and windswept areas of interior, northern and western Alaska.	Ericaceousshrubs such as black torpedoberry (Arctous alpine), lingonberry (Vacciniumvitis-idaea), bog blueberry (V. uliginosum), narrowed-leaved Labrador-tea (Rhododendron tomentosum), black crowberry (Empetrum nigrum) and white arctic mountain-heather (Cassiope tetragona).



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Cover Type	Code	General Location	Representative Plants
Willow dwarf scrub; < 20 cm tall at maturity	II D 3*	Common in alpine areas and other windswept tundra settings throughout the state (except Southeast) occurring in habitats such as snowbeds, wet highalpine drainage channels, gelifluction lobes, windblown high-center polygon summits, stabilized sand dunes, mesic slopes, exposed slopes and ridges.	Dwarf willows (polar willow (Salix polaris), net-vein willow (S. reticulate), skeleton-leaf willow (S. phlebophylla), round-leaf willow (S. rotundifolia), arctic seashore willow (S. ovalifolia), and arctic willow (S. arctica)) and other dwarf shrubs (black crowberry, clubmoss mountain-heather (Cassiope lycopodioides)), Dryas spp., bog blueberry, lingonberry, and narrowed-leaved Labrador-tea.
Herbaceous			
Dry graminoid herbaceous	III A 1	I ypically found on dry slopes at low elevation and on sub-alpine and alpine slopes and plateaus of Interior Alaska.	Grass (Festuca spp., Poa spp.) ericaceous shrubs, and willow.
Mesic graminoid herbaceous	III A 2	Tussock tundra is widespread in the Arctic foothills and parts of the Arctic Coastal Plain and is also found along floodplains, valley bottoms, and on upland slopes throughout Alaska.	Tussock cottongrass ( <i>Eriophorum</i> vaginatum), bluejoint grass ( <i>Calamagrostis Canadensis</i> ), sedge, alder, and willow.
Wet graminoid herbaceous (emergent); shrubs provide <25% cover	III A 3	Common on Arctic lowlands and in alpine areas.	Sedge, cottongrass ( <i>Eriophorum</i> spp.), grass ( <i>Festuca</i> spp., <i>Poa</i> spp.), and pendantgrass ( <i>Arctophila fulva</i> ), willow.
Dry forb herbaceous	III B 1	Sparsely vegetated communities typically found in alpine areas and rocky, well-drained sites throughout Alaska.	Dwarf fireweed (Chamerion latifolium), dwarf alpine hawksbeard (Crepis nana), wild sweetpea (Hedysarum mackenzii), and Saxifraga spp.
Mesic forb herbaceous	III B 2	Primarily occur on rich, sheltered, well-drained sites with deep soils.	Narrow-leaf fireweed (Chamerion angustifolium), bellflowers (Campanula spp.), wild celery (Angelica spp.), lupin (Lupinus spp.), wormwood (Artemisia spp.), sweet pea (Lathyrus spp.), Anemone spp., larkspur (Delphiniumspp.), and larkspur-leaf monkshood (Aconitum delphinifolium). Sedges, grasses, ferns and mosses also are common.
Wet forb herbaceous (emergent)	III B 3	Occurs in permanently flooded sites (usually with 15 – 100 centimeters of water), including sloughs, oxbow lakes, sluggish rivers and lake margins.	Water horsetail (Equisetumfluviatile), buckbean (Menyanthes trifoliate), purple marshlocks (Comarum palustre), and Potamogeton spp.
Mosses	III C 1	Wet bryophyte communities reportedly occur in the southern (high precipitation) part of the state, while dry bryophytes are most common on windswept coarse mineral substrates (sand dunes and gravelly slopes).	Liverworts such as <i>Gymnocolea</i> acutiloba, <i>Scapania paludosa</i> , and <i>Nardia spp.</i> and mosses such as <i>Racomitrium</i> spp.
Lichens	III C 2	Common in windblown rocky sites with little or no soil development primarily in alpine regions throughout Alaska.	Crustose lichen.



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Cover Type	Code	General Location	Representative Plants
Freshwater Aquatic herbaceous	III D 1	Widely distributed throughout Alaska in ponds, sloughs, and oxbow lakes.	Pond lily (Nuphar polysepalum), marestail (Hipperis vulgaris), buttercup (Ranunculus spp.), burreed (Sparganiumspp.), water milfoil (Myriophylumspicatum), pondweed (Potamogeton spp.), and aquatic moss (Fontanalis neomexicana).
Brackish water aquatic herbaceous	III D 2	Common in brackish ponds in coastal marshes throughout the state.	Fourleaf marestail (Hippurus tetraphylla), sago pondweed (Stuckenia pectinate), spiral ditchgrass (Ruppia cirrhosa) and homed pondweed (Zannichellia palustris).
Marine aquatic herbaceous	III D 3	Occur in protected bays, inlets, and lagoons with clear water along the Alaska coast as far north as the Seward Peninsula.	Eelgrass and various species of marine algae.

Source: The Alaska Vegetation Classification (Viereck et al., 1992).

<sup>\*</sup>In some instances, dwarf scrub vegetation could only be classified to Viereck Level II.



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Waterbody crossings occurring along the Project Rev C centerline are presented in Table 3-6, organized by ecoregion and HUC 8 Sub-basin name. A total of 687 intermittent, lower perennial, and upper perennial stream and river crossings were mapped within the approximately 804 mile length of the Project route.

Table 3-6. Preliminary Stream Crossings, Along the Project Route, by Ecoregion

Ecoregion/HUC 8 Name	Total Number of Streams by Stream Classification			
	Tidal (R1) Crossing	Lower Perennial (R2) Crossing	Upper Perennial (R3) Crossing	Intermittent (R4) Crossing
Alaska Range Transition	Ecoregion			
Upper Kenai Peninsula	0	0	0	5
Redoubt-Trading Bays	0	1	4	17
Lower Susitna River	0	3	21	72
Yentna River	0	1	0	3
Chulitna River	0	1	28	45
Nenana River	0	0	12	49
Intermontane Boreal Ecor	egion			
Nenana River	0	1	6	12
Lower Tanana River	0	1	0	0
Tolovana River	0	4	5	31
Ramparts	0	1	4	87
Yukon Flats	0	0	1	15
Kanuti River	0	0	1	5
South Fork Koyukuk River	0	0	11	28
Upper Koyukuk River	0	0	0	6
Arctic Tundra Ecoregion				
Upper Koyukuk River	0	0	26	81
Middle Fork-North Fork Chandalar Rivers	0	0	6	7
Sagavanirktok River	0	13	6	54
Lower Colville River	0	0	0	1
Kuparuk River	0	1	1	10
Total:		27	132	528
Grand Total:				687



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## 4.0 ACRONYMS AND ABBREVIATIONS

ADNR Alaska Department of Natural Resources

CFR Code of Federal Regulations

DP Determination Point

FAC Facultative

FACU Facultative upland FACW Facultative wetland

FERC Federal Energy Regulatory Commission

FT Field Target

GIS Geographic Information System
GPS Global Positioning System
GTP Gas Treatment Plant
HGM Hydrogeomorphic
HUC Hydrologic Unit Code
LIDAR Light Detection and Ranging

LNG Liquefied Natural Gas

MP Milepost

MSB Matanuska Susitna Borough

NRCS National Resources Conservation Service
NTCHS National Technical Committee for Hydric Soils

NWI National Wetland Inventory

Obligate wetland OBL OP Observation Point Project Alaska LNG PBU Prudhoe Bay Unit Palustrine emergent PEM PFO Palustrine forested **PSS** Palustrine scrub shrub PTU Point Thomson Unit

QA/QC Quality Assurance/Quality Control

Rev Revision ROW Right-of-Way

TNW Traditional Navigable Water

U.S. United States

USACE U.S. Army Corps of Engineers
USDA U.S. Department of Agriculture
USFWS U.S, Fish and Wildlife Service
USGS U.S. Geological Survey
WDF Wetland Determination Form



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#### 6.0 APPENDICES



### 2016 WETLAND AND VEGETATION FIELD STUDY REPORT

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#### APPENDIX A - 2016 WETLAND DETERMINATION FIELD SURVEY PROTOCOLS

	DOCKET NO. CP17000	Doc No: USAI-EX-SRREG-00-
	RESOURCE REPORT NO. 2	000004-000
Alaska LNG	APPENDIX G – WETLAND FIELD SURVEY	DATE: APRIL 14, 2017
PROJECT	REPORTS	REVISION: 0
	PRIVILEGED AND CONFIDENTIAL	

# APPENDIX G.3 2016 WETLAND AND VEGETATION FIELD STUDY REPORT (USAI-P1-SRZZZ-00-000016-000)



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Rev		Date	Revision Description		Originato	or	Reviewer / Endorser	Respo Cod		Ap	prover
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**DATE: APRIL 4, 2016** 

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### **REVISION MODIFICATION LOG**

Revision	Section	Description
1	Global	Updated for 2016 field studies.



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#### 1.0 PURPOSE AND SCOPE

#### 1.1 PROJECT DESCRIPTION

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LLP (a whollyowned affiliate of AGDC, and with AGDC, collectively referred to herein as "AGDC") (Applicants) plan to construct one integrated liquefied natural gas (LNG) Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular from the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and opportunities for in-state deliveries of natural gas.

In accordance with 18 CFR 157.21(f)(9), the Applicants are submitting the enclosed response to issues raised during scoping. This response covers written comments received by the Federal Energy Regulatory Commission (FERC) from March 4, 2015 to December 4, 2015 and comments made during FERC scoping meetings in October and November 2015. Due to the large number of comments received, and consistent with FERC direction and practice, the comment topics have been grouped into major themes with associated responses. The responses indicate how the Project is addressing or will address the comment themes, and provides cross references to content in Draft Resource Reports, where applicable.



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#### 2.0 INTRODUCTION

Wetland determination surveys will be conducted for Alaska LNG to verify the pre-field mapping wetland types and boundaries of all Waters of the United States (U.S.), including wetlands, within the defined corridor and in specific areas along the Project route. The 2016 field surveys will focus on previously unmapped or field verified sections of the alignment, as well as off right-of-way (ROW) areas.

All Waters of the U.S. are regulated by the U.S. Army Corp of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. All projects, as part of the Section 404 permitting process, must avoid impacts to wetlands wherever possible, minimize impacts to wetlands to the maximum extent practicable, and compensate for all unavoidable wetland impacts.

Results of the wetland surveys will facilitate the eventual evaluation of project-related direct, indirect, and cumulative impacts under the Federal Energy Regulatory Commission (FERC) Resource Report 2 (Water Use and Quality), the National Environmental Policy Act (NEPA), and Section 404 and Section 10 permits administered by the USACE.

This document presents the wetland determination field survey protocols that will be used during the 2016 field season. It discusses the protocols used in both the field and office for delineating the boundaries of areas that are regulated by USACE and may be impacted by the proposed project.

#### 2.1 OBJECTIVES

The main objectives for the Alaska LNG 2016 wetland field season are:

- Complete wetland surveys in the vicinity of the pre-selected field targets;
- Collect data at field-selected observation points and at additional wetland determination points where necessary to adequately update the field maps; and
- Update the pre-field wetland mapping based on results of the field data.

#### 2.2 PROJECT AREA

The Alaska LNG route passes through three ecoregions with nine sub-ecoregions (Figure 2-1), as described by Nowacki et al. (2001):

- Alaska Range Transition Ecoregion
  - o Cook Inlet Basin Sub-Ecoregion
  - o Alaska Range Sub-Ecoregion
- Intermontane Boreal Ecoregion
  - o Tanana-Kuskokwim Lowlands Sub-Ecoregion
  - o Yukon-Tanana Uplands Sub-Ecoregion
  - o Ray Mountains Sub-Ecoregion
  - o Kobuk Ridges and Valleys Sub-Ecoregion
- Arctic Tundra Ecoregion
  - o Brooks Range Sub-Ecoregion



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- Brooks Foothills Sub-Ecoregion
- o Beaufort Coastal Plain Sub-Ecoregion

Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions (World Wildlife Fund 2015). The Alaska LNG corridor begins in the Cook Inlet Basin at the LNG Facility in Nikiski, on the Kenai Peninsula, and continues through the Alaska Range, the Tanana-Kuskokwim Lowlands, Yukon-Tanana Uplands, Ray Mountains, Kobuk Ridges and Valleys, and then up through the Brooks Range and Brooks Foothills. The study area corridor continues north into the Beaufort Coastal Plain reaching Deadhorse, Alaska before bearing east to Point Thompson and the PTU production fields. Ecoregion descriptions are presented in the 2015 Vegetation Study Report (Alaska LNG 2015).

The wetlands survey area for the Project is divided into two corridors: A wetland mapping corridor and a field survey corridor. The mapping corridor has been preliminarily established as a 2,000 foot corridor (1,000 feet on either side of the proposed alignment centerline). This mapping corridor width may be modified, with the approval of USACE, to exclude terrain features such as steep mountain slopes or lands on the far side of rivers, which are not under consideration for use. All wetlands and waterbodies will be mapped within the mapping corridor using aerial photograph interpretation. The smaller field survey corridor is 300-feet-wide (150-feet on each side of the proposed alignment centerline) and centered within the mapping corridor. Field work will generally be concentrated within the field survey corridor, or within an off-ROW footprint, ensuring that the wetland field work occurs near areas most likely to be disturbed by the proposed project.

The Alaska LNG field survey area is divided into eight geographic spreads for planning purposes:

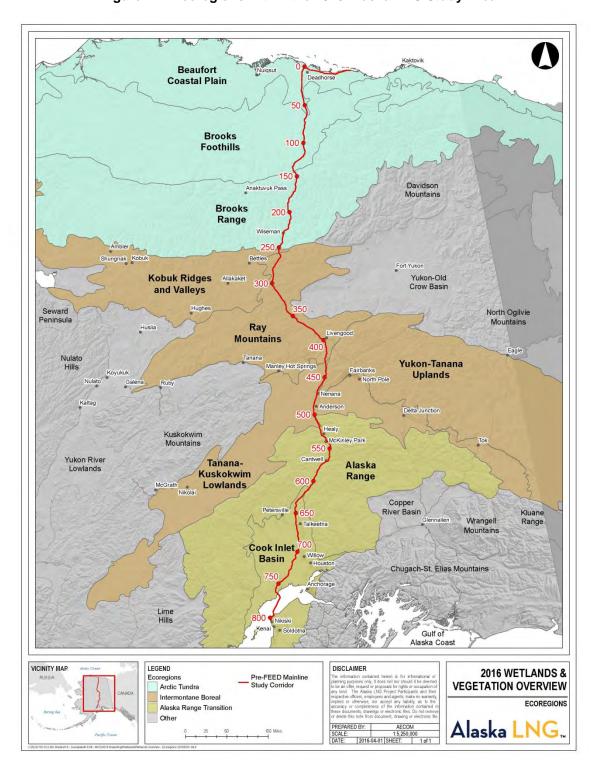
- Cook Inlet to Nikiski (IN), Mainline MP 792-804;
- Trapper Creek to Cook Inlet (TI), MP 664.5-765;
- Healy to Trapper Creek (HT), MP 525-664.5;
- Livengood to Healy (LH), MP 403.5-525;
- Yukon River to Livengood (YL), MP 357-403.5;
- Atigun Pass to Yukon River (AY), MP 169-357;
- Prudhoe Bay to Atigun Pass (PA), MP 0-169; and
- Point Thomson to Prudhoe Bay (PP), PT Pipeline milepost (MP) 0-58.

The 2016 field season will focus on areas along the Project route from the Brooks Foothills to the Cook Inlet Basin.

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Figure 2-1. Ecoregions within the 2016 Alaska LNG Study Area





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#### 3.0 METHODS

#### 3.1 OVERVIEW

The USACE defines wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." Wetlands are considered jurisdictional "if the wetland, either alone or in combination with similarly situated lands in the region, significantly affect the chemical, physical, and biological integrity of other covered waters more readily understood as 'navigable." (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]) (Stonestreet et al. 2009). Other aquatic habitats under the jurisdiction of the USACE include deepwater aquatic habitats, unvegetated ponds, river channels, and other special aquatic sites as described by the USACE. Uplands are non-wetland areas that are neither deepwater aquatic habitats, nor other special aquatic sites.

All wetlands and other Waters of the U.S. in the preliminary Alaska LNG corridor will be delineated and classified using standard National Wetland Inventory (NWI) codes as described in Classification of Wetlands and Deepwater Habitats of the United States (Cowardin et al. 1979). Cowardin classifies wetlands and aquatic habitats by system, subsystem, class, subclass, and water regime and is based on hydrologic setting (riverine, lacustrine, estuarine, palustrine), vegetation structure (forested, scrub-shrub, emergent, aquatic bed), and water regime (saturated, temporarily flooded, seasonally flooded, semi-permanently flooded, etc.).

One deviation from standard NWI protocols for this project will be the use of two non-wetland categories. One category will include all vegetated uplands. The other will be labeled "Disturbed/Fill" and include uplands that have been impacted by human development, including all roads, gravel pads, buildings, and farmland.

Standard methods are used to delineate wetlands for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) wetland pre-mapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of wetland pre-mapping based on results of field efforts.

#### 3.2 WETLAND PRE-MAPPING

The wetland pre-mapping has been completed for the preliminary Alaska LNG route (Rev B) corridor. Wetland boundaries were delineated on digital ortho-rectified and geo-referenced true color aerial photography with 1.6-foot pixel resolution using the following aerial imagery:

- Alaska LNG Imagery. (0.5-foot resolution) (Paragon 2013);
- Nikiski Area Aerial Orthophoto. (2.5-foot resolution) (Kenai Peninsula Borough 2006);
- Kenai Peninsula Borough Aerial Imagery. (2.5-foot resolution) (Kenai Peninsula Borough 2013);
- Point MacKenzie Aerial Orthophoto (0.5-meter resolution) (Matanuska Susitna Borough, MSB 2011d);
- Willow Aerial Orthophoto (1.0-foot resolution) (MSB 2011c):
- Caswell Aerial Orthophoto (1.0-foot resolution) (MSB 2011b):
- Talkeetna Aerial Orthophoto (1.0-foot resolution) (MSB 2011a);
- Healy Area Orthophoto (1.0-meter resolution) (U.S. Census Bureau 2006);



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- Digital Orthophoto Quarter Quadrangles Anderson Area (0.6-meter resolution) (NRCS 2006);
- Southern Corridor Ortho Mosaic (1.6-foot resolution) (Digital Globe 2013b);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a);
- Quantum Aerial Imagery. (1.6-foot resolution) (Quantum Spatial 2014);
- iCubed Satellite Imagery. (1.0-meter resolution) (iCubed 2014);
- ExxonMobil aerial imagery for the Alaska Pipeline Project (0.5-meter pixel resolution; summer 2008, 2009, 2010, and 2011) (ExxonMobil 2008, ExxonMobil 2009b, ExxonMobil 2011);
- BP Exploration Alaska Inc. aerial imagery for Prudhoe Bay, Endicott, and Badami (1.0-foot pixel resolution; July 2012) (BPX 2012a, BPX 2012b, BPX 2012c); and
- ExxonMobil aerial imagery for Point Thomson (2.0 and 0.5-foot pixel resolution; July 2001/2006, and July 2009) (ExxonMobil 2001-6, ExxonMobil 2009a).

Data from the following sources was also used during the mapping process:

- USFWS, NWI digital datasets and hardcopy maps;
- Kenai Watershed Forum Cook Inlet Wetlands for the Kenai Peninsula and the Matanuska Susitna Boroughs (Gracz 2011);
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging generated topographic contours (TransCanada 2011, MSB 2011d);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;
- U.S. Geological Survey Digital Raster Graphics (e.g., topographic maps);
- Point Thomson Project wetlands mapping between Point Thomson and Badami (USACE 2012);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

All wetland mapping was created in a GIS geodatabase, using a "heads-up" digitizing effort. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. This is the generally accepted wetland and deepwater habitat mapping technique employed by the U.S. Fish and Wildlife Service personnel as part of the NWI program (Dahl et al. 2009). Data sources were overlaid on aerial photography and wetland, non-wetland, and areas of uncertain wetland status were identified by interpreting color, texture, and landscape position, among other elements. Aerial photography clues can include dwarf or stunted trees, topography characteristics (such as swales, toe slopes, and depressions), and obvious signs of inundation.

All wetlands were mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer. Lakes, ponds and rivers were mapped at a scale of 1:1,200 (1 inch to 100 feet). Larger rivers and streams were delineated as polygons. Smaller streams, those with bankfull widths of approximately 10 feet or less, were mapped as vector lines.



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#### 3.3 FIELD TARGET SELECTION

Field targets were selected from the pre-mapping based on changes in the wetlands types, aerial vegetation signatures, NWI classification, and NRCS soil classification. The primary focus of the pre-selected field targets will be to characterize specific wetland types which represent all similar wetland types in the region and to identify wetland/upland boundaries by selecting paired plots. Field targets will be used to confirm areas where wetland subject matter experts have high confidence in their aerial interpretation, and will be used to confirm or correct wetland boundary locations. Field targets were also placed in low-confidence areas to provide field data where the photo signatures or landscape features were not clearly indicative of wetland or upland. The USACE may want to review and approve the 2016 field target locations that are selected to ensure that an appropriate range of representative wetlands are sampled.

Field targets may be re-evaluated based on the status of land access permissions. When necessary, new field targets will be located on nearby accessible parcels in areas with similar aerial photography vegetation signatures and site conditions as the original field targets.

#### 3.4 WETLAND FIELD DATA COLLECTION

Wetland determinations will be made using the USACE *Wetlands Delineation Manual* (1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region* (Regional Supplement) (2007a).

In order for an area to be identified as a wetland, the following three parameters must be present:

- 1. <u>Hydrophytic vegetation:</u> The prevalent vegetation must be adapted to areas of saturated or inundated soils.
- 2. <u>Hydric soils:</u> The soil must be classified as hydric or possess characteristics that are associated with reducing soil conditions.
- 3. <u>Wetland hydrology:</u> The area must be inundated or saturated at some time during the growing season.

Field targets will be accessed via existing highways and secondary roads where available. A helicopter will be required to access remote sites. A Global Positioning System (GPS) device will be used to locate sites and to collect coordinates. At each field target, a USACE *Wetland Determination Data Form – Alaska Region* (**Appendix A**) will be used to determine if the site is a wetland, other Water of the U.S., or upland. All wetlands and waterbodies will be delineated and classified using NWI codes. The GPS device will also be used to collect limited field data on an electronic form that will be developed for the project.

Field crews will also collect qualitative wetland data at observation points and establish additional field targets and complete *Wetland Determination Data Forms* where necessary, and will not be limited by the pre-selected field targets. The field crews will identify changes in wetland types or wetland/upland boundaries not easily identified on the aerial photography. Wetland scientists will use their best professional judgment and collect appropriate field data to adequately revise the wetland pre-mapping. A detailed wetland field survey gear list is provided in **Appendix B**.

#### 3.5 MAP REVISIONS

As wetlands field data (i.e., GPS data, Wetland Determination Forms, Vegetation Classification Forms for upland sites, site photographs, logbooks, field maps) becomes available, the field data will be downloaded in the office and plotted on the base maps of the route. The location of each plot will be attributed with the information collected in the field. This allows the creation of a reference dataset linking an aerial photography signature to a wetland status and vegetation type. This reference dataset will be used to finalize the mapping of the 2,000-foot corridor which could



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include adjusting boundaries and wetland classifications such as hydrogeomorphic (HGM) and Cowardin codes.

Generally, the wetland pre-mapping revision process involves:

- Exporting spatial data for all field targets and photo points from the Alaska LNG database;
- Compiling electronic copies of all notes, sketches, and photographs associated with above points; and
- Using this data in a GIS platform to update files through heads-up digitizing, or modifying the initial map on screen as described in Section 3.2 of the Wetland Determination Field Survey Protocols.

#### 3.6 WETLAND FUNCTIONAL ASSESSMENT

Wetlands are known to provide a variety of ecological functions depending on the location and type of wetland. At sites determined to be wetland, functional assessment data (**Appendix A**) will be collected. Information from this data sheet will be incorporated into the functional models described in *A Rapid Procedure for Assessing Wetland Functional Capacity* (Magee and Hollands 1998). Magee and Hollands have identified five HGM classes of wetland that occur in Alaska.

- 1. <u>Depressional wetlands:</u> Depressional wetlands occur in a topographic depression. Predominant water sources are direct precipitation, surface water runoff, and groundwater (Brinson 1976).
- 2. <u>Slope wetlands:</u> Slope wetlands generally occur on a hillside and water flow is predominantly unidirectional parallel to the slope. The water source is primarily groundwater and occasionally precipitation (Brinson 1976).
- 3. <u>Lacustrine fringe wetlands:</u> A lacustrine fringe wetland borders a lake and lacks any topographic features. The water source is surface water and flow is bidirectional.
- 4. <u>Flat wetlands</u>: There are two types of flats wetlands: organic and mineral flats. Flat wetlands in Alaska are primarily organic flats. Organic flats "can occur on relatively gentle to moderate slopes up to 20% in steepness. In relatively undisturbed conditions and without significant human alteration, the dominant hydrodynamics are vertical, even on relatively gentle to moderate slopes (i.e., slopes < 20%). Specifically, the main hydrologic input to wetlands within the organic soil flat class in interior Alaska is precipitation" (ADEC/USACE 1999).
- 5. <u>Riverine wetlands</u>: Riverine wetlands are adjacent to rivers and are dominated by overbank flooding. Water flow is bidirectional locally with an overall regional flow down the river valley.

Magee and Hollands use these HGM classes to compare the functions of wetlands within a particular HGM class. Each HGM class represents a separate functional model, which is used to define the Functional Capacity Index (FCI) of eight functions. The eight functions identified by Magee and Hollands are listed below.

- 1. <u>Modification of groundwater discharge:</u> The capacity of a wetland to influence the amount of water moving from the groundwater to surface water.
- 2. <u>Modification of groundwater recharge:</u> The capacity of a wetland to influence the amount of water moving from surface water to groundwater.
- 3. <u>Storm and flood-water storage:</u> The storage of inflowing water from storm or flooding events, resulting in detention and retention of water on the wetland surface.
- 4. <u>Modification of stream flow:</u> The modification of inflow hydrology by the wetland to produce the outlet stream's hydrology.
- 5. <u>Modification of water quality:</u> Removal of suspended and dissolved solids from surface water and dissolved solids from groundwater and conversion into other forms, plant or animal



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biomass, or gases. Wetlands with a low slope-angle or location in depressions provide a high level of this function.

- 6. <u>Export of detritus</u>: Export of organic detritus from the wetland to adjacent and downstream aquatic ecosystems.
- 7. <u>Contribution to abundance and diversity of wetland vegetation:</u> The capacity of a wetland to produce an abundance and diversity of hydrophytic plant species individually or as part of a group of wetlands in a local landscape (Tiner 1984).
- 8. <u>Contribution to abundance and diversity of wetland fauna:</u> The capacity of a wetland to support large and/or diverse populations of animal species that spend part or all of their lifecycle in wetlands, individually, or as part of a mosaic of wetlands in a local landscape.

The Magee and Hollands's functional assessment method requires site-specific information to be entered into a model that will produce a FCI for each wetland function. The FCI indicates the potential degree to which the wetland performs the function and is only comparable to other wetlands within the same HGM class and region. The FCI scale is from 0.0 to 1.0. Most of the model inputs will be collected in the field, with the remaining variables taken from available GIS datasets (such as wetland size and land ownership). The results from the functional assessment models will be extrapolated to the applicable wetlands within the mapping corridor. This information will potentially serve as the basis to determine appropriate compensatory mitigation for the unavoidable impacts of the project. Wetland functional assessment data will be reported in 2016, after all field data is collected. The Wetland Determination Data Form (Appendix A) will be reviewed and adjusted as necessary to collect appropriate functional assessment data for the different ecoregions.

#### 3.7 JURISDICTIONAL DETERMINATION

USACE regulates wetlands and other Waters of the U.S. that are under their jurisdiction. Jurisdictional status is based on connectivity to Traditional Navigable Waters (Rapanos v. United States and Carabell v. United States [33 U.S. Code §1251 et seq.]). Field visits by USACE, the Federal Energy Regulatory Commission, the Environmental Protection Agency, and the Owner's Representative could also be conducted (with minimal notice) to observe field survey teams while they are conducting wetland delineations, and to review protocols and any data collected.

The Project, similar to other large pipeline and energy projects permitted by the USACE, will assume that all wetlands found fall under USACE jurisdiction. Because the FERC requires that the Project adhere to certain construction requirements in all wetlands, regardless of jurisdiction, the Project will assume that all wetlands found will be within the USACE jurisdiction for permitting, mitigation, and construction method purposes.

#### 3.8 DATA RECORDING AND PROCESSING

Data will be recorded on hardcopy field forms (**Appendix A**), and some of the data will be entered into an electronic data form. Electronic data files will be uploaded to a project website through an internet connection or by a satellite link, and will include GPS locations, electronic data form, site photos, site sketches, and field notes.

#### 3.9 QUALITY ASSURANCE / QUALITY CONTROL

Each crew member is responsible for collecting clear and accurate data according to the sampling protocol. The field crew chief will review all hardcopy and electronic data forms and complete a quality assurance/quality control (QA/QC) checklist (**Appendix C**) before leaving each site.



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The field crew manager will ensure that all data files, hardcopy and electronic, are uploaded to the Project website. These transmitted files will then be downloaded and reviewed by office-based data management staff. The wetlands technical lead will check each hardcopy data sheet and electronic data form for quality and consistency, as it is received. If problems arise, the field crew will be notified promptly to ensure that any data quality issues are corrected immediately.

Wetland mapping will be reviewed by experienced wetland scientists both after the initial premapping, and after map revisions are complete.

#### 3.10 REPORTING

The results of the 2016 field work will be compiled into a field survey report at the end of the season. The report will include a GIS dataset comprised of field-verified wetland and vegetation mapping, field sample locations, and data collected at each site. It will also outline the field survey methods and identify all wetland types found throughout the corridor describing common plant species, hydrology indicators, and hydric soil indicators.

After all wetland field data is finalized, a report on the Wetland Functional Assessment for all wetlands surveyed will be provided. The Wetland Functional Assessment will be submitted to USACE for review and concurrence. Once USACE concurs, the wetland boundaries delineated will be used to calculate Project impacts for Section 404 permitting. The Wetland Functional Assessment will help USACE characterize the impacted wetlands to determine appropriate compensatory mitigation for the unavoidable project impacts to wetlands and other Waters of the U.S.

Results of this survey will be provided in the FERC Resource Report 2.



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#### 4.0 FIELD STUDIES EXECUTION

Field study execution details are currently in the process of being developed and will include: field crew composition, schedule and march charts, field target maps, and general project-wide permits and approvals. Field safety will also be discussed and a specific Job Safety Analysis (JSA) developed for wetland surveys will be included.



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#### 5.0 ACRONYMS AND ABBREVIATIONS

FCI Functional Capacity Index

FERC Federal Energy Regulatory Commission

GIS Geographic Information System

GPS Global Positioning System

GTP Gas Treatment Plant HGM hydrogeomorphic

JSA Job Safety Analysis
LNG liquefied natural gas

MP milepost

MSB Matanuska Susitna Borough

NEPA National Environmental Policy Act

NRCS Natural Resources Conservation Service

NWI National Wetland Inventory

PBU Prudhoe Bay Unit
PTU Point Thomson Unit

ROW right-of-way
U.S. United States

USACE U.S. Army Corps of Engineers
USFWS U.S. Fish and Wildlife Service



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#### 7.0 APPENDICES



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#### APPENDIX A – WETLAND DETERMINATION DATA FORM – ALASKA REGION



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#### WETLAND DETERMINATION DATA FORM

Survey Type: Centerline	Access Road (explain)	Other (explain)	Field Tar	get:	Map #:Map Date:
Date:	Project Name: Alasi	ta LNG		Feature Id	
Investigators;					Team No.:
State: Alaska	Region: Alaska	Mile	post:		
Latitude:		Longitude:			Datum: WGS84
Logbook No.:	Logbook Page No.;	Picto	ire No.:		
SITE PARAMETERS					
Subregion:		Land	form (hillslope, terra	ce, hummock	s, etc.):
Slope (%):		Loca	relief (concave, co	vex, none):	
Pre-mapped Alaska LNG/NWI cla	ssification	Evid	ence of Wildlife Use:		
Are climatic/hydrologic conditions Yes No (if n	on the site typical for this time to explain in Notes)	of year?	Are "Normal Circuityes No		sent: plain in Notes.)
	or Hydrology Significan	tly Disturbed?	7 7 7 7	plain in Notes	
11 14 15 15 15 15 15 15 15 15 15 15 15 15 15	or Hydrology Naturally			plain in Note:	
SUMMARY OF FINDINGS	- Jg/ (micron)		(1, 102, 0)		
Hydrophytic Vegetation Present?	YesNo	is the Sa	mpled Area within	a Wetland?	Yes No
Hydric Soil Present?	Yes No	Wetland	Туре:		
Wetland Hydrology Present?	YesNo	- Alaska V	egetation Classificat	ion (Viereck)	



VEGETATION (use scientific names of plants)

### 2016 WETLAND DETERMINATION FIELD SURVEY PROTOCOLS

Absolute Dominant Indicator Dominance Test worksheet:

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#### WETLAND DETERMINATION DATA FORM

Tree Stratum (Plot sizes:)	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC:(A
ti		77.03		Total Number of Dominant Species Across All Strata:(E
2.				% Dominant Species that are OBL. FACW, or FAC:(A/
3.				
4.				Prevalence Index worksheet:
Total Cove				Total % Cover of Multiply by:
50% of total cove	rt 20	% of total cov	er:	OBL species:X1 =
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:X 2 =  FAC speciesX 3 =  FACU speciesX 4 =
2.				UPL speciesX 5 =
3.				Column Totals: (A) (B)
4.				PI = B/A =
5.				-
6.				-
7.	-			+
8.				-
9.				-
Total Cove			-	-
50% of total cove		1% of total cov	er:	
5070 0110101 0070		70 07 10101 007	-	
VEGETATION (use scientific names of plant	\$)			
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1.				Morphological Adaptations (Provide supporting data in
2.				Notes)
3.	1			Problematic Hydrophytic Vegetation (Explain)
4.				Indicators of hydric soil and wetland hydrology must be present unless
5.			-	disturbed or problematic.
6.			-	
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water
				Hydrophytic Vegetation Present (Y/N):
Total Cove	r 20	9% of total cov	er;	Notes: (If observed, list morphological adaptations below):



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#### WETLAND DETERMINATION DATA FORM

Depth Ma	ESCRIPTION: (	Describe						an afindicators !	
Jepun			to the depth	needed to docum	ent the	indicator or	confirm the abser	ice of indicators.)	
inches) Co	latrix		Redox Fea	tures				4	
	olor (moist)	%	Calor (mais	st) % T	ype'	Loc"	Texture	Notes	
- 111									
		-							
						1			
			-			-			
		etion, RN	/I=Reduced N	Matrix, CS=Covere	d or Co	ated Sand G		n: PL=Pore Lining, M=Matr	
HYDRIC SOIL IND	2 2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2		-				- STORY STORY	FOR PROBLEMATIC HY	Department of the Control
Histosol or Histel (A				Gleyed (A13)				Change (TA4)4	
Histic Epipedon (A	(2)		Alaska	Redox (A14)				Swales (TA5)	
Black Histic (A3) _			Alaska	Gleyed Pores (A1	5)			( with 2,5Y Hue	
Hydrogen Sulfide (	(A4)						Alaska Gleye Layer	d without 5Y Hue or Redde	r Underlying
Thick Dark Surface	e (A12)						Other (Expla	n in Notes)	
Charles and the first of the control of	ydrophytic vege	tation, o	one primary in	ndicator of wetland	hydrolo	gy, and an	The second second second second	cape position must be prese	ent unless
Give details of col		otes.							
				Depth (inch	es):				
TOSHINING LAYER (I		-							
TOSHIOINE LEYET (I									
Hydric Soil Prese	ent (Y/N):								
	ent (Y/N):								
Hydric Soll Prese	ent (Y/N):								
Hydric Soll Prese	ent (Y/N):								
Hydric Soll Prese Notes:				ator is sufficient)		SECONDAR	YINDICATORS	2 or more required)	
Hydric Soll Prese Notes: HYDROLOGY PRI	IMARY INDICA	TORS (s		CARROLL PLANTED BY	N.	SECONDAR Vater-staine eaves (B9)	d	2 or more required) Stunted or Stresse Plants (D1)	•d
Hydric Soll Prese	IMARY INDICA	TORS (S	any one Indic riace Soil Cri Indation Visit	CARROLL PLANTED BY	- Ľ	Vater-staine .eaves (B9)	d	Stunted or Stresse Plants (D1)	_
Hydric Soli Presei Notes: HYDROLOGY PRI Surface Water (A1	(A2)	Su Inu (Bi	any one Indio riace Soil Cri indation Visib 7) arsely Veget	acks (B6) ble on Aerial Image	- V	Vater-staine .eaves (B9) Orainage Pai	d ttems (B10) zospheres along	Stunted or Stresse Plants (D1)	on (D2)
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Hydric Soil Preser Notes: HYDROLOGY PRI Surface Water (A1 High Water Table ( Saturation (A3)	(A2)	Su Su Inu (B. Sp. Coo Maa Hy Od	any one indice frace Soil Cristindation Visit (7) arsely Veget and the Soil (8) drogen Sulfactor (C1) y-Season after Table (C: her (Explain in Depth (in):	acks (B6) ale on Aerial Image ated se (B8) B15) de	- V	Vater-staine eaves (B9) Drainage Pal Drainage Pal Drainage Pal Drainage Pal Drainage Pal Living Roots Presence of ron (C4) Salt Deposits Notes:	d  ttems (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stresse Plants (D1)  Geomorphic Positi  Shallow Aquitard ( Microtopographic Relief (D4)  FAC-Neutral Test (	D3)



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#### AQUATIC SITE ASSESSMENT DATA FORM

VEGETATION VARIABLES P= Plot, M= Matrix	
Primary Vegetation Type (P): Vegetation Lacking     Forested-Deciduous-Needle-leaved     Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved     Scrub Shrub-Deciduous-Needle-leaved     Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved     Scrub Shrub-Evergreen-Needle-leaved     Emergent-Non-persistent       Persistent     Aquatic Bed	t
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)	
Number of Wetland Types (M):	en
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Den           80%)         Very High Density (80-100%)	
Interspersion of Cover & Open Water (P): 100% Cover or Open Water	attered or
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)	
Presence of Islands (M): Absent (none) One or Few Several to Many N/A	
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches, Parts of Site Open Small Scattered Patches Continuous Cover	
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)	
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)	
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe	
and traders of	
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sap	
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey	
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated	
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Se	diment.
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)	)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs	
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow	
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading	
Surficial Geologic Deposit Under Wetland (P): High Permeability Stratified DepositsLow Permeability Stratified Deposits Glacial Till/Not Permeable	-
Basin Topographic Gradient (M):     Low Gradient (<2%)	_
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown	
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)	
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized	
Size: Small (<10 acres)	
Your Chief OMOC shock	



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#### APPENDIX B - WETLAND SURVEY GEAR LIST



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Wetland and Vegetation Gear	Communication
1 - Sharp shooter shovel (fiberglass, not wood handle)	1 - VHF Radio
1 - U-Dig-it (Hand shovel)	1 - charger for vhf radio
1 - Compass	1 - Iridium Satellite Phone
1 - Hand lens	1 - charger for satellite phone
1 - Leatherman/sample knife (folding) 4" serrated	Safety/Survival Pack (Need for 2 teams)
1 - Digital camera	2 - Sleeping Bags 1 - Tent
1 - calculator	1 - Wilderness First Aid Kit
1 - extra batteries for digital camera	
1 - pH meter (pen kind) with storage solution	1 - Flare gun kit
1 - Pocket rod (measuring tape)	1 - Emergency procedures Manual
1 - Opaque small spray bottle filled with alpha-alpha dipyridyl	1 - Iodine Tablets /Filter
2 - packages – gallon Ziploc bags	1 - 50' Nylon Rope/Parachute cord
1 - package- pint Ziploc bags	1 - small Flashlight/headlamp (for soil pit)
Squirt Water bottle (for moistening soil to color)	2 - Space Blankets
200+ - USACE Wetland Determination Form – Alaska Region (on Rite-in-the-Rain) with Aquatic Site Assessment	1 - Bear Spray
1 set - Field Maps on Rite-in-the-Rain	1 - Tarp (10' x 12')
4+ - Rite-in-the-Rain Field notebooks (spiral with lines)	1 - Gloves – Work/Latex/Insulated rubber
12+ - Mechanical Pencils w/ extra lead	matches
12+ - Sharpies (red and black)	1 - Roll of duct tape
1 - Laptop Computer (for downloading data every night)	Flagging tape (1 bright color per team)
2 - Clipboards	BPA-free water jug
Extra Rite-in-the-Rain paper	Personal Gear
1 - 12 inch file (for shovel sharpening) with handle	1 - Xtratuffs
1 - scissors	1 - Felt insoles for Xtratuffs
1 - tape	1 - Blaze Orange Surveyor Field Vest
2 - post it notes	1 - Mosquito Head Net
2 - toilet paper	1 - Rain Jacket/Pants
1 - Roll of duct tape	2 - Bug Spray
1 - (see through) small dry bag for soil kit	2 - Sunblock
1 – (see through) medium dry bag for field reference materials	1 - Sun Glasses
1 – dry erase board (for pictures)	1 - Water Bottle
1 – plant press	1 - Backpack
Books	1 - Hat
1 - Munsell Soil Color charts	Cell phone and charger
1 - Flora of Alaska and Neighboring Territories – Eric Hulten	1 - umbrella
1 - Trees and Shrubs – Viereck	Boot dryers
1 - Western Boreal Forest and Aspen Parkland – MacKinnon and Pojar	
1 - Wetland Sedges of Alaska – Tande and Lipkin	
1 - Willows of Interior Alaska – Collett	
1 - National List of Plant Species that Occur in Wetlands – Alaska Region - Reed 1988 (print)	
1 - Field Guide to Alaskan Wildflowers – Verna Pratt	
1 - Wildflowers along the Alaskan Highway – Verna Pratt	
Rapid Procedure for Assessing Wetland Functional Capacity: Based on HGM Classification – Hollands and Magee (print)	
1 - 1987 Wetland Delineation Manual (print)	
1 - 2007 Regional Supplement to the Corps of Engineers Wetland Delineation Manual – Alaska Region (print)	
1 - Classification of Wetlands and Deepwater Habitats – Cowardin (print)	
1 - Hydric soils in Alaska (print)	
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#### APPENDIX C - QA/QA CHECKLIST



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#### Wetland Determination Data Form QA/QC Checklist

This form to be completed before leaving the field site.

=eature	e ID:	D: Field Target:	Date:
For all	item	ns not checked, please provide detailed explanation in the notes	section of data form.
1.	Sit	ite Description	
		,	complete?
2.	Ve	egetation	
		identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per solution in the correct for each species?	
3.	So	oil	
		and the second second	
4.	Ну	ydrology	
			if present?
5.	Fu	unctions and Values	
		Vegetation, soil, hydrologic variables, and landscape variables	complete if site is a wetland?
6.	Fie	eld Logbook	
		Notes have been recorded at each site, including general description of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?	ription, sketch, and accuracy
7.	Ма	aps	
		, , , , , , , , , , , , , , , , , , , ,	



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8.	Pho	**~
_		) ( ) ?

0.	FIIOLOS						
	□ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil psoil plug)?						
	☐ Two photos were taken for	each Observation Point (vegetation/site overview)?					
X		X					
Wetlar	nd Scientist (print)	Signature / Date					
V		V					
X		X					
Field C	Crew Chief (print)	Signature / Date					



2016 WETLAND AND VEGETATION FIELD STUDY REPORT

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#### APPENDIX B - 2016 VEGETATION FIELD STUDY PROTOCOLS



## 2016 VEGETATION SURVEY FIELD STUDY PROTOCOLS

#### USAI-UR-SPFLD-00-000001-000

Rev		ate	Revision D	escription	Originator Revie Endo			Response Code		Approver		
0	5/	5/15	Issued for Information		V. Watkins							
1	4/4/16		Issued for Information		V. Watkins							
Docum	cument ntrol No.	Country	Facility	Originator	Discipline	Туре	Sub-Ty	pe L	ocation	Sec	quence	Identifier
Contro		US	Al	UR	S	Р	FLD		00	00	00001	000



### 2016 VEGETATION SURVEY FIELD STUDY PROTOCOLS

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**DATE: APRIL 4, 2016** 

**DATE: APRIL 4, 2016** 

**PREPARATION** 

PREPARED BY:

NAME: VALERIE WATKINS

TITLE: WETLAND AND VEGETATION LEAD

DATE: APRIL 4, 2016



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### **REVISION MODIFICATION LOG**

Revision	Section	Description
1	Global	Updated for 2016 field season.



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Note – All pipeline routing and/or facility siting information described in this document should be considered preliminary and subject to change.



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#### 1.0 PURPOSE AND SCOPE

#### 1.1 Project Description

The Alaska Gasline Development Corporation, BP Alaska LNG LLC, ConocoPhillips Alaska LNG Company, ExxonMobil Alaska LNG LLC, and TransCanada Alaska Midstream LLP (a whollyowned affiliate of AGDC, and with AGDC, collectively referred to herein as "AGDC") (Applicants) plan to construct one integrated liquefied natural gas (LNG) Project (Project) with interdependent facilities for the purpose of liquefying supplies of natural gas from Alaska, in particular from the Point Thomson Unit (PTU) and Prudhoe Bay Unit (PBU) production fields on the Alaska North Slope (North Slope), for export in foreign commerce and opportunities for in-state deliveries of natural gas.

In accordance with 18 CFR 157.21(f)(9), the Applicants are submitting the enclosed response to issues raised during scoping. This response covers written comments received by the Federal Energy Regulatory Commission (FERC) from March 4, 2015 to December 4, 2015 and comments made during FERC scoping meetings in October and November 2015. Due to the large number of comments received, and consistent with FERC direction and practice, the comment topics have been grouped into major themes with associated responses. The responses indicate how the Project is addressing or will address the comment themes, and provides cross references to content in Draft Resource Reports, where applicable.



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#### 2.0 INTRODUCTION

Alaska LNG will conduct vegetation studies to identify and describe vegetative cover types, and to verify the pre-field vegetation mapping within specific areas along the Project route. The 2016 field surveys will focus on previously unmapped or field verified sections of the alignment, as well as off right-of-way (ROW) areas.

Results of the vegetation survey will facilitate the eventual evaluation of project-related direct, indirect, and cumulative impacts under the Federal Energy Regulatory Commission (FERC) Resource Report 3 (Fish, Wildlife, and Vegetation), and the National Environmental Policy Act (NEPA).

This document presents the vegetation survey field protocols that will be used during the 2016 field season. It discusses the protocols used in both the field and office for classifying vegetation cover types that may be impacted by the proposed project.

#### 2.1 OBJECTIVES

The primary objective of the 2016 vegetation survey is to identify and describe vegetative cover types along select areas of the Project route.

Specific objectives include:

- Complete vegetation surveys in the vicinity of the pre-selected field targets;
- Collect data at field-selected observation points and at additional vegetation points where necessary to adequately update the field maps;
- Update the pre-field vegetation mapping based on results of the field data; and
- Complete a desktop analysis to document merchantable timber within the Project area.

#### 2.2 PROJECT AREA

The Alaska LNG Project route passes through three ecoregions with nine sub-ecoregions (Figure 2-1), as described by Nowacki et al. (2001):

- Alaska Range Transition Ecoregion
  - o Cook Inlet Basin Sub-Ecoregion
  - Alaska Range Sub-Ecoregion
- Intermontane Boreal Ecoregion
  - o Tanana-Kuskokwim Lowlands Sub-Ecoregion
  - o Yukon-Tanana Uplands Sub-Ecoregion
  - Ray Mountains Sub-Ecoregion
  - o Kobuk Ridges and Valleys Sub-Ecoregion
- Arctic Tundra Ecoregion
  - Brooks Range Sub-Ecoregion
  - o Brooks Foothills Sub-Ecoregion
  - Beaufort Coastal Plain Sub-Ecoregion



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Ecoregions are defined as a unit of land or water with a geographically distinct compilation of species, communities, and environmental conditions (World Wildlife Fund 2015). The Alaska LNG corridor begins in the Cook Inlet Basin at the LNG Facility in Nikiski, on the Kenai Peninsula, and continues through the Alaska Range, the Tanana-Kuskokwim Lowlands, Yukon-Tanana Uplands, Ray Mountains, Kobuk Ridges and Valleys, and then up through the Brooks Range and Brooks Foothills. The study area corridor continues north into the Beaufort Coastal Plain reaching Deadhorse, Alaska before bearing east to Point Thompson and the PTU production fields. Ecoregion descriptions are presented in the 2015 Vegetation Study Report (Alaska LNG 2015).

The 2016 Alaska LNG Vegetation Survey will focus on classifying vegetation at pre-selected target sites along the Project route from the Brooks Foothills to the Cook Inlet Basin. Field work will generally be concentrated within a 300-foot field survey corridor (150-feet on each side of the proposed alignment centerline), or within an off-ROW footprint, ensuring that the vegetation field work occurs near areas most likely to be disturbed by the proposed project. The mapping effort will include all the lands and waters within a 2000-foot wide corridor – 1000 feet on either side of the proposed Alaska LNG mainline centerline.

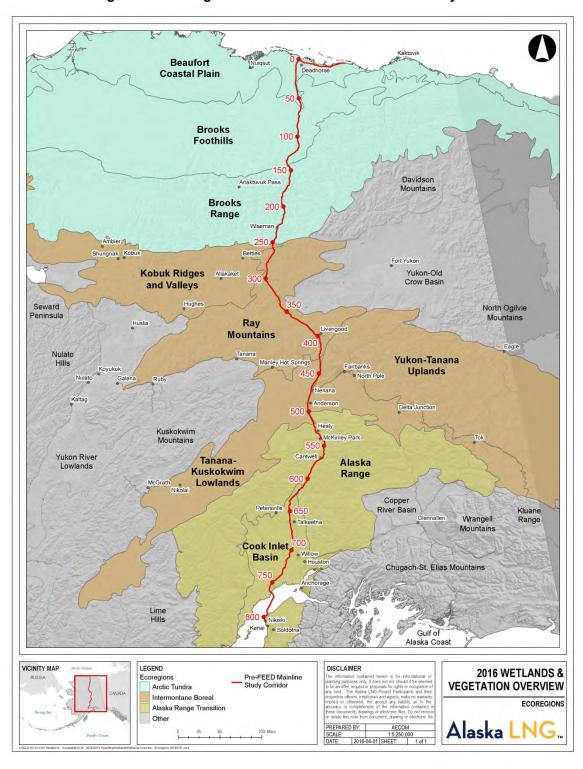
The Alaska LNG field survey area is divided into eight geographic spreads for planning purposes:

- Cook Inlet to Nikiski (IN), Mainline MP 792-804;
- Trapper Creek to Cook Inlet (TI), MP 664.5-765;
- Healy to Trapper Creek (HT), MP 525-664.5;
- Livengood to Healy (LH), MP 403.5-525;
- Yukon River to Livengood (YL), MP 357-403.5;
- Atigun Pass to Yukon River (AY), MP 169-357;
- Prudhoe Bay to Atigun Pass (PA), MP 0-169; and
- Point Thomson to Prudhoe Bay (PP), PT Pipeline milepost (MP) 0-58.

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Figure 2-1. Ecoregions within the 2016 Alaska LNG Study Area





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#### 3.0 METHODS

#### 3.1 OVERVIEW

Vegetation is classified using Level III of the Alaska Vegetation Classification System (Viereck et al. 1992), which is a hierarchical system based on dominant growth forms (tree, shrub, herb), canopy height and closure, general soil moisture and salinity, and dominant plants. Classification to Level III of the Viereck system provides the detail necessary to characterize plant communities for the purpose of assessing habitat in the survey area.

Standard methods are used to delineate wetlands and vegetation for large linear projects in Alaska. The protocols comprise a three-phased iterative approach, including: 1) vegetation premapping relying primarily on aerial photo interpretation; 2) collection of ground reference data at pre-determined field targets; and 3) revision of vegetation pre-mapping based on results of field efforts. The vegetation survey will be completed in conjunction with the wetland surveys.

#### 3.2 VEGETATION PRE-MAPPING

The vegetation pre-mapping has been completed for the preliminary Alaska LNG route (Rev B) corridor. Vegetation classes were delineated on digital ortho-rectified and geo-referenced true color aerial photography with 1.6-foot pixel resolution using the following aerial imagery:

- Alaska LNG Imagery. (0.5-foot resolution) (Paragon 2013);
- Nikiski Area Aerial Orthophoto. (2.5-foot resolution) (Kenai Peninsula Borough 2006);
- Kenai Peninsula Borough Aerial Imagery. (2.5-foot resolution) (Kenai Peninsula Borough 2013):
- Point MacKenzie Aerial Orthophoto (0.5-meter resolution) (Matanuska Susitna Borough, MSB 2011d);
- Willow Aerial Orthophoto (1.0-foot resolution) (MSB 2011c);
- Caswell Aerial Orthophoto (1.0-foot resolution) (MSB 2011b);
- Talkeetna Aerial Orthophoto (1.0-foot resolution) (MSB 2011a);
- Healy Area Orthophoto (1.0-meter resolution) (U.S. Census Bureau 2006);
- Digital Orthophoto Quarter Quadrangles Anderson Area (0.6-meter resolution) (NRCS 2006):
- Southern Corridor Ortho Mosaic (1.6-foot resolution) (Digital Globe 2013b);
- Northern Central Corridor Ortho Mosaic (Digital Globe 2013a);
- Quantum Aerial Imagery. (1.6-foot resolution) (Quantum Spatial 2014);
- iCubed Satellite Imagery. (1.0-meter resolution) (iCubed 2014);
- ExxonMobil aerial imagery for the Alaska Pipeline Project (0.5-meter pixel resolution; summer 2008, 2009, 2010, and 2011) (ExxonMobil 2008, ExxonMobil 2009b, ExxonMobil 2011);
- BP Exploration Alaska Inc. aerial imagery for Prudhoe Bay, Endicott, and Badami (1.0-foot pixel resolution; July 2012) (BPX 2012a, BPX 2012b, BPX 2012c); and
- ExxonMobil aerial imagery for Point Thomson (2.0 and 0.5-foot pixel resolution; July 2001/2006, and July 2009) (ExxonMobil 2001-6, ExxonMobil 2009a).

Data from the following sources was also used during the mapping process:



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- USFWS, NWI digital datasets and hardcopy maps;
- Kenai Watershed Forum Cook Inlet Wetlands for the Kenai Peninsula and the Matanuska Susitna Boroughs (Gracz 2011);
- NRCS Soil Survey digital datasets and hardcopy maps;
- Light Detection and Ranging generated topographic contours (TransCanada 2011, MSB 2011d);
- Pertinent previous studies, such as Terrestrial and Aquatic Habitat Mapping Along the Alaska Natural Gas Pipeline System (USFWS 1980), the Denali Pipeline Project, the instate Alaska Stand Alone Pipeline Project, and the Alaska Pipeline Project;
- U.S. Geological Survey Digital Raster Graphics (e.g., topographic maps);
- Point Thomson Project wetlands mapping between Point Thomson and Badami (USACE 2012);
- Existing Geographic Information System (GIS) layers including waterbodies, contours, and roads; and
- Existing Land Status GIS layers including: State of Alaska, U.S. Bureau of Land Management, and Native allotments.

All vegetation mapping was created in a GIS geodatabase, using a "heads-up" digitizing effort. This "heads-up" process applies aerial image interpretation to delineate vector polygons of ground features. Data sources were overlain on aerial photography and non-wetland vegetation communities were identified by interpreting color, texture, and landscape position, among other elements. The wetland mapping effort resulted in the classification of mapping polygons as either wetland (meeting the U.S. Army Corps of Engineers [USACE] wetland delineation criteria as a wetland) or non-wetland. The dominant vegetation structure (trees, shrubs, herbaceous vegetation) in wetland polygons was classified using the Cowardin (1979) classification system, while vegetation within non-wetland polygons was classified using the Alaska Vegetation Classification System (Viereck et al., 1992). For completeness, wetland polygons were also assigned a Viereck classification code. It should be noted that although a polygon was classified as "upland" during wetland mapping, that does not mean that the vegetation within the polygon is upland vegetation. Mesic vegetation communities are common in polygons that do not meet the three criteria of a wetland under USACE methods. Vegetation was mapped at a scale of 1:2,400 (1 inch to 200 feet) or finer.

#### 3.3 FIELD TARGET SELECTION

Field targets for the vegetation survey will be the same as those selected for the wetland survey, although vegetation points will be taken in adjacent uplands as well as wetlands. Vegetation observation points will also be established in representative cover types as reference sites.

Field targets may be re-evaluated based on the status of land access permissions. When necessary, new field targets will be located on nearby accessible parcels in areas with similar aerial photography vegetation signatures and site conditions as the original field targets.

#### 3.4 VEGETATION FIELD DATA COLLECTION

Vegetation field surveys will be conducted at the same time as the wetland field surveys and by the same field crew. Field targets will be accessed via existing highways and secondary roads where available. A helicopter will be required to access remote sites. A Global Positioning System (GPS) device will be used to locate sites and to collect coordinates. Field crews will collect vegetation data at each field target using the Vegetation Classification Data Form (**Appendix A**).



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The GPS device will also be used to collect limited field data on an electronic form that will be developed for the Project.

Regional vegetation guides will be used to identify plants including: Flora of Alaska and Neighboring Territories (Hulten 1968), Wetland Sedges of Alaska (Tande and Lipkin 2003), Field Guide to Alaska Grasses (Skinner et al. 2012), Alaska Trees and Shrubs (Viereck and Little 2007), and Willows of Interior and Southcentral Alaska (Collet 2004, 2010). Non-vascular plants (lichens, mosses, liverworts) and fungi will not be surveyed or recorded as part of this effort. Rare and sensitive plants will also be recorded with photos and GPS locations when encountered, but there will be no specific effort to search for them. Invasive species will also be noted when encountered, but because these species are often very widespread, the exact location would not be recorded for each observation.

Field crews will also collect qualitative vegetation data at observation points and establish additional field targets and complete Vegetation Classification Data Forms where necessary, and will not be limited by the pre-selected field targets. Field crews will use their best professional judgment and collect appropriate field data to adequately revise the wetland pre-mapping. A detailed wetland and vegetation field survey gear list is provided in **Appendix B**.

#### 3.5 MAP REVISIONS

As vegetation field data (i.e., GPS data, Vegetation Classification Forms for upland sites, site photographs, logbooks, and field maps) become available, this data will be downloaded in the office and plotted on the base maps of the route. The location of each plot will be attributed with the information collected in the field. This allows the creation of a reference dataset linking an aerial photography signature to a vegetation type. This reference dataset will be used to finalize the mapping of the 2,000-foot corridor.

Generally, the pre-mapping revision process involves:

- Exporting spatial data for all field targets and photo points from the Alaska LNG database;
- Compiling electronic copies of all notes, sketches, and photographs associated with above points; and
- Using these data in a GIS platform to update files through heads-up digitizing, or modifying the initial map on screen as described in Section 3.2 of the Vegetation Survey Field Study Protocols.

#### 3.6 Merchantable Timber

Existing data will be analyzed to identify timber management areas within the 300-foot mapping corridor. If timber production areas are identified within the mapping corridor, volumetric data will be acquired from the Bureau of Land Management (BLM) or the state, and will be used to determine the approximate board feet of merchantable timber. No field work is proposed for analysis of merchantable timber.

#### 3.7 DATA RECORDING AND PROCESSING

Data will be recorded on hardcopy field forms (**Appendix A**), and some of the data will also be entered into an electronic data form. Electronic data files will be uploaded to a Project website through an internet connection or by a satellite link, and will include GPS locations, electronic data form, site photos, site sketches, and field notes.



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#### 3.8 QUALITY ASSURANCE / QUALITY CONTROL

Each crew member is responsible for collecting clear and accurate data according to the field survey protocol. The field crew chief will review all hardcopy and electronic data forms and complete a quality assurance/quality control (QA/QC) checklist (**Appendix C**) before leaving each site.

The field crew manager will ensure that all data files are uploaded to the Project website. These transmitted files will then be downloaded and reviewed by office-based data management staff. The wetlands and vegetation technical lead will check each hardcopy data sheet and electronic data form for quality and consistency, as it is received. If problems arise, the field crew will be notified promptly to ensure that any data quality issues are corrected immediately.

#### 3.9 REPORTING

Results will be compiled with the wetland data into a Wetland and Vegetation Survey Report, and will include project background, methodologies, and results and analysis. A GIS dataset consisting of vegetation communities will also be compiled.

Results of this survey will eventually be provided in the FERC Resource Report 3 and provided to other resource agencies to assist in overall Project permitting.



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### 4.0 FIELD STUDIES EXECUTION

Field study execution details are currently in the process of being developed and will include: field crew composition, schedule and march charts, field target maps, and general project-wide permits and approvals. Field safety will also be discussed and a specific Job Safety Analysis (JSA) developed for wetland and vegetation surveys will be included.



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### 5.0 ACRONYMS AND ABBREVIATIONS

BLM Bureau of Land Management

FERC Federal Energy Regulatory Commission

GIS Geographic Information System

GPS Global Positioning System

GTP Gas Treatment Plant
JSA Job Safety Analysis
LNG liquefied natural gas

MP milepost

MSB Matanuska Susitna Borough

NEPA National Environmental Policy Act

NRCS Natural Resources Conservation Service

PBU Prudhoe Bay Unit
PTU Point Thomson Unit

ROW right-of-way
U.S. United States

USACE U.S. Army Corps of Engineers
USFWS U.S. Fish and Wildlife Service



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### 7.0 APPENDICES



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### APPENDIX A – VEGETATION CLASSIFICATION DATA FORM



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vegetation Classification	on Data Form				
Date: Project Name: Alaska LNG				Field Target:	
Investigators:				Feature ID:	
Latitude:		Longitude:		Datum:	
Picture No.:		Logbook No:		Logbook Page No:	
<b>Location Description:</b>					
Common Species Obse	erved (Scientific Nar	ne)			
Percent Cover of Dominant	Structure Level:				
Habitat Description:					
Alaska Vegetation Clas	sification: Level I, L	evel II, Level	III		
Notes:					
Field Crew Chief:	····	F	ield Scientist/T	echnician	
Technical Lead:					



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Level I	Level II	Level III			
I. Forest	A. Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland			
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland			
	C. Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland			
II. Scrub	A. Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland			
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub			
	C. Low scrub	(1) Closed low scrub (2) Open low scrub			
	D. Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub			
III. Herbaceous	A. Graminoid herbaceous	Dry graminoid herbaceous     Mesic graminoid herbaceous     Wet graminoid herbaceous     (emergent)			
	B. Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)			
	C. Bryoid herbaceous	(1) Mosses (2) Lichens			
	D. Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceou     Marine aquatic herbaceous			

Desc	criptions of levels I, II, III, and IV follow the classification table.
la.	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more I. Forest 2
1 b.	Trees over 3 meters (10 ft) tall are absent or nearly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters [10 ft] tall may be present and abundant
I. Fo	rest
2a.	Over 75 percent of tree cover contributed by needleleaf (conifer) species
2b.	Less than 75 percent of tree cover contributed by needleleaf (conifer) species
За.	Tree canopy of 60-100 percent cover
3b.	Tree canopy of 25-59 percent cover
3c.	Tree canopy of 10-24 percent cover
4a.	Over 75 percent of tree cover contributed by broadleaf species
4b.	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover
5a.	Tree canopy of 60-100 percent cover I.B.1 Closed broadleaf forest
5b.	Tree canopy of 25-59 percent cover
5c.	Tree canopy of 10-24 percent cover I.B.3 Broadleaf woodland
6a.	Tree canopy of 60-100 percent cover I.C.1 Closed mixed forest
6b.	Tree canopy of 25-59 percent cover I.C.2 Open mixed forest
6c.	Tree canopy of 10-24 percent cover I.C.3 Mixed woodland
7a.	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 ft] tall)
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover)

II. So	crub
8a.	Vegetation with at least 10 percent cover of dwarf trees
8b.	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees
9a.	Dwarf tree canopy of 60-100 percent cover
9b.	Dwarf tree canopy of 25-59 percent cover
9c.	Dwarf tree canopy of 10-24 percent cover II.A.3 Dwarf tree scrub woodland
10a.	Shrubs more than 1.5 meters         (5 ft) tall
10b.	Shrubs less than 1.5 meters (5ft)tall
11 a	. Shrub canopy cover greater than 75 percent
11 b	. Shrub canopy cover of 25-74 percent
12a.	Shrubs 20 centimeters to 1.5 meters tall II.C Low scrub 13
12b.	Shrubs under 20 centimeters in height II.D Dwarf scrub 14
13a.	Shrub canopy cover greater than 75 percent II.C.I Closed low scrub
13b.	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present
14a.	Dryas species dominant in the dwarf shrub layer
14b.	Ericaceous species dominant in the dwarf shrub layer
14c.	Willow species dominant in the dwarf scrub layer
III. F	Herbaceous
15a.	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation
15b.	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water

16a. Grasses, sedges, or rushes (graminoid) plants dominant
16b. Forbs or bryophytes dominant
17a. Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes.  Typically (but not always) dominated by Elymus spp., Fesfuca spp., and Deschampsia spp
17b. On moist sites, but usually not with standing water. Usually dominated by Calamagrostis spp., Carex spp. or Eriophorum spp.; tussocks often present
17c. On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra, bogs, marshes, and fens
18a. Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)
18b. Vegetation dominated by mosses or lichens ,
19a. On dry sites, usually rocky and well drained; mostly tundra sites
19b. On moist sites but without standing water, mostly within forested areas
19c. On wet sites, usually with standing water for part of the year
20a. Vegetation cover dominated by mosses
20b. Vegetation cover dominated by lichens III.C.2 Bryoid lichen
21a. Vegetation submerged or floating in fresh water
21 b. Vegetation submerged or floating in brackish water
21c. Vegetation submerged or floating in salt water



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### APPENDIX B – WETLAND AND VEGETATION SURVEY GEAR LIST



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Wetland and Vegetation Gear	Communication		
1 - Sharp shooter shovel (fiberglass, not wood handle)	1 - VHF Radio		
1 - U-Dig-it (Hand shovel)	1 - charger for vhf radio		
1 - Compass	1 - Iridium Satellite Phone		
1 - Hand lens	1 charger for satellite phone		
1 - Leatherman/sample knife (folding) 4" serrated	Safety/Survival Pack (Need for 2 teams)		
1 - Digital camera	2 - Sleeping Bags		
1 - calculator	1 - Tent		
1 - extra batteries for digital camera	1 - Wilderness First Aid Kit		
1 - pH meter (pen kind) with storage solution	1 - Flare gun kit		
1 - Pocket rod (measuring tape)	1 - Emergency procedures Manual		
1 - Opaque small spray bottle filled with alpha-alpha dipyridyl	1 - Iodine Tablets /Filter		
2 - packages – gallon Ziploc bags	1 - 50' Nylon Rope/Parachute cord		
1 - package- pint Ziploc bags	1 - small Flashlight/headlamp (for soil pit)		
Squirt Water bottle (for moistening soil to color)	2 - Space Blankets		
200+ - USACE Wetland Determination Form – Alaska Region (on Rite-in-the-Rain) with functional assessment	1 - Bear Spray		
1 set - Field Maps on Rite-in-the-Rain	1 - Tarp (10' x 12')		
4+ - Rite-in-the-Rain Field notebooks (spiral with lines)	1 - Gloves – Work/Latex/Insulated rubber		
12+ - Mechanical Pencils w/ extra lead	matches		
12+ - Sharpies (red and black)	1 - Roll of duct tape		
1 - Laptop Computer (for downloading data every night)	Flagging tape (1 bright color per team)		
2 - Clipboards	BPA-free water jug		
Extra Rite-in-the-Rain paper	Personal Gear		
1 - 12 inch file (for shovel sharpening) with handle	1 - Xtratuffs		
1 - scissors	1 - Felt insoles for Xtratuffs		
1 - tape	1 - Blaze Orange Surveyor Field Vest		
2 - post it notes	1 - Mosquito Head Net		
2 - toilet paper	1 - Rain Jacket/Pants		
1 - Roll of duct tape	2 - Bug Spray		
1 - (see through) small dry bag for soil kit	2 - Sunblock		
1 - (see through) medium dry bag for field reference materials	1 - Sun Glasses		
1 - dry erase board (for pictures)	1 - Water Bottle		
1 - plant press	1 - Backpack		
Books	1 - Hat		
1 - Munsell Soil Color charts	Cell phone and charger		
1 - Flora of Alaska and Neighboring Territories – Eric Hulten	1 - umbrella		
1 -Trees and Shrubs – Viereck	Boot dryers		
1 - Western Boreal Forest and Aspen Parkland – MacKinnon and Pojar			
1 - Wetland Sedges of Alaska – Tande and Lipkin			
1 - Willows of Interior Alaska – Collett			
1 - National List of Plant Species that Occur in Wetlands - Alaska Region - Reed 1988 (print)			
1 - Field Guide to Alaskan Wildflowers – Verna Pratt			
1 - Wildflowers along the Alaskan Highway – Verna Pratt			
Rapid Procedure for Assessing Wetland Functional Capacity: Based on HGM Classification – Hollands and Magee (print)			
1 - 1987 Wetland Delineation Manual (print)			
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1 - Classification of Wetlands and Deepwater Habitats – Cowardin (print)			
1 - Hydric soils in Alaska (print)			



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### APPENDIX C - QA/QC CHECKLIST



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#### **Vegetation Classification Data Form QA/QC Checklist**

This form is to be completed before leaving the field site.

Fe	atur	e ID:	_ Field Target:	Date:					
Fo	r all	items not checke	ed, please provide detailed explana	ation in the notes section of data form.					
1.	General Information								
••		Location data re							
2.		<ul><li>Photo taken and photo number recorded?</li><li>Location Description</li></ul>							
		_	recorded with enough detail to hel	p relocate?					
3.		ommon Species		F					
		<u>-</u>	of common species recorded?						
			of dominant structure level noted?						
4.	На	Habitat Description							
		Habitat describe							
5.	Classification								
		All three levels	of classification recorded?						
6.	Fie	Field Log Book							
		Field form entries consistent with log book?							
		,	·						
	X		X						
	ield T	Technician (print)	Signature	<u> </u>					
•	icia i	recrinician (print)	Signature						
١,			<b>\</b>						
	X		X						
F	ield (	Crew Chief (print)	Signature						



# APPENDIX C – 2016 WETLAND FIELD DATA SUMMARY TABLE AND US ARMY CORPS OF ENGINEERS ALASKA DISTRICT WETLAND DETERMINATION FORMS

(Provided in a Digital Format)



## 2014 WETLAND STUDY REPORT – LIVENGOOD (MP 401) TO TRAPPER CREEK (MP 709.5)

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APPENDIX C – 2014 WETLANDS FIELD DATA SUMMARY TABLE AND U.S. ARMY CORPS OF ENGINEERS ALASKA DISTRICT WETLAND DETERMINATION FORMS

Feature ID	Data Type <sup>1</sup>	Date	Field Target #	Latitude	Longitude	Cowardin Code	HGM Classification	Vegetation Classification
W60HT001	WDF	6/9/2014	87	62.9995	-149.5567	PSS1B	SLOPE	II B 2
W60HT002	WDF	6/9/2014	86	63.0112	-149.5465	PEM1/SS1B	FLAT	III A 2, II C 2
W60HT003	WDF	6/9/2014	88	62.9939	-149.5775	UPLAND	N/A	III A 1, II C 2
W60HT004	WDF	6/10/2014	133	62.4506	-150.271	PSS1/EM1B	DEPRESSIONAL	II C 2, III A 2
W60HT005	WDF	6/10/2014	136	62.4455	-150.2689	PSS1B	DEPRESSIONAL	II B 2
W60HT006	WDF	6/10/2014	135	62.4468	-150.2694	PEM1F	DEPRESSIONAL	III A 3
W60HT007	WDF	6/10/2014	134	62.4489	-150.2715	UPLAND	N/A	II B 1
W60HT008	WDF	6/12/2014	142	62.4209	-150.2638	UPLAND	N/A	I C 2
W60HT009	WDF	6/12/2014	141	62.4207	-150.2655	PEM1F	DEPRESSIONAL	III A 3
W60HT010	WDF	6/12/2014	143	62.4182	-150.2633	UPLAND	N/A	III A 3
W60HT011	Veg	6/13/2014	144	62.3957	-150.2659	UPLAND	N/A	I C 2
W60HT012	WDF	6/13/2014	145	62.3793	-150.2694	PSS1B	RIVERINE	II B 2
W60HT013	WDF	6/14/2014	146	62.3652	-150.2603	PEM1B	DEPRESSIONAL	III A 1
W60HT014	WDF	6/11/2014	147	62.3618	-150.2578	PEM1B/ PUBF	DEPRESSIONAL	III A 2
W60HT015	WDF	6/24/2014	91	62.9348	-149.6872	PSS1B	FLAT	II B 2, II C 2
W60HT015_OP	OP	6/24/2014	91	62.9347	-149.6872	R4SB	*	N/A
W60HT016	Veg	6/24/2014	91	62.9345	-149.6871	UPLAND	N/A	I C 2, II C 2
W60HT017	Veg	6/24/2014	120	62.5347	-150.2366	UPLAND	N/A	I C 2, II B 2
W60HT018	WDF	6/24/2014	121	62.5342	-150.2363	UPLAND	N/A	I C 2, II B 2
W60HT019	WDF	6/24/2014	122	62.5343	-150.2351	PEM1F	DEPRESSIONAL	III A 3
W60HT020	WDF	6/25/2014	125	62.5283	-150.2378	UPLAND	N/A	II B 2, III A 2
W60HT021	WDF	6/25/2014	126	62.5278	-150.2386	UPLAND	N/A	I C 1, II C 2
W60HT022	Veg	6/25/2014	127	62.5229	-150.2405	UPLAND	N/A	I C 2, II B 2
W60HT023	WDF	6/25/2014	128	62.5152	-150.252	UPLAND	N/A	I C 2, II C 2
W60HT023_OP	OP	7/6/2014	129	62.5012	-150.267	UPLAND	N/A	NONE
W60HT024	WDF	6/26/2014	104	62.7728	-150.0452	PSS4/1B	DEPRESSIONAL	II A 2, II B 2, II C 2
W60HT025	WDF	7/9/2014	148	62.3449	-150.2641	PEM1C	DEPRESSIONAL	III A 3, II C 2
W60HT026	WDF	6/26/2014	106	62.7657	-150.0687	UPLAND	N/A	I B 3, II B 1
W60HT026_OP	OP	6/26/2014	105	62.7693	-150.0582	R4SB	*	II B 1, I B 2
W60HT027	WDF	6/26/2014	107	62.7657	-150.0693	PEM1/SS1F	DEPRESSIONAL	III A 3, II C 2
W60HT028	WDF	6/27/2014	92	62.9293	-149.6967	UPLAND	N/A	I C 2
W60HT028_OP	OP	6/27/2014	92	62.9288	-149.6957	R3UB	*	N/A
W60HT029	WDF	6/27/2014	93	62.8983	-149.7387	UPLAND	N/A	I C 2, II C 1

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Feature ID	Data Type <sup>1</sup>	Date	Field Target #	Latitude	Longitude	Cowardin Code	HGM Classification	Vegetation Classification
W60HT030	WDF	6/27/2014	94	62.8787	-149.8255	PSSI/EM1B	DEPRESSIONAL	II C 2, III A 3
W60HT030_OP	OP	6/27/2014	94	62.8772	-149.8248	UPLAND	N/A	II C 2, II B 2
W60HT031	WDF	6/28/2014	95	62.868	-149.8518	UPLAND	N/A	I B 2, II C 2
W60HT031_OP	OP	6/28/2014	96	62.8679	-149.8521	UPLAND	N/A	I C 2
W60HT032	WDF	6/28/2014	97	62.8679	-149.8532	UPLAND	N/A	I C 2, II C 2
W60HT033	WDF	7/1/2014	89	62.9732	-149.6314	PSS1/EM1B	DEPRESSIONAL	II C 2, III A 3
W60HT034	WDF	7/1/2014	90	62.9565	-149.6504	PSS1/EM1B	FLAT	II C 2, III A 3
W60HT035	WDF	7/1/2014	98	62.8632	-149.8723	PEM1/SS1B	DEPRESSIONAL	III A 3, II C 2
W60HT036	Veg	7/1/2014	98	62.863	-149.872	UPLAND	N/A	I C 2, II C 2
W60HT037	WDF	7/2/2014	99	62.863	-149.8741	PSS1/EM1B	DEPRESSIONAL	II B 1, III A 3
W60HT038	WDF	7/2/2014	100	62.8408	-149.8894	PEM1/SS1B	DEPRESSIONAL	III A 3, II C 2
W60HT039	WDF	7/2/2014	100	62.8402	-149.8888	UPLAND	N/A	I C 3, II B 2
W60HT040	WDF	7/2/2014	101	62.8326	-149.8979	PEM1/SS1F	DEPRESSIONAL	III A 3, II C 2
W60HT041	WDF	7/2/2014	102	62.8213	-149.9196	PEM1/SS1F	FLAT	III A 3, II C 2
W60HT042	WDF	7/3/2014	103	62.8047	-149.9663	PSS1B	DEPRESSIONAL	II C 2, III A 3
W60HT043	Veg	7/3/2014	103	62.8051	-149.9669	UPLAND	N/A	I C 2, II B 1
W60HT044	WDF	7/3/2014	108	62.7582	-150.0935	PEM1/SS1B	DEPRESSIONAL	III A 3, II C 2
W60HT045	WDF	7/3/2014	109	62.7377	-150.1466	PEM1/SS1B	DEPRESSIONAL	III A 2, I C 2, II C 2
W60HT045_OP	OP	7/3/2014	109	62.7377	-150.1465	R4SB	*	III A 2, II C 2, I C 2
W60HT046	WDF	7/3/2014	110	62.7373	-150.1472	PSS1/EM1B	SLOPE	II C 2, III A 2
W60HT046_OP	OP	7/5/2014	111	62.6987	-150.2309	UPLAND	N/A	I C 3, II B 1
W60HT047	WDF	7/9/2014	149	62.3445	-150.2713	PFO4/SS1B	FLAT	I A 2, II C 2
W60HT048	WDF	7/5/2014	112	62.6263	-150.2281	UPLAND	N/A	IB1
W60HT049	WDF	7/5/2014	118	62.546	-150.2506	PFO4/SS1B	FLAT	I A 3, II B 2
W60HT050	WDF	7/5/2014	119	62.5465	-150.2496	PFO1/4/SS1B	FLAT	I C 2, II B 2
W60HT051	WDF	7/5/2014	123	62.533	-150.2371	PEM1C	DEPRESSIONAL	III A 3
W60HT052	Veg	7/5/2014	124	62.5329	-150.2364	UPLAND	N/A	I C 2, II B 2
W60HT053	WDF	7/8/2014	138	62.4313	-150.2687	PSS1/EM1B	DEPRESSIONAL	II C 2, III A 3
W60HT053_OP	OP	7/8/2014	137	62.4316	-150.2688	PEM1F	*	III A 3
W60HT053_OP1	OP	7/6/2014	140	62.4264	-150.2672	PEM1/SS1F	*	III A 3, II C 2
W60HT054	WDF	7/6/2014	130	62.4886	-150.2726	PEM1/SS1F	DEPRESSIONAL	III A 3,I IC 2
W60HT055	WDF	7/6/2014	132	62.477	-150.2716	PEM1F	DEPRESSIONAL	III A 3
W60HT055_OP	OP	7/6/2014	131	62.4865	-150.2716	PEM1F	*	III A 3

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W60HT055_OP1	OP	7/6/2014	131	62.4893	-150.2728	R4SB	*	N/A
W60HT056	WDF	7/6/2014	139	62.4266	-150.2675	PSS1/EM1B	DEPRESSIONAL	II C 2, III A 3
W60HT057	WDF	9/3/2014	202	62.354	-150.2745	PEM1/SS1B	DEPRESSIONAL	III A 3, II C 2
W60HT058	Veg	9/3/2014	202	62.3547	-150.2735	UPLAND	N/A	I C 2, II C 2
W60HT059	WDF	9/3/2014	203	62.3299	-150.2765	UPLAND	N/A	I C 2, II C 2
W60HT059_OP	OP	9/3/2014	203	62.33	-150.2721	PEM1E	*	III A 2, II C 2
W60HT059_OP1	OP	9/3/2014	204	62.3274	-150.2728	PEM1H	*	III A 3
W60TI001	WDF	6/1/2014	193	61.808	-150.3114	PSS1B	DEPRESSIONAL	II C I
W60TI001_OP	OP	6/1/2014	193	61.8082	-150.3117	UPLAND	N/A	I A 3, II C 2
W60TI002	Veg	6/1/2014	192	61.8083	-150.3106	UPLAND	N/A	I A 3, II C 2
W60TI003	WDF	6/1/2014	191	61.8313	-150.2817	PEM1B	DEPRESSIONAL	III A 3
W60TI004	WDF	6/2/2014	190	61.8341	-150.2804	PEM1/SS1B	DEPRESSIONAL	III A 2, II C 2
W60TI005	Veg	6/2/2014	190	61.8341	-150.2809	UPLAND	N/A	I C 1
W60TI006	WDF	6/2/2014	188	61.9255	-150.2017	PEM1/SS1B	DEPRESSIONAL	III A 2, II C 2
W60TI007	Veg	6/2/2014	189	61.9238	-150.2045	UPLAND	N/A	II B 2, II C 2, III A 2
W60TI008	WDF	6/3/2014	187	61.9459	-150.1957	PSS1B	FLAT	II C 1
W60TI008_OP	OP	6/3/2014	187	61.9466	-150.1952	UPLAND	N/A	II B 2, II C 2
W60TI009	Veg	6/3/2014	187	61.9467	-150.1952	UPLAND	N/A	II B 2, II C 2
W60TI010	WDF	6/3/2014	186	61.949	-150.1938	PSS1/ EM1C	DEPRESSIONAL	II C 2, III A 2
W60TI010_OP	OP	6/3/2014	186	61.9485	-150.1941	PSS1B	*	II B 2, II C 2
W60TI011	Veg	6/3/2014	186	61.9482	-150.1943	UPLAND	N/A	II B 2, II C 2
W60TI012	WDF	6/3/2014	185	61.9553	-150.1912	UPLAND	N/A	II C 2
W60TI012_OP	OP	6/3/2014	185	61.9556	-150.1889	PSS4/1B	*	II A 3, II C 2
W60TI013	WDF	6/3/2014	184	61.9871	-150.1974	PEM1/SS1B	FLAT	II B 2, III A 2
W60TI013_OP	OP	6/3/2014	184	61.9862	-150.1976	PSS1/3B	*	II C 2
W60TI014	WDF	6/4/2014	183	61.988	-150.1973	UPLAND	N/A	II B 2, II C 2
W60TI015	WDF	6/4/2014	181	62.032	-150.1967	PEM1/SS1B	DEPRESSIONAL	III A 2, II C 2
W60TI015_OP	OP	6/4/2014	181	62.0322	-150.1965	PSS4/1B	*	II A 2, II C 2
W60TI016	WDF	6/4/2014	182	62.0317	-150.1972	PEM1B	DEPRESSIONAL	III A 2
W60TI017	WDF	6/4/2014	179	62.0357	-150.1927	PSS4/1B	DEPRESSIONAL	II A 3, II C 2
W60TI018	WDF	6/4/2014	180	62.0352	-150.193	PEM1/SS1F	DEPRESSIONAL	III A 3, II C 2
W60TI019	WDF	6/5/2014	177	62.048	-150.1785	PSS4/1B	DEPRESSIONAL	II A 3, II C 2
W60TI020	WDF	6/5/2014	176	62.0481	-150.1783	PUB/ ABH	DEPRESSIONAL	III D 1

Feature ID	Data Type <sup>1</sup>	Date	Field Target #	Latitude	Longitude	Cowardin Code	HGM Classification	Vegetation Classification
W60TI020_OP	OP	6/5/2014	176	62.0479	-150.1776	PEM1F	*	III A 3
W60TI021	Veg	6/5/2014	176	62.0483	-150.1748	UPLAND	N/A	I C 2, II C 2
W60TI022	WDF	6/5/2014	178	62.0477	-150.179	PEM1/ SS1B	DEPRESSIONAL	III A 2, II C 2
W60TI023	WDF	6/5/2014	173	62.0581	-150.1671	PSS1/EM1C	RIVERINE	II C 2, III A 3
W60TI023_OP	OP	6/5/2014	173	62.0581	-150.1668	N/A	N/A	N/A
W60TI024	WDF	6/5/2014	174	62.0571	-150.1686	PSS1/EM1B	DEPRESSIONAL	II C 2, III A 2
W60TI025	WDF	6/5/2014	175	62.0569	-150.1686	UPLAND	N/A	I A 2, II B 2
W60TI025_OP	OP	6/5/2014	175	62.0569	-150.1694	PF04/SS4B	*	I A 2, II A 2
W60TI026	Veg	6/5/2014	173	62.0576	-150.1679	UPLAND	N/A	I C 2, II C 2
W60TI027	WDF	6/6/2014	170	62.0645	-150.1595	PSS4/1B	DEPRESSIONAL	II A 2, II C 2
W60TI028	WDF	6/6/2014	171	62.0644	-150.16	PF04/SS4B	FLAT	I A 2, II A 2
W60TI028_OP	OP	6/6/2014	171	62.0641	-150.1605	UPLAND	N/A	I C 2, II C 2
W60TI029	WDF	6/5/2014	172	62.0641	-150.1608	UPLAND	N/A	I C 2, II B 2
W60TI030	WDF	6/5/2014	169	62.0646	-150.1597	PSS4/1B	DEPRESSIONAL	II A 2, II C 2
W60TI031	WDF	6/8/2014	167	62.1223	-150.164	PSS4/1B	DEPRESSIONAL	II A 2, II C 2
W60TI032	WDF	6/8/2014	166	62.123	-150.1637	PF04B	DEPRESSIONAL	I A 2
W60TI033	Veg	6/8/2014	166	62.1233	-150.1646	UPLAND	N/A	I C 2
W60TI034	WDF	6/8/2014	168	62.1223	-150.1636	PSS4/EM1B	DEPRESSIONAL	II A 3, III A 2
W60TI035	WDF	6/8/2014	165	62.1357	-150.1653	PSS1/4/EM1B	DEPRESSIONAL	II C 2, III A 3
W60TI036	WDF	6/8/2014	164	62.1358	-150.1652	PSS4/1B	DEPRESSIONAL	II A 2, II C 2
W60TI037	WDF	6/9/2014	163	62.1362	-150.1652	PF04B	DEPRESSIONAL	I A 2
W60TI038	WDF	6/11/2014	153	62.2427	-150.2513	PSS1C	RIVERINE	II C 1
W60TI039	WDF	6/11/2014	152	62.2858	-150.2474	PSS1C	RIVERINE	II C 2
W60TI040	WDF	6/11/2014	151	62.2882	-150.2495	PEM1B	DEPRESSIONAL	III A 2
W60TI041	WDF	6/30/2014	161	62.1681	-150.195	PSS4/EM1B	DEPRESSIONAL	II A 2, III A 2
W60TI042	WDF	6/13/2014	160	62.1884	-150.216	PSS1/4/EM1F	DEPRESSIONAL	II C 2, III A 2
W60TI043	WDF	6/13/2014	159	62.1888	-150.2134	PF04/1B	RIVERINE	I C 2
W60TI044	WDF	6/14/2014	154	62.2313	-150.2404	UPLAND	N/A	I C 1
W60TI045	WDF	6/14/2014	155	62.2314	-150.2399	PSS4/1B	DEPRESSIONAL	II A 2, II B 2
W60TI046	WDF	6/14/2014	156	62.2314	-150.2393	PSS1F	DEPRESSIONAL	II C 2
W60TI047	WDF	6/30/2014	162	62.1678	-150.1942	PEM1F	FLAT	III A 3
W60TI048	WDF	6/30/2014	162	62.1676	-150.1923	PFO1/4B	FLAT	I C 1, II C 1
W60TI049	WDF	7/8/2014	157	62.221	-150.2349	PSS4/1B	FLAT	II A 3, II C 2

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W60TI050	WDF	7/8/2014	158	62.2208	-150.2359	PEM1/SS4E	FLAT	III A 3, II A 3
W60TI051	WDF	7/9/2014	150	62.29	-150.2512	PEM1B	DEPRESSIONAL	III A 2
W60TI052	WDF	9/4/2014	205	62.2084	-150.2376	PEM1E	DEPRESSIONAL	III A 3
W60TI052_OP	OP	9/4/2014	205	62.2084	-150.2359	PEM1/SS1B	*	III A 2, II B 2
W60TI053	WDF	9/4/2014	206	62.1985	-150.235	UPLAND	N/A	I C 2, II C 2
W60TI054	WDF	9/4/2014	207	62.1792	-150.2229	PF01/SS1B	FLAT	I B 2, II B 2, III B 2
W60TI055	WDF	9/5/2014	208	62.1549	-150.2082	PEMI/SS1B	DEPRESSIONAL	III A 2, II B 2
W60TI055_OP	OP	9/5/2014	208	62.1548	-150.2084	R2UBH	*	N/A
W60TI056	WDF	9/5/2014	209	62.1352	-150.2288	PSS1/EM1C	DEPRESSIONAL	II C 2, III A 3
W60TI057	Veg	9/5/2014	211	62.1046	-150.2247	PF01/SS1E	*	I B 2, II B 2
W60TI058	WDF	9/6/2014	210	62.1065	-150.2254	PEM1/SS1F	DEPRESSIONAL	III A 3, II C 2
W60TI059	WDF	9/6/2014	212	62.1034	-150.2253	PFO4/SS1B	FLAT	I A 2, II C 2
W60TI060	Veg	9/6/2014	213	62.086	-150.2128	PF04/SS1B	*	I A 2, II B 1
W60TI061	WDF	9/7/2014	214	62.0609	-150.2039	PSS1/4C	DEPRESSIONAL	II B 2, II C 2
W60TI062	WDF	9/7/2014	215	62.0501	-150.2095	PEMI/SS1E	FLAT	III A 3, II C 2
W60TI063	WDF	9/7/2014	216	62.0492	-150.2115	UPLAND	N/A	I C 2, II C 2
W60TI063_OP	OP	9/7/2014	216	62.0492	-150.2116	R4SB	*	N/A
W60TI064	WDF	9/7/2014	217	62.0428	-150.2133	PEM1/SS1E	DEPRESSIONAL	III A 3, II C 2
W60TI065	WDF	9/7/2014	218	62.0423	-150.2136	UPLAND	N/A	I A 1, II B 2
W60TI066	Veg	9/7/2014	219	62.0355	-150.2151	UPLAND	N/A	I C 2, II B 2, III A 2
W60TI067	WDF	9/8/2014	221	62.0318	-150.2051	PSS4/EM1B	DEPRESSIONAL	II A 3, III A 2
W60TI068	WDF	9/8/2014	220	62.0317	-150.2083	UPLAND	N/A	I C 2, II B 2
W60TI068_OP	OP	9/8/2014	220	62.0319	-150.2089	PSS4/EM1B	*	I B 2, III A 3
W60TI069	WDF	9/8/2014	223	61.768	-150.3201	UPLAND	N/A	I C 2, II B 2
W60TI070	WDF	9/8/2014	224	61.7612	-150.3139	PSS3/1B	DEPRESSIONAL	I C 2, III A 2
W60TI071	Veg	9/8/2014	225	61.7602	-150.3142	UPLAND	N/A	I C 3, II B 2
W60TI072	Veg	9/6/2014	210	62.1062	-150.2247	UPLAND	N/A	I C 3, II C 2
W61HT001	WDF	6/27/2014	53	63.8855	-149.0751	PSSI/4B	FLAT	II C 1, II A 3
W61HT001_OP	OP	6/27/2014	53	63.8845	-149.0798	UPLAND	N/A	I C 2
W61HT002	WDF	6/28/2014	60	63.6074	-148.7725	PSS4/1B	SLOPE	I A 2, II C 1
W61HT002_OP	OP	6/28/2014	60	63.6075	-148.7714	PEM1/SS1/4C	*	III A 1, II C 1, II B 2
W61HT003	WDF	6/28/2014	57	63.672	-148.7644	PSS1/4B	FLAT	II C 1, II A 2
W61HT003_OP	OP	6/28/2014	57	63.6714	-148.7642	PSS1C	*	II C 1

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W61HT004	WDF	6/28/2014	58	63.6724	-148.7633	UPLAND	N/A	II C 1, I A 2
W61HT004_OP	OP	6/28/2014	58	63.6721	-148.7632	PSS1/4B	*	II C 1, II A 2
W61HT005	WDF	6/29/2014	59	63.6414	-148.7389	PEM1B		III A 2
W61HT005_OP	OP	6/29/2014	59	63.6413	-148.7387	PEM1E	*	III A 3
W61HT006	WDF	6/29/2014	72	63.3494	-149.075	PSS1C	RIVERINE	II B 1
W61HT006_OP	OP	6/29/2014	72	63.3495	-149.0753	PEM1E	*	III A 3
W61HT007	WDF	6/29/2014	80	63.1576	-149.4106	PEM1E	FLAT	III A 3
W61HT008	WDF	6/29/2014	81	63.1574	-149.4109	PEM1F	FLAT	III A 3
W61HT009	WDF	6/29/2014	82	63.1573	-149.4113	PUB/ABH	DEPRESSIONAL	III D 1
W61HT010	WDF	6/30/2014	55	63.8192	-148.9913	PSS1/EM1B	FLAT	II C 1, III A 2
W61HT010_OP	OP	6/30/2014	55	63.8191	-148.991	PSS1/EM1B	*	II C 1, III A 2
W61HT011	WDF	6/30/2014	54	63.8198	-148.9922	PSS1/EM1B	FLAT	II C 1, III A 2
W61HT011_OP	OP	6/30/2014	54	63.8197	-148.9924	PSS1C	*	II C 1, III A 3
W61HT012	WDF	6/30/2014	56	63.8099	-148.967	PSS1/EM1B	FLAT	II C 1, III A 2
W61HT012_OP	OP	6/30/2014	56	63.8103	-148.9679	PSS1A	*	II B 1
W61HT013	WDF	7/1/2014	83	63.1423	-149.4213	UPLAND	N/A	I A 2, II B 2, II C 1
W61HT014	WDF	7/1/2014	84	63.1328	-149.4491	UPLAND	N/A	I C 2, II B 2, II C 1
W61HT014_OP	OP	7/1/2014	84	63.1323	-149.4503	UPLAND	N/A	I A 2, II C 1
W61HT015	WDF	7/1/2014	85	63.1143	-149.4715	UPLAND	N/A	III A 1
W61HT015_OP	OP	7/1/2014	85	63.1145	-149.4714	PSS1C	*	II B 1
W61HT016	WDF	7/2/2014	115	62.5653	-150.2594	UPLAND	N/A	III A 3
W61HT016_OP	OP	7/2/2014	115	62.5654	-150.2592	UPLAND	N/A	II B 1
W61HT017	WDF	7/2/2014	114	62.5659	-150.2634	UPLAND	N/A	I B 1, III A 1
W61HT017_OP	OP	7/2/2014	114	62.5661	-150.2626	PEM1C	*	III A 3
W61HT018	WDF	7/2/2014	113	62.5648	-150.265	PEM1B	DEPRESSIONAL	III A 3
W61HT019	WDF	7/3/2014	117	62.5571	-150.2628	UPLAND	N/A	I C 3, II B 2, III A 1
W61HT019_OP	OP	7/3/2014	117	62.5571	-150.2623	PEM1B	*	III A 2
W61HT020	WDF	7/3/2014	116	62.5577	-150.2654	PEM1/SS1B	FLAT	III A 3, II C 2
W61HT021	WDF	7/5/2014	74	63.3134	-149.1822	PEM1/SS1F	FLAT	III A 3, II C 2
W61HT022	WDF	7/5/2014	73	63.315	-149.1814	UPLAND	N/A	II B 2, II C 1
W61HT022_OP	OP	7/5/2014	73	63.3152	-149.1819	UPLAND	N/A	II C 1
W61HT022_OP1	OP	7/5/2014	73	63.3149	-149.181	UPLAND	N/A	II B 2, II C 1
W61HT023	WDF	7/5/2014	67	63.4159	-148.8457	PSS1/EM1B	FLAT	II C 1, III A 2

				u regett				
Feature ID	Data Type <sup>1</sup>	Date	Field Target #	Latitude	Longitude	Cowardin Code	HGM Classification	Vegetation Classification
W61HT023_OP	OP	7/5/2014	67	63.4161	-148.8459	PSS1C	*	II C 1
W61HT024	WDF	7/5/2014	66	63.4377	-148.8269	PSSIB	FLAT	II C 1
W61HT024_OP	OP	7/5/2014	66	63.4377	-148.8278	UPLAND	N/A	I A 2, II C 1
W61HT025	WDF	7/6/2014	64	63.4416	-148.8026	PSSIB	SLOPE	II C 1
W61HT025_OP	OP	7/6/2014	64	63.4418	-148.8027	UPLAND	N/A	I A 2, II A 2, II C 1
W61HT026	WDF	7/6/2014	65	63.4416	-148.8039	UPLAND	N/A	I A 2, II C 2, III A 1
W61HT027	WDF	7/6/2014	68	63.4025	-148.8579	PEM1/SS1B	SLOPE	III A 2, II C 2
W61HT027_OP	OP	7/6/2014	68	63.4023	-148.858	UPLAND	N/A	II C 2
W61HT028	WDF	7/6/2014	69	63.3799	-148.9101	PSS1/EM1B	FLAT	II C 1, III A 2
W61HT029	WDF	7/6/2014	71	63.374	-148.9484	PSS1/EM1B	RIVERINE	II C 1, III A 2
W61HT030	WDF	7/6/2014	70	63.3742	-148.9471	PSS1C	RIVERINE	II B 1, II C 2
W61HT031	WDF	7/7/2014	75	63.2556	-149.2624	PEM1/SS1F	FLAT	III A 3, II C 2
W61HT031_OP	OP	7/7/2014	75	63.2551	-149.2626	PSS1B	*	II C 1
W61HT032	WDF	7/7/2014	76	63.254	-149.2642	PSS1/EM1B	FLAT	II C 1, III A 3
W61HT033	WDF	7/7/2014	77	63.2536	-149.2647	PSS1B	FLAT	II B 1, III A 2
W61HT034	WDF	7/8/2014	79	63.2366	-149.2748	PFO1/4/SS1B	RIVERINE	I C 3, III A 2
W61HT035	WDF	7/8/2014	78	63.2441	-149.2724	UPLAND	N/A	II C 2, III A 2
W61HT036	WDF	7/8/2014	63	63.4654	-148.8062	PSS1/EM1B	FLAT	II A 2, II C 1, III A 2
W61HT036_OP	OP	7/8/2014	63	63.4654	-148.8062	PSS1B	*	II C 1
W61HT037	WDF	7/8/2014	62	63.5206	-148.8005	UPLAND	N/A	I A 2, II C 1, III A 1
W61HT038	WDF	7/8/2014	61	63.5235	-148.8019	UPLAND	N/A	I A 2, II C 2
W61HT038_OP	OP	7/8/2014	61	63.5235	-148.8021	PEM1F	*	III A 3
W61LH001	WDF	6/7/2014	1	65.4459	-148.6187	PSS4/1/F04B	FLAT	II B 1, I A 2
W61LH002	WDF	6/7/2014	2	65.4451	-148.6184	PSS1/4C	RIVERINE	II C 1
W61LH002_OP	OP	6/7/2014	2	65.445	-148.6185	R4SB	*	N/A
W61LH003	WDF	6/7/2014	3	65.4441	-148.6186	UPLAND	FLAT	II A 2, II B 2, II C 2
W61LH004	WDF	6/7/2014	4	65.4303	-148.6122	PSS4B	FLAT	II A 2
W61LH005	WDF	6/8/2014	5	65.4195	-148.6085	UPLAND	FLAT	I A 2
W61LH005_OP	OP	6/8/2014	5	65.4201	-148.6075	PSS1C	*	II C 1
W61LH006	WDF	6/8/2014	6	65.4045	-148.6171	PSS1B	FLAT	II B 2, II C 2
W61LH006_OP	OP	6/8/2014	6	65.4045	-148.6177	PSS1/4B	*	II B 2, II C 2
W61LH007	WDF	6/8/2014	7	65.3952	-148.6277	PSS4/1B	FLAT	II A 2, II C 2
W61LH008	WDF	6/8/2014	8	65.3196	-148.6614	PSS 13B	FLAT	II C 1, II C 2

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Feature ID	Data Type <sup>1</sup>	Date	Field Target #	Latitude	Longitude	Cowardin Code	HGM Classification	Vegetation Classification
W61LH009	WDF	6/9/2014	9	65.3075	-148.6655	UPLAND	N/A	I A 2, II C 1
W61LH009_OP	OP	6/9/2014	9	65.307	-148.6652	PSS1B	*	II C 1
W61LH010	WDF	6/8/2014	7	65.3948	-148.6281	PSS1/EM1B	FLAT	II C 1, III A 2
W61LH011	WDF	6/9/2014	11	65.2631	-148.6819	UPLAND	N/A	II C 1
W61LH011_OP	OP	6/9/2014	11	65.2629	-148.6822	PSS1B	*	II B 2, II C 2
W61LH011_OP1	OP	6/9/2014	10	65.2642	-148.6791	UPLAND	N/A	II B 1
W61LH012	WDF	6/9/2014	12	65.2143	-148.6904	PSS1B	FLAT	II C 1
W61LH012_OP	OP	6/9/2014	12	65.2141	-148.6906	PSS1/EM1B	*	II C 1, III B 2
W61LH013	WDF	6/10/2014	13	65.1957	-148.7037	PSS4/1B	FLAT	I A 2, II A 2, II C 1
W61LH014	WDF	6/10/2014	14	65.1945	-148.7052	PSS4/1B	FLAT	II A 2, II C 2
W61LH015	WDF	6/10/2014	15	65.1256	-148.7437	PSS1B	DEPRESSIONAL	II B 1
W61LH016	WDF	6/11/2014	16	65.1146	-148.7285	PSS1/4	FLAT	II C 2, II A 2
W61LH016_OP	OP	6/11/2014	16	65.1145	-148.7291	PSS1/4B	*	B 1 ,    C 1 ,     A 3
W61LH017	WDF	6/10/2014	17	65.1076	-148.7204	PSS1/EM1B	FLAT	II C 1, III A 2
W61LH018	WDF	6/10/2014	18	65.1074	-148.7203	PSS1/EM1B	FLAT	II C 1, III A 2
W61LH019	WDF	6/11/2014	19	65.0862	-148.7217	PEM 1 SS1B	FLAT	III A 2, II C 1
W61LH020	WDF	6/11/2014	20	65.0851	-148.7205	PSS1/EMIB	FLAT	II C 1, III A 2
W61LH021	WDF	6/11/2014	21	65.0843	-148.7199	UPLAND	N/A	I B 2, III B 1
W61LH022	WDF	6/12/2014	22	65.0732	-148.7052	UPLAND	N/A	I C 2, II A 2
W61LH023	WDF	6/12/2014	23	65.0354	-148.6759	PF04/SS1B	FLAT	I A 2, II C 2
W61LH024	WDF	6/12/2014	24	65.0339	-148.6752	UPLAND	N/A	I C 1
W61LH025	WDF	6/14/2014	25	64.9949	-148.6753	UPLAND	N/A	II C 2, III A 2
W61LH025_OP	OP	6/14/2014	25	64.9948	-148.6748	PSS1/EM1B	*	II C 2, III A 2
W61LH026	WDF	6/12/2014	26	64.9946	-148.6742	UPLAND	N/A	II C 2
W61LH027	WDF	6/14/2014	27	64.9943	-148.6724	UPLAND	N/A	II A 2, I A 2
W61LH028	WDF	6/14/2014	35	64.782	-148.8209	UPLAND	N/A	I A 2, II C 1
W61LH028_OP	OP	6/14/2014	35	64.7822	-148.8211	UPLAND	N/A	II B 1
W61LH029	WDF	6/14/2014	36	64.7824	-148.8228	PM1B	FLAT	III A 2
W61LH030	WDF	6/15/2014	34	64.7887	-148.8101	PSS4/IB	FLAT	I A 2, II C 2
W61LH030_OP	OP	6/15/2014	34	64.7882	-148.8117	PSS4B	*	II A 1
W61LH030_OP1	OP	6/15/2014	34	64.7873	-148.8118	PSS4/1B	*	II A 2, II C 2
W61LH031	WDF	6/15/2014	37	64.7643	-148.8276	PF04/SSIB	FLAT	I A 2, II C 1
W61LH031_OP	OP	6/15/2014	37	64.7642	-148.8271	PSS4/1C	*	II A 2, II C 2

Feature ID	Data Type <sup>1</sup>	Date	Field Target #	Latitude	Longitude	Cowardin Code	HGM Classification	Vegetation Classification
W61LH032	WDF	6/15/2014	38	64.7635	-148.8271	UPLAND	N/A	I C 2, II B , II C 2
W61LH033	WDF	6/16/2014	39	64.7391	-148.8337	PFO4/SS1B	FLAT	I A 2, II C 1
W61LH033_OP	OP	6/16/2014	39	64.739	-148.8336	UPLAND	N/A	I B 2, II C 1
W61LH034	WDF	6/16/2014	40	64.7363	-148.8406	PSS4B	FLAT	I A 2, II C 1
W61LH034_OP	OP	6/16/2014	40	64.7365	-148.8371	UPLAND	N/A	I C 2, II C 2
W61LH035	WDF	6/16/2014	41	64.7218	-148.8574	PSS1/4B	FLAT	II C 2, II A 2
W61LH035_OP	OP	6/16/2014	41	64.7221	-148.8575	PF04/SS1B	*	I A 2, II B 1
W61LH036	WDF	6/16/2014	42	64.7215	-148.8583	PF04/SS4B	FLAT	I A 2, II A 2
W61LH037	WDF	6/16/2014	43	64.7209	-148.856	PF04/SS1B	FLAT	I A 2, II C 1
W61LH037_OP	OP	6/16/2014	43	64.7203	-148.8572	UPLAND	N/A	I B 1, II C 2
W61LH038	WDF	6/17/2014	44	64.709	-148.8758	UPLAND	N/A	I A 2, II C 1
W61LH038_OP	OP	6/17/2014	44	64.7093	-148.8756	PSS1B	*	II B 1
W61LH039	WDF	6/17/2014	45	64.7081	-148.8741	PSS1B	FLAT	II B 1
W61LH039_OP	OP	6/17/2014	45	64.7086	-148.8735	PFO4/SS1B	*	I A 2, II B 2, III A 2
W61LH040	WDF	6/17/2014	47	64.6867	-148.9252	PF01/SS1B	FLAT	I B 2, II C 2
W61LH041	WDF	6/17/2014	46	64.6863	-148.9226	UPLAND	N/A	II B 1, II C 2
W61LH041_OP	OP	6/17/2014	46	64.6864	-148.9224	PSS1/EM1B	*	III A 2, II C 2
W61LH041_OP1	OP	6/17/2014	46	64.6853	-148.9225	PEM1C	*	III A 3
W61LH042	WDF	6/18/2014	48	64.0043	-149.1292	PSS1/EM1B	FLAT	II C 1, III A 2
W61LH042_OP	OP	6/18/2014	48	64.005	-149.1299	PSS1/4B	*	II C 1, II A 2
W61LH043	WDF	6/19/2014	49	63.9926	-149.1228	PSS1/4B	FLAT	II B 2, II C 1
W61LH043_OP	OP	6/19/2014	49	63.9924	-149.1228	PSS1/4/EM1B	*	II C 1, III A 2
W61LH044	WDF	6/19/2014	50	63.9467	-149.1097	PFO4/SS1B	FLAT	I A 2, II B 2, II C 1
W61LH045	WDF	6/19/2014	51	63.9439	-149.1071	PSS1/4B	FLAT	II C 1, II A 2
W61LH046	WDF	6/27/2014	52	63.9307	-149.0932	PSS1/EM1B	FLAT	II C 1, III A 2
W61LH046_OP	OP	6/27/2014	52	63.9308	-149.0919	PSS1/4B	*	II C 1, II A 2
W61LH047	WDF	6/11/2014	20	65.086	-148.72	PEM1 SS1C	FLAT	III A 3, II C 1

<sup>&</sup>lt;sup>1</sup>WDF = Wetland Data Form; Veg = Vegetation Data Form; OP = Observation Point, No Data Form

<sup>\*</sup>HGM Classification was not collected on Vegetation Forms or at Observation Points

### WETLAND DETERMINATION DATA FORM

SITE DESCRIPTION			L		
Survey Type: Centerline Acce	ss Road (explain)	Other (expla	nin)X corrido	Field Target: 087	Map #: <u>59</u> Map Date: <u>5/27</u> //
Date: 06 - 09 - 20 14	Project Name & No.:	Alaska LNG	26221306	Feature lo	: W60HT:001
Investigators: Dan La Plant,	Zoe Meade				Team No.: W & O
State: Alaska	Region: Alaska		Milepost: (		
Latitude: 62° 59' 58.11"		Longitude	: 149° 33	24.63"	Datum: WGS84
Logbook No.: 2	Logbook Page No.:	001	Picture No.:	PHT001_	N.S. Pit. Plug
SITE PARAMETERS	-				
Subregion: interior			Landform (hill	slope, terrace, hummoc	ks, etc.): hills 10 pe
Slope (%): 3-5 0 0			Local relief (c	oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica			Soil Map Unit		
Are climatic/hydrologic conditions on th Yes No (if no exp	e site typical for this time plain in Notes)	e of year?	Are "No Yes	ormal Circumstances" pr No_X(If no, e	esent: xplain in Notes.)
Are Vegetation, Soil, or Hy	drologySignifican	tly Disturbed?	No_ <u>X</u>	_(If yes, explain in Note	s)
Are Vegetation, Soil, or Hy	drology <u>X</u> Naturally	Problematic?	No	_ (If yes, explain in Note	es.)
SUMMARY OF FINDINGS		- S 14s			
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes_	X No	w	etland Type:	PSS1B	
Wetland Hydrology Present? Yes_	No	AI	aska Vegetatior	n Classification (Viereck	пв2
Notes and Site Sketch: Please include corridor.  Beaver dam  See Shert's page	complex			re, Distances from Cent	erline, Photo Locations, and Survey
7007					

### WETLAND DETERMINATION DATA FORM

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)
1.				Total Number of Dominant Species Across All Strata: (B)  % Dominant Species that are OBL, FACW, or FAC: (A/B)
2.				% Dominant Species that are OBL, FACW, or FAC: 700 (A/B)
3.				
4.				Prevalence Index worksheet:
Total Cover	_ 0			Total % Cover of: Multiply by:
50% of total cover	· <u> </u>	% of total cov	/er:_ <i>O</i>	OBL species:
Sapling/Shrub Stratum ( 2.6')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 83
1. Alnus sep	15		FAC	UPL species 0 x 5 = 0
2. Salex michardsonii	65	У	FACW	Column Totals: 182 (A) 474 (B)
3. Salex Pulchra	15		FACW	PI = B/A = 2.60
4. Spiraea Stevenii	5		FACU	
5.				
6.				
7.				
8.				
9.				
Total Cover 50% of total cover		% of total cov	er:20	

Herb Stratum(26))	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Chamerion anavstofolium	1		FACU	Prevalence Index is ≤ 3.0
2. Mertensia paniculata	1		FACU	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Anemone richardsonii	T		FAC	Problematic Hydrophytic Vegetation¹ (Explain)
4. Viola palustris	3		FACW	Indicators of hydric soil and wetland hydrology must be present unless.
5. Geranium erianthum	4		FACU	disturbed or problematic.
6. Calama grostis Canadensis	60	У	FAC.	
7. Smilaciona stellata	1		FAC.	% Bare Ground
8. Veratrum viride	10		FAC	<u>3 O</u> % Cover of Wetland Bryophytes
9. Sanguisorba canadensis	T		FACH	Total Cover of Bryophytes
10. Equise turn Arvense	2		FAC	% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover:_	85			
50% of total cover:_	42.5 20	% of total cov	er: 17_	Notes: (If observed, list morphological adaptations below):
unidentified herb	3			

### 



PROPILE DESCRIPTION: (Describe to the depth needed to document the Indicator or confirm the absence of indicators.)	SOIL	-		Date 06 - 0 9 Fe	ature ID	W607	1001 1037		Soil Pit Required (Y	(N) Y
Redox Features		LE DESCRIPTION: (						confirm the absence		
Color (moist) % Color (moist) % Type* Loc² Texture Notes  7 - 4										
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PVDRIC SOIL INDICATORS    INDICATORS   INDICATORS   INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS*	•	Color (moist)	1%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix.   Type: Calculation (A2)	7 - 4				_			Fibric	organics	
Type: C-Concentration, D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL-Pore Lining, M=Matrix.  INDICATORS INDIC		10 YR 4/3	106						· · ·	
NDICATORS FOR PROBLEMATIC HYDRIC SOILS										
INDICATORS FOR PROBLEMATIC HYDRIC SOILs'										
NDICATORS FOR PROBLEMATIC HYDRIC SOILS										
NDICATORS FOR PROBLEMATIC HYDRIC SOILS										
INDICATORS FOR PROBLEMATIC HYDRIC SOILS						1 0	-1-1010	21	DI -Dare Lining M-Matrix	
Alaska Color Change (TA4)*  Alaska Color Change (TA4)*  Alaska Redox (A14)  Alaska Redox (A14)  Alaska Redox with 2.5Y Hue  Alaska Redox with	,,		tion, RN	/I=Reduced Matrix, C	S=Cove	rea or Co	ated Sand G			SUII 63
Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Redox (A15) Alaska Redox with 2.57 Hue Alaska Gleyed Pores (A15) Alaska Gleyed Without 5Y Hue or Redder Underlying Layer Other (Explain in Notes)				1 11-1-01-1-1	(440)	2-1				SUILS
Alaska Gleyed Pores (A15)  Alaska Redox with 2.57 Hue Alaska Gleyed without 57 Hue or Redder Underlying Layer  Other (Explain in Notes)								_		
Alaska Gleyed without SY Hue or Redder Underlying Layer.  Other (Explain in Notes)										
Notes Dark Surface (A12)				Alaska Gleyed	roies (A	10)				lerlying
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless listurbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type:								Layer		
isturbed or problematic.  Siew details of color change in Notes.  Restrictive Layer (if present): Type:  Depth (inches):  Soli Reserve Color Change in Notes.  Restrictive Layer (if present): Type:  Depth (inches):  Soli Record and Problematic Color Change in Notes.  Restrictive Layer (if present): Type:  Depth (inches):  Soli Record and Problematic Color Change in Notes.  Restrictive Layer (if present): Type:  Depth (inches):  Soli Record and Problematic Color Change in Notes.  Restrictive Layer (if present): Type:  Depth (inches):  Soli Record and Problematic Color Change in Notes.  Secondary Indicators Second	hick Dark S	Surface (A12)	7	yu.				Other (Explain	n Notes) X 46	
Give details of color change in Notes.  Restrictive Layer (if present): Type:  Depth (inches):  Nydropy for vaplation, widland hydrology present and landscape position of the period of			tation, o	ne primary indicator	of wetlar	nd hydrolo	ogy, and an a	appropriate landsca	pe position must be present ur	ness
Address of Present (Y/N):  Appropriate Control of Contr	notal board.	of color change in No	toe							
Joint Soil Present (YIN):    Apply   Present	Give details	Of Color Change III 140	103				-			
Alter Marks (B1)  Water Marks (B2)  Water Table (Pape)  Water Table (Present (Y/N):  Water Table Present (Y/N):  Water Table Present (Y/N):  Water Table Present (Y/N):  Water Marks (Water (Pape)  Water Marks (W	Give details Restrictive L	ayer (if present): Type	e:							
Surface Water (A1) X Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Saturation (A3) Surface Surface (B8) Sparsely Vegetated Concave Surface (B8) Surface (B8) Shallow Aquitard (D3) Shallow Aquitard (D4) Sediment Deposits (B2) Shallow Surface (B3) Shallow Surface (B3) Shallow Aquitard (D4) Shallow Concave Surface (B8) Shallow Shallow Aquitard (D4) Shallow Concave Surface (B8) Shallow Aquitard (D4) Shallow Concave Surface (B8) Shallow Aquitard (D4) Shallow Concave Surface (B4) Shallow Concave Surface (B4) Shallow Aquitard (D5) Shallow Aquitard (D4) Shallow Concave Surface (B4) Shallow	Restrictive L	ayer (if present): Type	e:	*					opinen. See lagbook www	0-3 p
AYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) X Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1) Geomorphic Position (D2) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) Shallow Aquitard (D4) Presence of Reduced Iron (C4) Relief (D4) Saturation (C1) Saturation (C1) Shallow Aquitard (D3) Shallow Aquitard (D4) Shallow Aquitard (D5) Notes:  Drift Deposits (B3) Dry-Season Water Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N): Y Depth (in): C4 Shallow Aquitard (D5) Shallow Aquitard (D5) Shallow Aquitard (D6) Shallow Aqui	Restrictive L	ayer (if present): Type	e:	*	Source	enecked	006/30/	14 89 3, पाराजा		
AYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) X Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  Saturation (A2) X Inundation Visible on Aerial Imagery (B7)  Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Dry-Season Water Table (C2)  Other (Explain in Notes):  Surface Water Present (Y/N): Y Depth (in): Capable (	Restrictive L	ayer (if present): Type	e:	*	Source	enecked	006/30/	14 89 3, पाराजा		
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Surface Water (A1) A Surface Soil Cracks (B6) Leaves (B9) Plants (D1) Geomorphic Position (D2) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3) Presence of Reduced Iron (C4) Relief (D4) Sediment Deposits (B2) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): Staturation Present (Y/N): Depth (in): Sediment Present (Y/N): Penth (in): Seaturation Present (Y/N): Penth (in): Seaturation Present (Y/N): Penth (in): Plants (B9) Plants (B9) Plants (D1) Plants (B9) Plants (D1) Plants (B9) Plants (D1) Plants (D	Restrictive L	ayer (if present): Type	e:	*	Source	enecked	006/30/	14 89 3, पाराजा		
Sparsely Vegetated Concave Surface (B8)  Water Marks (B1)  Sediment Deposits (B2)  Orift Deposits (B3)  Orift Deposits (B4)  Other (Explain in Notes):  Surface Water Present (Y/N):  Water Table Present (Y/N):  Vater Table Pres	Restrictive Li	eyer (if present): Type  Present (Y/N):  Amphy fix vag  tenae	e:	~, wother by	hydn lock	logy p D by	on 6/20/ Jesent beans	with land	Ascapa position	
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Nater Marks (B1) Marl Deposits (B15) Iron (C4) Relief (D4)    Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Notes:  Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N):	Hydric Soil Notes: hy HYDROLOG	Present (Y/N):  Arrely fix Vag  terrare  BY PRIMARY INDICA  er (A1)  X	TORS (a	any one indicator is surface Soil Cracks (Be	hydro lock- ufficient)	lay p	beau (  SECONDAR  Water-staine Leaves (B9)	with land or drawn.	or more required)  Stunted or Stressed Plants (D1)	-
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Notes:  Dry-Season Water Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N):	Hydric Soil Notes: hy HYDROLOG Gurface Water	Present (Y/N):  Arphy fix vig  ten Ac  EY PRIMARY INDICA  er (A1)  Table (A2)	TORS (a	any one indicator is surface Soil Cracks (Beindation Visible on Array)	hydrolocical ocical ufficient)	Loy P	SECONDAR Vater-staine Leaves (B9) Drainage Pa	ay INDICATORS (2 dd	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D	02)
Dry-Season Water Table (C2)	Restrictive Lindy Aydric Soil  Notes: Aydric S	Present (Y/N):  Present (Y/N):	TORS (a Su Inu (B7 Co	any one indicator is surface Soil Cracks (Beindation Visible on Act)  arsely Vegetated neave Surface (B8)	hydra locical ufficient)	gery [	SECONDAR Vater-staine Leaves (B9) Drainage Pa Dxidized Rhi Living Roots Presence of	with land land land land land land land land	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D  Shallow Aquitard (D3)  Microtopographic	02)
Algal Mat or Crust (B4) Other (Explain in Notes):  Fron Deposits (B5)  Surface Water Present (Y/N):	Restrictive Lindy Aydric Soil  Rotes: /ny  AYDROLOG  Surface Water Talenth Water Marks	Present (Y/N):  Present (Y/N):	TORS (a Sulface Sulfac	any one indicator is surface Soil Cracks (Beindation Visible on Arr) arsely Vegetated neave Surface (B8) ard Deposits (B15) drogen Sulfide	hydrocle ocle ocle ocle ocle ocle ocle ocle	gery [	Deaves  SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Dxidized Rhi Living Roots  Presence of ron (C4)	Y INDICATORS (2 dd	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D3)  Microtopographic Relief (D4)	)2)
ron Deposits (B5)	Hydric Soil Notes: HyDROLOG Gurface Water High Water Saturation (A Water Marks Sediment De	Present (Y/N):  Present (Y/N):	TORS (a Sull Inu (B7 Sp Co Ma Hy Od	any one indicator is surface Soil Cracks (B6) indation Visible on Ac7) arsely Vegetated incave Surface (B8) induction Deposits (B15) induction (C1) inductio	hydrocle ocle ocle ocle ocle ocle ocle ocle	gery [	SECONDAR Nater-staine Leaves (B9) Drainage Pa Dxidized Rhi Living Roots Presence of ron (C4)	Y INDICATORS (2 dd	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D3)  Microtopographic Relief (D4)	)2)
Surface Water Present (Y/N):   Nater Table Present (Y/N):   Depth (in):   Depth (in):   Wetland Hydrology Present (Y/N):   Saturation Present (Y/N):   Depth (in):   Depth (in):	Restrictive Lindy Aydric Soil Notes: Aydric Soil No	Present (Y/N):  Present (Y/N):  Arphy fix Vig  For Arc  BY PRIMARY INDICA  BY PRIMARY INDICA  BY (A1)  A3)  BY (B1)  BY (B2)  BY (B3)  BY (B3)	TORS (as Sull Inu (B7 Co Ma Hy Odd Dr) Wa	any one indicator is surface Soil Cracks (B6 indation Visible on Ac7) arsely Vegetated incave Surface (B8) ard Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2)	hydrocle ocle ocle ocle ocle ocle ocle ocle	gery [	SECONDAR Nater-staine Leaves (B9) Drainage Pa Dxidized Rhi Living Roots Presence of ron (C4)	Y INDICATORS (2 dd	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D3)  Microtopographic Relief (D4)	)2)
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Water Table Present (Y/N):   Depth (in):   D	Hydric Soil Notes: Hydric Soil Notes: HydroLog Surface Water High Water Saturation (A Water Marks Sediment De Drift Deposit	Present (Y/N):  Present (Y/N):	TORS (as Sull Inu (B7 Co Ma Hy Odd Dr) Wa	any one indicator is surface Soil Cracks (B6 indation Visible on Ac7) arsely Vegetated incave Surface (B8) ard Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2)	hydrocle ocle ocle ocle ocle ocle ocle ocle	gery [	SECONDAR Nater-staine Leaves (B9) Drainage Pa Dxidized Rhi Living Roots Presence of ron (C4)	Y INDICATORS (2 dd	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D3)  Microtopographic Relief (D4)	)2)
	Hydric Soil Notes: hy HYDROLOG Surface Water High Water To Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or ron Deposits	Present (Y/N):  Present (Y/N):	TORS (as Sull Inu (B7 Co Ma Hy Odd Dr) Wa	any one indicator is s  rface Soil Cracks (Be indation Visible on Ar  7)  arsely Vegetated ncave Surface (B8)  In Deposits (B15)  drogen Sulfide for (C1)  y-Season atter Table (C2)  mer (Explain in Notes	hydrocle ocle ocle ocle ocle ocle ocle ocle	gery [	SECONDAR Nater-staine Leaves (B9) Drainage Pa Dxidized Rhi Living Roots Presence of ron (C4)	Y INDICATORS (2 dd	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D3)  Microtopographic Relief (D4)	)2)
	Restrictive Liver Soil Motes: Any Soil Motes: Any Soil Motes: Any Soil Motes: Any Soil Motes Mot	Present (Y/N):	TORS (a Su Inu (B7 Co Ma Hy Odd Dny Wa	any one indicator is s  rface Soil Cracks (Be indation Visible on Ar  r)  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  y-Season ater Table (C2)  mer (Explain in Notes	hydrocle ocle ocle ocle ocle ocle ocle ocle	gery [	Drainage Pa Drainage Pa Dxidized Rhi Living Roots Presence of ron (C4)	Y INDICATORS (2 d d d d d d d d d d d d d d d d d d d	or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D Shallow Aquitard (D3) _ Microtopographic Relief (D4)  FAC-Neutral Test (D5)	)2)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         5         Short shrub (0.5-2m)         5           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inle
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%) High Gradient (≥2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below         Only Connected Above Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural_X 5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check:  GPS Technician QA/QC check:  Page 4 of 4

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	Field Target: 08 Date: 06-09-19
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?
	<ul><li>✓ Cover calculations are complete and correct?</li><li>✓ All dominant species have been determined and recorded per strata?</li></ul>
	✓ Indicator status is correct for each species?
	Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>☑ Appropriate hydrology indicators are marked?</li><li>☑ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- ☑ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)		Signature / Date	0	
X Zoe 1	Neade	X	1	oemeade

FT 87

# WETLAND DETERMINATION DATA FORM

Hedrophthic from First

SOIL			Date 6 30 114 F	eature II	WOA	- 1-1	87	Soil Pit Required (Y/N)
SOIL PROFI	LE DESCRIPTION:	Describe	to the depth neede	d to doci	ment the	indicator or	confirm the absen	
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-4							Fibric	organics
4-20	5Y 5/1	95	5 y 3/4	5	С	PL		and - med-Ifine
							)	
	110		1		1.	1 0		7
	1719	1	SANG (	a.	Hav	1 1C	CarAld	forming Hiduc 50.
Type: C=Co	ncentration, D=Depl	etion, RI	/I=Reduced Matrix,	CS=Cove	ered or Co	ated Sand G	rains. <sup>2</sup> Location	PL=Pore Lining, M=Matrix.
HYDRIC SOI	IL INDICATORS		andd.	-	Location	-0.30	1	FOR PROBLEMATIC HYDRIC SOILS
Histosol or H	istel (A1)		Alaska Gleye	d (A13) _			Alaska Color (	Change (TA4) <sup>4</sup>
	lon (A2)		Alaska Redox					Swales (TA5)
Black Histic (	A3)		Alaska Gleye	d Pores (	A15)			with 2.5Y Hue
	ılfide (A4)							d without 5Y Hue or Redder Underlying
Thick Dark S	urface (A12)							in Notes) X 467 low organ
disturbed or p Give details	oroblematic. of color change in No ayer (if present): Typ	ntes		~		1.		ape position must be present unless
Hydric Soil F	Present (Y/N):	/			- Pr	in Au-1	Hilia, posi	tion, ItId. Veg Present
Notes: C.o.	1 1 1 10c2+ m	16+	Dod zaston	Lev	4. Ral	VIDE	to low	of of Phone and
1 1	1 614 1		20,000	,	1160	ay Dan	10 00	is totally late. I
UNK	08 AUA,1450	1 tro	7 50,1	#AS	Lon	WANK	IND CONT	land & Haric Prob. 50. 94
HYDROLOG	Y PRIMARY INDICA	TORS (a	ny one indicator is	sufficient)	S	ECONDARY	Y INDICATORS (2	2 or more required)
Surface Wate	er (A1)X	Su	rface Soil Cracks (B	6)		Vater-stained eaves (B9)		Stunted or Stressed Plants (D1)
ligh Water T	able (A2) X	Inu (B7	ndation Visible on A ')	erial Ima	gery C	rainage Pati	terns (B10) <u>X</u>	Geomorphic Position (D2) X
Saturation (A	3)	Sp:	arsely Vegetated ncave Surface (B8)		_ C	xidized Rhiz iving Roots (	cospheres along (C3)	Shallow Aquitard (D3)
Vater Marks	(B1)		rl Deposits (B15)		P	resence of F on (C4)		Microtopographic Relief (D4)
Sediment De	posits (B2)	– Hyd	drogen Sulfide or (C1)				(C5)	FAC-Neutral Test (D5)
Orift Deposits	(B3)	Dry	-Season ter Table (C2)		N	lotes:		16
Ngal Mat or (	Crust (B4)		er (Explain in Notes					
ron Deposits	(B5)					_		
	er Present (Y/N):		Depth (in): >/		Wet	land Hydro	logy Present (Y/N	w: V
	Present (Y/N):		Depth (in):					
Saturation Proincludes cap			Depth (in):					
lotes:	and ruy.							

SITE DESCRIPTION							
Survey Type: Centerline X Acces	s Road (explain)	Other (expla	nin)	Field Targ	et: <u>086</u>	Map #: <u>58</u> Map Date: <u>5/27/</u> /4	
Date: 06 - 09 - 2014	Project Name & No.:	Alaska LNG				:W60 H T 002	
Investigators: Dan La Plant	e				Team No.: W60		
State: Alaska	Region: Alaska		Milepost:	602			
Latitude: 63° 00' 40.08'		Longitude:	149° 32'	47.86	Į 4	Datum: WGS84	
Logbook No.: () () 2.	Logbook Page No.:	2	Picture No.:	PW60F	FT 002	- Nis, Pit, Plug	
SITE PARAMETERS			0. 1	- 271			
Subregion: interior			Landform (hill	lslope, terrac	e, hummock	s, etc.): +errace	
Slope (%):   5						Concave	
Pre-mapped Alaska LNG/NWI classificat	ion: PEMI/SSIB	3	Soil Map Unit				
Are climatic/hydrologic conditions on the YesX No (if no expla		of year?	Are "No Yes_X	ormal Circum		esent: plain in Notes.)	
Are Vegetation, Soil, or Hyd	rology Significantl	ly Disturbed?	No_X	_(If yes, exp	lain in Notes	)	
Are Vegetation, Soil, or Hydi	rology Naturally P	roblematic?	No_X	_ (If yes, exp	lain in Notes	i.)	
SUMMARY OF FINDINGS							
Hydrophytic Vegetation Present? Yes	X No	ls t	he Sampled A	rea within a	Wetland?	Yes No	
Hydric Soil Present? Yes	X No	We	Wetland Type: PEM1 / SS 1-B				
Wetland Hydrology Present? Yes	) No	- Ala	Alaska Vegetation Classification (Viereck): III. A 2 , II C 2				
Notes and Site Sketch: Please include Dicorridor.  See Sik Sketch i		,	ength of featur	re, Distances	from Center	line, Photo Locations, and Survey	

Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3  Total Number of Dominant Species Across All Strata: 3
1,				% Dominant Species that are OBL, FACW, or FAC: 100 (A
2,				% Dominant Species that are OBL, FACW, or FAC.
3,				
4.				Prevalence index worksheet:
Total Cover	: 0			Total % Cover of: Multiply by:
50% of total cover	<u> </u>	% of total cov	rer:_0	OBL species:X 1 =O
Sapling/Shrub Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:       35       X 2 =       70         FAC species       70       X 3 =       210         FACU species       0       X 4 =       0
1. Andromeda polifolia	35	Y	FACW	UPL species O X 5 = O  Column Totals: $105$ (A) $280$ (B)
2. Betula nana	30	Y	FAC	Column Totals: 105 (A) 280 (B)
3. Empetrum nigrum	10		FAC	PI = B/A = 2.67
4. Spiraea Stevenii 2m		-		
5. Salix Ovalifolia	10		FAC	
6. Vaccinium uliqino sum	20		FAC	
7. vaccinium vitis-idaea	T			
8,				
9.				
Total Cover		)% of total cov	ver:21	
50% of total cover	r:_52.5 20	% of total cov	ver:21	
50% of total cover	r:_52.5 20	Dominant Species? (Y/N)	Indicator	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is < 3.0
50% of total cover	s) Absolute	Dominant Species?	Indicator	
VEGETATION (use scientific names of plant:	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%
VEGETATION (use scientific names of plant Herb Stratum ( 26' )  1. Carex bigeLowii	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	<ul> <li>✓ Dominance Test is &gt; 50%</li> <li>✓ Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in</li> </ul>
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( 26' )  1. Carex bigeLowii  2. Rubuj Chamaemorous	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
VEGETATION (use scientific names of plants Herb Stratum ( 26' )  1. Carex bigeLowii 2. Rubuj Chamaemorous 3.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes)
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( 26' )  1. Carex bigeLowii  2. Rubuj Chamaemorous  3.  4.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( 26' )  1. Carex bigeLowii  2. Rubuj Chamaemorous  3.  4.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( 26' )  1. Carex bigeLowii 2. Rubus Chamaemorous 3. 4. 5. 6.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  O % Bare Ground  8 5 % Cover of Wetland Bryophytes
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( 26' )  1. Carex bigeLowii 2. Rubus Chamaemorous 3. 4. 5. 6. 7.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum (26')  1. Carex bigeLowii  2. Rubus Chamaemorous  3.  4.  5.  6.  7.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  O % Bare Ground  8 5 % Cover of Wetland Bryophytes  8 5 Total Cover of Bryophytes  O % Cover of Water
50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( 26' )  1. Carex bigeLowii 2. Rubus Chamaemorous 3. 4. 5. 6. 7. 8. 9.	s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	

SOIL PROFILE DESCRIPTION. (Describe to the depth needed to document the indicator or confirm the absence of indicators.)  Dipph Matrix (Redox Features)  (Inches) Color (moist) % Color (moist) % Type¹ Loc² Texture Notes  0 - 1.3	SOIL		7	Date 06-09-14 Feature				Soil Pit Required (Y/N)
Color (moist)   % Color (moist)   % Type   Loc   Texture   Notes   3 - 1.3	SOIL PROFII	LE DESCRIPTION: (	Describe	to the depth needed to do	cument th	e indicator or	confirm the absence	e of indicators.)
Fi bric   Organics   Standard   Fibric   Organics   Standard   S	Depth	Matrix		Redox Features				
3 - 2 0	(inches)	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.   *Location: PL=Pore Lining, M=Matrix, HYDRIC SOIL, INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOIL HISTORY   Alaska Gleyed (A13)   Alaska Color Change (TA4)   Alaska Color Change (TA4)   Alaska Color Change (TA4)   Alaska Gleyed (A13)   Alaska Gleyed Pores (A15)   Alaska Redox (A14)   Alaska Gleyed Without 5Y Hue or Redder Underlyin Lare?   Other (Explain in Notes)   Other (Explain	0-13		-	-		-	- Fibric	organics
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains.	3-20	-	-					
Hydric Soil Indicators Histosol or Histel (A1) X   Alaska Gleyed (A13)   Alaska Color Change (TA4)*   Histosol or Histel (A1) X   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Black Histic (A3)   Alaska Alpine Swales (TA5)   Black Histor (A3)   Alaska Alpine Swales (TA5)   Black Histor (A3)   Alaska Alpine Swales (TA5)   Black Histor (A3)   Alaska Gleyed without 5Y Hue   Alaska Cleyed without 5Y Hue   Alaska Cleyed without 5Y Hue or Redder Underlyin   Layer   Other (Explain in Notes)   One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless statuted or problematic. Give details of color change in Notes.  Hydric Soil Present (Y/N):   Depth (inches):    Hydric Soil Present (Y/N):   Surface Soil Cracks (B6)   Leaves (B9)   Burface Water (A1)   Surface Soil Cracks (B6)   Leaves (B9)   Burface Water Table (A2)   Inundation Visible on Aerial Imagery (B7).    Notes:   Drainage Patterns (B10)   Geomorphic Position (D2)   Concave Surface (B8)   Drainage Patterns (B10)   Geomorphic Position (D2)   Concave Surface (B8)   Drainage Patterns (B10)   Shallow Aquitard (D3)   Concave Surface (B8)   Drainage Patterns (B10)   Relief (D4)   Concave Surface (B8)   Dry-Season (C4)   Relief (D4)   Concave Surface (B8)   Dry-Season (C4)   Shallow Aquitard (D3)   Concave Surface (B8)   Dry-Season (C4)   Sh	20-22					-	Sand I grave	1
Hydric Soil Indicators Histosol or Histel (A1) X   Alaska Gleyed (A13)   Alaska Color Change (TA4)*   Histos Epipedon (A2)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Black Histic (A3)   Alaska Alpine Swales (TA5)   Black Histic (A3)   Alaska Alpine Swales (TA5)   Alaska Clove Change (TA4)   Alaska Alpine Swales (TA5)   Alaska Alpine Swales (TA5)   Alaska Clove Change (TA4)   Alaska Cleved without 5? Hue   Alaska Cleved								
Alaska Gleyed (A13)			1					2.7
INDICATORS   INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOIL			-					
INDICATORS   INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOIL	Type: C=Co	ncentration D=Denk	etion RN	#=Reduced Matrix_CS=Co	vered or C	oated Sand (	Grains <sup>2</sup> Locations	· Pl =Pore Lining M=Matrix
Alaska Gleyed (A13) Alaska Clor Change (TA4)*  Alaska Redox (A14) Alaska Alpine Swales (TA5)  Alaska Redox (A14) Alaska Alpine Swales (TA5)  Alaska Redox (M12) Alaska Gleyed Pores (A15) Alaska Redox (M12)  Alaska Gleyed Pores (A15) Alaska Redox (M12)  Alaska Gleyed without 5Y Hue or Redder Underlyin Layer  Other (Explain in Notes)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless issurbed or problematic.  Restrictive Layer (if present): Type: Depth (inches):  Alaska Gleyed without 5Y Hue or Redder Underlyin Layer  Other (Explain in Notes)  Other (Explain in Notes)  Other (Inches):  Alaska Gleyed without 5Y Hue or Redder Underlyin Layer  Other (Explain in Notes)  Other (Explain in Notes)  Other (Inches):  Alaska Gleyed Without 5Y Hue  Alask			etion, ixi	W-INEGUCEG WAITIX, CO-CO	vereu or c	oaled Sand (		
Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Redox (A15) Alaska Gleyed Pores (A15) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue Alaska Gleyed Without SY Hue or Redder Underlyin Layer Other (Explain in Notes)				Alaska Gleved (A13)				
Alaska Gleyed Pores (A15)  Alaska Gleyed Pores (A15)  Alaska Gleyed without 5Y Hue or Redder Underlyin Layer  Dick Dark Surface (A12)  Other (Explain in Notes)  Other (Explain in Notes)  Other Gestrictive Layer (if present): Type:  Depth (inches):  Depth (inche								
Alaska Gleyed without 5Y Hue or Redder Underlyin Layer  Thick Dark Surface (A12)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless issurbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):								
Layer   Other (Explain in Notes)				Alaska Gleyeu Poles	, (U 13)			
One indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):							Layer	_
isiturbed or problematic. Give details of color change in Notes.  Restrictive Layer (if present): Type:			_					
Give details of color change in Notes.  Restrictive Layer (if present): Type:	One indicato	r of hydrophytic vege problematic.	etation, o	ne primary indicator of weti	land hydro	ology, and an	appropriate landsca	ape position must be present unless
Notes: Water Hable 2" Jam Surface  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) (B7) Prainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Other (Explain in Notes):  Notes:  Surface Water Present (Y/N): N Depth (in): N A Water Table Present (Y/N): Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N):	Give details	of color change in No	otes.					
Art Port Private    Art Port Port Port Port Port Port Port Po	Restrictive La	iyer (if present): Typ	e:	Depth (	(inches):			
Notes: Water Abbe. 2" Jum Surface  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Plants (D1)  High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N): N Depth (in): NA  Wetland Hydrology Present (Y/N): Wetland Hydrology Present (	Hudric Soil E	Propert (V/N):						
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Drainage Patterns (B10) Geomorphic Position (D2) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Shallow Aquitard (D3) Shallow Aquitard (D3) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Mater Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N): N Depth (in): N A Water Table Present (Y/N): Pepth (in): 2 Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N):								
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Drainage Patterns (B10) Geomorphic Position (D2) Saturation (A3) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Shallow Aquitard (D3) Sediment Deposits (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Dry-Season Water Table (C2) Notes:  Surface Water Present (Y/N): N Depth (in): N A Water Table Present (Y/N): Pepth (in): 1 Depth (in):	Notes:	ne Inbb	2"	from Surface				
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) High Water Table (A2) Inundation Visible on Aerial Imagery (B7)	u	19-11/ - 1/4 VC	•					
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Stunted St		-						
Surface Soil Cracks (Bb) Leaves (B9) Plants (D1)  High Water Table (A2)X	HYDROLOG	Y PRIMARY INDICA	TORS (a	any one indicator is sufficier	nt)	SECONDAR	RY INDICATORS (2	or more required)
Fight   Figh	Surface Wate	or (Δ1)	Su	rface Soil Cracks (B6)		Water-stained Stunted or Stress		
Saturation (A3)   X   Sparsely Vegetated Concave Surface (B8)   Oxidized Rhizospheres along Living Roots (C3)   Shallow Aquitard (D3)	Juliace vvale	(٨١)				Leaves (B9)		Plants (D1)
Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3)	High Water T	able (A2)X			nagery	Drainage Pa	tterns (B10)	Geomorphic Position (D2)
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)   Sediment Deposits (B2) Dry-Season Water Table (C2) Notes:    Algal Mat or Crust (B4) Other (Explain in Notes):			Sp	arsely Vegetated				Shallow Aquitard (D3)
Sediment Deposits (B1)	Saturation (A	3) <u>/                                   </u>	Co	ncave Surface (B8)				
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Notes:  Drift Deposits (B3) Other (Explain in Notes):  Algal Mat or Crust (B4) Other (Explain in Notes):  Burnon Deposits (B5) Depth (in): N   A	Water Marks	(B1)	Ma	rl Deposits (B15)	_			
Drift Deposits (B3) Dry-Season Water Table (C2) Notes:    Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) // Notes:   Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) // Notes:			Hv	drogen Sulfide				
Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5)  Surface Water Present (Y/N): N Depth (in): N A  Water Table Present (Y/N): Y Depth (in): 1  Wetland Hydrology Present (Y/N):	Sediment Der	oosits (B2)	- Od	or (C1)		Salt Deposit	s (C5)	FAC-Neutral Test (D5)
Algal Mat or Crust (B4) Other (Explain in Notes):    Iron Deposits (B5)	Drift Deposits	(B3)	Dry	/-Season		Notes:		
Surface Water Present (Y/N): N Depth (in): N A Water Table Present (Y/N): Y Depth (in): 2  Wetland Hydrology Present (Y/N): Y		(/	VVa	iter Table (C2)				
Surface Water Present (Y/N): N Depth (in): N A Water Table Present (Y/N): Y Depth (in): 2  Wetland Hydrology Present (Y/N): Y	Algal Mat or Crust (B4) Other (Explain in Notes):							
Surface Water Present (Y/N): N Depth (in): N A Water Table Present (Y/N): Y Depth (in): 2  Wetland Hydrology Present (Y/N): Y	Iron Denosits	(B5)						
Water Table Present (Y/N):  Depth (in):  Depth (in):		\-\sigma_1	-			100		
Water Table Present (Y/N):  Depth (in):  Depth (in):	Surface Wate	r Present (Y/N):	V	Depth (in): NIA				
				1.	- w	etland Hydro	ology Present (Y/N	ı):
Saturation Present (Y/N): (includes capillary fringe)  Depth (in):	Water Table F	Present (Y/N):	1	Depth (in): 2		-		
(includes capillary fringe) / Depth (in):	Saturation Pre	esent (Y/N):		Donath (in)				1
,,,,				Deptn (in):				
Notes:	Notes:							

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         ○         Sapling (<5 dbh, <6m tall)         ○         Tall shrub (2-6m)         ○         Short shrub (0.5-2m)         ○           Dwarf shrub (<0.5m)
Number of Wetland Types (M): _3 Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25">25% Scattered/Peripheral Cover"&gt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A_X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P):       Soil Lacking       Histosol:Fibric       X       Histosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perenn
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 y
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below X Only Connected Above Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)_X
Watershed Land Use: 0-5% Rural X 5-25% Urbanized 25-50% Urbanized >50% Urbanized >50% Urbanized
Size:         Small (<10 acres)         X         Medium (10-100 acres)         Large (>100 acres)

Crew Chief QA/QC check:

GPS Technician QA/QC check:

2/11

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	02
Featur	re ID: W 6 0 A T 0 5 Field Target: 086 Date: 06 - 09 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?
	Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Uegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?

#### 8. Photos

ф	Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1
1	soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

X 20 e Meadl X Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION		COY	ridor		Teleped I	Delta Process
Survey Type: Centerline Acces	ss Road (explain) Other		_	jet: <u>0 8 8</u>	Мар #: <u>60</u> м	ap Date: <u>5/27/</u> 14
Date: 06 - 09 - 14	Project Name & No.: Alask	a LNG 26221306		Feature Id:	W60HT	003
Investigators: Dan La Plant,	Zoe Meade				Team No.: W	60
State: Alaska	Region: Alaska	Milepost:	603			
Latitude: 62° 59' 38, 18	Long	gitude: 149 3	9'39.	18'	Datum: WG\$84	4
Logbook No.: OO2	Logbook Page No.:	Picture No.:	P- W60	HT-V	J, E, Pit,	Plua
SITE PARAMETERS	*				2 00	,
Subregion: interior		Landform (hi	llslope, terrac	e, hummocks	s, etc.): h i 11 S	10pe. W/
Slope (%): 15			concave, conv	-	humm	
Pre-mapped Alaska LNG/NWI classifica	tion: PSS1B	Soil Map Uni	t Name:	4.		
Are climatic/hydrologic conditions on the Yes_X No_ (if no expl	site typical for this time of year	? Are "N Yes X	lormal Circum	stances" pres	sent: lain in Notes.)	
Are Vegetation, Soil, or Hyd			(If yes, exp			
Are Vegetation, Soil, or Hyd	Irology Naturally Problem			olain in Notes.		
SUMMARY OF FINDINGS	New York	Land Hall			S CHO	
Hydrophytic Vegetation Present? Yes_	X No	Is the Sampled A	Area within a	Wetland?	Yes	NoX
Hydric Soil Present? Yes	NoX	Wetland Type:	uplar	70		
Wetland Hydrology Present? Yes	NoX	Alaska Vegetation	n Classificatio	on (Viereck):	ША1, I	TC2
Notes and Site Sketch: Please include D corridor.	Av.	erline, Length of featu	re, Distances	from Centerl	ine, Photo Location	ons, and Survey
see logbool						
4. h						
	\					
<i>y</i> 2						
	79					
						1
						1
					9	

96

20% of total cover: 17

Total Cover:\_

50% of total cover: 45

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 4 (
1.				% Dominant Species that are OBL, FACW, or FAC: 100 (A
2.				% Dominant Species that are OBL, I AGW, OH AC.
3.				
4.				Prevalence Index worksheet:
Total Cover:	_0			Total % Cover of: Multiply by:
50% of total cover	<u>O</u> 20	% of total cov	er:_ <b>0</b>	OBL species:X 1 =O
Sapling/Shrub Stratum(20)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. Spiraea Stevenii	2		FACU	UPL species 0 X 5 = 0
2. Betula nana	25	Y	FAC	Column Totals: 138 (A) 420 (B)
3. Empetrum nigrum	10	Y	FAC	PI = B/A = 3.04
4. Vaccinium vitis-idaea	T		FAC	
5. Rhodo dendron tomentosum	1		FACW	
6. Vaccinium uliginosum	10	Y	FAC	
7.				
8.				
9.				
Total Cover	47			
50% of total cover	23,5 20	% of total cov	ver: 9 · 4	
Value				
VEGETATION (use scientific names of plants	5)	d	7	
Herb Stratum ( 26	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Calamagrostis canadensis	85	Y	FAC	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Gymnocarpium dryopteris	5		FACU	Notes)
3. Cornus canadensis	T		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Anemone narcissiflora	t		FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.	,			disturbed or problematic.
6.				
7.			4	O % Bare Ground
8.				20 % Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
				O % Cover of Water

Hydrophytic Vegetation Present (Y/N):

Notes: (If observed, list morphological adaptations below):

SOIL			Date 06-14-09 Feature	ID WED	HTOOR	The second	Soil Pit Required (Y/N)
	E DESCRIPTION: (		to the depth needed to do			confirm the absence	
	Matrix	50001150	Redox Features	ournoin in	o maioator or		- Indisals.
Depth (inches)	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0 - 2		1	(*****			Fibric	organi c
2-6 /	>					511+ 100m	
2-22	10 YR 4/1	100			1	Silt loam -	Haravel mix
`	-7.5 YR 2-5/1	100					
				1			
					_	2	
		etion, RM	I=Reduced Matrix, CS=Co	vered or C	oated Sand (		PL=Pore Lining, M=Matrix.
	INDICATORS		144 1 24 1442		200		FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed (A13)				hange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)				Swales (TA5)
	/3)		Alaska Gleyed Pores	s (A15)			with 2.5Y Hue without 5Y Hue or Redder Underlying
Hydrogen Sul	fide (A4)					Layer	— — — — — — — — — — — — — — — — — — —
	ırface (A12)					Other (Explain	
°One indicator disturbed or p		etation, o	ne primary indicator of wet	land hydro	logy, and an	appropriate landsca	pe position must be present unless
⁴Give details o	of color change in No	otes.					
Restrictive La	yer (if present): Typ	e:	Depth	(inches):			
	resent (Y/N):	N					
HYDROLOGY	PRIMARY INDICA	TORS (a	ny one indicator is sufficie	nt)	SECONDA	RY INDICATORS (2	
Surface Wate	г (А1)		face Soil Cracks (B6)		Water-staine Leaves (B9)	ed 	Stunted or Stressed Plants (D1)
High Water Ta	able (A2)		ndation Visible on Aerial Ir	magery	Drainage Pa	atterns (B10)	Geomorphic Position (D2)
Saturation (A3	3)	Spa	arsely Vegetated ncave Surface (B8)		Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
Water Marks	(B1)		rl Deposits (B15)	_	Presence of		Microtopographic Relief (D4)
Sediment Dep	posits (B2)		drogen Sulfide or (C1)			ts (C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)	Dry Wa	r-Season ter Table (C2)		Notes:		
Aigal Mat or C	Crust (B4)	_ Oth	ner (Explain in Notes):		-		
Iron Deposits	(B5)			_			
				1-			
	r Present (Y/N):		Depth (in):				N. N
Surface Wate				1 14			
	Present (Y/N): N		Depth (in):	W	etland Hydr	ology Present (Y/N	1):

VEGETATION VARIABLES P= Plot, M	1= Matrix
Forested-Evergreen-Needle-leaved	Scrub Shrub-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Short herb (<1m) Moss-Lichen Floating Submerged
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or d or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance (Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and interspersion (P): Low (large High (small groupings))	patches, concentric rings) Moderate (broken irregular rings)ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	
	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S	onally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Created	ce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No O	verbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow	
	rcumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading : High Permeability Stratified Deposits Low Permeability Stratified Deposits
- / <del>- /-</del>	Gradient (<2%) High Gradient (≥2%) ps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isolate Only Connected Above Connected	d Wetlands within 400m, Not Connected Only Connected Below I Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., a	g.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural	5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Mediu	ım (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check:	GPS Technician QA/QC check: Page 4 of 4

### Wetland Determination Data Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: <u>(1)60 HT 063</u> Field Target: 88 Date: 6/9/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?
	All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?
	Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  ☐ Each logbook page is initialed and dated?
7.	Mapş
	Wetland boundaries have been corrected if necessary?

Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION						
Survey Type: Centerline Acces	s Road (explain)	Other (expl	ain)	Field Target:	/33	Map #: <u>93</u> Map Date: <u>5/27/19</u>
Date: 06-10-14	Project Name & No.:		26221306	Fe	eature Id:	W60HT 004
Investigators: Dan La Plant	, Zoe Mead	de				Team No.: W60
State: Alaska	Region: Alaska		Milepost: /	24		
Latitude: 62°27'02.0	2 "	Longitude	: 1500 16	15.34	<i>  ''</i>	Datum: WGS84
Logbook No.: 002	Logbook Page No.:	005	Picture No.:	PW6 OHI	004_	E, S. PH, Plug
SITE PARAMETERS		M. WAT			10-	The second second
Subregion: Interior			Landform (hills	slope, terrace, h	ummocks	s, etc.): Slight hammicck
Slope (%): 0 - 3			Local relief (co	oncave, convex	none):	CONCAVE
Pre-mapped Alaska LNG/NWI classificat	ion: PSS2 / EN	11.C	Soil Map Unit	Name:		
Are climatic/hydrologic conditions on the Yes No (if no expla	site typical for this time in in Notes)	e of year?		rmal Circumsta No		
Are Vegetation, Soil, or Hyd	rologySignifican	tly Disturbed?	No_X	_(If yes, explain	in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally I	Problematic?	NoX_	_ (If yes, explain	in Notes	)
SUMMARY OF FINDINGS	E-21/4-21	Harris	L	Company of the		
Hydrophytic Vegetation Present? Yes	X No	ls	the Sampled A	rea within a W	etland?	YesX No
Hydric Soil Present? Yes	X No	We	etland Type: 🎉	351/6	M.J.	$\mathcal{B}$
Wetland Hydrology Present? Yes	X No	Ala	ska Vegetation	Classification (	√iereck):	II C2, III A2
Notes and Site Sketch: Please include Discorridor.  See Ska	rectional & North Arrow					

<u>Tree Stratum</u> (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3  Total Number of Dominant Species Across All Strata: 3
1,				% Dominant Species that are OBL, FACW, or FAC: 100 (
2.				(A Dominant Species that are OBE, 1 AOV, 011 AO.
3.				
4.				Prevalence Index worksheet:
Total Cover:	0		1	Total % Cover of: Multiply by:
50% of total cover:	<u> </u>	% of total cov	rer:O	OBL species: 48 X1 = 48
Sapling/Shrub Stratum(26°)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:       35       X2 = 70         FAC species       52       X3 = 156         FACU species       0       X4 = 0
1. Picea mariana	20	У	FACW	UPL species
2. Betula nana	15		FAC	Column Totals: 135 (A) 274 (B)
3. Vaccinium oxycoccus	5		OBL	PI = B/A = 2.03
4. Chamaedaphne Calycula	ta 2		FACW	
5. Rhododendron tomentosum			FACW	
6. Empetrum nigrum	30	Y	FAC	
7.				
8.				
9.				
Total Cause	760			
Total Cover:		% of total cov	ver: 15,2	
50% of total cover:	)	r		Liver about a Variation in directors
50% of total cover:		Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%
50% of total cover:	Absolute	Dominant	Indicator	X Dominance Test is > 50% X Prevalence Index is ≤ 3.0
VEGETATION (use scientific names of plants  Herb Stratum ( Z6' )  1. Equise fum arvense	Absolute	Dominant Species?	Indicator Status	Dominance Test is > 50%
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum (	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
50% of total covers  VEGETATION (use scientific names of plants  Herb Stratum ( Z6' )  1. Equise fum arvense 2. Drosera rotundifalia 3. Rulous Chamaemorow	Absolute % Cover	Dominant Species?	Indicator Status FAC 0BL FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
VEGETATION (use scientific names of plants Herb Stratum ( ZG' )  1. Equise fum arvense 2. Drosera rotundifolia 3. Rubus Chamaemorow 4. Pedicularis labridorica	Absolute % Cover	Dominant Species?	Indicator Status FAC	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
50% of total covers  VEGETATION (use scientific names of plants  Herb Stratum ( ZG' )  1. Equise fum arvense 2. Drosera rotundifolia 3. Rulous Chamaemorows  4. Pedicularis labridorica 5. Carex microglochim	Absolute % Cover	Dominant Species?	Indicator Status  FAC  OBL  FACW  FACW  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
VEGETATION (use scientific names of plants Herb Stratum ( ZG' )  1. Equise fum arvense 2. Drosera rotundifolia 3. Rubus Chamaemorow 4. Pedicularis labridorica	Absolute % Cover	Dominant Species?	Indicator Status  FAC  OBL  FACW  FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
50% of total covers  VEGETATION (use scientific names of plants  Herb Stratum ( Z6' )  1. Equise fum arvense 2. Drosera rotundifalia 3. Rulous Chamaemorous 4. Pedicularis labridorica 5. Carex microglochin 6. Carex limosa	Absolute % Cover	Dominant Species?	Indicator Status  FAC  OBL  FACW  FACW  OBL	X   Dominance Test is > 50%   X   Prevalence Index is ≤ 3.0   Morphological Adaptations¹ (Provide supporting data in Notes)   Problematic Hydrophytic Vegetation¹ (Explain)   Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Equise fum arvense 2. Drosera rotundifolia 3. Rubus Chamaemorous 4. Pedicularis labridorica 5. Carex microglo Chim 6. Carex limosa 7.	Absolute % Cover	Dominant Species?	Indicator Status  FAC  OBL  FACW  FACW  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Equise tum arvense 2. Drosera rotundifalia 3. Rulous Chamaemorous 4. Pedicularis labridorica 5. Carex microglo chim 6. Carex limosa 7. 8. 9.	Absolute % Cover	Dominant Species?	Indicator Status  FAC  OBL  FACW  FACW  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  O % Bare Ground  O % Bare Ground  O % Cover of Wetland Bryophytes  Total Cover of Bryophytes  Cover of Water
1. Equise fum arvense 2. Drosera rotundifalia 3. Rulous Chamaemorous 4. Pedicularis labridorica 5. Carex microglochim 6. Carex limosa 7. 8.	Absolute % Cover  7 1 2 40 3	Dominant Species?	Indicator Status  FAC  OBL  FACW  FACW  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Bare Ground  Company Cover of Wetland Bryophytes  Total Cover of Bryophytes

SOIL PROF	0.0 - 0.0		Daday Frature			
Depth	Matrix	-	Redox Features	1 1 2		
inches)	Color (moist)	%	Color (moist) % Ty	pe <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
5-22					— Histi€	organics
					Fibric	
		-				
		-				
				-		
Type: C=C	ncentration D=Depl	etion R	M=Reduced Matrix, CS=Covered	or Coated San	d Grains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
	IL INDICATORS					FOR PROBLEMATIC HYDRIC SOIL
	listel (A1)		Alaska Gleyed (A13)			hange (TA4) <sup>4</sup>
	don (A2)		Alaska Redox (A14)			Swales (TA5)
	(A3)		Alaska Gleyed Pores (A15			with 2.5Y Hue
			Alaska Gieyea i Gies (A IS	' <del></del>		without 5Y Hue or Redder Underlying
	ulfide (A4)				Layer	
	Surface (A12)				Other (Explain	
	or of hydrophytic veg problematic.	etation, c	one primary indicator of wetland h	ydrology, and a	n appropriate landsca	ape position must be present unless
Otton Hadelin		otes.				
Restrictive L	ayer (if present): Typ	e:	Depth (inche	s):		
	Present (Y/N):	Y				
	Present (Y/N):	Y				
Notes:			any one indicator is sufficient)	SECOND	ARY INDICATORS (2	or more required)
Notes:		TORS (	<u> </u>	Water-sta		Stunted or Stressed
Notes:  HYDROLOG  Surface Wat	SY PRIMARY INDICA	Su	any one indicator is sufficient)  rface Soil Cracks (B6)	Water-sta Leaves (B	ned	Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Surface Wat  High Water	er (A1)X	Su Su Inu - (B	any one indicator is sufficient)  rface Soil Cracks (B6)	Water-sta Leaves (B	ned 9) Patterns (B10) Rhizospheres along	Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Surface Wat  High Water T	er (A1)	Su Inu - (B Sp Co	any one indicator is sufficient)  rface Soil Cracks (B6) undation Visible on Aerial Imagery 7)	Water-sta Leaves (B Drainage Oxidized F Living Roo	ned 9) Patterns (B10) Rhizospheres along	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Notes:  HYDROLOG  Surface Wat  High Water T  Saturation (A	er (A1)	Su International Survey (B) Sp Co	any one indicator is sufficient)  rface Soil Cracks (B6) undation Visible on Aerial Imagery 7) arsely Vegetated ancave Surface (B8)	Water-sta Leaves (B Drainage Oxidized F Living Roc Presence Iron (C4)	Patterns (B10) Rhizospheres along	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Wat High Water T Saturation (A Water Marks	er (A1)  Fable (A2)  A3)	Su Su Inu (B Sp Co Ma	any one indicator is sufficient)  rface Soil Cracks (B6) undation Visible on Aerial Imagery 7) earsely Vegetated encave Surface (B8) arl Deposits (B15)	Water-sta Leaves (B Drainage Oxidized F Living Roc Presence Iron (C4)	Patterns (B10) Rhizospheres along of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water T Saturation (A Water Marks Sediment De	er (A1)  Fable (A2)  A3)  (B1)  eposits (B2)	Su International	any one indicator is sufficient)  Inface Soil Cracks (B6)  undation Visible on Aerial Imagery  7)  arrsely Vegetated ancave Surface (B8)  arl Deposits (B15)  drogen Sulfide dor (C1)  y-Season	Water-sta Leaves (B Drainage Oxidized F Living Rod Presence Iron (C4)	Patterns (B10) Rhizospheres along of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water T Saturation (A Water Marks Sediment De Drift Deposit	er (A1)	Su International	any one indicator is sufficient)  rface Soil Cracks (B6) undation Visible on Aerial Imagery 7) earsely Vegetated oncave Surface (B8) arl Deposits (B15) drogen Sulfide dor (C1) y-Season ater Table (C2)	Water-sta Leaves (B Drainage Oxidized F Living Rod Presence Iron (C4)	Patterns (B10) Rhizospheres along of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOG  Surface Wat  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposit  Algal Mat or  ron Deposits	er (A1)	Su International	any one indicator is sufficient)  Inface Soil Cracks (B6)  Indation Visible on Aerial Imagery  Inface Soil Cracks (B8)  Inface Sufface (B8)  Inface Sufface (B8)  Inface Sufface (B15)  Inface Soil Cracks (B6)  Inface Soil Cracks (B6)	Water-sta Leaves (B Drainage Oxidized F Living Rod Presence Iron (C4) Salt Depo Notes:	Patterns (B10) Rhizospheres along sts (C3) of Reduced sits (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOG  Surface Wat  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposit  Algal Mat or  ron Deposits	er (A1)	Su International	any one indicator is sufficient)  rface Soil Cracks (B6) undation Visible on Aerial Imagery 7) earsely Vegetated oncave Surface (B8) arl Deposits (B15) drogen Sulfide dor (C1) y-Season ater Table (C2)	Water-sta Leaves (B Drainage Oxidized F Living Roc Presence Iron (C4) Salt Depo Notes:	Patterns (B10) Rhizospheres along its (C3) of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or ron Deposits	er (A1)	Su International	any one indicator is sufficient)  Inface Soil Cracks (B6)  Indation Visible on Aerial Imagery  Inface Soil Cracks (B8)  Inface Sufface (B8)  Inface Sufface (B8)  Inface Sufface (B15)  Inface Soil Cracks (B6)  Inface Soil Cracks (B6)	Water-sta Leaves (B Drainage Oxidized F Living Roc Presence Iron (C4) Salt Depo Notes:	Patterns (B10) Rhizospheres along sts (C3) of Reduced sits (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water High Water Marks Sediment De Drift Deposite Algal Mat or Iron Deposite Surface Water Water Table Saturation P	er (A1)  Fable (A2)  (B1)  eposits (B2)  Crust (B4)  s (B5)  er Present (Y/N):	Su International	any one indicator is sufficient)  rface Soil Cracks (B6) undation Visible on Aerial Imagery 7) arsely Vegetated encave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season eter Table (C2) ther (Explain in Notes):  Depth (in): Z" Before a	Water-sta Leaves (B Drainage Oxidized F Living Roc Presence Iron (C4) Salt Depo Notes:	Patterns (B10) Rhizospheres along its (C3) of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Ø       Sapling (<5 dbh, <6m tall)       Ø       Tall shrub (2-6m)       Ø       Short shrub (0.5-2m)       Ø         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)       High Density (60-80%)       High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A_X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)        Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
POU VARIADI ES
Soil Variables  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol:
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Outlet Perennial Inlet/No Ou
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitte
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitt
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Per
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitt
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitt
Inlet/Outlet Class (P): No Inlet/Outlet

GPS Technician QA/QC check:

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: WGOHTOO 4 Field Target: 133 Date: 06 - 10 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>☑ Vegetation names are entered legibly for all strata present?</li> <li>☑ Cover calculations are complete and correct?</li> <li>☑ All dominant species have been determined and recorded per strata?</li> <li>☑ Indicator status is correct for each species?</li> <li>☑ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>✓ Appropriate hydrology indicators are marked?</li> <li>✓ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps "
	☐ Wetland boundaries have been corrected if necessary? ☐ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

X youmende

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION				
Survey Type: Centerline Acces	ss Road (explain) Other (e	explain)X	Field Target: 136	Map #: <u>94</u> Map Date: <u>5/27/</u> 14
Date: () () =   () =	Project Name & No.: Alaska L		Feature Id	:W60117 005
Investigators: Dan La Pla	int, Zoe Meac	le		Team No.: W6.0
State: Alaska	Region: Alaska	Milepost:	124	
Latitude: 0 62° 26' 43.8	Longitude	ude: /50°/6	6 8.709 "	Datum: WGS84
Logbook No.: 0 () 2	Logbook Page No.: 00 6	Picture No.:	P_ N. E. Pi	t, plug
SITE PARAMETERS				
Subregion: 1 11 1 (11 0)		Landform (hill	Islope, terrace, hummock	e etc).
Slope (%): 0 - 3			oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	tion: wekind	Soil Map Unit		concarc
Are climatic/hydrologic conditions on the	site typical for this time of year?		ormal Circumstances" pre	esent:
Yes No (if no explain		Yes_X		
Are Vegetation, Soil, or Hyd		<u>.</u>	_(If yes, explain in Notes	
Are Vegetation, Soil, or Hyd	rology Naturally Problemati	c? No	_ (If yes, explain in Notes	1.)
Hydrophytic Vegetation Present? Yes_	Y N-			
Hydrophytic vegetation Present? Yes_	NO	Is the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	X No	Wetland Type:	P5513	
Wetland Hydrology Present? Yes	<u>X</u> No	Alaska Vegetation	Classification (Viereck):	ILB2
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow, Centerlin	ne, Length of featur	e, Distances from Center	rline, Photo Locations, and Survey
	eafth in Logb	sok St	oz paje	006

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:
1.			V	Total Number of Dominant Species Across All Strata: 2
2.				% Dominant Species that are OBL, FACVV, of FAC(
3.				4 7 -
4.				Prevalence Index worksheet:
Total Cover:				Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	er:	OBL species: X1 = 0
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. Salex alaxensis	80	У	FAC	
2 Alnus SSP.	3		FAC	UPL species
3. Viburnum edule	3		FACU	PI = B/A =
4. Rubus parviflorus	3		FACU	
5.				
				1
D.				
7,,				
7 <sub>*</sub> 8. 9.				
7. 8. 9. Total Cover: 50% of total cover:	पठ. <b>5</b> 20	0% of total cov	ver: 18.2	
7. 8. 9. Total Cover: 50% of total cover: VEGETATION (use scientific names of plants)	<u> प्र.5</u> 20		·	
7. 3. 9. Total Cover: 50% of total cover: VEGETATION (use scientific names of plants)	पठ. <b>5</b> 20	Dominant Species? (Y/N)	rer: 18.2 Indicator Status	Hydrophytic Vegetation Indicators:X Dominance Test is > 50%
Total Cover: 50% of total cover:  /EGETATION (use scientific names of plants)	15.5 20     Absolute	Dominant Species?	Indicator Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0
Total Cover:_ 50% of total cover:_ VEGETATION (use scientific names of plants	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0
Total Cover:  50% of total cover:  VEGETATION (use scientific names of plants)  Herb Stratum ()  1-Calamagrostis Canadensis	45.5 20   Absolute % Cover   9.0     5	Dominant Species?	Indicator Status	<ul> <li>X Dominance Test is &gt; 50%</li> <li>Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in</li> </ul>
7. 8. 9. Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ()  1 Calamagrostis Canadensis 2 Chamerion angustofolium 3. Viola epipseta palustris	Absolute % Cover	Dominant Species?	Indicator Status FAC FAC U	<ul> <li>X Dominance Test is &gt; 50%</li> <li>Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> <li>Problematic Hydrophytic Vegetation¹ (Explain)</li> <li>¹ Indicators of hydric soil and wetland hydrology must be present unless</li> </ul>
7. 8. 9. Total Cover: 50% of total cover: 50% of total cover:  VEGETATION (use scientific names of plants; Herb Stratum ()  1. Calamagrostis Canadensis 2. Chamerion angustofolium 3. Viola epiaseta palustris 4. Equisetum arvense	45.5 20   Absolute % Cover   9.0     5	Dominant Species?	Indicator Status FAC FAC U	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes)
7. 8. 9. Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ()  1. Calamagrostis Canadensis 2. Chamerion angustofolium 3. Viola coia eta palustris	Absolute % Cover 9 0	Dominant Species?	Indicator Status  FAC FAC U FAC W FAC	<ul> <li>X Dominance Test is &gt; 50%</li> <li>Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> <li>Problematic Hydrophytic Vegetation¹ (Explain)</li> <li>¹ Indicators of hydric soil and wetland hydrology must be present unles</li> </ul>
Total Cover:  50% of total cover:  50% of total cover:  VEGETATION (use scientific names of plants)  Herb Stratum ()  1. Calamagrostis Canadensis 2. Chamerion angustofolium 3. Viola epia eta palustris 4. Equisetum arvense 5. Mertensia paniculata 6. Echimo panaxii Horridum	Absolute % Cover 9 0	Dominant Species?	Indicator Status  FAC FACU FACW FACW FAC	
Total Cover:  50% of total cover:  50% of total cover:  VEGETATION (use scientific names of plants)  Herb Stratum ()  1. Calamagrostis Canadensis 2. Chamerion angustofolium 3. Viola epia eta palustris 4. Equisetum arvense 5. Mertensia paniculata 6. Echimo panaxii Horridum	Absolute % Cover 9 0	Dominant Species?	Indicator Status  FAC FACU FACW FACW FAC	
7.  8.  9.  Total Cover: 50% of total cover: 50% of total cover:  VEGETATION (use scientific names of plants)  Herb Stratum ()  1. Calamagrostis Canadensis 2. Chamerion angustofolium 3. Viola epia eta palustris 4. Equisetum arvense 5. Mertensia paniculata 6. Echimo panaxiii Horvidum 7. Opto panax	Absolute % Cover 9 0	Dominant Species?	Indicator Status  FAC FACU FACW FACW FAC	
1. Calamagrostis Canadensis 2. Chamerion angustofolium 3. viola pointeda palustris 4. Equisetum arvense 5. Mertensia paniculata 6. Echino panaxan Horridum 7. O plo panax 8.	Absolute % Cover 9 0	Dominant Species?	Indicator Status  FAC FACU FACW FACW FAC	

**Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.  **HYDRIC SOIL INDICATORS**    INDICATORS FOR PROBLEMATIC HYDRIC SOILS**   Histors of Hister (A1)	SOIL			Date Fe	ature II	WGDH	1005		Soil Pit Required (Y/N)
(inches) Color (moisl) % Color (moisl) % Type* Loc² Texture Notes  0 - 2 - 1	SOIL PROFI	LE DESCRIPTION: (	Describe	e to the depth needed	to docu	ment the	indicator or	confirm the absence	e of indicators.)
O - 2	Depth	Matrix		Redox Features					
9 - 2 2 10 YR 5 8 50 SIV 1/V 50 C M SIH Clay 9 - 2 2 10 YR 5 8 50 SIV 1/V 50 C M SIH Clay 1 Type: C=Concentration, D=Depleton, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRO SOUI. NDICATORS Histosol or Histel (A1) Alaska Gleyed (A13) Alaska Color Change (TA4)* Histic Epipadon (A2) Alaska Redox (A14) Alaska Gleyed Fores (A15) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue Hydrogen Suffide (A4) Alaska Gleyed Fores (A15) Alaska Gleyed without 5Y Hue Thick Dark Surface (A12) Other (Explain in Notes)  Toke Inches of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problemate. Grice details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N): Depth (inches):  Hydric Soil Present (A1) Surface Soil Cracks (B5) Leaves (B9) Sparsely Vegetated Concave Surface (B8) Concave Surface (B8) Dring Roots (C3) Shallow Aquiterd (D3) Leaves (B1) Mar Deposits (B15) Presence of Reduced Microtopographic Rolled (D4) Grocove Surface (B8) Dry-Season Water Table (C2) Water Present (Y/N): Depth (in): Surface Water Present (Y/N): Depth (in): Depth (in): Surface Water Present (Y/N): Depth (in): Depth (in): Surface Water Present (Y/N): Depth (in): Object (Explain in Notes): Depth (in): Obje	(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.   *Location: PL=Pore Lining, M=Matrix.	0-2				=		1	Fibric	organi es
Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL INDICATORS   NIDICATORS FOR PROBLEMATIC HYDRIC SOILS*	2-9	107R 4/1							T T
'Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL NDICATORS    Alaska Gleyed (A13)   Alaska Gleyed (A13)   Alaska Gleyed (A13)   Alaska Gleyed (A13)   Alaska Gleyed (A14)   Alaska Alpine Swales (TA5)	9-22	10YR 5/8	50	G164141561	50		M	Silt Clay	
Histoso or Histel (A1) Alaska Gleyed (A13) Alaska Color Change (TA4)* Histos Epiedon (A2) Alaska Redox (A14) Alaska Color Change (TA4)* Histos Epiedon (A2) Alaska Redox (A14) Alaska Redox with 2.57 Hue Histos Epiedon (A2) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Alaska Redox with 2.57 Hue Orbital Charles (A12) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Orbital Charles (A12) Alaska Gleyed Without 5Y Hue Orbital Charles (A12) Alaska Gleyed Without 5Y Hue Orbital Charles (A12) Other (Explain in Notes) Other (Explain in No				564 4/1/				7	
Histoso or Histel (A1) Alaska Gleyed (A13) Alaska Color Change (TA4)* Histos Epiedon (A2) Alaska Redox (A14) Alaska Color Change (TA4)* Histos Epiedon (A2) Alaska Redox (A14) Alaska Redox with 2.57 Hue Histos Epiedon (A2) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Alaska Redox with 2.57 Hue Orbital Charles (A12) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Orbital Charles (A12) Alaska Gleyed Without 5Y Hue Orbital Charles (A12) Alaska Gleyed Without 5Y Hue Orbital Charles (A12) Other (Explain in Notes) Other (Explain in No				,					
Histos Or Histel (A1)									
Histosol or Histel (A1) Alaska Gleyed (A13) Alaska Color Change (TA4) Histosol or Histel (A1) Alaska Color Change (TA4) Alaska Color Change (TA4) Alaska Color Change (TA4) Alaska Color Change (TA4) Alaska Chipme Swales (TA5) Alaska Chipme Swales (TA5) Alaska Redox (A14) Alaska Redox with 2.57 Hue Alaska Redox with 2.57 Hue Orbital Charles (A3) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Orbital Charles (A4) Alaska Gleyed Without 57 Hue or Redder Underlying Layer Orbital Charles (A4) Alaska Gleyed Without 57 Hue or Redder Underlying Layer (Chipme Charles) Orbital Charles (A4) Alaska Gleyed Without 57 Hue or Redder Underlying Layer (Chipme Charles) Orbital Charles (A4) Orbital Charles (A4) Alaska Gleyed Without 57 Hue or Redder Underlying Layer (Chipme Charles) Orbital Charles (A4) Orbital Charles (A4) Alaska Gleyed Without 57 Hue or Redder Underlying Layer (Chipme Charles) Orbital Charles (A4) Orbital Charles (A									
Histosol or Histel (A1)	<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RI	M=Reduced Matrix, C	S=Cove	red or Co	ated Sand G	Grains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
Histic Epipedon (A2)	HYDRIC SO	IL INDICATORS						INDICATORS I	FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
Black Histo (A3)				Alaska Gleyed	(A13) _	×		Alaska Color C	hange (TA4) <sup>4</sup>
Black Histo (A3) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Hydrogen Sulfide (A4) Alaska Gleyed Pores (A15) Alaska Redox with 2.57 Hue Hydrogen Sulfide (A4) Other (Explain in Notes)  Alaska Gleyed without 5Y Hue or Redder Underlying Layer Other (Explain in Notes)  Depth (inches):  Hydric Soil Present (Y/N):  Depth (inches):  Hydric Soil Present (Y/N):  Notes:  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Plants (D1)  High Water Table (A2) [Inundation Visible on Aerial Imagery (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Saturation (A3) Mart Deposits (B15) Presence of Reduced Inco (C4) Relief (D4)  Water Marks (B1) Mart Deposits (B3) Dry-Season Water Table (C2) Notes:  Water Table Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):  Mater Table Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Mater Table Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Mater Table Present (Y/N):  Depth (in):	Histic Epiped	lon (A2)		Alaska Redox	(A14) _	X		Alaska Alpine S	Swales (TA5)
Layer X   Layer X   Layer X   Layer X   Layer X   Layer X   Layer (Explain in Notes)				Alaska Gleyed	Pores (	A15)		Alaska Redox v	vith 2.5Y Hue
Thick Dark Surface (A12) Cither (Explain in Notes)  'One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.  'Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes:  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Stunted or Stressed Leaves (B9) Plants (D1)  High Water Table (A2) (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) Living Roots (C3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Presence of Reduced Iron (C4) Relief (D4)  Proposits (B3) Dry-Season Water Table (C2) Other (Explain in Notes):  Wetland Hydrology Present (Y/N): Depth (in): Other (Explain in Notes):	Hydrogen Su	Ilfide (A4)							
**Cons Indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type:    Depth (inches):									
disturbed or problematic.   Give details of color change in Notes.  Restrictive Layer (if present): Type:				one primary indicator o	of wetlar	nd hydrolo	ogy, and an a		
Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes:  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Stunted or Stressed Plants (D1)  High Water Table (A2) Inundation Visible on Aerial Imagery (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Wetland Hydrology Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Obepth (in)	disturbed or p	problematic.		, , , , , , , , , , , , , , , , , , ,			- <del> </del>		po poetion must be precent amous
Notes:  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Plants (D1)  High Water Table (A2) Inundation Visible on Aerial Imagery (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Drift Deposits (B3) Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Wetland Hydrology Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Open (In)	Give details Restrictive La	of color change in No	otes.		enth (in	ches).			
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  Drift Deposits (B3) Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Open	T COULTOUT C	ayer (ii present). Typ	·		cptii (iii				
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  Drift Deposits (B3) Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Open	Hydric Soil F	Present (Y/N):	Y						
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Stunted or Stressed Plants (D1) Plants (D2)			19						
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) Inundation Visible on Aerial Imagery (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Dry-Season Water Table (C2) Notes:  Dry-Season Water Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Gaturation Present (Y/N): Gaturation Present (Y/N): Depth (in): Gaturation Present (Y/N): Gaturation Present (Y/N	Notes:								
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) [Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Geomorphic Position (D2)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Microtopographic Relief (D4)  Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  Drift Deposits (B3) Dry-Season Water Table (C2) Notes:  Surface Water Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Open (in): Ope									
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) [Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Geomorphic Position (D2)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Hydrogen Sulfide Cdor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  Drift Deposits (B3) Dry-Season Water Table (C2) Notes:  Surface Water Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Gaturation Present (Y/N): Depth (in): Depth (in): Gaturation Present (Y/N): Depth (in): Depth (in): Gaturation Present (Y/N): Depth (in): Gaturation Present (Y/N): Depth (in): Depth (in): Gaturation Present (Y/N): Gaturation Present (Y/									
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  High Water Table (A2) [B7] Drainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Drainage Patterns (B10) Geomorphic Position (D2)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Pry-Season Water Table (C2) Notes:  Dry-Season Water Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Graturation Presen	HYDROLOG	Y PRIMARY INDICA	TORS (	any one indicator is su	ufficient)		SECONDAR	Y INDICATORS (2	or more required)
Surface Water (A1) Surface Soli Cracks (B6) Leaves (B9) Plants (D1) Leaves (B1) Leaves (B1						,			
Saturation (A3) Sparsely Vegetated Concave Surface (B8) Shallow Aquitard (D3) Shallow Aq	Surrace vvate	er (A1)				— I			
Saturation (A3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)	High Water T	able (A2)			rial Ima	gery [	Drainage Pat	terns (B10)	Geomorphic Position (D2)
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Microtopographic Relief (D4) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Presence of Reduced Iron (C4) Relief (D4) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Presence of Reduced Iron (C4) Relief (D4)									
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Microtopographic Relief (D4)  Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5) Depth (in):  Water Table Present (Y/N): Depth (in):  Water Table Present (Y/N): Depth (in): Depth (in): Obeth (in): Depth (in): Obeth (in	Saturation (A	.3)	Co	ncave Surface (B8) _		_   `	iving Roots	(C3)	Shallow Aquitard (D3)
Sediment Deposits (B2)	Water Marks	(B1)	Ma	arl Denosite (R15)		F	Presence of		Microtopographic
Drift Deposits (B3) Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5) Depth (in):  Water Table Present (Y/N):  Water Table Present (Y/N):  Depth (in):  Saturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):		(81)					ron (C4)		Relief (D4)
Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5) Depth (in):  Surface Water Present (Y/N): Depth (in):  Water Table Present (Y/N): Depth (in):  Saturation Present (Y/N): Depth (in):  Saturation Present (Y/N): Depth (in): Other (Explain in Notes):	Sediment De	posits (B2)				5	Salt Deposits	(C5)	FAC-Neutral Test (D5)
Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5)  Surface Water Present (Y/N): Depth (in):  Water Table Present (Y/N): Depth (in):  Saturation Present (Y/N): Depth (in):  Saturation Present (Y/N): Depth (in):						1	Votes:		
Surface Water Present (Y/N):  Water Table Present (Y/N):  Depth (in):  Saturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	Drift Deposits	s (B3)					.0.001		
Surface Water Present (Y/N):  Water Table Present (Y/N):  Depth (in):  Saturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	Algal Mat or (	Cruet (RA)	Oti	her (Evolain in Notes)					
Surface Water Present (Y/N):  Water Table Present (Y/N):  Depth (in):  Saturation Present (Y/N):  Depth (in):  Depth (in):			-   011	Tier (Explain in Notes)					
Water Table Present (Y/N):  Saturation Present (Y/N): (includes capillary fringe)  Depth (in):  Depth (in):	Iron Deposits	(B5)							
Water Table Present (Y/N):  Saturation Present (Y/N):  (includes capillary fringe)  Depth (in):  Wetland Hydrology Present (Y/N):  Depth (in):					90			The same	LYR THE THE LANGE
Water Table Present (Y/N):  Saturation Present (Y/N): (includes capillary fringe)  Depth (in):  Depth (in):	Surface Wate	er Present (Y/N):	NO	Depth (in):					Y
(includes capillary fringe)	Water Table		v.	Depth (in):	11	We	tland Hydro	ology Present (Y/N)	):
Notes:			45	Depth (in):					
	Notes:	1	2	1					

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):     Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Clayey
Ministal. Stationy Ministal. Salay Ministal. Salay
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet
Telefinida inicia editet
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs  Return Interval >5 yrs Restricted Outflow Unrestricted Outflow
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs  Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated         Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment         Evidence of Sedimentation (P): No Evidence Observed       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment         Created         Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.)       Well Developed (6-18in.)       Pronounced (>18in.)         Frequency of Overbank Flooding (P): No Overbank Flooding       Return Interval 1-2 yrs       Return Interval 2-5 yrs         Return Interval Pyrs       Restricted Outflow       Unrestricted Outflow         Water pH (P): No surface water       Circumneutral (5.5-7.4)       Alkaline (>7.4)       Acid (<5.5)
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (>2%)  Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring  LANDSCAPE VARIABLES (M)
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated         Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment         Evidence of Sedimentation (P): No Evidence Observed       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment         Created         Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.)       Well Developed (6-18in.)       Pronounced (>18in.)         Frequency of Overbank Flooding (P): No Overbank Flooding       Return Interval 1-2 yrs       Return Interval 2-5 yrs         Return Interval Pyrs       Restricted Outflow       Unrestricted Outflow         Water pH (P): No surface water       Circumneutral (5.5-7.4)       Alkaline (>7.4)       Acid (<5.5)
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Pronounced
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)

Crew Chief QA/QC check:

2m

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W60HT005 Field Target: # 136 Date: 06-10-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>☑ Vegetation names are entered legibly for all strata present?</li> <li>☑ Cover calculations are complete and correct?</li> <li>☑ All dominant species have been determined and recorded per strata?</li> <li>☑ Indicator status is correct for each species?</li> <li>☑ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

Signature / Date

Field Crew Chief (print)

Signature / Date

# soil check

# WETLAND DETERMINATION DATA FORM



Soils check

S - IO   S - IV   S	SOIL			Date 1214 Fea	- 14	-			Soll Plt Required (Y/N)
Color (moist)   %   Color (moist)   %   Type¹   Loc²   Texture   Notes	SOIL PROFIL	E DESCRIPTION: (	Describe	to the depth needed	to docum	ent the	indicator or	confirm the absence	e of indicators.)
D - 5	Depth	Matrix		Redox Features					
Second Present (Y/N):   Surface Water Table (A2)   Surface Soil Cracks (B6)   Leaves (B9)   Surface Present (Y/N):   Surface Water Table (A2)   Surface (B8)   Concave (B	(inches)	Color (moist)	%	Color (moist)	% T	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
10 YR 2 / 2	0-5								organic
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.	5-10								organic
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.		10 YR 2/2							, , , , , , , , , , , , , , , , , , , ,
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore HYDRIC SOIL INDICATORS  Histosol or Histel (A1)		5 y 4/1				С		silt loam	
HYDRIC SOIL INDICATORS Histosol or Histel (A1)	16-20	10YR 5/2	10YR 416	50	C	PL	4 -		
HYDRIC SOIL INDICATORS Histosol or Histel (A1)									
HYDRIC SOIL INDICATORS Histosol or Histel (A1)									
Histosol or Histel (A1)	<sup>1</sup> Type: C=Con	centration, D=Deple	tion, RM	=Reduced Matrix, CS	S=Covere	d or Co	ated Sand C		PL=Pore Lining, M=Matrix.
Histic Epipedon (A2) X Alaska Redox (A14) Alaska Alpine Swales (TA Black Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without 5Y Layer  Hydrogen Sulfide (A4) Alaska Gleyed Pores (A15) Other (Explain in Notes)  Thick Dark Surface (A12) Other (Explain in Notes)  Thick Dark Surface (A12) Other (Explain in Notes)  To indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position disturbed or problematic.  **Cive details of color change in Notes.**  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes:  **HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient) SECONDARY INDICATORS (2 or more result of the property of the property in the pr	HYDRIC SOIL	INDICATORS	11						FOR PROBLEMATIC HYDRIC SOILS
Hydrogen Sulfide (A4)									
Hydrogen Sulfide (A4)	Histic Epipedo	n (A2)X		Alaska Redox (	A14)	-76	1	Alaska Alpine S	Swales (TA5)
Hydrogen Sulfide (A4) Layer	Black Histic (A	.3)		Alaska Gleyed	Pores (A1	5)			
Thick Dark Surface (A12) Other (Explain in Notes)  *One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position disturbed or problematic.  *Cive details of color change in Notes.  *Restrictive Layer (if present): Type: Depth (inches):	Hydrogen Sulf	ide (A4)							without 5Y Hue or Redder Underlying
**Tone indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position disturbed or problematic.  **Give details of color change in Notes.  **Restrictive Layer (if present): Type:				7					in Notes)
disturbed or problematic.  **Give details of color change in Notes.  Restrictive Layer (if present): Type:				ne primary indicator o	f wetland	hvdrole	ogy, and an		
Restrictive Layer (if present): Type: Depth (inches):	disturbed or pr	roblematic.		, , , , , , , , , , , , , , , , , , , ,		,			
Notes:    Hydrocody Primary Indicators (any one indicator is sufficient)   Secondary Indicators (2 or more result of the plant of the p	Give details o	of color change in No	tes.		enth (inch	De).	_		
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Pla  High Water Table (A2) Inundation Visible on Aerial Imagery (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Iving Roots (C3) Modern (C4) Rel  Sediment Deposits (B1) Presence of Reduced Iron (C4) Rel  Sediment Deposits (B2) Dry-Season Water Table (C2) Mater Table (C2) Moter (Explain in Notes):  Iron Deposits (B5) Depth (in): Water Table Present (Y/N): Depth (in): Depth (in): I Dep	Restrictive Lay	yei (ii pieseiii). Type	J		eptii (iiici	ics)			
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Pla  High Water Table (A2) Inundation Visible on Aerial Imagery (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Iving Roots (C3) Modern (C4) Rel  Sediment Deposits (B1) Presence of Reduced Iron (C4) Rel  Sediment Deposits (B2) Dry-Season Water Table (C2) Mater Table (C2) Moter (Explain in Notes):  Iron Deposits (B5) Depth (in): Water Table Present (Y/N): Depth (in): I D	Hardele Oell D		7						
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)	Hydric Soil Pi	resent (17N):	-						
Surface Water (A1)	Notes:								
Surface Water (A1)									
Surface Water (A1)									
Surface Water (A1)	HYDROLOGY	PRIMARY INDICA	TORS (a	nv one indicator is su	ifficient)		SECONDAR	Y INDICATORS (2	or more required)
Surface Water (A1)			-			1			Stunted or Stressed
Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) X Shared Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Rel Sediment Deposits (B2) Other (C1) Salt Deposits (C5) FAC Drift Deposits (B3) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): Depth (in): Water Table Present (Y/N): Depth (in): Dept	Surface Water	r (A1)	Sur	face Soil Cracks (B6)	-	-	Leaves (B9)		Plants (D1)
Saturation (A3) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Sharman Shar	High Water Ta	able (A2)			rial Image	ery	Drainage Patterns (B10)		Geomorphic Position (D2)X
Saturation (A3)X Concave Surface (B8) Living Roots (C3)X Shaturation (A3)X Concave Surface (B8) Living Roots (C3)X Shaturation (C4) Shaturation (C4) Shaturation (C4) Shaturation (C4) Shaturation (C4) Shaturation (C4) Shaturation (C5) _	Thigh trace Te	1010 (712)				_	Ovidinal Phinasheres slong		
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Rel  Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC  Drift Deposits (B3) Dry-Season Water Table (C2) Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5) Depth (in):  Water Table Present (Y/N): Depth (in):	Saturation (A3	3)X						Shallow Aquitard (D3)	
Water Marks (B1) Marl Deposits (B15) Iron (C4) Rel   Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAG   Drift Deposits (B3) Dry-Season Water Table (C2) Notes:   Algal Mat or Crust (B4) Other (Explain in Notes):   Iron Deposits (B5) Depth (in):   Surface Water Present (Y/N): Depth (in):   Water Table Present (Y/N): Depth (in):   Saturation Present (Y/N): Depth (in):   Obepth (in): Other (Explain in Notes):								Microtopographic	
Drift Deposits (B3) Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes);  Iron Deposits (B5) Depth (in):  Water Table Present (Y/N): Depth (in):   Wetland Hydrology Present (Y/N):    Saturation Present (Y/N):   Depth (in):   O    Depth (in)	Water Marks (	B1)	Mai	rl Deposits (B15)					Relief (D4)
Drift Deposits (B3) Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5) Depth (in):  Water Table Present (Y/N): Depth (in):	Sediment Den	osits (B2)					Salt Deposit	s (C5)	FAC-Neutral Test (D5)
Drift Deposits (B3) Water Table (C2)X  Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5)  Surface Water Present (Y/N): Depth (in):  Water Table Present (Y/N): Depth (in):   Wetland Hydrology Present (Y/N):/  Saturation Present (Y/N): Depth (in): O			_						
Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5)  Surface Water Present (Y/N): Depth (in):  Water Table Present (Y/N): Depth (in):   H    Saturation Present (Y/N): Depth (in): O    Depth (in):	<b>Drift Deposits</b>	(B3)	Dry Wa	-Season ter Table (C2)			Notes,		
Surface Water Present (Y/N):  Water Table Present (Y/N):  Saturation Present (Y/N):  (includes capillary fringe)  Depth (in):  Depth (i									
Surface Water Present (Y/N):  Water Table Present (Y/N):  Depth (in):	Algal Mat or C	Crust (B4)	_ Oth	er (Explain in Notes)					
Surface Water Present (Y/N):  Water Table Present (Y/N):  Depth (in):	Iron Deposits	(B5)							
Water Table Present (Y/N):  Depth (in):			_		-	-	-		
Water Table Present (Y/N):  Depth (in):  Dep	Surface Water	r Present (Y/N):		Depth (in):					V
(includes capillary fringe)						W	etland Hydr	ology Present (Y/N	1):/
				Depth (in): \ O					
	•	,							

SITE DESCRIPTION	Tel Control	1235	Corri	dor		WILL CO	-3-30
Survey Type: Centerline Acces	s Road (explain)	Other (exp	plain)X	Field Targ	et: <u>135</u>	Map #: 94 N	Map Date: 5   27
Date: 06 - 10 - 14	Project Name & No.:	Alaska LN	IG 26221306		Feature Id:	W60 HT	006
Investigators: Dan La Plan	t. Zue Me	ade				Team No.: ∨∧	160
State: Alaska		Milepost: 124					
Latitude: 62°26'48.489	5"	Longitud	ie: 150°	6'98	67.	Datum: WGS8	34
Logbook No.: 002	Logbook Page No.:	007	Picture No.:			r, plug	
SITE PARAMETERS	Total Control						
Subregion: interior			Landform (hills	slope, terrac	e, hummocks	s, etc.): depre	ession
Slope (%): () -3						oncave	. 55 (0)
Pre-mapped Alaska LNG/NWI classificat	ion: upiand		Soil Map Unit		. , ,	.0111000	
Are climatic/hydrologic conditions on the YesX No (if no expla	site typical for this time	of year?		rmal Circum	stances" pres (If no, exp	sent: plain in Notes.)	
Are Vegetation, Soil, or Hyd	rology Significant	ly Disturbed	1? No_X_	_(If yes, exp	lain in Notes)		
Are Vegetation, Soil, or Hyd	rology Naturally F	Problematic?	? No <u>X</u>	(If yes, exp	lain in Notes.	)	
SUMMARY OF FINDINGS	1 -1					STELL	Early Con
Hydrophytic Vegetation Present? Yes	XNo	t	s the Sampled A	rea within a	Wetland?	Yes_X	No
Hydric Soil Present? Yes	X No	v	Vetland Type: ↓	EMI F			1
Wetland Hydrology Present? Yes	X No	_ A	Alaska Vegetation	Classification	on (Viereck):	ш А 3	5.
Notes and Site Sketch: Please include Dicorridor.  See Sketch	rectional & North Arrow	r, Centerline	e, Length of feature	e, Distances	from Centerl	ine, Photo Locat	ions, and Survey

	Absolute	Dominant	Indicator	Dominance Test worksheet:
<u>Tree Stratum</u> (Plot sizes:)	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC: 2 (A Total Number of Dominant Species Across All Strata: 2 (B
1.				% Dominant Species that are OBL, FACW, or FAC: 100 (A/E
2.				W Dominant Species that are OBL, 1 AGW, 011 AG. (AL
3.				No.
4.				Prevalence Index worksheet:
Total Cover	: <u> </u>			Total % Cover of: Multiply by:
50% of total cover	r: <u> </u>	% of total cov	er:0	OBL species:X 1 =
Sapling/Shrub Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. Salex glaxensis	25	Y	FAC	UPL species X 5 =
2.				Column Totals: (A) 196 (B)
3.				PI = B/A = 1.72
4.				
5.				
6.				
7,				
8.				
9.				
Total Cover				
		)% of total cov	rer:5	
Total Cover	r: 12,5 20	)% of total cov	rer: 5	
Total Cover	r: 12,5 20	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%
Total Cover 50% of total cover VEGETATION (use scientific names of plant Herb Stratum ( 26' )	s) Absolute	Dominant	Indicator Status	X Dominance Test is > 50% X Prevalence Index is ≤ 3.0
Total Cover 50% of total cover VEGETATION (use scientific names of plant Herb Stratum ( 26' )	s) Absolute % Cover	Dominant Species?	Indicator Status	X Dominance Test is > 50% X Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in
Total Cover 50% of total cover vegetation (use scientific names of plant Herb Stratum (26')  1. Equisetum fluviative 2. Calamagnostis Canadensia	x: 12.5 20 s) Absolute % Cover	Dominant Species?	Indicator Status	X Dominance Test is > 50% X Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes)
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum (26')  1. Equise turn fluviative 2. Calamagnostis Canadensis 3. Gymnocarpium drypteris 4. Streptopus amplexifori	Absolute % Cover 75	Dominant Species?	Indicator Status	X Dominance Test is > 50% X Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum (26')  1. Equise turn fluviative 2. Calamagrostis Canadensis 3. Gymnocarpium drypteris 4. Streptopus amplexifori 5.	Absolute % Cover 75	Dominant Species?	Indicator Status  OBL FAC FACU	X   Dominance Test is > 50%     X   Prevalence Index is ≤ 3.0     Morphological Adaptations¹ (Provide supporting data in Notes)     Problematic Hydrophytic Vegetation¹ (Explain)     Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum (26')  1. Equisetum fluviative 2. Calamagnostis Canadensis 3. Gymnocarpium dry opteris 4. Streptopus amplexifori 5.  6.	Absolute % Cover 75	Dominant Species?	Indicator Status  OBL FAC FACU	X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum (26')  1. Equise turn fluviative 2. Calamagnostis Canadensis 3. Gymnocarpium dry opteris 4. Streptopus amplexifori 5. 6. 7.	Absolute % Cover 75	Dominant Species?	Indicator Status  OBL FAC FACU	X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic  O % Bare Ground
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum (26')  1. Equisetum fluviative 2. Calamagnostis Canadensia 3. Gymnocarpium dry opteris 4. Streptopus amplexifori 5. 6. 7. 8.	Absolute % Cover 75	Dominant Species?	Indicator Status  OBL FAC FACU	X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  O % Bare Ground O % Cover of Wetland Bryophytes
Total Cover 50% of total cover 50% of total cover 100% of total co	Absolute % Cover 75	Dominant Species?	Indicator Status  OBL FAC FACU	X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  O % Bare Ground O % Cover of Wetland Bryophytes
Total Cover 50% of total cover 50% of total cover 100% of total co	Absolute % Cover 75	Dominant Species?	Indicator Status  OBL FAC FACU	X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic  O % Bare Ground  O % Cover of Wetland Bryophytes  D Total Cover of Bryophytes

-			to the depth needed to documen	it the indicator of	confirm the absence	of indicators.)
Deptil			Redox Features			
inches)	Color (moist)	%	Color (moist) % Typ	pe <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
			/			
-540		/				
	1					
	X					
	/	1				)
	<u> </u>				3	
		ion, RN	1=Reduced Matrix, CS=Covered	or Coated Sand		
	IL INDICATORS					OR PROBLEMATIC HYDRIC SOIL
	listel (A1)		Alaska Gleyed (A13)			ange (TA4) <sup>4</sup>
	don (A2)		Alaska Redox (A14)			wales (TA5)
slack Histic	(A3)		Alaska Gleyed Pores (A15)			ith 2.5Y Hue
lydrogen Su	ılfide (A4)				Alaska Gleyed w	vithout 5Y Hue or Redder Underlying
hick Dark S	urface (A12)				Other (Explain in	Notes) X
		ation, o	ne primary indicator of wetland hy	drology, and an		e position must be present unless
Give details	problematic. of color change in Note	96				
Restrictive L	ayer (if present): Type:		Depth (inches	s):		
lydric Soil	Present (Y/N):	7				
	ager in cen	TEV	of wetland pon	el - no p	it possible	
						ar mana saguiradh
IYDROLOG	Y PRIMARY INDICATO		ny one indicator is sufficient)	SECONDAR	RY INDICATORS (2 o	
IYDROLOG		ORS (a		SECONDAI Water-staine	RY INDICATORS (2 d	Stunted or Stressed Plants (D1)
HYDROLOG	Y PRIMARY INDICATO	ORS (a	ny one indicator is sufficient) face Soil Cracks (B6)	SECONDAR Water-staine Leaves (B9)	RY INDICATORS (2 o	Stunted or Stressed Plants (D1)
HYDROLOG Surface Water High Water T	Y PRIMARY INDICATO	Sur Inu (B7	ny one indicator is sufficient) face Soil Cracks (B6)	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh	ed atterns (B10)	Stunted or Stressed Plants (D1)
AYDROLOG Surface Water T High Water T Saturation (A	er (A1) X able (A2) X	Sur Inu (B7 Spa Co	face Soil Cracks (B6)ndation Visible on Aerial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa	ed atterns (B10) izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOG Surface Water T High Water T Saturation (A	er (A1) X able (A2) X 3	Sur Inu (B7 Spa Cor Ma	ny one indicator is sufficient)  face Soil Cracks (B6)  ndation Visible on Aerial Imagery )  arsely Vegetated ncave Surface (B8)	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)	ed atterns (B10) izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	er (A1)  Table (A2)  (B1)	Sur Inu (B7 Spa Co Ma Hyd Od	riny one indicator is sufficient)  face Soil Cracks (B6)  indation Visible on Aerial Imagery  arsely Vegetated incave Surface (B8)  If Deposits (B15)	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)	ed atterns (B10)izospheres along s (C3) FReduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	PY PRIMARY INDICATOR  Fable (A2)  (B1)  posits (B2)	Sur Inu (B7 Spa Co) Ma Hyd Od Dry Wa	riny one indicator is sufficient)  face Soil Cracks (B6)  Indation Visible on Aerial Imagery  arsely Vegetated incave Surface (B8)  If Deposits (B15)  drogen Sulfide incr(C1)  -Season	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed atterns (B10)izospheres along s (C3) FReduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	PY PRIMARY INDICATOR (A1)  Table (A2)  (B1)  posits (B2)  s (B3)	Sur Inu (B7 Spa Co) Ma Hyd Od Dry Wa	riny one indicator is sufficient)  face Soil Cracks (B6)  Indation Visible on Aerial Imagery  arsely Vegetated facave Surface (B8)  If Deposits (B15)  drogen Sulfide for (C1)  -Season fer Table (C2)	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed atterns (B10)izospheres along s (C3) FReduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG  Surface Water  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposits  Algal Mat or  ron Deposits	PY PRIMARY INDICATOR (A1)	Sur Inu (B7 Spa Co) Ma Hyd Od Dry Wa	In y one indicator is sufficient)  Iface Soil Cracks (B6)  Indation Visible on Aerial Imagery  Imagery  Imagery  Indation Visible on Aerial Imagery  Imagery	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed atterns (B10)izospheres along s (C3) FReduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Gurface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or	PY PRIMARY INDICATOR (A1)	Sur Inu (B7 Spa Co) Ma Hyd Od Dry Wa	riny one indicator is sufficient)  face Soil Cracks (B6)  Indation Visible on Aerial Imagery  arsely Vegetated facave Surface (B8)  If Deposits (B15)  drogen Sulfide for (C1)  -Season fer Table (C2)	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit  Notes:	ed atterns (B10) izospheres along s (C3) FReduced ss (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG  Gurface Water  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposits  Algal Mat or a  ron Deposits  Gurface Water	PY PRIMARY INDICATOR (A1)	Sur Inu (B7 Spa Co) Ma Hyd Od Dry Wa	In y one indicator is sufficient)  Iface Soil Cracks (B6)  Indation Visible on Aerial Imagery  Imagery  Imagery  Indation Visible on Aerial Imagery  Imagery	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit  Notes:	ed atterns (B10)izospheres along s (C3) FReduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Surface Water Water Table Saturation Pr	PY PRIMARY INDICATOR  Fable (A2)  (B1)  posits (B2)  Crust (B4)  (B5)  er Present (Y/N): Y	Sur Inu (B7 Spa Co) Ma Hyd Od Dry Wa	In y one indicator is sufficient)  Iface Soil Cracks (B6) Indation Visible on Aerial Imagery ) arsely Vegetated incave Surface (B8) If Deposits (B15)  If or (C1)Season ter Table (C2)  Iter (Explain in Notes):	SECONDAR  Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit  Notes:	ed atterns (B10) izospheres along s (C3) FReduced ss (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X

VEGETATION VARIABLES P= Plot, M	= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	cking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall) Dwarf shrub (<0.5m) Tall herb (≥1r	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Moss-Lichen Floating Submerged
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)_	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattered	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or d or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant s	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	// One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered StemsX 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance ( Abundant (>50% of surface)	0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and intersperse	patches, concentric rings) Moderate (broken irregular rings)ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	Histosol:Fibric Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy	Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
	No locatile to an ittent Outlet V
ninerodilet olass (i ). No illierodilet	
Inlet/Intermittent Outlet Perennial In	No Inlet/Intermittent Outlet/ No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Ilet/Perennial Outlet
Wetland Water Regime (P): Drier: Season Wet: Perm. Flooded, Intermittently Exposed, S	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pere
Wetland Water Regime (P): Drier: Season Wet: Perm. Flooded, Intermittently Exposed, Stridence of Sedimentation (P): No Evidence Created	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet P
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Outflow	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pe
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Overbank Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water Ci	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pe
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Overbank F	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outle
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Overbank F	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Overbank F	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Overbank F	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_ Frequency of Overbank Flooding (P): No Overbank Fl	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_ Frequency of Overbank Flooding (P): No Overbank Fl	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Poorly Flooded Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Sease Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Overbank F	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Poorly Flooded Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)

Crew Chief QA/QC check:

eck;

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W 6 0 H T 0 0 6 Field Target: 135 Date: 06-10-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>□ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>□ Vegetation names are entered legibly for all strata present?</li> <li>□ Cover calculations are complete and correct?</li> <li>□ All dominant species have been determined and recorded per strata?</li> <li>□ Indicator status is correct for each species?</li> <li>□ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	☐ Soil profile is complete? No Soil P + Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)? 2 veg photos (no soil pit dug)

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X zoureale
Wetland Scientist (print)	Signature / Date

Field Crew Chief (print) Signature / Date

SITE DESCRIPTION			off t	tighwau	1, Map	ac
Survey Type: Centerline Acces	ss Road (explain)	Other (expla	ain)X	Field Targ	jet: <u>13</u> 닉	Map #: <u>94</u> Map Date: <u>5/27</u>
Date: 06-10-14	Project Name & No.:	Alaska LNG	NG 26221306 Feature Id:			W60 HT 007
Investigators: pain La Plant	, Zoe Mead	C				Team No.: W60
State: Alaska	Region: Alaska		Milepost: 124			
Latitude: 62° 26' 55,82	П	Longitude	ude: ~150°16'17.45"			Datum: WGS84
Logbook No.: OO 2	008	Picture No.: P_S, N, pit, plug				
SITE PARAMETERS	We was			9.8		
Subregion: Intevior			Landform (hil	Islope, terrac	e, hummocks	s, etc.): terrace
Slope (%): 3 - 5			Local relief (c	concave, con	vex, none):	Concave
Pre-mapped Alaska LNG/NWI classifica	tion: upland		Soil Map Unit	: Name:		
Are climatic/hydrologic conditions on the Yes No (if no expl		of year?			stances" pre	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	lrology Significant	y Disturbed?	No_X	_(If yes, exp	lain in Notes)	
Are Vegetation, Soil, or Hyd	irology Naturally P	roblematic?	No_X	_ (If yes, exp	olain in Notes	.)
SUMMARY OF FINDINGS	40.0				2-1	
Hydrophytic Vegetation Present? Yes_	No X	Is	the Sampled A	Area within a	Wetland?	Yes No
Hydric Soil Present? Yes	NoX	We	etland Type:	upland		
Wetland Hydrology Present? Yes	NoX	— Ala	iska Vegetatior	n Classificatio	on (Viereck):	II B 1
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow	, Centerline, I	ength of featu	re, Distances	from Center	line, Photo Locations, and Survey
	4				8.	
						-

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes:)	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC:
1,				Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC: 25
3.				(III)
4.				Prevalence Index worksheet:
Total Cover:	0	l.		Total % Cover of: Multiply by:
50% of total cover;	<u> </u>	% of total cov	er: <u> </u>	OBL species: OX 1 = O
Sapling/Shrub Stratum ( Z 6' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. Alnus ssp.	90	Y	FAC	UPL species
2. Oplopanax horridus	30	У	FACU	Column Totals: 258 (A) 939 (B)
3.				PI = B/A = 3.64
4.				
5.				
6.				
7.				
8.				
9.				
Total Cover:				
50% of total cover:	<u>60</u> 20	% of total cov	er:	
		% of total cov	er:	
VEGETATION (use scientific names of plants		% of total cov	er:2_4_	Hydrophytic Vegetation Indicators:
VEGETATION (use scientific names of plants	)	Dominant Species?		No Dominance Test is > 50%
VEGETATION (use scientific names of plants) Herb Stratum(26')	Absolute % Cover	Dominant	Indicator Status	
VEGETATION (use scientific names of plants, Herb Stratum ( 26' )  1 Streptoptus am plexifolio.	Absolute % Cover	Dominant Species?	Indicator Status	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
VEGETATION (use scientific names of plants Herb Stratum ( 26' )  1-Streptoptus amplexifolio.  2-Gymnocar pivm dryopteris	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status FACU FACU	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1-Streptoptus amplexifolio. 2-Gymnocarpium dryopteris 3. Dryopteris expansa	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1-Streptoptus amplexifolio. 2-Gymnocarpium dryopteris 3-Dryopteris expansa 4-Equisetum Sylvaticum	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status FACU FACU	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
VEGETATION (use scientific names of plants Herb Stratum ( 26' )  1 Streptoptus amplexifolio. 2 Gymnocarpium dryopteris 3 Dryopteris expansa 4 Equisetum Sylvaticum 5.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	No Dominance Test is > 50%  Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unles
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1. Streptoptus amplexifolio. 2. Gymnocarpium dryopteris 3. Dryopteris expansa 4. Equisetum Sylvaticum 5. 6.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.
VEGETATION (use scientific names of plants, Herb Stratum ( 26' )  1. Streptoptus amplexifolio. 2. Gymnocarpium dryopteris 3. Dryopteris expansa 4. Equisetum Sylvaticum 5. 6. 7.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1. Streptoptus amplexifolio. 2. Gymnocarpium dryopteris 3. Dryopteris expansa 4. Equisetum Sylvaticum 5. 6. 7. 8.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	No Dominance Test is > 50%  No Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  O % Bare Ground  O % Cover of Wetland Bryophytes
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1 Streptoptus amplexifolio. 2 Gymnocarpium dryopteris 3. Dryopteris expansa 4 Equisetum Sylvaticum 5. 6.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	Notes)  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1. Streptoptus amplexifolio. 2. Gymnocarpium dryopteris 3. Dryopteris expansa 4. Equisetum Sylvaticum 5. 6. 7. 8. 9.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	Notes)  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  O  Bare Ground O  Cover of Wetland Bryophytes O  Total Cover of Bryophytes O  Cover of Water
VEGETATION (use scientific names of plants, Herb Stratum ( 26')  1 Streptoptus amplexifolio. 2 Gymnocarpium dryopteris 3 Dryopteris expansa 4 Equisetum Sylvaticum 5. 6. 7. 8.	Absolute % Cover 5 5 0 80 3	Dominant Species? (Y/N)	Indicator Status  FACU FACU FACU	Notes)  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes

Depth inches)  Matrix  Color (moist)  - 2  - 9  10 YR 31	ON: (Describ	a to the denth needed to document t		nfirm tha abaara	o of indicators \
Color (moist 3 - 2 - 9 10 YR 3)		T	the indicator or col	mirm the absence	e of mulcators.)
3-2 -9 10 YR 31		Redox Features	1 2		A1.4
-9 10 YR 31	t) %	Color (moist) % Type	Loc <sup>2</sup>	Texture	Notes
				Fibric	organics
-27 In VR				Silt loam	
10 / 1	114 100			Silt loam	
			-		
Type: C=Concentration D=	=Depletion R	M=Reduced Matrix, CS=Covered or	Coated Sand Gra	lains. <sup>2</sup> Location:	: PL=Pore Lining, M=Matrix,
TYDRIC SOIL INDICATORS		Troubou mating of corollars.			FOR PROBLEMATIC HYDRIC SOILS
Histosol or Histel (A1)		Alaska Gleyed (A13)			Change (TA4) <sup>4</sup>
Histic Epipedon (A2)		Alaska Redox (A14)		-	Swales (TA5)
Black Histic (A3)		Alaska Gleyed Pores (A15)			with 2.5Y Hue
		Thusia Gloyed Foles (7110)			without 5Y Hue or Redder Underlying
Hydrogen Sulfide (A4)				Layer	
Thick Dark Surface (A12)			lastam, and	Other (Explain	in Notes) ape position must be present unless
IYDROLOGY PRIMARY IN	IDICATORS	(any one indicator is sufficient)	SECONDARY	INDICATORS (2	2 or more required)
HYDROLOGY PRIMARY IN		(any one indicator is sufficient) urface Soil Cracks (B6)	Water-stained		2 or more required) Stunted or Stressed
	Si		Water-stained Leaves (B9) Drainage Patte	erns (B10)	Stunted or Stressed Plants (D1)
Surface Water (A1)	Si	urface Soil Cracks (B6)undation Visible on Aerial Imagery	Water-stained Leaves (B9) Drainage Patte Oxidized Rhizo Living Roots (C	erns (B10) ospheres along C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Surface Water (A1)	Si	urface Soil Cracks (B6)undation Visible on Aerial Imagery B7)	Water-stained Leaves (B9)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1) High Water Table (A2) Saturation (A3)	Si In (E Si C C M H	urface Soil Cracks (B6) undation Visible on Aerial Imagery B7) parsely Vegetated oncave Surface (B8)	Water-stained Leaves (B9) Drainage Patter Oxidized Rhizo Living Roots (Control Presence of Reference (C4) Salt Deposits (Control Presence (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	Si In (E S C C C M M O D D	urface Soil Cracks (B6) undation Visible on Aerial Imagery B7) parsely Vegetated oncave Surface (B8) arl Deposits (B15) ydrogen Sulfide	Water-stained Leaves (B9) Drainage Patter Oxidized Rhizo Living Roots (Control Presence of Reference (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)	Si In (E Si C C C M C C C C C C C C C C C C C C	unface Soil Cracks (B6) undation Visible on Aerial Imagery B7) parsely Vegetated oncave Surface (B8) arl Deposits (B15) ydrogen Sulfide dor (C1) ry-Season	Water-stained Leaves (B9) Drainage Patter Oxidized Rhizo Living Roots (Control Presence of Reference (C4) Salt Deposits (Control Presence (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)	Si In (E Si C C C C C C C C C C C C C C C C C C	urface Soil Cracks (B6) undation Visible on Aerial Imagery B7) parsely Vegetated oncave Surface (B8) arl Deposits (B15) ydrogen Sulfide dor (C1) ry-Season /ater Table (C2)	Water-stained Leaves (B9) Drainage Patter Oxidized Rhizo Living Roots (Control Presence of Reference (C4) Salt Deposits (Control Presence (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	Si	unface Soil Cracks (B6) undation Visible on Aerial Imagery B7) parsely Vegetated oncave Surface (B8) arl Deposits (B15) ydrogen Sulfide dor (C1) ry-Season /ater Table (C2) ther (Explain in Notes):	Water-stained Leaves (B9) Drainage Patter Oxidized Rhizo Living Roots (Control Presence of Reference (C4) Salt Deposits (Control Presence (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)N
Surface Water (A1)  High Water Table (A2)  Saturation (A3)  Water Marks (B1)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)	Si	urface Soil Cracks (B6) undation Visible on Aerial Imagery B7) parsely Vegetated oncave Surface (B8) arl Deposits (B15) ydrogen Sulfide dor (C1) ry-Season /ater Table (C2)	Water-stained Leaves (B9) Drainage Patter Oxidized Rhizo Living Roots (Control Presence of Reference (C4) Salt Deposits (Control Presence (C4)	erns (B10) pospheres along C3) educed (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)N

Crew Chief QA/QC check:

**VEGETATION VARIABLES** P= Plot, M= Matrix Primary Vegetation Type (P): Vegetation Lacking\_ Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Dwarf shrub (<0.5m) \_\_\_\_\_ Tall herb (≥1m) \_\_\_ Short herb (<1m) Moss-Lichen\_\_\_\_ Floating Submerged Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even \_\_\_\_\_Highly Uneven Moderately even Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-Very High Density (80-100%) Interspersion of Cover & Open Water (P): 100% Cover or Open Water\_\_\_ <25% Scattered/Peripheral Cover \_\_\_\_\_ 26-75% Scattered or Peripheral Cover >75% Scattered or Peripheral Cover\_\_\_\_ Plant Species Diversity (P): Low (< 5 plant species) \_\_\_ Medium (5-25 species) Presence of Islands (M): Absent (none) \_\_ One or Few\_\_ Several to Many Cover Distribution of Dominant Layer (P): No Veg.\_\_\_\_\_ Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Small Scattered Patches \_\_\_ Continuous Cover Dead Woody Material (P): Low Abundance (0-25% of surface) \_\_\_\_\_ Moderately Abundant (25-50% of surface) \_\_\_\_ Abundant (>50% of surface) Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings)\_\_\_ High (small groupings, diverse and interspersed) HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine \_\_\_ Estaurine Fringe SOIL VARIABLES Soil Lacking\_ Soil Factors (P): Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey HYDROLOGIC VARIABLES Inlet/Outlet Class (P): No Inlet/Outlet \_\_\_\_\_ No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Intermittent Inlet/Intermittent Outlet \_\_\_\_\_ Intermittent Inlet/Perennial Outlet \_\_\_\_\_ Perennial Inlet/No Outlet Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Microrelief of Wetland Surface (P) Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs\_ Degree of Outlet Restriction (P): No Outflow\_\_\_\_\_ Restricted Outflow Unrestricted Outflow Water pH (P): No surface water \_\_\_\_\_ Circumneutral (5.5-7.4)\_ \_\_ Alkaline (>7.4) Acid.(<5.5)\_\_\_\_\_ pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits\_\_\_\_\_\_ Low Permeability Stratified Deposits\_ Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Gradient (<2%)\_\_\_\_\_ High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs\_\_\_\_\_ Seeps Observed Intermittent Spring Perennial Spring LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space) Watershed Land Use: 0-5% Rural\_\_\_\_ 5-25% Urbanized 25-50% Urbanized >50% Urbanized Size: Small (<10 acres) \_\_\_ Medium (10-100 acres)\_\_\_\_\_ Large (>100 acres)\_\_

Tym

GPS Technician QA/QC check:

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Fe	atur	e ID: <u>W 6 0 H T O 0 7</u> Field Target: <u>  3 4</u> Date: <u>0 b - 1 0 - 1 4</u>
Fo	r all	items not checked, please provide detailed explanation in the notes section of data form.
	1.	Site Description
		☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
	2.	Vegetation
		<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> </ul>
		☐ Indicator status is correct for each species? ☐ Dominance Test and Prevalence Index have been completed?
	3.	Soil
		☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
	4.	Hydrology
		<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
	5.	Functions and Values
		☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6.	Field Logbook
		<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
	7.	Maps
		☑ Wetland boundaries have been corrected if necessary? ☑ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

  Two photos were taken for each Observation Point (vegetation/site overview)?

SITE DESCRIPTION			2001	o' corridor	F7/2-07
Survey Type: Centerline Acces	ss Road (explain)	Other (expl	ain)	Field Target: 142	Map #: <u>98</u> Map Date: <u>5/27//</u> 4
Date: 06-12-14	Project Name & No.:	Alaska LNG	26221306	Feature	Id: W60 HT008
Investigators: Dan La Plant	, Zoe Meade	೭			Team No.: W60
State: Alaska	Region: Alaska		Milepost:	22.2	
Latitude: 62° 25' 15, 0	3"	Longitude	: 150° 15	'50.03"	Datum: WGS84
Logbook No.: 002	Logbook Page No.:	013	Picture No.:	P- NW, NE.	pit, plug
SITE PARAMETERS			1 - 1		
Subregion: interior			Landform (hil	lslope, terrace, hummo	ocks, etc.): valley bottom
Slope (%): 0 -4				concave, convex, none	
Pre-mapped Alaska LNG/NWI classifica	tion: Upland		Soil Map Unit	Name:	
Are climatic/hydrologic conditions on the Yes_X No (if no explain		e of year?		ormal Circumstances" ( No (If no,	
Are Vegetation, Soil, or Hyd	lrology Significan	tly Disturbed?	No_X	_(If yes, explain in No	tes)
Are Vegetation, Soil, or Hyd	rology Naturally	Problematic?	No_X	_ (If yes, explain in No	tes.)
SUMMARY OF FINDINGS					
Hydrophytic Vegetation Present? Yes_	NoX	Is	the Sampled A	Area within a Wetland	? Yes No_X
Hydric Soil Present? Yes	NoX	w	etland Type:	upland	
Wetland Hydrology Present? Yes_	NoX	— AI	aska Vegetatio	n Classification (Viered	k): IC2
Notes and Site Sketch: Please include Doctridor.	Pirectional & North Arrow				

Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2  Total Number of Dominant Species Assess All States (6)
1. Betula neoalaskana	30	Y	FACU	Total Number of Dominant Species Across All Strata: 6  % Dominant Species that are OBL, FACW, or FAC: 33
2. Picea glauca	35	У	FACU	% Dominant Species that are OBL, FACW, of FAC
3.				
4.				Prevalence Index worksheet:
Total Cove			12	Total % Cover of: Multiply by:  OBL species: X 1 = 0
50% of total cove Sapling/Shrub Stratum(26′)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. Viburnum edule	40	Y	FACU	UPL species
2. Oplopanax horridus	25	У	FACU	Column Totals: 320 (A) 1107 (B)
3. Alnus Ssp.	15		FAC	PI = B/A = 3,46
4. Sambucus racemosa	5		FACU	
5.				
6.				
7.				
8.				
9.	V			
Total Cover 50% of total cover		% of total cov	er: 17	

Herb Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Provious Index is < 3.0
1. Calamagrostis Canadensis	80	Y	FAC	Prevalence Index is ≤ 3.0
2. Athyrium cyclosorum	75	Y	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3. Gymnocarpium dryopteris	10		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
45treptopus amplexifolius	2		FACU	Indicators of hydric soil and wetland hydrology must be present unless
5. Equisetum sylvaticum	3		FAC	disturbed or problematic.
6. Cornus canadensis	T		FAC	
7.				% Bare Ground
8				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water
Total Cover:_		% of total cov	er: <u>34</u>	Hydrophytic Vegetation Present (Y/N):Notes: (If observed, list morphological adaptations below):

SOIL		D	ate 06 - 12-14 Feature ID W	OH	1008	- 45	Soil Pit Required (Y/N)
	E DESCRIPTION: (		to the depth needed to document			onfirm the absence	
Depth	Matrix		Redox Features				
(inches)	Color (moist)	%	Color (moist)  % Type	e <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-4		-				organic	
1-6.5		1 -		-			Ash
5.5 - 8.5	2.5 YR 3/1	100		_		Silt loam	
3.5-22	5 YR 5/6	100				Silt loam	
						1	
						21	Di Dan Linia MeMatria
		etion, RM=	=Reduced Matrix, CS=Covered o	r Coat	ted Sand G		
	INDICATORS						FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed (A13)			_	hange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)			_	Swales (TA5)
3lack Histic (A	\3)		Alaska Gleyed Pores (A15)		-		with 2.5Y Hue without 5Y Hue or Redder Underlying
Hydrogen Sul	fide (A4)		-			Layer_	without 51 Tide of Nedder Onderlying
	ırface (A12)					Other (Explain	
One indicator	of hydrophytic vege	tation, on	e primary indicator of wetland hy	drolog	y, and an a	ppropriate landsca	pe position must be present unless
disturbed or p	of color change in No	otes.					
Restrictive La	yer (if present): Type	e:	Depth (inches	):			
	- 1						
Hydric Soil P	resent (Y/N):						
Notes:							
IIVDDOLOG	/ DDIMA BY INDICA	TORE /or	ny one indicator is sufficient)	l er	ECONDAD'	Y INDICATORS (2	or more required)
HYDROLOG	PRIMART INDICA	TORS (al	ly one indicator is sufficient,		/ater-stained		Stunted or Stressed
Surface Wate	r (A1)	Surf	ace Soil Cracks (B6)				
High Water T	able (A2)	Inur	dation Visible on Aerial Imagery			terns (B10)	
ingii vvater 18	able (A2)	- (B7)		-			
Saturation (A	3)	Spa   Con	rsely Vegetated cave Surface (B8)		Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
\0/-4+ · 84 · 1	(D4)			Pr	Presence of Reduced		Microtopographic
vvater Marks	(B1)		I Deposits (B15)	Iro	on (C4)	<del></del>	Relief (D4)
Sediment Der	oosits (B2)		rogen Sulfide	Sa	Salt Deposits (C5)		FAC-Neutral Test (D5)
			or (C1) -Season	N	otes:		1.
Drift Deposits	(B3)	Wat	er Table (C2)				
Algal Mat or C	Crust (B4)		er (Explain in Notes):	3			
Algai Widt Of C	JIUST (D4)	-   000	or (Explain in Notes).				
Iron Deposits	(B5)						
				117	AL AL		
Surface Wate	r Present (Y/N):	1	Depth (in):	,		I D 1 0/0	u):N
Water Table I	Present (Y/N):		Depth (in):	Wet	iand Hydro	ology Present (Y/N	N);
		1	, , ,				
Saturation Pro			Depth (in):				
Notes:	mary minge) 11						
NOCES							

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)       Properties the second of the control of the con
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Nemic Histosol: Sapric_
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/P
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Peren
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennia
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/Perennial Inlet/Perennial Outlet_ Perennial Inlet/No Outlet_ Pe
Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/Perennial Outlet Inlet/No
Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet
Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet I
Outlet
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Outlet
Intermittent Intermittent Outlet

Crew Chief QA/QC check:

GPS Technician QA/QC check:

ym

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W 60HT 008 Field Target: 142 Date: 06-12-14
	items not checked, please provide detailed explanation in the notes section of data form.
	Otto Describettos
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?
	Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	P	h	O	to	S
----	---	---	---	----	---

中	Four photos were taken for each Wetland Determination Data Form (2 vegetation,	, 1
	soil pit, 1 soil plug)?	

Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)	Signaturye / Date	
X Zoe Meade	X Zomeade	6/12/11

Field Crew Chief (print)

X

Signature / Date

SITE DESCRIPTION	5/15	Quille	200	o' corridor			
Survey Type: Centerline Acces	ss Road (explain)	Other (exp	lain)X	Field Target: 14	Map #: 98 Map Date: 5/27/14		
Date: () (6 - 12 - 14)	Project Name & No.:	Alaska LNO	3 26221306	Feature I	d: W60 HT009		
Investigators: Dan La Plan	t, Zoe Mea	de			Team No.: W60		
State: Alaska	Region: Alaska		Milepost:	22.2			
Latitude: 62° 25′ 14.37	И	Longitude	e: 150° 15	'56.09"	Datum: WGS84		
Logbook No.: 002	Logbook Page No.:	014	Picture No.:	P.W., NW, Pit.	plug		
SITE PARAMETERS	diet.		1/25	135			
Subregion: interior			Landform (hill	Islope, terrace, hummod	oks, etc.): Walley bottom		
Slope (%): () - 2_			Local relief (c	oncave, convex, none):	Concave		
Pre-mapped Alaska LNG/NWI classifica	tion: PSS 1/EM	11 B	Soil Map Unit	Name:			
Are climatic/hydrologic conditions on the Yes X No (if no explanation)		of year?		ormal Circumstances" p No (If no, e			
Are Vegetation, Soil, or Hyd	rology Significan	tly Disturbed	? No_X	_(If yes, explain in Note	es)		
Are Vegetation, Soil, or Hyd	rology Naturally I	Problematic?	No_X	_ (If yes, explain in Note	es.)		
SUMMARY OF FINDINGS			HE de				
Hydrophytic Vegetation Present? Yes_	X No	Is	the Sampled A	rea within a Wetland?	Yes No		
Hydric Soil Present? Yes	× No	w	Wetland Type: PEM1F				
Wetland Hydrology Present? Yes	X No	A	Alaska Vegetation Classification (Viereck): TTT A 3				
Notes and Site Sketch: Please include D corridor.							

VEGETATION (use scientific names of plants	3)			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2
1				Total Number of Dominant Species Across All Strata: 2
2.				% Dominant Species that are OBL, FACW, or FAC: <u>↓00</u> (/
3.				
4.				Prevalence Index worksheet:
Total Cover	: 0			Total % Cover of: Multiply by:
50% of total cover	:	% of total cov	er:O	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1.				UPL species 0 X 5 = 0
2.				Column Totals: 115 (A) 135 (B)
3.				PI = B/A =
4.				
5.				
6.				
7.				
8.				
9.				
Total Cover 50% of total cover		% of total cov	er:	
VEGETATION (use scientific names of plants	5)			the second secon
Herb Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%
1. Comarum palustre	15		OBL	X Prevalence Index is ≤ 3.0
2. Equisetum fluviatile	65	У	OBL	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3. unidentified herb	5			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Carex aquatilis	25	У	OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Calamagrostis canadensis	10		FAC	disturbed or problematic.
6.				527 00 00 00 00 00
7				% Bare Ground
8				2.5 % Cover of Wetland Bryophytes
9.				<u>2_5</u> Total Cover of Bryophytes
10.				
				Hydrophytic Vegetation Present (Y/N):
Total Cover	120		1.	hydrophytic vegetation Present (1/N):

SOIL			Date OG 12 Fea					Soil Pit Required (Y/N)
SOIL PROFIL	E DESCRIPTION: (D	escribe	to the depth needed t	to docu	ment the	indicator or co	onfirm the absenc	e of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-3		-		-				organics
	2.5 YR 3/1	100		_			Silt loam	0
	7.5 YR 7/1	75	2.5 YR 6/8	25	C	PL, M	Siltloam	
¹Type: C=Con	centration, D=Deplet	tion. RN	I I=Reduced Matrix. CS	=Cove	red or Co	pated Sand Gr	ains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
	INDICATORS			100				FOR PROBLEMATIC HYDRIC SOILS
	tel (A1)		Alaska Gleyed (	A13)				Change (TA4) <sup>4</sup> _X
	n (A2)		Alaska Redox (A					Swales (TA5)
			Alaska Gleyed F	_	-		-	with 2.5Y Hue
Black Histic (A			Alaska Gleyeu F	oles (	A 13)	_		without 5Y Hue or Redder Underlying
Hydrogen Sulf	ide (A4)						Layer	That of The of Redder Orderlying
Thick Dark Sur	rface (A12)						Other (Explain	in Notes)
<sup>3</sup> One indicator disturbed or pr	of hydrophytic veget oblematic.	ation, o	ne primary indicator o	f wetla	nd hydrol	ogy, and an ar	propriate landsca	ape position must be present unless
4Give details o	f color change in Not	es.	De	nath (!-	obos):			
Restrictive Lay	rer (if present): Type	-	De	eptri (in	cnes):			
	4.0400	Y						
Hydric Soil Pi	resent (Y/N):	1						
Notes:	Mar and M	In ttl	es are in th	0 00	re 50	acco a	nd in the	matrix
72.5	YR 6/8	10 (11	es are in th	- 70	-	Vevi	1 largel	slor of matrix changed
1/ 0 1/1	or thois lea	)	2 16 11, MC12	XIX	\			or deri experience
							Win first	5 minutes of exposure
HYDROLOGY	PRIMARY INDICAT	ORS (a	iny one indicator is su	fficient		SECONDARY	INDICATORS (2	or more required)
Surface Water	(A1)X	Sui	face Soil Cracks (B6)			Water-stained		Stunted or Stressed Plants (D1)
		Inu	ndation Visible on Aer	ial Ima		Leaves (B9)		1.
High Water Ta	ble (A2)X	(B7		iai iiiia	gery	Drainage Patte	erns (B10)	Geomorphic Position (D2)X
Saturation (A3	, X		arsely Vegetated				ospheres along	Shallow Aquitard (D3)
Saturation (AS	)	Co	ncave Surface (B8)			Living Roots (		
Water Marks (	B1)X	Ма	rl Deposits (B15)			Presence of R		Microtopographic
		111	dan Cultida			Iron (C4)X		Relief (D4)
Sediment Dep	osits (B2)		drogen Sulfide or (C1)			Salt Deposits	(C5)	FAC-Neutral Test (D5)
		_	r-Season			Notes:		- 1
Drift Deposits	(B3)	Wa	iter Table (C2)					
Algol Mat or C	runt (DA)	044	or (Evalais in Notes)					
Algal Mat or Crust (B4) Other (Explain in Notes):								
Iron Deposits (	(B5) <u>X</u>							
	2 11 230	and the				I I said		
Surface Water	Present (Y/N):	1	Depth (in):		5			V
					W	etland Hydrol	ogy Present (Y/N	4):
Water Table P	resent (Y/N):		Depth (in):					
Saturation Pre	sent (Y/N):		Depth (in):					
(includes capil			Depth (in):					
Notes:		-						

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent       Emergent-Non-persistent
Percent Cover (P): Tree (>5 dbh, >6m tall)       O       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Variables  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol:
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Incomment Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inl
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding X Return Interval 1-2 yrs Return Interval 2-5 yrsReturn Interval >5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) X pH Reading 5-36
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated X       Wetlands within 400m, Not Connected
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space) X
Watershed Land Use:         0-5% Rural         5-25% Urbanized         25-50% Urbanized         >50% Urbanized
Size: Small (<10 acres)X

Crew Chief QA/QC check:

GPS Technician QA/QC check:

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W 60 H T 009 Field Target: 141 Date: 06 - \$12 - 14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> </ul>
	Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	☑ Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  ☑ Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

edand soenusc (princ) Signature / Da

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION		- 10	The same of	The Late of the la	
Survey Type: Centerline_X Acce	ess Road (explain)	Other (ex	plain)	Field Target: 143	Map #: 98 Map Date: 5/27
Date: 06 - 12 - 2014	Project Name & No.	: Alaska LN	IG 26221306	Feature Id	:W60HT010
Investigators: Dan La Plan	t, Zoe Mead	е			Team No.: W 60
State: Alaska	Region: Alaska		Milepost:	22	
Latitude: 62° 25 '05, 39	11	Longitue	de: 150' 15'	148.46"	Datum: WGS84
Logbook No.: 062	Logbook Page No.:	0/6	Picture No.:	P_SE, NW, Pi	t, plug
SITE PARAMETERS	0,424				Company Man
Subregion: interior			Landform (hi	llslope, terrace, hummock	s, etc.): Valley bottom
Slope (%): () - \			Local relief (	concave, convex, none):	concave
Pre-mapped Alaska LNG/NWI classific	ation: upland		Soil Map Uni	t Name:	
Are climatic/hydrologic conditions on th	e site typical for this time	e of year?		ormal Circumstances" pre	
Are Vegetation, Soil, or Hy		ntly Disturbe	d? No_X	(If yes, explain in Notes	s)
Are Vegetation, Soil, or Hy	drology Naturally	Problemation	? No_X	(If yes, explain in Note	S.)
SUMMARY OF FINDINGS					
Hydrophytic Vegetation Present? Yes_	No		is the Sampled	Area within a Wetland?	Yes NoX
Hydric Soil Present? Yes_	No <u>X</u>	_	Wetland Type:	upland	
Wetland Hydrology Present? Yes_	NoX	_	Alaska Vegetatio	n Classification (Viereck)	III. A ×
corridor. See 5	Ketch in	logi.	book O	De Page	_0/6.

	s)	47.2.34	-	year and the second
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Betula neoalaskana	10	Y	FACU	Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC: 25
3.				
4.				Prevalence Index worksheet:
Total Cover	: 10		-	Total % Cover of: Multiply by:
50% of total cover	:_5 20	% of total cov	ver:2	OBL species:
Sapling/Shrub Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. Sambucus racemona	2		FACU	UPL species
2. Oplopanax horridus	10	Y	FACU	Column Totals: 175 (A) 586 (B)
3. Rubus idaeus	3	Y	FACU	PI = B/A = 3 · 3 5
4.				
5.				
6.				
7.				
8.				
9.				
9. Total Cover: 50% of total cover:		% of total cov	ver:3	
Total Cover: 50% of total cover:	7.5 20	% of total cov	<sub>ver:3</sub>	
Total Cover: 50% of total cover: VEGETATION (use scientific names of plants	7.5 20	% of total cov  Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
Total Cover: 50% of total cover: VEGETATION (use scientific names of plants	7,5 20 Absolute Cover	Dominant Species?	Indicator	Dominance Test is > 50% Prevalence Index is ≤ 3.0
Total Cover: 50% of total cover: 50% of total cover: VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angusto folium	7.5 20  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angustofolium 3. Trientalis europaea	7.5 20  Absolute % Cover  90 5	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angustofolium 3. Trientalis europaea	7.5 20  Absolute % Cover  90 5	Dominant Species? (Y/N)	Indicator Status FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angustofolium 3. Trientalis europaea 4. Gymnocarpium dryopteris	7.5 20  Absolute % Cover  90 5	Dominant Species? (Y/N)	Indicator Status FAC FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angustofolium 3. Trientalis europaea  4. Gymnocarpium dryopteris 5. Equisetum sylvaticum	7.5 20  Absolute % Cover  90 5 7	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensia 2. Chamarion angustofolium 3. Trientalis europaea  4. Gymnocarpium dryopteris 5. Equisetum sylvaticum 6. Veratrum viride	7.5 20  Absolute % Cover  90 5 T 25 20	Dominant Species? (Y/N)	Indicator Status  FAC  FACU  FACU  FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensia 2. Chamarion angustofolium 3. Trientalis europaea 4. Gymnocarpium dryopteris 5. Equisetum sylvaticum 6. Veratrum viride 7. Streptopus amplexifolius	7.5 20  Absolute % Cover  90 5 T 25 20	Dominant Species? (Y/N)	Indicator Status  FAC  FACU  FACU  FACU  FACU  FACU  FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensia 2. Chamarion angustofolium 3. Trientalis europaea  4. Gymnocarpium dryopteris 5. Equisetum sylvaticum 6. Veratrum viride 7. Streptopus amplexifolius 8. Dryopteris expansia	7.5 20  Absolute % Cover  90 5 T 25 20	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angustofolium 3. Trientalis europaea 4. Gymnocarpium dryopteris 5. Equisetum sylvaticum	7.5 20  Absolute % Cover  90 5 T 25 20	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes 0 Total Cover of Bryophytes 0 % Cover of Water
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Calamagrostis canadensis 2. Chamarion angustofolium 3. Trientalis europaea 4. Gymnocarpium dryopteris 5. Equisetum sylvaticum 6. Veratrum viride 7. Streptopus amplexifolius 8. Dryopteris expansis 9.	7.5 20  Absolute % Cover  90 5 7 25 20 1 5	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes

SOIL	C-FI	- 1	Date 06 - 12 Fea	ture II	D WGOT	17010		Soil Pit Required (Y/N)
SOIL PROFILE	E DESCRIPTION: (D	escribe	to the depth needed t	o doc	ument the	indicator or c	onfirm the absence	e of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc²	Texture	Notes
0-2								organics
2-4								Ash, volcaníc
4 - 8	2.5 YR 2.5/1	100					Silt loam	
8-22	10 YR 5/8	100					Silfloam	
				-				
17		- DA	Deduced Metric CC		arad ar Ca	stad Cand Co	roine <sup>2</sup> l continu	PL=Pore Lining, M=Matrix.
		ion, Riv	1=Reduced Matrix, CS	=Cov	erea or Co	ated Sand Gi		FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	INDICATORS		Alaska Olavad (	(442)				hange (TA4) <sup>4</sup>
	tel (A1)		Alaska Gleyed (					Swales (TA5)
	n (A2)		Alaska Redox (A	_				
	3)		Alaska Gleyed F	ores	(A 15)	_		with 2.5Y Hue without 5Y Hue or Redder Underlying
Hydrogen Sulfi	ide (A4)						Layer_	without of the of thought officeritying
	rface (A12)						Other (Explain	
<sup>3</sup> One indicator disturbed or pr		ation, o	ne primary indicator of	f wetla	and hydrolo	gy, and an a	ppropriate landsca	pe position must be present unless
<sup>4</sup> Give details o	f color change in Note	es.						
Restrictive Lay	er (if present): Type:		De	epth (i	nches):			
	N.							
Hydric Soil Pr	resent (Y/N):		-					
Notes:							-	
HADBOI UCA	PRIMARY INDICAT	ORS (a	iny one indicator is suf	fficien	1)	SECONDARY	/ INDICATORS (2	or more required)
MIDROLOGI	TRIMART INDIGAT	T			1	Vater-stained		Stunted or Stressed
Surface Water	(A1)	Sui	face Soil Cracks (B6)			eaves (B9)		Plants (D1)
High Water Ta	ble (A2)		ndation Visible on Aer	ial Ima	agery [	Orainage Patt	erns (B10)	Geomorphic Position (D2)
riigii vvator ra		(B7	-	_			ospheres along	
Saturation (A3	)		arsely Vegetated ncave Surface (B8)				C3)	Shallow Aquitard (D3)
Motor Marks (I	B1)	Ma	rl Deposits (B15)			Presence of F		Microtopographic
vvater ivialiks (i	D1)					ron (C4)		Relief (D4)
Sediment Dep	osits (B2)	Hy	drogen Sulfide or (C1)		8	Salt Deposits (C5) FAC-Neutral Test (D5)		
			y-Season		1	Votes:		
Drift Deposits	(B3)		ter Table (C2)					
Algal Mat or C	rust (B4)	Oth	ner (Explain in Notes):					
			(		_			
Iron Deposits (	(B5)							
		1500			100			
Surface Water	Present (Y/N): N		Depth (in):		18/0	tland Uudra	logy Present (Y/N	n: N
Water Table P	resent (Y/N):		Depth (in):		We	uanu nyuro	logy Present (1/N	)
Coturation D		-						
Saturation Pre (includes capil			Depth (in):					
Notes:								

VEGETATION VARIABLES P= Plot, N	A= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	Scrub Shrub-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           m)         Short herb (<1m)
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattered	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or dor Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
<b>Vegetative Interspersion (P):</b> Low (large High (small groupings, diverse and interspers	patches, concentric rings)Moderate (broken irregular rings)ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
COLL MADIADUS	X
SOIL VARIABLES Soil Factors (P): Soil Lacking	Histosol:Fibric Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy	Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In	Outlet / Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S	onally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded
Created	ce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
1	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Return Interval >5 yrs	verbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
7	Restricted Outflow Unrestricted Outflow
	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Glacial Till/Not Permeable	: High Permeability Stratified Deposits Low Permeability Stratified Deposits
Basin Topographic Gradient (M): Low 6 Evidence of Seeps and Springs (P): No See	
Evidence of Seeps and Springs (P): No See	eps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isolate	d Wetlands within 400m, Not Connected Only Connected Below d Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., a	ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural	5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Media	um (10-100 acres) Large (>100 acres)

Crew Chief QA/QC check

GPS Technician QA/QC check:

zm

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W60 HT 0 10 Field Target: 143 Date: 06-12-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	PI	h	O	to	S

þ	Four photos were taken for each Wetland Determination Data Form (2 vegetation,
	soil pit, 1 soil plug)?
T	Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade X MMMM 06-12-14

Wetland Scientist (print) Signature/Date

X April 1 April 1 Signature / Date

Field Crew Chief (print) Signature / Date

# Vegetation Classification Data Form

Site Description		4000	ave CVA		
Date: 06-13-14	Project Name & #: Alaska LNG 26221306			Field Target:	
Investigators:	ant, Zoe M			Feature ID: WGOHTOII	
Latitude:	3"	Longitude:	7.64"	Datum: WGS84	
Logbook #:	pq. 020	Logbook F のタ	Page #:	Picture #: P_WGOHTON_vey_vey	
Location Description	on: °	TALL.	- 24/		
Common Species C	bserved (Scienti	fic Name)			
Betula ne	o a laskano	(	dryop	teris expansa	
Alnus ssp	),		trientalis europaea		
Calamagro	stis canad	densis			
Sambucu					
Percent Cover of Do	70, AINUS		0%		
Habitat Description					
	- Birch/spr				
Alaska Vegetation (	Classification: Le	vel I, Level II	, Level III		
I	_	$\mathcal{C}$		2	
Notes:		- Line is	No.		
Field target trail, easily	approxima accessable	tely 3' and r	off of no signs	recreational ATV of Wetland Features.	
Field Crew Chief:	91	F	Field Scientist	Technician JMMuull—	

# Vegetation Classification Data Form

Level I	Level II	Level (III		
I. Forest	A. Needleleef (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland		
	B Broadleaf forest	(1) Closed broadleaf forest (2) Open broadleaf forest (3) Broadleaf woodland		
	C Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland		
II. Scrub	A. Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland		
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub		
	C Low scrub	(1) Closed low scrub (2) Open low scrub		
	D Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub		
III Herbaceous	A Graminoid herbaceous	Dry graminoid herbaceous     Mesic graminoid herbaceous     Wet graminoid herbaceous     (amergent)		
	B Forb herbaceous	Dry forb herbaceous     Mesic forb herbaceous     Wet forb herbaceous (emergent)		
	C Bryoid herbaceous	(1) Mosses (2) Lichens		
	D Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marina aquatic herbaceous		

Des	criptions of levels I, II, III, and IV follow	the classification table
la ,	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more	1 Forest
1 b_	Trees over 3 meters (10 ft) tall are absent or nearly so, Less then 10 percent cover (Dwarf trees, less than 3 meters [10 ft) tall may be present and abundant	
I Fo	rest	
2a	Over 75 percent of tree cover contributed by needletesf (confler) species	LA Needleleaf forest
2b	Less than 75 percent of tree cover contributed by needleleaf (conifer) species	
3a	Tree canopy of 60-100 percent cover	IA 1 Closed needleleaf forest
3b.	Tree canopy of 25-59 percent cover	I.A.2 Open needleleaf fores
3с	Tree canopy of 10-24 percent cover	I.A.3 Needleleaf woodland
4a	Over 75 percent of tree cover contributed by broadleaf species	LB Broadleaf forest
4b	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover	
5a.	Tree canopy of 60-100 percent cover	I B 1 Closed broadleaf fores
5b.	Tree canopy of 25-59 percent cover	I 8 2 Open broadleaf fores
5ċ.		LB.3 Broadleaf woodland
6a.	Tree canopy of 60-100 percent cover.	I.C 1 Closed mixed fores
θb.	Tree canopy of 25-59 percent cover.	I.C.2 Open mixed fores
вс.	Tree canopy of 10-24 percent cover	LC 3 Mixed woodland
7a.	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 ft]tail)	
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover)	

II, Sc	rub
8a	Vegetation with at least 10 percent cover of dwarf tree scrub 9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees
9a	Dwarf tree canopy of 60-100 percent cover
9b.	Dwarf tree canopy of 25-59 percent cover
9c.	Dwarf tree canopy of 10-24 percent cover II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall
10b	Shrubs less than 15 meters (5ft)tall
11 a	Shrub canopy cover greater than 75 percent II.8 1 Closed tall scrub
11 b	Shrub canopy cover of 25-74 percent II B 2 Open tall scrut
12a.	Shrubs 20 centimeters to 1.5 meters tall
12b	Shrubs under 20 certimeters in height
13a	Shrub canopy cover greater than 75 percent Ii C I Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present
14a	Dryas species dominant in the dwarf shrub layer II D 1 Dryas dwarf scrui
14b	Ericaceous species dominant in the dwarf shrub layer
14c	Willow species dominant in the dwarf scrub layer
III. H	erbaceous
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation 16
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water

16a	Grasses, sedges, or rushes (graminoid) plants dominant	17
16b	Forbs or bryophytes dominant	18
17a	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by E/mus spp., Festica spp., and Deschampsie spp. III A.I Dry graminoid herbaceou	J/S
17b.	On moist sites, but usually not with standing water. Usually dominated by Calamagnostis spp.  Carex spp. or Enophorum spp; tussocks often present	us
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra, bogs, marshes, and fens	
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)	19
18b	Vegetation dominated by mosses or lichens	20
19a	On dry sites, usually rocky and well drained; mostly tundra sites	15
196	On moist sites but without standing water, mostly within forested areas	ıs
19c	On wet sites, usually with standing water for part of the year III B 3 Wet forb herbaceout	5
	Vegetation cover dominated by mosses	
	Vegetation cover dominated by lichens III C 2 Bryoid liche	
21a	Vegetation submerged or floating in fresh water	LIS
	Vegetation submerged or floating in brackish water — III D 2 Brackish water aquatic herbaceo	
21c	Vegatation submerged or floating in salt water III D 3 Marine aquatic herbaceou	

#### Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Feature ID: 144 Field Tar	get: W60HT611 Date: 06-13-14
	ide detailed explanation in the notes section of data form.
Tot all items not checked, please provi	de detailed explanation in the notes section of data form,
1. General Information	
Location data recorded?	
Photo taken and photo number	recorded?
2. Location Description	
Location of site recorded with e	enough detail to help relocate?
3. Common Species	
	ecies recorded?
Percent cover of dominant structure	
4. Habitat Description	otare rever risted.
Habitat described?	
5. Classification	
All three levels of classification	recorded?
6. Field Log Book	recorded:
Field form entries consistent wi	th log book?
Logbook clearly identifies the F	
Eogbook clearly identifies the F	leid Target ID and Feature ID?
X Zoe Meade	X harmande
	Journe
Field Technician (print)	Signature
V	V / 11/1/1/1/1
1 am LADlant	1 (a) A fallant 6/13/14
Field Crew Chief (print)	Signature

SITE DESCRIPTION			- 3 - 3			
Survey Type: Centerline X Acces	ss Road (explain)	Other (exp	olain)	Field Target: 145	Map #: 100 Map Date: 5/27	
Date: 06-13-14	Alaska LN	G 26221306	Feature Id:	W60HT012		
Investigators: Dan La Plan	t, Zoe Mead	de			Team No.: W60	
State: Alaska	Region: Alaska		Milepost:	119.2		
Latitude: 62° 22' 45.36"		Longitud	de: 150° 16′ 10. 02′′		Datum: WGS84	
Logbook No.: 002	Logbook Page No.:	021	Picture No.:	P_W, E, pit,	Plug	
SITE PARAMETERS						
Subregion: interior			Landform (hil	lslope, terrace, hummock	s, etc.): Stream bed	
Slope (%): 0 − Z				oncave, convex, none):		
Pre-mapped Alaska LNG/NWI classificat	tion: upland		Soil Map Unit			
Are climatic/hydrologic conditions on the Yes_XNo(if no expla		of year?		ormal Circumstances" pre No (If no, exp		
Are Vegetation, Soil, or Hyd	IrologySignificant	tly Disturbed	1? No X	_(If yes, explain in Notes)	)	
Are Vegetation, Soil, or Hyd	Irology Naturally F	⊃roblematic′	? No X	_ (If yes, explain in Notes	.)	
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Yes_	X No		Is the Sampled Area within a Wetland? Yes No			
Hydric Soil Present? Yes	X No		Wetland Type: PSS1B			
Wetland Hydrology Present? Yes	X No	— A	Alaska Vegetation Classification (Viereck): I B Z			
Notes and Site Sketch: Please include D corridor	rirectional & North Arrow	v, Centerline	, Length of featu	re, Distances from Center	line, Photo Locations, and Survey	
See 5	Ketch in			002, PA	Fe 021.	

VEGETATION (use scientific names of plan	ts)			
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or
1,,				Total Number of Dominant Species Across All Stra % Dominant Species that are OBL, FACW, or FAC
				- % Dominant Species that are OBL, FACW, or FAC
•				
				Prevalence Index worksheet:
Total Cove	er:O			Total % Cover of: Multiply b
50% of total cove	er:O 20	% of total cov	er:O	OBL species:X 1 =
Sapling/Shrub Stratum( 20′ )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species 30 x 2 = 60  FAC species 155 x 3 = 165+  FACU species 79 x 4 = 316
1. Ainus ssp.	50	Y	FAC	UPL species O X 5 = O
Alnus ssp. 2. Spiraea stevenii	2		FACU	Column Totals: 274 (A) 551
3. Viburnum edule	5		FACH	PI = B/A = 2.01
4. Oplopanax horridus	15	Y	FACY	
5.				
6,				
7,				
8.				
9.		1		
Total Cove	er:_72			
50% of total cove	er: 36 20	% of total cov	er: 14, 4	
VEGETATION (use scientific names of plan	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
Herb Stratum ( 26')	% Cover	Species?	Status	Pominance Test is > 50%

Herb Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Equisetum arvens	70	Υ	FAC	X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Gymnocarpium dryopteris	2		FACU	Notes)
3. Viola palustris	30		FACW	Problematic Hydrophytic Vegetation¹ (Explain)
4. Streptopus amplexifolius	- T		FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Calamagrostis Canadens	15 10		FAC	disturbed or problematic.
6. Dryopteris expansa	55	Y	FACU	
7. Carex aquatilis	10		OBL	% Bare Ground
8. Equisetum sylvaticum	25		FAC	% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover: 50% of total cover:		)% of total cov	ver: 40.4	Notes: (If observed, list morphological adaptations below):

SOIL			Date 06-13-14 Feature ID W	00H+01	12	Soil Pit Required (Y/N)	
SOIL PROFIL	E DESCRIPTION: (De	escribe	to the depth needed to document	the indicator	or confirm the absence	e of indicators.)	
Depth	Matrix		Redox Features				
(inches)	Color (moist)	%	Color (moist) % Type	e <sup>1</sup> Loc <sup>2</sup>	Texture	Notes	
0-2					Histic	0	
2-3	7.5 YR 3/1	100			<b>(</b>	glacial till	
3-15+	aleu 2-3/586	100			glacial till	J	
0 10	586 3/1						
	100 41			- 1			
¹Type: C=Cor	.l ncentration D=Depleti	on RM	I=Reduced Matrix, CS=Covered o	r Coated Sar	nd Grains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
* 1	INDICATORS					FOR PROBLEMATIC HYDRIC SOILS	
			Alaska Gleyed (A13)	- vw		hange (TA4) <sup>4</sup>	
	stel (A1)		Alaska Redox (A14)			Swales (TA5)	
	on (A2)						
Black Histic (A	\3)		Alaska Gleyed Pores (A15)			vith 2.5Y Hue without 5Y Hue or Redder Underlying	
Hydrogen Sulf	fide (A4)				Layer_	without 31 True of Redder Orderlying	
Thick Dark Su	rface (A12)				Other (Explain	in Notes)	
disturbed or pr	roblematic.		ne primary indicator of wetland hy	drology, and	an appropriate landsca	pe position must be present unless	
Give details o	of color change in Note	es.	ia till Depth (inches	. 24			
Restrictive Lay	yer (if present). Type.	giac	Deptil (inches	)			
Hydric Soil P	resent (Y/N):	γ				*	
Notes: Scil	was rethecke	dor	16/25/14 by 5 christi	sphen. Se	e wwo 3 region	ok pagy q. = me	
A Or	f Fibric org skith	WENTER	30% with small gravely		and the section of	Or a control AX	
4-4	8 4/N SATYS	ma.	30% with small gravely	Ledon 10	9K 9/9 2090 C	PL Refusal of 8" ind	
HYDROL OGY	PRIMARY INDICAT	nRS (a	nny one indicator is sufficient)	SECOND	DARY INDICATORS (2	or more required)	
		1		Mater etc		Stunted or Stressed	
Surface Water	r (A1) <u>X</u>	Sur	face Soil Cracks (B6)	Leaves (	B9)		
High Water Ta	able (A2)X	lnu	ndation Visible on Aerial Imagery		Patterns (B10)	L/	
- Ingil vvaler re	ADIC (A2)		Y) X				
Saturation (A3	B)X	Spa	arsely Vegetated ncave Surface (B8)	Living Ro	Rhizospheres along oots (C3)	Shallow Aquitard (D3)	
_					of Reduced	Microtopographic	
Water Marks (	(B1)	Ma	rl Deposits (B15)	Iron (C4)		Relief (D4)	
Sodiment Den	oosits (B2)	Нус	drogen Sulfide	Salt Den	osits (C5)	FAC-Neutral Test (D5)	
Sediment Dep	JUSIIS (DZ)	Ou	or (C1)		1718 Heatrai 1881 (28)		
Drift Deposits	(B3)		r-Season	Notes:			
		VVa	ter Table (C2)	-			
Algai Mat or Crust (B4) Other (Explain in Notes):				2			
Iron Denocite	(B5)						
TOTI Deposits	(55)	-					
Surface Water	r Present (Y/N):	/ [	Depth (in): 0 - 3 *			· · · · · · · · · · · · · · · · · · ·	
Surface vvale	Triesent (1714).			Wetland H	vdrology Present (Y/N	):	
Water Table F	Present (Y/N):		Depth (in): 0 -3 *	Wetland Hydrology Fresent (1774).			
Saturation Pre	sent (V/NI)						
(includes capi			Depth (in):				
,		-			, 1		
"Pe	erched wate	er t	able over gley	layer	(glacier"	+.11)	
			U )	V	• 0	,	

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       ♥       Sapling (<5 dbh, <6m tall)       ♥       Tall shrub (2-6m)       ♠       Short shrub (0.5-2m)       ₱         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial I
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 y
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Closed Person (P): United States (P): No surface water (P): No surface w
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%) X
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space) X
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized >50% Urbanized
Size:         Small (<10 acres)         X         Medium (10-100 acres)         Large (>100 acres)

Crew Chief QA/QC check,

GPS Technician QA/QC check:

m

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: <u>W60HT 01Z</u> Field Target: <u>145</u> Date: <u>b/13/14</u>
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

j	Four pl	notos wer
`		1 soil plu

e taken for each Wetland Determination Data Form (2 vegetation, 1

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

SITE DESCRIPTION	-outside 2000' corridor					
Survey Type: Centerline Acces	s Road (explain)	Other (expla	ain)X	Field Targ	jet: 146	Map #: 101 Map Date: 5/27/1
Date: 06 - 14 - 14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60HT013
Investigators: Dan La Plant,	Loe Meade					Team No.: W60
State: Alaska	Region: Alaska		Milepost:	18.2		
Latitude: 62° 21′ 54, 69″		Longitude	: 150° 15'	36.99	11	Datum: WGS84
Logbook No.: 002	Logbook Page No.:	023	Picture No.:	P- N	INW	pit plug
SITE PARAMETERS						Samuel Marie and
Subregion: interior			Landform (hills	slope, terrac	ce, hummocks	s, etc.): hummocks
Slope (%): 0 - 2			Local relief (co	oncave, con	vex, none):	concave
Pre-mapped Alaska LNG/NWI classificat	ion: UP land		Soil Map Unit	Name;		
Are climatic/hydrologic conditions on the YesX No (if no expla		of year?			nstances" pre (If no, exp	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significant	tly Disturbed?	No_X	_(If yes, exp	lain in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally F	Problematic?	No_X_	_ (If yes, exp	olain in Notes	.)
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Yes	X No	Is	the Sampled A	rea within a	Wetland?	YesXNo
Hydric Soil Present? Yes	X No	we	etland Type:	PEM =	LB	
Wetland Hydrology Present? Yes	X No	— Ala	aska Vegetation	Classification	on (Viereck):	ША1.
Notes and Site Sketch: Please include Dicorridor.  See Sketch;	n Loghad					

VEGETATION (use scientific names of plants	)			
<u>Tree Stratum</u> (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)
1.		(1/14)		Total Number of Dominant Species Across All Strata: (B)
2.				% Dominant Species that are OBL, FACW, or FAC: _50 _ (A/B)
3.				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover:	<u> </u>	% of total cov	ver:	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	OBL species:       0       X 1 = 0         FACW species:       2       X 2 = 4         FAC species       9       X 3 = 29         FACU species       5       X 4 = 216
1. Betola heodlas kana	10	Y	FACU	
2. Rubus idaeus	4	Y	FACU	UPL species
3. Salax alaxensis	5	Ý	FAC	PI = B/A = 3.34
4. Spirea Stevenii	T		FACU	
5.				
6.				
7.				
8.				,
9.				
Total Cover: 50% of total cover:		% of total cov	ver: 3 · 8	
VEGETATION (use scientific names of plants	)			
Herb Stratum ( 2 0 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
1. Chamaerion angustofolium	10		FACU	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2 Fauise tum sylvaticum	2		FAC	Notes)
3. Calamagrostis canadensis	85-	Y	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Streptopus amplexifolius	T		FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Oplopanax horridus		_		disturbed or problematic.
6. Rubus idae us				
7. Gymnocarpium dryopteris	15		FACU	% Bare Ground
8. Onjopteris expansa	15		FACU	% Cover of Wetland Bryophytes
9. Equise turn arrense	5		FAC	Total Cover of Bryophytes
10. viola palustre	12		FACW	Hydrophytic Vegetation Present (Y/N):
Total Cover:	132			Notes: (If observed, list morphological adaptations below):
50% of total cover:	66 20	% of total cov	ver: 26.4	rivotes. (ii observed, list morphological adaptations below);
Georgialon lividicum	-9	4.1	FACU	

JOIL FIXORI			to the depth needed			idiodici oi oo			,
Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (moist)	% Тур	e <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
0 - 1		-						organ	ics
- ,   - 7	10 YR 3/1	100	-				Silt loam	0	
1-22	10 YR 4/3	70	5 YR 416	30 (	`	M	silt loam		
1 22	10 /12 1/3		3716 170 00 0				0771 100017		
						1 12 10	21	DI - Dana Li	alan Mandaliy
<u> </u>	oncentration, D=Deple	tion, RN	I=Reduced Matrix, CS	S=Covered o	or Coa	ted Sand Gra	,		
	IL INDICATORS								EMATIC HYDRIC SOILS
	listel (A1)		Alaska Gleyed			-1-	Alaska Color C		
	don (A2)		Alaska Redox (						
3lack Histic	(A3)		Alaska Gleyed	Pores (A15)	_	_	Alaska Redox v		
Hydrogen Sι	ulfide (A4)						Alaska Gleyed Laver	without 5Y H	ue or Redder Underlying
Thick Dark S	Surface (A12)						Other (Explain	in Notes)	
One indicate	or of hydrophytic vege	— tation, o	ne primary indicator o	of wetland hy	drolog	gy, and an ap	propriate landsca	pe position r	nust be present unless
0:	problematic.	4				1			
Give details Restrictive L	of color change in No ayer (if present): Type	tes.	D	epth (inches	): -				
	., (.			CENSON STATISTICS	****				
Hydric Soil	Present (Y/N):	Y							
				(mactal)	17# <i>[</i> *	See CV	A-3 Install	CXICA R	
Notes: Soi	I was rechecked	on	6/25/14 642	(ch/istop	ner,	, See W	00-3 logbook	(xgl8,	7
Notes: Soi	I was rechecked	on	6/25/14 642	(nristop) 10% PL	ner,	, See W(	00-3 logboöl Meets AX Rec	lox indica	nor
Notes: Soi		on	6/25/14 642	(Christop) 10% PL 15% PL	₩ <b>^</b> {/`,	, 5€€ <b>ω</b> (	00-3 logboöl meets AK Rec	lox indice	nor.
Notes: Soii ひ-み のう つ~10 1	I was rechecked	Redo Redo	6/25/14 by 2 1x 7.5 484/6 1x 1048 4/6	10% PL 15% PL		-	00-3 logbook Meets AX Rec INDICATORS (2	lox indice	itor,
Notes: Soil	i we <b>d rechecke</b> ganes BYR5/3 90% <b>BY</b> 4/1 85%	Redo Redo FORS (a	6/25/14 by 2 1x 7.5 484/6 1x 1048 4/6	10% PL 15% PL Ifficient)	SI	ECONDARY /ater-stained	meets AK Rec	or more requ	itor,
Notes: Soil Property of the Control	CYR 5/3 90%  SYP 1/1 85%  SYPRIMARY INDICA	Rede Rede FORS (a	iny one indicator is surface Soil Cracks (B6)	IOYO PL ISYO PL Ifficient)	SI W Le	ECONDARY /ater-stained eaves (B9)	meets AK Rec	or more requ	uired) ed or Stressed
HYDROLOG Surface Water	EY PRIMARY INDICATE (A1) X	Redo Redo Su Inu (B7	iny one indicator is surface Soil Cracks (B6)	IOYO PL ISYO PL Ifficient)	SI W	ECONDARY /ater-stained eaves (B9) rainage Patte	INDICATORS (2  erns (B10)  ospheres along	or more requestions of stunter Plants  Geom	uired) ed or Stressed s (D1)
HYDROLOG Surface Water High Water	EY PRIMARY INDICATE (A1) X	Redu Redu Su Inu (B7 Sp Co	iny one indicator is surface Soil Cracks (B6) ndation Visible on Ae arsely Vegetated	ufficient)  rial Imagery	SI W Le	ECONDARY /ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Re	INDICATORS (2 erns (B10) ospheres along	or more requestions of stunter plants Geom Shallo	uired) ed or Stressed s (D1) prophic Position (D2)
HYDROLOG Surface Water High Water T Saturation (A	er (A1) X  Table (A2) X	FORS (a Su Inu (B) Sp Co	arsely Vegetated ncave Surface (B8)	ufficient)  rial Imagery	SI W. Le	ECONDARY /ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Re	INDICATORS (2  erns (B10)  pspheres along (23) educed	or more requestions of stanta Plants Geom Shallo Micro Relief	uired) ed or Stressed s (D1) porphic Position (D2) pow Aquitard (D3) topographic
HYDROLOG Surface Water High Water T Saturation (A Water Marks	EYR 5/3 70 16 16 16 17 17 16 16 17 17 17 18 17 18 17 18 18 18 18 18 18 18 18 18 18 18 18 18	FORS (a Su Inu (B7 Co Ma Hy Od	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae incave Surface (B8) irl Deposits (B15) irl Deposits (B15)	ifficient)  rial Imagery	SI W. Le	ECONDARY /ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4)	INDICATORS (2  erns (B10)  pspheres along (23) educed	or more requestions of stanta Plants Geom Shallo Micro Relief	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	EYR 5/3 70 % 35 % SY PRIMARY INDICA*  er (A1)  Table (A2)  S (B1)  eposits (B2)	Su Inu (B7 Co Ma Hywa	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae incave Surface (B8) irl Deposits (B15) irl Deposits (B15) irl Deposits (B15) irl Deposits (B15)	ifficient)  rial Imagery	SI W. Le	ECONDARY /ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4) alt Deposits (	INDICATORS (2  erns (B10)  pspheres along (23) educed	or more requestions of stanta Plants Geom Shallo Micro Relief	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)
HYDROLOG Surface Water High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	EYR 5/3 70 16 16 16 17 16 16 16 17 16 16 16 17 16 16 16 16 16 16 16 16 16 16 16 16 16	Su Inu (B7 Co Ma Hywa	iny one indicator is surface Soil Cracks (B6) Indation Visible on Ae The contract of the contr	ifficient)  rial Imagery	SI W. Le	ECONDARY /ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4) alt Deposits (	INDICATORS (2  erns (B10)  pspheres along (23) educed	or more requestions of stanta Plants Geom Shallo Micro Relief	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	EYR 5/3 70 16 16 16 17 17 16 16 17 17 17 18 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Su Inu (B7 Co Ma Hywa	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae The contract of the contr	ifficient)  rial Imagery	SI W. Le	ECONDARY /ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4) alt Deposits (	INDICATORS (2  erns (B10)  pspheres along (23) educed	or more requestions of stanta Plants Geom Shallo Micro Relief	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or Iron Deposits	EYR 5/3 70 16 16 16 17 16 16 17 16 16 17 16 16 17 16 16 17 16 17 16 17 16 17 16 17 16 17 16 17 16 17 16 17 16 17 16 17 16 17 17 17 17 17 17 17 17 17 17 17 17 17	Su Inu (B7 Co Ma Hywa	iny one indicator is surface Soil Cracks (B6) Indation Visible on Ae The contract of the contr	ifficient)  rial Imagery	D O Li	/ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4) alt Deposits (cotes:	INDICATORS (2  erns (B10)  espheres along C3)  educed  C5)	or more requestion of stundard	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or Iron Deposits Surface Water	EYR 5/3 70 16 16 16 17 17 16 16 17 17 17 18 17 18 18 18 18 18 18 18 18 18 18 18 18 18	Su Inu (B7 Co Ma Hywa	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae The contract of the contr	ifficient)  rial Imagery	D O Li	/ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4) alt Deposits (cotes:	INDICATORS (2  erns (B10)  pspheres along (23) educed	or more requestion of stundard	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)
HYDROLOG Surface Water High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or Iron Deposits Surface Water Water Table Saturation P	er (A1) X  Table (A2) X  (B1)  eposits (B2)  S (B5)  er Present (Y/N): Y	Su Inu (B7 Co Ma Hywa	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae inarsely Vegetated incave Surface (B8) irl Deposits (B15) irl Deposits (B15) irrespensive or (C1) irrespensive or (C2) irrespensive or (Explain in Notes) inter (Explain in Notes)	ifficient)  rial Imagery	D O Li Prim Si	/ater-stained eaves (B9) rainage Patte xidized Rhizo ving Roots (Coresence of Recon (C4) alt Deposits (cotes:	INDICATORS (2  erns (B10)  espheres along C3)  educed  C5)	or more requestion of stundard	uired) ed or Stressed s (D1)  horphic Position (D2)  bw Aquitard (D3)  topographic f (D4)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       ○       Sapling (<5 dbh, <6m tall)       ○       Tall shrub (2-6m)       ○       Short shrub (0,5-2m)       ○         Dwarf shrub (<0,5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) X Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P):       Soil Lacking       Histosol:Fibric       Histosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inl
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment  Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Return Interval >5 yrs Return Interval Yrs Return Inte
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4)X Alkaline (>7.4) Acid (<5.5) pH Reading 5.59 Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits X
Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated_X Wetlands within 400m, Not Connected Only Connected Below
Only Connected Above Connected Upstream & Downstream Unknown
Westiand Land Lise: High Intensity (Lo. co.) Moderate Intensity (Lo. forestar)
2 months and the second
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized  Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)

rew Chief QA/QC check

GPS Technician QA/QC check:

MW

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: <u>W60HT013</u> Field Target: 146 Date: 06-14-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>Appropriate hydrology indicators are marked?</li> <li>Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X spenialle 6/14/14
Wetland Scientist (print)	Signature // Date
Von 1 al t	V () a Table 1 1

SITE DESCRIPTION			2000 10	orridor			
Survey Type: Centerline Acces	ss Road (explain)	Other (expla	nin)X	Field Targe	et: <u>                                     </u>	Map #: 102_Map Date: 5/27/14	
Date: () 6 - 11 - 14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	:NGOF1041-WGOHTOI	
Investigators: Dan La Plan	t, Zoe Mead	de				Team No.: W 60	
State: Alaska		Milepost:	18				
Latitude: 62°21'42.015"		Longitude	150°15	128.70	)/"	Datum: WGS84	
Logbook No.: 062	Logbook Page No.: ¿	012	Picture No.:	P_5,8	sw, pit	-, plug	
SITE PARAMETERS		100			91		
Subregion: interior			Landform (hill	Islope, terrace	e, hummock	s, etc.): Ywi sicox	
Slope (%): 5 – 10			Local relief (c			contav	
Pre-mapped Alaska LNG/NWI classifica	ition: PEM 1 B		Soil Map Unit	: Name:	_		
Are climatic/hydrologic conditions on the YesX No(if no exp	site typical for this time	of year?	Are "No Yes_X	ormal Circums		esent: plain in Notes.)	
Are Vegetation, Soil, or Hy	drology Significantl	y Disturbed?	No_X	_(If yes, expl	ain in Notes	)	
Are Vegetation, Soil, or Hyd	drology Naturally P	roblematic?	No_X	_ (If yes, exp	lain in Notes	3.)	
SUMMARY OF FINDINGS	1000	35.158					
Hydrophytic Vegetation Present? Yes_	XNo	ls	Is the Sampled Area within a Wetland? YesX No				
Hydric Soil Present? Yes_	X No	w	Wetland Type: PEMIB/PUBF				
Wetland Hydrology Present? Yes_	X No	— Ala	aska Vegetatior	n Classificatio	n (Viereck):	III AZ	
Notes and Site Sketch: Please include I	Directional & North Arrow	, Centerline,	Length of featu	ıre, Distances	from Cente	rline, Photo Locations, and Survey	
Several large boulders in the Pond/islands	PEMIRS		uplan IC		N	Parks Highway	

VEGETATION (use scientific names of plant	is)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2 (A)
1.		Vivia		Total Number of Dominant Species Across All Strata:(B)
2.				% Dominant Species that are OBL, FACW, or FAC:(A/B)
3.				
4.				Prevalence Index worksheet:
Total Cove	r:O		-	Total % Cover of: Multiply by:
50% of total cove	r: <u> </u>	% of total cov	ver:O	OBL species: X 1 = 8
Sapling/Shrub Stratum ( 261 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1.				UPL species
2.				Column Totals: 17 3 (A) 503 (B)
3.				PI = B/A = 2 - 91
4.				
5.				1
6.				1
7.				
8.				
9.				
Total Cover				
50% of total cover	r: <u> </u>	% of total cov	ver: O	
VEGETATION (use scientific names of plants	s)			
Herb Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Carex aquatilis	8	•	OBL	Prevalence Index is ≤ 3.0
	80	Y	FAC	Morphological Adaptations¹ (Provide supporting data in Notes)
2. Equisetum arvense 3. Calamagrostis Can-	85	Y	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4- Viola Palustris	T		FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover			2116	Notes: (If observed, list morphological adaptations below):
50% of total cover	: <u>80-5</u> 20°	% of total cov	er: <u>34.6</u>	

SOIL			Date 06-11-14 Feat					
SOIL PROFILE	DESCRIPTION: (De	escribe	to the depth needed to	o doci	ument the	indicator or co	nfirm the absence	of indicators.)
Depth	Matrix	P.	Redox Features				1.	
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-2		-	-	-				organics
2-8	10 YR 3/1	-		-			Silt loam	
8-22	10 YR 5/3	60	10YR 5/8	30	С	M	clay loam	
							- 1	
							2	
<sup>1</sup> Type: C=Con	centration, D=Deplet	ion, R	M=Reduced Matrix, CS	=Cov	ered or Co	ated Sand Gra		PL=Pore Lining, M=Matrix.
	INDICATORS							FOR PROBLEMATIC HYDRIC SOILS3
Histosol or His	tel (A1)		Alaska Gleyed (/					nange (TA4) <sup>4</sup>
Histic Epipedo	n (A2)		Alaska Redox (A	(14)_	X	*		wales (TA5)
Black Histic (A	3)		Alaska Gleyed P	ores	(A15)			vith 2.5Y Hue
Hydrogen Sulf	ide (A4)						Alaska Gleyed v	without 5Y Hue or Redder Underlying
Thick Dark Sur							Other (Explain i	n Notes)
		— ation, c	ne primary indicator of	wetla	and hydrolo	ogy, and an ap		pe position must be present unless
disturbed or pr	oblematic.		,		•			
Give details o	f color change in Note	es.	De	oth (i	nches):			*
Hydric Soil Pr	resent (Y/N):	V						
11,4110				10. 1	and a second		C ( 10.45	7
Notes:	soil rechecly	ed o	n 7/8/14 bys.	CN	1550pm	is see way	boek water	5.
	contivm	ech 12	n 7/8/14 by J. Haska Rrdox					
HYDROLOGY	PRIMARY INDICAT	ORS (	any one indicator is suf	ficien	t) \$	SECONDARY	INDICATORS (2	or more required)
Surface Water	(A1)	Su	rface Soil Cracks (B6)			Water-stained Leaves (B9) _	_	Stunted or Stressed Plants (D1)
High Water Ta	ble (A2)	Int (B	undation Visible on Aeri 7)	ial Im		Drainage Patterns (B10)		Geomorphic Position (D2) X
Saturation (A3	) <u>X</u>	Sp	arsely Vegetated oncave Surface (B8)			Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
Water Marks (	B1)X	Ma	arl Deposits (B15)			Presence of R Iron (C4)		Microtopographic Relief (D4)
Sediment Dep	osits (B2)		drogen Sulfide dor (C1)			Salt Deposits	(C5)	FAC-Neutral Test (D5)
Drift Deposits	Dry-Season Water Table (C2)							
Algal Mat or C	Algal Mat or Crust (B4) Other (Explain in Notes):							
Iron Deposits	(B5)							
Curfoce Mist-	Present (Y/N):		Depth (in):					
Surface vvater	Present (1/N).		Depth (in): ()		We	etland Hydrol	ogy Present (Y/N	):
Water Table P	resent (Y/N):		Depth (in): NA					,
Saturation Pre (includes capil			Depth (in): 12					
	dug on ee site s		10°10 gradi	en	t ak	oove d	epression	al pond.

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):     Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Santic
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Saprīc Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES   Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Pe
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermit
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Ou
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Interm
Inlet/Outlet Class (P): No Inlet/Outlet

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	WGOHTO19
	EID: 140 T1041 Field Target: 147 Date: 6/11/2014
or all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present? ✓ Cover calculations are complete and correct? ✓ All dominant species have been determined and recorded per strata? ✓ Indicator status is correct for each species? ✓ Dominance Test and Prevalence Index have been completed?
•	
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	☑ Wetland boundaries have been corrected if necessary? ☑ Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

soils recheck

### WETLAND DETERMINATION DATA FORM

Soils check FT 147

SOIL PROFI		Describe	to the depth needed	I to documen	the indica	ator or o	confirm the absence	e of indicators.)
Depth	Matrix		Redox Features					
inches)	nches) Color (moist) %		Color (moist)	% Typ	e <sup>1</sup> L	oc²	Texture	Notes
0-1				101			Fibric	organics; dry
-8	10 YR 4/1						Siltloam	
3-12	10 YR 5/1						Silt loans	
2-20	5 y 5/1	90	10 YR 4/6	10 (		PL	silt loam	
			140					
							21 11	Di Di di i Mala
-	oncentration, D=Depl	etion, RN	/I=Reduced Matrix, C	S=Covered	or Coated	Sand G		PL=Pore Lining, M=Matrix.
	IL INDICATORS							FOR PROBLEMATIC HYDRIC SOILS
	listel (A1)		Alaska Gleyed					hange (TA4) <sup>4</sup>
Histic Epiped	don (A2)		Alaska Redox					Swales (TA5)
3lack Histic (	(A3)		Alaska Gleyed	Pores (A15)				with 2.5Y Hue
Hydrogen Su	ulfide (A4)	_					Alaska Gleyed Layer_	without 5Y Hue or Redder Underlying
Thick Dark S	Surface (A12)						Other (Explain	in Notes)
			one primary indicator	of wetland h	drology, a	and an		pe position must be present unless
Give details	of color change in N	otes.	!	South /inchor	1:			
Restrictive La	ayer (if present): Typ	oe:		Depth (inches	):			
	Present (Y/N):	У						
Notes:				sufficient)	SECO	ONDAR	Y INDICATORS (2	or more required)
Notes:	SY PRIMARY INDICA	ATORS (	any one indicator is s		Mate		Y INDICATORS (2	
Notes:		ATORS (			Wate	r-staine		or more required)  Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Surface Wate	SY PRIMARY INDICA	Su	any one indicator is s rface Soil Cracks (Boundation Visible on A	5)	Water Leave	r-staine es (B9)	d	Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Surface Water	er (A1)	Su Inu - (B	any one indicator is s rface Soil Cracks (Boundation Visible on A 7) arsely Vegetated	6)erial Imagery	Water Leave Drain	r-staine es (B9) age Pa zed Rhi	tterns (B10)	Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Notes:  HYDROLOG  Surface Water	er (A1)	Su Inu - (B	any one indicator is s rface Soil Cracks (Boundation Visible on A	6)erial Imagery	Water Leave Drain	r-staine es (B9) age Pa zed Rhi	d 	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)
Notes:  HYDROLOG  Surface Water  High Water T	EY PRIMARY INDICA er (A1) Table (A2)	Su Interest (a Su Interest (a Su Su Co	any one indicator is surface Soil Cracks (Buundation Visible on A.) arsely Vegetated incave Surface (B8)	6)erial Imagery	Drain Oxidia Living Prese	r-staine es (B9) age Pa zed Rhi g Roots ence of	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water High Water T Saturation (A	EY PRIMARY INDICATION (A1)  Table (A2)  A3)  E (B1)	Su Int (B	any one indicator is s rface Soil Cracks (Boundation Visible on A 7)	6)erial Imagery	Drain Oxidiz Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A	EY PRIMARY INDICA er (A1) Table (A2)	Su Int. (B Sp Cc	any one indicator is surface Soil Cracks (Build and Arrows Vegetated and Source Surface (B8) and Deposits (B15)	5)erial Imagery	Drain Oxidiz Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water High Water T Saturation (A Water Marks	er (A1) Table (A2)  A3)  s (B1) eposits (B2)	Su International Su Int	any one indicator is sufface Soil Cracks (Boundation Visible on A 7)  arsely Vegetated ancave Surface (B8) arl Deposits (B15) drogen Sulfide dor (C1)	5)erial Imagery	Drain Oxidia Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks	EY PRIMARY INDICATION (A1)  Table (A2)  A3)  E (B1)	Su International Su Int	any one indicator is s  rface Soil Cracks (Boundation Visible on A  7)  arsely Vegetated incave Surface (B8) arl Deposits (B15)  drogen Sulfide lor (C1)	5)erial Imagery	Drain Oxidia Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	er (A1) Table (A2)  A3)  s (B1) eposits (B2)	Su International	any one indicator is sufface Soil Cracks (Boundation Visible on A 7)  arsely Vegetated ancave Surface (B8) arl Deposits (B15) drogen Sulfide dor (C1)	6)	Drain Oxidia Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	PRIMARY INDICATION OF TABLE (A2)  A3)  B (B1)  Eposits (B2)  Crust (B4)	Su International	any one indicator is surface Soil Cracks (Build and Article Soil Cracks (Build and Article Soil Cracks (Basil Soil Cracks (Basi	6)	Drain Oxidia Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	PRIMARY INDICA er (A1) Table (A2) A3) s (B1) eposits (B2)	Su International	any one indicator is surface Soil Cracks (Build and Article Soil Cracks (Build and Article Soil Cracks (Basil Soil Cracks (Basi	6)	Drain Oxidia Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or	PRIMARY INDICATION OF THE PRIMARY INDICATION	Su International	any one indicator is surface Soil Cracks (Buildation Visible on A 7)	6)	Drain Oxidia Living Prese Iron (	r-staine es (B9) age Pa zed Rhi g Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or	PRIMARY INDICATION OF TABLE (A2)  A3)  B (B1)  Eposits (B2)  Crust (B4)	Su International	any one indicator is surface Soil Cracks (Build and Article Soil Cracks (Build and Article Soil Cracks (Basil Soil Cracks (Basi	6)	Drain Oxidia Living Prese Iron (I	r-staine es (B9) age Pa zed Rhi i Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or Iron Deposits	PRIMARY INDICATION OF THE PRIMARY INDICATION	Su International	any one indicator is surface Soil Cracks (Buildation Visible on A 7)	6)	Drain Oxidia Living Prese Iron (I	r-staine es (B9) age Pa zed Rhi i Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposite Algal Mat or Iron Deposite Surface Water Water Table Saturation P	PRIMARY INDICATION (A1)  Table (A2)  A3)  S (B1)  eposits (B2)  Crust (B4)  s (B5)  ter Present (Y/N):	Su International	any one indicator is surface Soil Cracks (Bi Indation Visible on A 7)	6)	Drain Oxidia Living Prese Iron (I	r-staine es (B9) age Pa zed Rhi i Roots ence of C4)	tterns (B10) zospheres along (C3)X Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

Investigators: Joe Christopher, Value State: Alaska Region: Alas Latitude: 62°56'05, 42"  Logbook No.: 003 Logbook Page SITE PARAMETERS	levie Watka ska	IG 26221306  INS, ZOE  Milepost: 10  Me: 149° 41	Meade 67.4 '14.17"	Map #: <u>63</u> Map Date: <u>5/27/</u> 14 : W60 HT 015 Team No.: W 60			
Investigators: Joe Christopher, Va.  State: Alaska  Latitude: 62°56°05, 42"  Logbook No.: 003  Logbook Page  SITE PARAMETERS	levie Watk	Milepost: 10	Meade 67.4 '14.17"				
State: Alaska  Latitude: 62°56°05,42"  Logbook No.: 003  Logbook Page  SITE PARAMETERS	Longitud	Milepost: 1	Meade 67.4 '14.17"				
State: Alaska  Latitude: 62°56°05,42"  Logbook No.: 003  Logbook Page  SITE PARAMETERS	Longitud	Milepost: 1	67.4				
Logbook No.: 0 0 3 Logbook Page SITE PARAMETERS							
SITE PARAMETERS	ge No.: OO )	Picture No.:		Datum: WGS84			
			PE , PW, Pi	t, plug			
			1				
Subregion: interior		Landform (hills	slope, terrace, hummock	s, etc.): [1]			
Slope (%): 0 – 3			oncave, convex, none):	Concarl			
Pre-mapped Alaska LNG/NWI classification: PSS1	.В	Soil Map Unit	1	NA			
Are climatic/hydrologic conditions on the site typical for Yes X No (if no explain in Notes)	this time of year?		rmal Circumstances" pre	sent:			
Are Vegetation, Soil, or Hydrology S	ignificantly Disturbed	? No X	No (If no, exp _(If yes, explain in Notes)	plain in Notes.)			
Are Vegetation Soil X, or Hydrology N		Vr.	(If yes, explain in Notes				
SUMMARY OF FINDINGS			(ii yee, explain in redice				
Hydrophytic Vegetation Present? Yes No	Is	Is the Sampled Area within a Wetland? YesX No					
Hydric Soil Present? Yes X No_	w	Wetland Type: PSS1B					
Wetland Hydrology Present? YesX No_	AI	Alaska Vegetation Classification (Viereck): II B 2, II C 2					
Notes and Site Sketch: Please include Directional & Not corridor.  J. S. J. Hul W. M. M. J.		Length of feature	e, Distances from Center	line, Photo Locations, and Survey			

	Absolute	Dominant	Indicator	Dominance Test worksheet:			
Tree Stratum (Plot sizes: 26')	% Cover	Species?	Status	No_ of Dominant Species that are OBL, FACW, or FAC: 4  Total Number of Dominant Species Across All Strata: 4			
1. Picea gianca	1		FACH	% Dominant Species that are OBL, FACW, or FAC: 100			
2.	45			7. Bonniant opecies that are easy, as a second			
3.							
4.				Prevalence Index worksheet:			
Total Cover:	0			Total % Cover of: Multiply by:			
√ 50% of total cover:		% of total cov	er: <u> </u>	OBL species:X 1 =			
Sapling/Shrub Stratum ( 26 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 13			
1. Betula nana	70	Y	FAC	UPI species () X 5 = ()			
2. Saléx fuscences	5		FAC	Column Totals: 146 (A) 435 (B)			
3. Spirea stevenii	4		FACU	PI = B/A = 2 . 9 8			
4. Empetrum nigrum	1		FAC				
5. Picea glauca	2		FACU				
6. Vaccinium uliginosum	35	У	FAC	Picglan true olded to Shows.			
7. Salex pulchra	5		FACW	to Shows			
8. Betula neoalaskana	2		FACU	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
9. Salex barclayi	2		FAC				
Total Cover 50% of total cover			0.5.11				

Herb Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50% X Prevalence Index is ≤ 3.0
1. Chamerion angustofolium	1		FACU	Morphological Adaptations¹ (Provide supporting data in
2. Calama giostis canadensi	5 7	Y	FAC	Notes)
3 Equisetum Arvense	3		FAC	Problematic Hydrophytic Vegetation¹ (Explain)
4. Trientalis europaea	Ţ		FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Sangulsorba canadensis	7	Y	FACW	disturbed or problematic
6. Rubus chamaemorous			FACW	
7. Vaccinium Wigino oum			FAC	% Bare Ground
8. Equisetum sylvaticum	T		FAC	% Cover of Wetland Bryophytes
9. Rubus arcticas	T		FAC	Total Cover of Bryophytes O
10.				Hydrophytic Vegetation Present (Y/N):
Total Cover: 50% of total cover:		00% of total cov	ver: 3.8	Notes: (If observed, list morphological adaptations below):

SOIL PROF	ILE DESCRIPTION:	(Describe	to the depth needed	d to docur	nent the	indicator or	confirm the absence	e of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-6			-	-		1	Fibric	organics
6-8	10 YR 2/1	90					Silt loam	10% cobbles & gravels
8-18	2.5 4 2/1	85	10 YR 4/4	15	С	PL	Siltloam	
		-						
				-		-		
Type C=C	 oncentration, D=Depl	etion PM	I-Paducad Matrix C	S=Cover	od or Co	atad Sand C	Project 21 continu	DI - Dave Linia - M. Matri
	IL INDICATORS	etion, ixiv	-Neduced Matrix, C	3-Coven	ed of Co	ateu Sanu C		PL=Pore Lining, M=Matrix. FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	listel (A1)		Alaska Gleyed	Ι (Δ13)				
	don (A2)		Alaska Redox					hange (TA5)
	(A3)		Alaska Gleyed				Alaska Alpine S	Swales (TA5) vith 2.5Y HueX
			Alaska Gleyeu	roles (A	13)		Alaska Gleved	without 5Y Hue or Redder Underlying
	ulfide (A4)	-					Layer	- Williout 31 Tide of Reader Oriderlying
	Surface (A12)						Other (Explain i	
One indicate disturbed or i	or of hydrophytic vege problematic.	etation, o	ne primary indicator	of wetland	d hydrolo	gy, and an a	appropriate landsca	pe position must be present unless
Give details	of color change in No	otes.						
Restrictive La	ayer (if present): Typ	e:		Depth (inc	hes):	NA	-	
Uludaia Cail I	Description of OVAN	У						
	Present (Y/N);							
Notes:	vrated @	5"			1111			
144	or acca (a							
114~	e Primary 1	1)240 =	1 175 NEZ	,				
HYDROLOG	Y PRIMARY INDICA	TORS (a	ny one indicator is s	ufficient)	S	ECONDAR	Y INDICATORS (2	or more required)
	er (A1)X				V	Vater-staine		Stunted or Stressed
	51 (A1) <u>7.</u>		face Soil Cracks (B6)			Leaves (B9)		Plants (D1)
High Water T	able (A2) X	Inur (B7)	idation Visible on Ae	erial Image	ery D	Drainage Patterns (B10)		Geomorphic Position (D2)
Saturation (A	(3) X	Spa	rsely Vegetated	sely Vegetated		Oxidized Rhizospheres along		Challess Assistant (D2)
		Con	cave Surface (B8) _		_ L	iving Roots	(C3) <u>\</u>	Shallow Aquitard (D3)
Water Marks	(B1)	Mar	Deposits (B15)			resence of i	Reduced	Microtopographic Relief (D4)
Cadimant Da	it- (D0)	Hvd	rogen Sulfide					
Sediment De	posits (B2)		r (C1)		S	Salt Deposits (C5) FAC-Neutral Test (D5) _		
Drift Deposits	s (B3)		Season		N	lotes:		-
			er Table (C2)					
Algal Mat or (	Crust (B4)	Othe	er (Explain in Notes)	5				
ron Deposits	(B5)							
		-				15-12-		
Surface Wate	er Present (Y/N):	У	Depth (in):					
	· · · · · · · · · · · · · · · · · · ·				Wet	land Hydro	logy Present (Y/N)	:
vater lable l	Present (Y/N):		Depth (in):			_		
Saturation Pro			Depth (in): 5					
includes cap								
Notes: Loc	fallred Shma	ing H	10 Dy Lon	o proc	Kuds	40 E	ast.	
	-	Ů.		,	·			

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) 107  Dwarf shrub (<0.5m) Tall herb (≥1m) Short herb (<1m) 19 Moss-Lichen 0 Floating Submerged 0
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover_1X
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P):       Soil Lacking       Histosol: Fibric       Histosol: Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 6.
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space) X
Watershed Land Use:         0-5% RuralX
Size: Small (<10 acres) ✓ Medium (10-100 acres) Large (>100 acres)

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

 $\gamma$ 

Featu	re ID: W&HT016 Field Target: 91 Date: 6/24/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	☐ Appropriate hydrology indicators are marked? ☐ Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

# 8. Photos Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)? Two photos were taken for each Observation Point (vegetation/site overview)?

X Joe Christoph	X	4/24/14
Wetland Scientist (print)	Signature / Date	

X 200 Meade X 3000 Medle 6/24/14

Field Crew Chief (print) Signature / Date

## Vegetation Classification Data Form

Site Description	and the latest	Tri an		Introduction of the Control of the C	
Date: 0 % - 2 4 - 14 Investigators:	06-24-14 Alaska LNG 26221306			Field Target: H T 0 역 I Feature ID:	
Joe Christopher Latitude: 02° 56'04.	. 1/	Longitude:		Datum: WGS84	
Logbook #:		Logbook F		Picture #: $P = \mathcal{N}_1 = S$	
Location Description	100			Econolist Contract	
South of	WGOHTO	015			
Common Species Ob	served (Scientific	Name)			
Betula nano	λ		Vacciniu	m vitis-idaea	
Picea			Empetrum nigrum		
Rhododendro	on tomento	sum			
Geocaulon 1					
Percent Cover of Domi	nant Structure Leve	el: 30	010		
Habitat Description:			MAN I		
	irch forres				
Alaska Vegetation Cla	assification: Level	l I, Level II,	Level III		
IC2	I	C 2			
Notes:					
Upland knoll	Adj to FT	11			

Field Crew Chief:

Field Scientist/Technician Joll Meell

# Vegetation Classification Data Form

Level I	Level II	Level III
I. Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland
II Scrub	A. Dwarf tree scrub	(1) Closed dwarf tree scrub (2) Open dwarf tree scrub (3) Dwarf tree scrub woodland
	B Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C. Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	(1) Dryas dwarf scrub (2) Ericaceous dwarf scrub (3) Willow dwarf scrub
III Herbaceous	A Graminoid herbeceous	(1) Dry graminoid herbaceous (2) Mesic graminoid herbaceous (3) Wet graminoid herbaceous (emergent)
	B Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C. Bryoid herbaceous	(1) Mosses (2) Lichens
	D Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceou     Marine aquatic herbaceous

	criptions of levels I, II, III, and IV follow	MAC STREAM PRODUCTION CONTRACTOR
in_	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more	I Forest
1 b.	Trees over 3 meters (10 ft) ball are absent or nearly so, Less than 10 percent cover. (Owarf trees, less than 3 meters (10 ft) ball may be present and abundant.	U11011111121011111111111111111111111111
I Fo	prest	
2a	contributed by paerlisiant	I A Needleleaf forest
2b	Less than 75 percent of tree cover contributed by needleleaf (confler) species	
3a_	Tree canopy of 60-100 percent cover	I.A.1 Closed needleleaf fores
3b.	Tree canopy of 25-59 percent cover	IA 2 Open needleleaf fore
3с	Tree canopy of 10-24 percent cover	I A.3 Needleleaf woodlan
4a		I B Broadleaf forest
4b.	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover	
5a.	Tree canopy of 60-100 percent cover	LB 1 Closed broadleaf fore
5b.		I B 2 Open broadleaf fore
5c.		I.B 3 Broadleaf woodle
6a.		I.C 1 Closed mixed fore
6b.		I.C.2 Open mixed fore
6c.	Tree canopy of 10-24 percent cover .	LC.3 Mixed woodla
7a.	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 ft] tall)	
7b	Vegetation herbaceous (may have up to 25 percent shrub cover)	Contract Con

11, 50	crub	
8a	Vegetation with at least 10 percent cover of dwarf trees	II A Dwarf tree scrub 9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	
9a	Dwarf tree canopy of 60-100 percent cover	II.A.1 Closed dwarf tree scrub
9b	Dwarf tree canopy of 25-59 percent cover	I.A.2 Open dwarf tree scrub
9c	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall	II B Tall scrub
10b.	Shrubs less than 15 meters (5ft)tall	jai(12
	Shrub canopy cover greater than 75 percent	
11 b	Shrub canopy cover of 25-74 percent	II B 2 Open tali scru
12a	Shrubs 20 centimeters to 1.5 meters tall	il.C Low scrub 1
12b	Shrubs under 20 centimeters in height .	il.D Dwarf scrub 1
	Charle annual agree areater then	II C   Closed low scru
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	II C 2 Open low scrut
14a	Dryas species dominant in the dwarf shrub layer	. II D 1 Dryas dwarf scru
14b	Ericaceous species dominant in the dwarf shrub layer	II D 2 Ericaceous dwarf scrul
14c	. Willow species dominant in the dwarf scrub layer	II D 2 Willow dwarf scrub
Ш,	Herbaceous	
155	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	III D Aquatic herbaceous 2

16a (	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant
	Grasslands of well-drained dry sites, such as south-facing bluffs, old beaches, and sand dunes rypically (but not always) dominated by Elymus spp., Festuce spp., and Deschampsia spp
	On moist sites, but usually not with standing water. Usually dominated by Calamagrostis spp.  Carex spp or Eriophorum spp;  tussocks often present
	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet fundra, bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites III 8.1 Dry forb herbaceous
19b	On moist sites but without standing water, mostly within forested areas
19c	On wet sites, usually with standing water for part of the year III 8 3 Wet forb herbaceous
20a	Vegetation cover dominated by mosses
20b	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water
21c	Vegetation submerged or floating in salt water

### Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Fe	eatur	re ID: 091 Field Target: W60HT016 Date: 06-24-14
		items not checked, please provide detailed explanation in the notes section of data form.
		,
1.	Ge	eneral Information
	B	Location data recorded?
	Ø	Photo taken and photo number recorded?
2.	Lo	cation Description
	Ø	Location of site recorded with enough detail to help relocate?
3.	Co	mmon Species
	Ø	Scientific name of common species recorded?
	Ø	Percent cover of dominant structure level noted?
4.	Ha	bitat Description
	Ø'	Habitat described?
5.	Cla	essification
	Ø	All three levels of classification recorded?
6.	Fie	ld Log Book
	Ø	Field form entries consistent with log book?
	Z	Logbook clearly identifies the Field Target ID and Feature ID?
,	,	
	X	Zoe Meade X Zoemeade
Fi	eld Te	edmician (print) Signature
		///
	1	
	( (	X 1/ Sac Christopher
Fi	d Co	ow Chief (print) Signature
	/	эндими

# Vegetation Classification Data Form

Site Description					
THE PROPERTY OF THE PARTY OF TH		The second			
Date: Project Name & #: Alaska LNG 26221306				Field Target: HT/2 0 /120	
Investigators:				i i catule ID.	
Joe Christop	her, Valerie	2 Watk	ns, ZM	W60HT017	
Latitude: 62 32 0	74,71"	Longitude:	11.73"	Datum: WGS84	
Logbook #: 003		Logbook F	Page #: 0 0 3	Picture #:	
Location Description		BARD.			
FT120 W			1		
Common Species Ob	served (Scientific	Name)			
Alnus se	>.		Oplopar	nax horridus	
Veratrum vi			Ribes triste		
Mertensia	Panicula	ta	Gymnocarpium dryopteris		
Athyrium c	yclosorun	n	Streptopus ample xifolius		
Percent Cover of Domi	nant Structure Leve	el: 70 of	)		
Habitat Description:					
Tall birch, o				18 club	
Alaska Vegetation Cla	ssification: Leve	I I, Level II,	Level III		
Ic2	正	B2			
Notes:	I WINDS		Links	No. St. De Colonia	
TAN BITCH N/	Alnus, Fern, D	. club un	leistury, D	epression penile pos to mest.	
Field Crew Chief	NSC.	Fi	eld Scientist/Te	echnician WMade	

# Vegetation Classification Data Form

Level I	Level II	Level III
l Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C Mixed forest	Closed mixed forest     Closed mixed forest     Mixed woodland
II Scrub	A. Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf free scrub woodland
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub
III Herbaceous	A Graminoid herbaceous	Dry graminoid harbaceous     Mesic graminoid herbaceous     Wet graminoid herbaceous     (emergent)
	B. Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C Bryoid herbaceous	(1) Mosses (2) Lichens
	D. Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceou     Marine aquatic herbaceous

	criptions of levels I, II, III, and IV follow the Trees over 3 meters (10 ft) tall are	
la	present and have a canopy cover of 10 percent or more	I Forest
1 b	Trees over 3 meters (10 fi) tall are absent or nearly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters (10 ft) tall may be present and abundant	
I Fo	prest	
2m	Over 75 percent of tree cover contributed by needleleaf (conifer) species ,	I A Needleleaf forest
2b	Less than 75 percent of tree cover contributed by needleleaf (conifer) species	
За,	Tree canopy of 60-100 percent cover	I A 1 Closed needleleaf fore
3b.	Tree canopy of 25-59 percent cover	I A.2 Open needleleaf for
3с.	Tree canopy of 10-24 percent cover	I.A.3 Needleleef woodler
<b>4a</b> .	Over 75 percent of tree cover contributed by broadlesf species	I B Broadleaf forest
4b.	contribute 25 to 75 percent of the	
5a.	Tree canopy of 60-100 percent cover	I B 1 Closed broadleaf for
5b.	Tree canopy of 25-59 percent cover	I B 2 Open broadleaf for
5c.	Tree canopy of 10-24 percent cover	I.B.3 Broadleaf woodla
6a	Tree canopy of 60-100 percent cover	I C 1 Closed mixed for
6b.	Tree canopy of 25-59 percent cover	I.C.2 Open mixed for
бс	Tree canopy of 10-24 percent cover	
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10.8] tail)	
7b	Vegetation herbaceous (may have up to 25 percent shrub cover)	

II, Sc	rub	
	Vegetation with at least 10 percent cover of dwarf trees	II A Dwarf tree scrub 9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	10
9a	Dwarf tree canopy of 60-100 percent cover	
9Ь	Dwarf tree canopy of 25-59 percent cover	
9c	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall	II B Tall scrub 11
	Shrubs less than 1.5 meters (5ft)tall	12
	Shrub canopy cover greater than 75 percent	
11 b	Shrub canopy cover of 25-74 percent	II B 2 Open tall scrub
12a	Shrubs 20 centimeters to 1.5 meters tall	II C Low scrub 13
12b	Shrubs under 20 centimeters in height	II D Dwarf scrub 14
13a	Shrub canopy cover greater than 75 percent	II C I Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	. Il C 2 Open low scrub
14a	Dryas species dominant in the dwarf shrub layer	. II D 1 Dryas dwarf scrub
14b	Ericaceous species dominant in the dwarf shrub layer	II D 2 Encaceous dwarf scrub
14c	Willow species dominant in the dwarf scrub layer	II D 2 Willow dwarf scrub
M	Herbaceous	
	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	_16
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	III D Aquatic herbaceous 21

	Grasses, sedges, or rushes (graminoid) plants dominant	.III A Graminoid herbaceous 17
16b	Forbs or bryophytes dominant	18
	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by Elymus spp., Festuca spp., and Deschampsia spp.	III A I Dry graminoid herbaceous
17b	On moist sites, but usually not with standing water Usually dominated by Calamagrostis spp	III A 2 Mesic graminoid herbaceous
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses, includes wet fundra, bogs, marshes, and fens	
1 <b>8a</b>	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)	. III 8 Forb herbaceous 19
18b	Vegetation dominated by mosses or lichens	
19a	On dry sites, usually rocky and well drained, mostly tundra sites	III B.1 Dry forb herbaceous
19b	On moist sites but without standing water, mostly within forested areas	III.B.2 Mesic forb herbaceous
19c	On wet sites, usually with standing water for part of the year	III B 3 Wet forb herbaceous
20a	Vegetation cover dominated by mosses	
20b	Vegetation cover dominated by	III C 2 Bryoid lichen
21a	Vegetation submerged or floating in fresh water.	. III.D.1 Freshwater aquatic herbaceous
21 b	Vegetation submerged or floating in brackish water	III D 2 Brackish water aquatic herbaceous
21c	Vegetation submerged or floating	. III.D 3 Marine aquatic herbaceous

# Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Fe	Feature ID: <u>Wko H11</u> 7 Field Target:	120	Date: 6/24/14
Fo	For all items not checked, please provide o	detailed explanation in	
1.	. General Information		
	Location data recorded?		
	Photo taken and photo number rec	orded?	
2.	Location Description		
	Location of site recorded with enou	gh detail to help reloca	ate?
3.	. Common Species		
	Scientific name of common species	recorded?	
	Percent cover of dominant structure	e level noted?	
4.	. Habitat Description		
	☐ Habitat described?		
5.	. Classification		
	All three levels of classification reco	orded?	
6.	. Field Log Book		
	Field form entries consistent with lo	g book?	
	Logbook clearly identifies the Field	Target ID and Feature	ID?
		. 1	
)	X Zoe Meade >	mulling	all
Fie	Field Technician (print) Sie	mature	
		1	L.C.
		//	
>	X) we Christoph >	1	
		nature	1

SITE DESCRIPTION			Cor	ridor 300'	
Survey Type: Centerline Acce	ss Road (explain)	Other (exp	olain)X	Field Target: 12 [	Map #: 85 Map Date: 5/27/14
Date: 06-24-14	Project Name & No.:	Alaska LN	G 26221306	Feature	eld: W60HT 018
Investigators: Valerie Wath	cins, Joe Chric	rtense	n, 20er	neade	Team No.: W60
State: Alaska	Region: Alaska		Milepost:		
Latitude: 62° 32'03.32"		Longitud	e: 150°14′	10.84"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	4	Picture No.:	P-N,5	, pit plug
SITE PARAMETERS					
Subregion: interior			Landform (hill	Islope, terrace, hummo	ocks, etc.): hill slope
Slope (%): 4 ()				oncave, convex, none	
Pre-mapped Alaska LNG/NWI classifica	ition: upland		Soil Map Unit		IA
Are climatic/hydrologic conditions on the YesX No(if no expl	e site typical for this time ain in Notes)	of year?	Are "No Yes_X	ormal Circumstances" No (If no,	present: explain in Notes.)
Are Vegetation, Soil, or Hyd	drology Significant	ly Disturbed	? No_X	_(If yes, explain in No	tes)
Are Vegetation, Soil, or Hyd	drology Naturally F	roblematic?	No_X	_ (If yes, explain in No	tes.)
SUMMARY OF FINDINGS					
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a Wetland	? Yes NoX
Hydric Soil Present? Yes_	NoX	_ w	etland Type:	uplan d	
Wetland Hydrology Present? Yes	NoX	— AI	aska Vegetation	Classification (Vierec	k): IC2, IIB2
Notes and Site Sketch: Please include D corridor.					
- BAVE/OPEN Areas.	In mapping	Appear.	to B1 Sh	om EALLI Se	asan photo
1 HAVE NOT G	runed up to	+			
	sul pro	3	Sar Dic	gram	
					4

Total Cover: 57

50% of total cover: 28.5 20% of total cover: 11.4

VEGETATION (use scientific names of plants	5)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC: 3 (A)  Total Number of Dominant Species Across All Strata: (B)
1. Betula neoalaskana	75	Y	FACU	% Dominant Species that are OBL, FACW, or FAC: 50 (A)
<sup>2</sup> . Picea glauca	1		FACU	78 Bolliman Operior that are oblight well of the second of
3.				
4.				Prevalence Index worksheet:
Total Cover 50% of total cover	38 20	% of total cove	er: 15.2	Total % Cover of:         Multiply by:           OBL species:         0         X 1 =         0
Sapling/Shrub Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. Vaccinium uliginosum	15	Y	FAC	UPL species
2. Oplopanax horridus	15	Y	FACU	UPL species
3. Alnus ssp.	25	Y	FAC	PI = B/A = 3.67
4. picea glauca	1		FACU	
5.				
6.				
7,				
8.				
9.				
Total Cover		0% of total cov	ver: 11.2	
VEGETATION (use scientific names of plant	s)	J. C. H. C.		
Herb Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Strepto pus amplexifoliv	10	(,	FACU	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
0 1 1 P 12 LU 12 U 10 LATE 10 1 LATE 10 U.	1		- A	I INIORPHOLOGICAL Adaptations (Provide supporting data in
	115	У	FACU	Notes)
2. Dryop teris expansa	15	Y	FACU	Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
2. Dryop teris expansa 3. Gymnocar piv m dryopter	15	À		
2 Dryopteris expansa 3 Gymnocarpium dryopter 4 Athyrium cyclosorum	15	У	FACU FAC	Problematic Hydrophytic Vegetation¹ (Explain)
2 Dryop teris expansa 3 Gymnocarpium dryopter 4 Athyrium cyclosorum 5 Calamagrostis anadensis	15	У	FACU FAC	Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless
2. Dryop teris expansa 3. Gymnocarpium dryopter 4. Athyrium cyclosorum 5. Calamagrostis anadensis 6. Equisetum sylvaticum	15	У	FACU FAC FACU	Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless
2. Dryop teris expansa 3. Gymnocarpivm dryopter 4. Athyrivm cyclosorum 5. Calamagrostis canadensis 6. Equisetum sylvaticum 7. Cornus canadensis	15	У	FACU FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
2. Dryop teris expansa 3. Gymnocarpium dryopter 4. Athyrium cyclosorum 5. Calamagrostis anadensis 6. Equisetum sylvaticum	15	γ	FACU FAC FACU	Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground
2. Dryop teris expansa 3. Gymnocarpium dryopter 4. Athyrium cyclosorum 5. Calamagrostis anadensis 6. Equisetum sylvaticum 7- Cornus canadensis 8.	15	У	FACU FAC FACU	Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.

Notes: (If observed, list morphological adaptations below):

SUIL PRUFI		S				TT018		Soil Pit Required (Y/N)
	LE DESCRIPTION: (D	Describe	Redox Features	to docume	ent the	indicator or	confirm the absence	e of indicators.)
Depth (inches)	Color (moist)	1 %		%   T	1	12	Tanton	N
0-4	Color (Moist)	70	Color (moist)	76   1	ype <sup>1</sup>	Loc²	Texture	Notes
4-19	10 VD 412	100					Fibric	dry, organics
19-21	10 YR 4/3	100					- Silt loam	0
10 - 21	2.5 7 5/1	100		-			- SANDY Silt	small gravels
		1		++		4		
		1		++		-		1
				++-	_			
¹Type: C=Cc	l oncentration, D=Deple	tion RM	=Reduced Matrix CS	S=Covered	t or Co	ated Sand C	Crains 21 continu	PL=Pore Lining, M=Matrix.
	IL INDICATORS	tion, raiv	-Neduced Matrix, Co	3-Covered	10100	aled Sand G	-	
			Alaska Clayed	/A 12\				FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	istel (A1)		Alaska Gleyed					hange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (					Swales (TA5)
	A3)		Alaska Gleyed	Pores (A1	5)			vith 2.5Y Hue
Hydrogen Sul	lfide (A4)						Layer	without 5Y Hue or Redder Underlying
Thick Dark St	urface (A12)						Other (Explain	n Notes)
<sup>3</sup> One indicato	or of hydrophytic veget	ation, or	e primary indicator o	f wetland	hydrolo	gy, and an a		pe position must be present unless
disturbed or p	problematic. of color change in Not							
Restrictive La	ayer (if present): Type	.cs.	D	epth (inche	es):	NIN		
						7.0		
Hydric Soil F	Present (Y/N):N							
MOIGS.			./. / 0 . //					
	File SANZ 7	GrAU	els e 20"					
	- NO bysuc	GRAU	els e 20" s obseved					
	File SAME & - NO hydric	Grav	els e 20" s obsqueb					
	FILE SAME A - NO hyENC  Y PRIMARY INDICAT			fficient)	S	ECONDAR'	Y INDICATORS (2	or more required)
HYDROLOGY	Y PRIMARY INDICAT	ORS (a	ny one indicator is su		V	Vater-stained	d	Stunted or Stressed
HYDROLOGY		ORS (a	ny one indicator is su ace Soil Cracks (B6)		_ V\	Vater-stained		
HYDROLOGY Surface Wate	Y PRIMARY INDICAT	Sun	ny one indicator is su ace Soil Cracks (B6) dation Visible on Aer		_ Lo	Vater-stained eaves (B9) _	d	Stunted or Stressed Plants (D1)
HYDROLOGY Surface Wate High Water Ta	er (A1)able (A2)	Suri	ny one indicator is su ace Soil Cracks (B6) dation Visible on Aer		—	Vater-stained eaves (B9) _ trainage Pati	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
HYDROLOGY Surface Wate	er (A1)able (A2)	Sund Inur (B7) Spa	ny one indicator is su ace Soil Cracks (B6) dation Visible on Aer		— Ц У D	Vater-stained eaves (B9) _ trainage Pati	terns (B10)	Stunted or Stressed Plants (D1)
HYDROLOGY Surface Wate High Water Ta Saturation (A3	Y PRIMARY INDICAT or (A1) able (A2) 3)	Sund Inur (B7) Spa Con	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)	ial Imager	y D O Li	Vater-stained eaves (B9) _ rainage Pati exidized Rhiz iving Roots ( resence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOGY Surface Water High Water Ta Saturation (A3) Water Marks (	PRIMARY INDICAT or (A1) able (A2) 3) (B1)	Surf Surf Inur (B7) Spa Con	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15)	ial Imager	y D O Li	Vater-stained eaves (B9) _ rainage Pati ixidized Rhiz iving Roots (	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
HYDROLOGY Surface Water High Water Ta Saturation (A3) Water Marks (	Y PRIMARY INDICAT or (A1) able (A2) 3)	Sund Sund Inur (B7) Spa Con Mar	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8) Deposits (B15)	ial Imager	y D Cli	Vater-stained eaves (B9) _ rainage Pati exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOGY Surface Wate High Water Ta Saturation (A3 Water Marks ( Sediment Dep	Y PRIMARY INDICAT  or (A1)  able (A2)  3)  (B1)  posits (B2)	Surfice Surfic	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1)	ial Imager	— W. L. V.	Vater-stained eaves (B9) _ varianage Pati validized Rhiz iving Roots (resence of Fon (C4) _ alt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Wate High Water Ta Saturation (A3 Water Marks ( Sediment Dep	PRIMARY INDICAT or (A1) able (A2) 3) (B1)	Surdinur (B7) Spa Con Mar Hyd Odd Dry-	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8) Deposits (B15)	ial Imager	— W. L. V.	Vater-stained eaves (B9) _ rainage Pati exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	Y PRIMARY INDICAT  or (A1)  able (A2)  3)  (B1)  posits (B2)	Surdinur (B7) Spa Con Mar Hyd Odo Dry- Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15) rogen Sulfide r (C1) Season	ial Imager	— W. L. V.	Vater-stained eaves (B9) _ varianage Pati validized Rhiz iving Roots (resence of Fon (C4) _ alt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	y PRIMARY INDICAT  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)	Surdinur (B7) Spa Con Mar Hyd Odo Dry- Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	ial Imager	— W. L. V.	Vater-stained eaves (B9) _ varianage Pati validized Rhiz iving Roots (resence of Fon (C4) _ alt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	Y PRIMARY INDICAT or (A1) able (A2)  (B1)  posits (B2)  (B3)	Surdinur (B7) Spa Con Mar Hyd Odo Dry- Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	ial Imager	— W. L. V.	Vater-stained eaves (B9) _ varianage Pati validized Rhiz iving Roots (resence of Fon (C4) _ alt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Wate High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits	Y PRIMARY INDICAT  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)	Sund Inur (B7) Spa Con Mar Hydd Oddo Dry-Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	ial Imager	— W. L. V.	Vater-stained eaves (B9) _ varianage Pati validized Rhiz iving Roots (resence of Fon (C4) _ alt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Wate High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits	y PRIMARY INDICAT  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)	Sund Inur (B7) Spa Con Mar Hydd Oddo Dry-Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	ial Imager	Y D O Li	Vater-stained eaves (B9) _ varianage Pati varianage	terns (B10) rospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Wate High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits	PRIMARY INDICAT  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N):	Sund Inur (B7) Spa Con Mar Hydd Oddo Dry-Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	ial Imager	Y D O Li	Vater-stained eaves (B9) _ varianage Pati varianage	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Surface Water Water Table P Saturation Pre	Present (Y/N):	Sund Inur (B7) Spa Con Mar Hyd Odo Dry-Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):  Depth (in):	ial Imager	Y D O Li	Vater-stained eaves (B9) _ varianage Pati varianage	terns (B10) rospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Surface Water Water Table P Saturation Pre (includes capil	Present (Y/N):	Sund Inur (B7) Spa Con Mar Hyd Odo Dry-Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1) Season er Table (C2) er (Explain in Notes):	ial Imager	Y D O Li	Vater-stained eaves (B9) _ varianage Pati varianage	terns (B10) rospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Surface Water Water Table P Saturation Pre	Present (Y/N):	Sund Inur (B7) Spa Con Mar Hyd Odo Dry-Wat	ace Soil Cracks (B6) dation Visible on Aer rsely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):  Depth (in):	ial Imager	Y D O Li	Vater-stained eaves (B9) _ varianage Pati varianage	terns (B10) rospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot,	M= Matrix	
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	_ackingForested-Deciduous-Needle-leavedForested-Deciduous_ Scrub Shrub-Deciduous-Needle-leavedScrub Shrub-Deciduous-Broad- Scrub Shrub-Evergreen-Needle-leavedEmergent-Non-persistent	eaved Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall) Dwarf shrub (<0.5m) Tall herb (≥	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short sho	shrub (0.5-2m) Submerged
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly Uneven	Moderately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%	e (0-20%) Low Density (20-40%) Medium Density (40-60%)	High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scatter	100% Cover or Open Water <25% Scattered/Peripheral Cover red or Peripheral Cover N/A	_ 26-75% Scattered or
Plant Species Diversity (P): Low & 5 plant	t species) Medium (5-25 species) High (>25)	
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A	
	: No Veg Solitary, Scattered Stems 1 or More Large Patches;	Parts of Site
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	Moderately Abundant (25-50% of surface)	
Vegetative Interspersion (P): Low (larg High (small groupings, diverse and intersper	re patches, concentric rings) Moderate (broken irregular rings)	
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurir	ne Fringe
SOIL VARIABLES		
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol:	
HYDROLOGIC VARIABLES		
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermitten Inlet/Intermittent Outlet Perennial	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermit Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet	nittent Inlet/No utletPerennial
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermitten Inlet/Intermittent Outlet Perennial	nt Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outletasonally Flooded, Temporarily Flooded, Saturated	nittent Inlet/No utletPerennial
Inlet/Outlet Class (P): No Inlet/Outlet Outlet	nt Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outletasonally Flooded, Temporarily Flooded, Saturated	utlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created	nt Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outle	utlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermitten Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Per	quent Soils Sediment
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet/Perennia	quent Soils Sediment
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflood	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet/Perenni	quent Soils Sediment nounced (>18in.)
Inlet/Outlet Class (P): No Inlet/Outlet Outlet	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet/	quent Soils Sediment nounced (>18in.) yrs  pH Reading
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Love	Intermittent Inter/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Outlet Plooded	quent Soils Sediment rounced (>18in.) yrs  pH Reading sits
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Love	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outline Inlet/No Outline Perennial Inlet/No Outline Perennial Inlet/No Outline Perennial Inlet/No Outline Inlet/Perennial Inlet/No Outline I	quent Soils Sediment rounced (>18in.) yrs  pH Reading sits
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Lov Evidence of Seeps and Springs (P): No Se	Intermittent Inter/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Outlet Plooded	quent Soils Sediment iounced (>18in.) yrs  pH Reading sits
Inlet/Outlet Class (P): No Inlet/Outlet Outlet	Intermittent Inter/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Plooded	quent Soils Sediment nounced (>18in.)  yrs  pH Reading sits  nnial Spring
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs  Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Sea  LANDSCAPE YARIABLES (M) Wetland Juxtaposition: Wetland Isola Only Connected Above Connected	Intermittent Inter/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet	quent Soils Sediment rounced (>18in.)  yrs  pH Reading  sits  nnial Spring
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs  Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Sea  LANDSCAPE YARIABLES (M) Wetland Juxtaposition: Wetland Isola Only Connected Above Connected	Intermittent Inter/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/No Outlet Plooded Plooded Plooded Plooded Flooded Plooded	quent Soils Sediment rounced (>18in.)  yrs  pH Reading  sits  nnial Spring
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs  Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Sea  LANDSCAPE YARIABLES (M)  Wetland Juxtaposition: Wetland Isola Only Connected Above Connected Wetland Land Use: High Intensity (i.e.)	Intermittent Inter/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet	quent Soils Sediment nounced (>18in.)  pH Reading sits  nnial Spring elow n space)
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs Degree of Outlet Restriction (P); No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Second Connected Above Connected Wetland Juxtaposition: Wetland Isola Only Connected Above Connected Wetland Land Use: High Intensity (i.e. Watershed Land Use: 0-5% Rural	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet	quent Soils Sediment nounced (>18in.)  pH Reading sits  nnial Spring elow n space)

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### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: W60 H T 0 18 Field Target: 12 Date: 06 - 24 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	<ul> <li>✓ Site description, site parameters and summary of findings are complete?</li> <li>✓ A detailed site sketch is included in logbook?</li> </ul>
2.	Vegetation
	<ul> <li>At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>Vegetation names are entered legibly for all strata present?</li> <li>Cover calculations are complete and correct?</li> <li>All dominant species have been determined and recorded per strata?</li> <li>Indicator status is correct for each species?</li> <li>Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>Wetland boundaries have been corrected if necessary?</li><li>Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X Jamesle 06-24-14
Wetland Scientist (print)	Signature / Date
	A
X Jae Christan	X / 9/24/19
Field Crew Chief (print)	Signature/Date

SITE DESCRIPTION		30	10'corridor	
Survey Type: Centerline Acce	ss Road (explain) Other		Field Target: 122	Map #: 85 Map Date: 5/27/14
Date: 06 - 24 - 14	Project Name & No.: Alask	a LNG 26221306	Feature Id:	: W60HT019
Investigators: Joe Christop	her Valerie Wate	ins, Zoe M.	ead e	Team No.: W60
State: Alaska	Region: Alaska	Milepost:	647.8	
Latitude: 62 32 03, 57	Long	gitude: 1500 14	1'06.47"	Datum: WG\$84
Logbook No.: 003				-W-S-Surface
SITE PARAMETERS			Marian Company	and the control of th
Subregion: Interior		Landform (hil	Islope, terrace, hummocks	s, etc.): 1-/a+
Slope (%): 0 - 3			oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	tion: Upland	Soil Map Unit		
Are climatic/hydrologic conditions on the YesX No (if no expl	site typical for this time of year ain in Notes)	? Are "No Yes_X	ormal Circumstances" pres	
Are Vegetation, Soil, or Hyd	lrology Significantly Distu	rbed? No X	_(If yes, explain in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally Problem	atic? NoX	_ (If yes, explain in Notes.	.)
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes	+ No	Is the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	No	Wetland Type:	PemIF	
Wetland Hydrology Present? Yes	No	Alaska Vegetation	Classification (Viereck):	III A 3
Notes and Site Sketch: Please include Dicorridor.	irectional & North Arrow, Center	rline, Length of featur	e, Distances from Centerl	line, Photo Locations, and Survey
Sel	ASL 3 Se	N DIAMI	am	

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 26')	% Cover	Species?	Status	No. of Dominant Species that are OBL, FACW, or FAC: 2 ( Total Number of Dominant Species Across All Strata: 2 (
1.				% Dominant Species that are OBL, FACW, or FAC: (A
2.				% Dominant Species that are OBL, PAGW, 611 AC(A
3.				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover:	0 200	% of total cov	er:_O	OBL species: X1 = 1
Sapling/Shrub Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 2 0
1. Alnus ssp.			FAC	UPL species
2. Salex pulchra	20	Y	FACW	UPL species $O$ $X 5 = O$ Column Totals: $122$ (A) $332$ (B)
3.				PI = B/A = 2.72
4.				
5.				Salex up on moundo
6.				all other regetation @ plot Site lower in marshy waters
7.				Site
8.				Tower in marshy waters
9.				
Total Cover	10 00	% of total cov	ver: 4	
50% of total cover		% of total cov	-	
50% of total cover		% of total cov		
		Dominant	Indicator	Hydrophytic Vegetation Indicators:
VEGETATION (use scientific names of plants	5)	Dominant Species?		
VEGETATION (use scientific names of plants  Herb Stratum (	Absolute % Cover	Dominant	Indicator Status	X Dominance Test is > 50% X Prevalence Index is ≤ 3.0
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre	Absolute % Cover	Dominant Species?	Indicator Status	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in</li> </ul>
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre  2. Equisetum arvense	Absolute % Cover	Dominant Species?	Indicator Status  OBL  FAC	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> </ul>
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre 2. Equisetum arvense 3. Carex utriculata	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  OBL  FAC  OBL	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in</li> </ul>
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre 2. Equisetum arvense 3. Carex utriculata 4. Calamagrosti's canadense	Absolute % Cover 5	Dominant Species?	Indicator Status  OBL FAC OBL FRC	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> <li>Problematic Hydrophytic Vegetation¹ (Explain)</li> </ul>
1. Comarum palustre 2. Equisetum arvense 3. Carex utriculata 4. Calamagrostis canadensi 5. Viola palustris	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  OBL  FAC  OBL	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> <li>Problematic Hydrophytic Vegetation¹ (Explain)</li> <li>¹ Indicators of hydric soil and wetland hydrology must be present unless</li> </ul>
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre  2. Equisetum arvense  3. Carex utriculata  4. Calamagrostis canadense  5. Viola palustris  6.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  OBL FAC OBL FRC	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> <li>Problematic Hydrophytic Vegetation¹ (Explain)</li> <li>¹ Indicators of hydric soil and wetland hydrology must be present unless</li> </ul>
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre. 2. Equisetum arvense 3. Carex utriculata 4. Calamagrostis canadensis 5. Viola palustris	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  OBL FAC OBL FRC	<ul> <li>X Dominance Test is &gt; 50%</li> <li>X Prevalence Index is ≤ 3.0</li> <li>Morphological Adaptations¹ (Provide supporting data in Notes)</li> <li>Problematic Hydrophytic Vegetation¹ (Explain)</li> <li>¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.</li> </ul>
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre 2. Equisetum arvense 3. Carex utriculata 4. Calamagrostis canadensi 5. Viola palustris 6. 7.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  OBL FAC OBL FRC	
VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre 2. Equisetum arvense 3. Carex utriculata 4. Calamagrostis canadense 5. Viola palustris 6. 7. 8. 9.	Absolute % Cover 5	Dominant Species? (Y/N)	Indicator Status  OBL FAC OBL FRC	
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SOIL PROFIL	E DESCRIPTION	(Decerib	. 4- 4b- do-4b-	at the late				
	Matrix	Describe	e to the depth needed	to documer	nt the indicator	or confirm the abs	sence of ir	ndicators.)
Depth (inches)	Color (moist)	1 %	Color (moist)	% Tvr	1			
,	Color (Moist)	10	Color (Moist)	% Typ	pe <sup>1</sup> Loc <sup>2</sup>	Texture	No	otes
1				-				
1	-			-			1	
						$\rightarrow$		
	X		/				1	
-/			-	1				
		1						***
Type: C=Co	ncentration, D=Depl	etion, RN	M=Reduced Matrix, C	S=Covered (	or Coated San	d Grains <sup>2</sup> Locat	tion: Pl =	Pore Lining, M=Matrix.
	L INDICATORS				0, 20202			PROBLEMATIC HYDRIC SO
Histosol or Hi	stel (A1)		Alaska Gleyed	(A13)				e (TA4) <sup>4</sup>
	on (A2)		Alaska Redox	(A14)				
	A3)		Alaska Gleyed					s (TA5)
			Alaska Gloyou	Fules (A 10)				.5Y Hue ut 5Y Hue or Redder Underly
	lfide (A4)					Layer_	yeu willio	ut 51 Hue of Reduct Ondeny
	urface (A12)					Other (Expl	lain in Not	tes) X
One indicator disturbed or p	r of hydrophytic vege vroblematic	etation, o	ne primary indicator	of wetland hy	drology, and a	an appropriate land	dscape po	sition must be present unless
Give details of	of color change in No	otes.						
Restrictive Lay	yer (if present): Type	e:		epth (inches	): NA			*
		\/						
Hydric Soil P	resent (Y/N):	Α						
				.1 1.0	^ ,			
			due to in	undatí	ion - hi	ydric soi	Is as	s v mod.
				undati	ion - hi	ydnic soi	Is as	s v med.
Notes: no	soil pit	dug	due to in					
Notes:	Soil pit	dug			SECONDA	ARY INDICATORS		re required)
Notes:	soil pit	dug	due to in	ufficient)	SECONDA Water-sta	ARY INDICATORS	6 (2 or mo	re required) Stunted or Stressed
Notes: No	Soil pit	dug TORS (a	due to in	ufficient)	SECONDA Water-stai Leaves (B	ARY INDICATORS ned 9)	3 (2 or mo	re required) Stunted or Stressed Plants (D1)
Notes: No	Soil pit	TORS (a	any one indicator is sufface Soil Cracks (B6)	ufficient)	SECONDA Water-stal Leaves (B Drainage I	ARY INDICATORS ned 9) Patterns (B10)	\$ (2 or mo	re required) Stunted or Stressed
Notes: No	Soil pit  (PRIMARY INDICATOR)  (A1) X  Abble (A2) X	TORS (a Sur Inur (B7	any one indicator is surface Soil Cracks (B6)	ufficient) ) rial Imagery	SECONDA Water-stai Leaves (B Drainage I	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres alono	\$ (2 or mo	re required) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
HYDROLOGY Surface Water High Water Ta	Soil pit  (PRIMARY INDICATOR)  (A1) X  (able (A2) X	TORS (a Sur Inui (B7 Spa Cor	iny one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated acave Surface (B8)	ufficient) ) rial Imagery	SECONDA Water-stai Leaves (B Drainage I Oxidized F Living Roc	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3)	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
HYDROLOGY Surface Water High Water Ta	Soil pit  (PRIMARY INDICATOR)  (A1) X  Abble (A2) X	TORS (a Sur Inui (B7 Spa Cor	any one indicator is surface Soil Cracks (B6)	ufficient) ) rial Imagery	SECONDA Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres alono	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _, Shallow Aquitard (D3) Microtopographic
HYDROLOGY Surface Water High Water Ta Saturation (A3	Soil pit  (PRIMARY INDICA)  (A1) X  (A2) X  (B1)	TORS (a Sur Inur (B7 Spa Cor Mar	any one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated ancave Surface (B8) and Deposits (B15)	ufficient) ) rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4)	Patterns (B10) Rhizospheres along of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3	Soil pit  (PRIMARY INDICATOR)  (A1) X  (able (A2) X	TORS (a Sur Inur (B7 Spa Cor Mar Hyd	iny one indicator is surface Soil Cracks (B6) and ation Visible on Ae hoave Surface (B8) arsely Vegetated incave Surface (B15) arogen Sulfide or (C1)	ufficient) ) rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roc Presence Iron (C4) _	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _, Shallow Aquitard (D3) Microtopographic
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I	Soil pit  (PRIMARY INDICA)  (A1) X  (A2) X  (B1)	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc	iny one indicator is surface Soil Cracks (B6) andation Visible on Ae arsely Vegetated incave Surface (B8) ard Deposits (B15) argen Sulfide or (C1)	ufficient)	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4)	Patterns (B10) Rhizospheres along of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	any one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated acave Surface (B8) arrogen Sulfide or (C1)	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roc Presence Iron (C4) _	Patterns (B10) Rhizospheres along of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I	Soil pit  (PRIMARY INDICATOR)  (A1) X  (A2) X  (B1) X  (Osits (B2)	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	iny one indicator is surface Soil Cracks (B6) andation Visible on Ae arsely Vegetated incave Surface (B8) ard Deposits (B15) argen Sulfide or (C1)	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roc Presence Iron (C4) _	Patterns (B10) Rhizospheres along of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	any one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated acave Surface (B8) arrogen Sulfide or (C1)	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roc Presence Iron (C4) _	Patterns (B10) Rhizospheres along of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Depo	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	any one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated acave Surface (B8) arrogen Sulfide or (C1)	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roc Presence Iron (C4) _	Patterns (B10) Rhizospheres along of Reduced	\$ (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Depo	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar Hydd Odc Dry- Wat	iny one indicator is surface Soil Cracks (B6) andation Visible on Ae in arsely Vegetated incave Surface (B8) are I Deposits (B15) arogen Sulfide for (C1)	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4) _ Salt Depos Notes:	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced  sits (C5)	S (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Deporting Deposits (I Algal Mat or Cr Tron Deposits (I Surface Water	Present (Y/N): Y	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc Dry-Wat	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4) _ Salt Depos Notes:	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced  sits (C5)	S (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Depo	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar Hyd Odc Dry-Wat	iny one indicator is surface Soil Cracks (B6) andation Visible on Ae in arsely Vegetated incave Surface (B8) are I Deposits (B15) arogen Sulfide for (C1)	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4) _ Salt Depos Notes:	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced  sits (C5)	S (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Deporift Deposits ( Algal Mat or Cr ron Deposits ( Gurface Water Water Table Pr Saturation Pres	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar  Hyd Odd Dry Wat	any one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated acave Surface (B8) ar Deposits (B15) argument of (C1) argument of (C1) argument of (C2) argument of (Explain in Notes):  Depth (in): 2 - Depth (in): 0	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4) _ Salt Depos Notes:	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced  sits (C5)	S (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Depo Drift Deposits ( Algal Mat or Cr ron Deposits ( Gurface Water Water Table Pr Saturation Presincludes capilli	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar  Hyd Odd Dry Wat	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae	rial Imagery	Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4) _ Salt Depos Notes:	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced  sits (C5)	S (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks (I Sediment Deporift Deposits ( Algal Mat or Cr on Deposits ( Surface Water Vater Table Pr Saturation Presincludes capillates	Soil pit   Soil pit	TORS (a Sur Inur (B7 Spa Cor Mar  Hyd Odd  Othe	any one indicator is surface Soil Cracks (B6) and ation Visible on Ae arsely Vegetated acave Surface (B8) ar Deposits (B15) argument of (C1) argument of (C1) argument of (C2) argument of (Explain in Notes):  Depth (in): 2 - Depth (in): 0	rial Imagery	SECONDA Water-stai Leaves (B Drainage I Oxidized F Living Roo Presence Iron (C4) _ Salt Depos Notes:	ARY INDICATORS  ned 9) Patterns (B10) Rhizospheres along its (C3) of Reduced  sits (C5)	S (2 or mo	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, N	/I= Matrix
Forested-Evergreen-Needle-leaved_ Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) 2 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): Even X Highly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or ed or Peripheral Cover N/A
	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) X Moderately Abundant (25-50% of surface)
	e patches, concentric rings) Moderate (broken irregular rings) sed)
HGM Class (P): Slope Flat	.,
COUL WARIARI FO	
SOIL VARIABLES	All the transfer County
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol: Fibric Histosol: Hemic Histosol: Sapric A STUME A
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/OutletX Outlet Intermittent Inlet/Intermitten Inlet/Intermittent Outlet Perennial	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No  nt Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet
	sonally Flooded, Temporarily Flooded, Saturated
Evidence of Sedimentation (P): No Evide	nce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absen	tPoorly Developed (6in.)Well Developed (6-18in.)XPronounced (>18in.)
Frequency of Overbank Flooding (P): No (Return Interval >5 yrs	Overbank Flooding X Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflo	w X Restricted Outflow Unrestricted Outflow
	Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 4.53
	P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Basin Topographic Gradient (M): Lov	v Gradient (<2%)X High Gradient (≥2%)
Evidence of Seeps and Springs (P): No Se	
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isola Only Connected Above Connect	ted Wetlands within 400m, Not Connected Only Connected Below ted Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e.	, ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Wetland Land Use: High Intensity (i.e.  Watershed Land Use: 0-5% Rural	, ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)   5-25% Urbanized 25-50% Urbanized >50% Urbanized
Watershed Land Use: 0-5% Rural	7

M

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID: WGOHT019 Field Target: 122 Date: 06-24-14
For al	ll items not checked, please provide detailed explanation in the notes section of data form.
1.	. Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	☐ Soil profile is complete? - no Pit dug due to înunda film ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	☑ Wetland boundaries have been corrected if necessary? ☑ Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

X Lounsel 06-24/14

Wetland Scientist (print)

Signature / Date

X Lounsel 06-24/14

Signature / Date

Signature / Date

SITE DESCRIPTION			30	o' study	THE PARTY OF THE
Survey Type: Centerline Acce	ss Road (explain)	Other (expl		Field Target: 125	Map #: 86 Map Date: 5/27/19
Date: 06 - 25 - 14	Project Name & No.:	Alaska LNC	26221306	Feature Id	: W60 HT 020
Investigators: Joe Christon	her, Zoe M	eade		1	Team No.: W60
State: Alaska	Region: Alaska		Milepost:	130	
Latitude: 62° 31'41. 97	11	Longitude	: 1500/41	16. 16 "	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	105	Picture No.:	P_N, S, pi	t, plug
SITE PARAMETERS		117			
Subregion:			Landform (hill	slope, terrace, hummock	s, etc.):
Slope (%): interior 0-	3			oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	tion: PEM1C		Soil Map Unit	10.44	
Are climatic/hydrologic conditions on the Yes_\(\frac{\chi}{}\) No (if no expl	site typical for this time of ain in Notes)	of year?	Are "No Yes	ormal Circumstances" pre	sent:
Are Vegetation, Soil, or Hyd	Irology Significantly	/ Disturbed?		_(If yes, explain in Notes)	
Are Vegetation, Soil, or Hyd	lrology Naturally Pr	oblematic?	No_X	(If yes, explain in Notes	.)
SUMMARY OF FINDINGS		1111			
Hydrophytic Vegetation Present? Yes_	X No	_ ls t	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes_	NoX	_ We	etland Type:	upland	
Wetland Hydrology Present? Yes	No <u>X</u>	- Ala	ska Vegetation	Classification (Viereck):	IG1 IBQ IIAQ
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow,				
	stetch on	pag	ie 00	5 % 10g	600K 003
the Field maget cand the fol Correct. The The Field to	ygen Kerock polygon repo	coll resents	2 5 =	III AZ I	s correct 32 15 also area than

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3 (A Total Number of Dominant Species Across All Strata: 3 (B
				% Dominant Species that are OBL, FACW, or FAC: 100 (A/
,				7. Bollinani oposice alet sie eee, reser, eee
B <sub>+</sub> .				
				Prevalence Index worksheet:
Total Cover:_	0			Total % Cover of: Multiply by:
50% of total cover:_	<u>O</u> 20	% of total cov	er: <u>0</u>	OBL species:
Sapling/Shrub Stratum ( 261 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
-Salex bebbiana	10	Y	FAC	UPL speciesX 5 =0
2.				Column Totals:(A)(B)
3.				PI = B/A =3, O
4.				11 50
5,				Dom of all FAZ Ves.
5.				UES
7,				
В.				
9.				
Total Cover: 50% of total cover:	-	)% of total cov	ver:	
VEGETATION (use scientific names of plants	)		-	
Herb Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
1. Calamagrostis Canadensi	-90	Y	FAC	Morphological Adaptations¹ (Provide supporting data in
2. Equisatum sylvaticum	3		FAC	Notes)
3. Equisetum arvense	60	Y	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic,
6				
6.				% Bare Ground
7.				% Cover of Wetland Bryophytes
				1
7.				Total Cover of Bryophytes
7. 8. 9.				% Cover of Water
7. 8.	157			

SOIL			Date <u>562414</u> Feature ID V					oil Pit Required (Y/N)
SOIL PROFI	1	Describe	to the depth needed to docume	ent the i	ndicator or	confirm the absent	e of indicate	ors.)
Depth	Matrix		Redox Features		1			
inches)	Color (moist)	%	Color (moist) % T	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
1-4						Fibric		anics
1-8	10 YR 313					Silt loam		
1-20	10 YR 513					Silt loan	1	
		-			-			
		-						
Type: C=Cc	ncentration D=Denle	tion RM	=Reduced Matrix, CS=Covered	l or Con	ted Sand C	Prainc 2 coation	DI =Doro I	ining, M=Matrix.
	L INDICATORS	tion, raiv	-reduced Matrix, 00-00Verec	i oi coa	ited Sand C			LEMATIC HYDRIC SOILS
	istel (A1)		Alaska Gleyed (A13)			Alaska Color (		
	on (A2)		Alaska Redox (A14)			Alaska Alpine		
	A3)		Alaska Gleyed Pores (A1			Alaska Redox		
			Alaska Oleyea i oles (A i	·)				Hue or Redder Underlying
	lfide (A4)					Layer		ride of recorder officiallying
	urface (A12)					Other (Explain		
One indicato listurbed or p	r of hydrophytic veget oroblematic₋	ation, or	ne primary indicator of wetland	nydrolog	gy, and an a	appropriate landsc	pe position	must be present unless
Give details	of color change in Not	es.						
estrictive La	iyer (if present): Type		Depth (inche	(s):	(P)			
		1	Depth (Inche	es):^				
Hydric Soil F	Present (Y/N):	1	Depth (inché	(8):^				
lydric Soil F	Present (Y/N):						40 9.1	V
lydric Soil F	Present (Y/N):		Observed, Brish				No Redi	2¥-
lydric Soil F	Present (Y/N):						No Redi	2¥°
Hydric Soil F Notes: N ⊙	Present (Y/N): N	oils		, j - p	ish Chro	ima suils,		
Hydric Soil F Notes:	Present (Y/N):N hy dric s	Oils	Olo Served, Brick	, μ si	ish Chro	ma suils,	or more req	
Hydric Soil F Notes: No	Present (Y/N): N	OIIS ORS (an	observed, Brick  ny one indicator is sufficient)  face Soil Cracks (B6)	SI W	ECONDAR	ma suils,	or more req	uired)
Hydric Soil F Notes: N 0  HYDROLOG  Surface Wate	Present (Y/N):N hy dric s	ORS (an	ny one indicator is sufficient) face Soil Cracks (B6)	SI W	ECONDAR dater-stained eaves (B9)	ma suils, Y INDICATORS (2	or more req	uired) ted or Stressed s (D1)
IYDROLOG	Present (Y/N):N  hy druc s  Y PRIMARY INDICAT  or (A1)  able (A2)	ORS (and Surface (B7)	ny one indicator is sufficient) face Soil Cracks (B6)	SI W Le	ECONDAR Vater-staine eaves (B9)	Y INDICATORS (2	or more req Stuni Plant	uired) ted or Stressed ts (D1) norphic Position (D2)X
Hydric Soil F Notes: N 0 HYDROLOG	Present (Y/N):N  hy druc s  Y PRIMARY INDICAT  or (A1)  able (A2)	ORS (and Surface (B7) Spa	ny one indicator is sufficient) face Soil Cracks (B6)	SI WW Le	ECONDAR Vater-staine eaves (B9)	Y INDICATORS (2 d terns (B10)	or more req Stuni Plant	uired) ted or Stressed s (D1)
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Hydric Soil F Notes:  HYDROLOG  Burface Water High Water T  Baturation (A:	Present (Y/N):	ORS (and Surful (B7) Spa Con	ny one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imager  rsely Vegetated cave Surface (B8)	SI W Le	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall	uired) ted or Stressed ts (D1) norphic Position (D2)X ow Aquitard (D3)
Hydric Soil F Notes:  HYDROLOG  Gurface Water High Water T  Saturation (A:  Vater Marks	Present (Y/N):N  hy druc s  Y PRIMARY INDICAT  or (A1)  able (A2)  3)	ORS (and Surface Surfa	ny one indicator is sufficient)  face Soil Cracks (B6)  dation Visible on Aerial Imager  rsely Vegetated cave Surface (B8)  Deposits (B15)	SI W Le	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall Micro	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
Hydric Soil F Notes:  HYDROLOG  Surface Water High Water T Saturation (A:  Vater Marks  Sediment Dep	Present (Y/N):N  hy dric s  Y PRIMARY INDICAT  or (A1)  able (A2)  (B1)  posits (B2)	ORS (and Surface Surfa	ny one indicator is sufficient)  face Soil Cracks (B6)  Idation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season	SI WW Lee	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall Micro	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
Hydric Soil F Notes:  HYDROLOG  Gurface Water High Water T  Saturation (A:  Water Marks  Gediment Dep	Present (Y/N):	ORS (and Surface Surfa	ny one indicator is sufficient)  face Soil Cracks (B6)  dation Visible on Aerial Imager resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)	SI WW Lee	ECONDAR Vater-staine eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall Micro	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
Hydric Soil F Notes: No	Present (Y/N):N  hy dric s  Y PRIMARY INDICAT  or (A1)  able (A2)  (B1)  posits (B2)	ORS (and Surface Surfa	ny one indicator is sufficient)  face Soil Cracks (B6)  Idation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season	SI WW Lee	ECONDAR Vater-staine eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall Micro	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
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Hydric Soil Follows:  Notes: N	Present (Y/N):	ORS (and Surface Surfa	ny one indicator is sufficient)  face Soil Cracks (B6)  Idation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)	SI WW Lee	ECONDAR Vater-staine eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall Micro	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
Hydric Soil Follows:  HYDROLOGY  Surface Water  High Water Total  Saturation (A:  Water Marks  Sediment Deposits  Hydric Soil Follows	Present (Y/N):	ORS (and Surface Surfa	ny one indicator is sufficient)  face Soil Cracks (B6)  dation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):	SI WW Lee	ECONDAR fater-stained fater-st	Y INDICATORS (2) d terns (B10) zospheres along (C3) Reduced (C5)	or more req Stuni Plant Geor Shall Micro Relie FAC-	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
Hydric Soil F Notes:  HYDROLOG  Burface Water High Water T  Baturation (A: Vater Marks  Bediment Deposits  Urift Deposits  Urigal Mat or C  Ton Deposits  Burface Water	Present (Y/N):	ORS (and Inur (B7) Spa Conn Mar Hydd Odo Dry-Wat Othe	ny one indicator is sufficient)  face Soil Cracks (B6)  dation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):	SI WW Lee	ECONDAR fater-stained fater-st	Y INDICATORS (2) d terns (B10) zospheres along (C3) Reduced (C5)	or more req Stuni Plant Geor Shall Micro Relie FAC-	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
Hydric Soil F Notes:  HYDROLOG  Surface Water High Water T  Saturation (A: Water Marks  Sediment Deposits  Migal Mat or C  Tron Deposits  Surface Water	Present (Y/N):	ORS (and Inur (B7) Spa Conn Mar Hydd Odo Dry-Wat Othe	ny one indicator is sufficient)  face Soil Cracks (B6)  dation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):	SI WW Lee	ECONDAR fater-stained fater-st	Y INDICATORS (2 d terns (B10) zospheres along (C3) Reduced	or more req Stuni Plant Geor Shall Micro Relie FAC-	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
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Hydric Soil F Notes: No	Present (Y/N):	ORS (and Surful Inurum) Spa Con Mar Hydo Odo Dry-Wat Othe	ny one indicator is sufficient)  face Soil Cracks (B6)  dation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):	SI WW Lee	ECONDAR fater-stained fater-st	Y INDICATORS (2) d terns (B10) zospheres along (C3) Reduced (C5)	or more req Stuni Plant Geor Shall Micro Relie FAC-	uired)  ted or Stressed s (D1)  morphic Position (D2)X  ow Aquitard (D3)  ptopographic f (D4)
ydric Soil Flotes:  YDROLOG  urface Water igh Water Taturation (A: /ater Marks ediment Deposits ligal Mat or Con Deposits  urface Water /ater Table Flotunges capitates:	Present (Y/N):	ORS (and Surface (B7) Spa Con Mar Oddo Dry-Wat Other	ny one indicator is sufficient)  face Soil Cracks (B6)  Idation Visible on Aerial Imager  resely Vegetated cave Surface (B8)  Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):  Depth (in):	SI WULE V Dr Dr Iron Sa No	ECONDAR fater-stained eaves (B9) rainage Patikidized Rhizving Roots resence of I on (C4)alt Deposits oftes:	Y INDICATORS (2) d terns (B10) zospheres along (C3) Reduced (C5)	or more req Stuni Plant Geor Shall Micro Relie FAC-	uired) led or Stressed s (D1) morphic Position (D2)X ow Aquitard (D3) ptopographic f (D4)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density(Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very Nigh Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Shty Mineral: Clayey
HYDROLOGIC VARIABLES /
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet_ Intermittent Inlet/Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/Perennial Outlet_ Perennial Inlet/Perennial Outlet_ Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial In
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Pe
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Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitt
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Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermi
Inlet/Outlet Class (P): No Inlet/Outlet

Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	re ID: W60 HT 620 Field Target: 125 Date: 0625-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	<ul> <li>Vegetation names are entered legibly for all strata present?</li> <li>Cover calculations are complete and correct?</li> </ul>
	All dominant species have been determined and recorded per strata?
	<ul> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
2	Soil
3.	Soli
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>☑ Appropriate hydrology indicators are marked?</li> <li>☑ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>Wetland boundaries have been corrected if necessary?</li><li>Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X zoe meade	X Joenale 06-25-14
Wetland Scientist (print)	Signature / Date
	()M
X Joe Christophy	X 6/15/14
Field Crew Chief (print)	Signature / Date

2.71				
SITE DESCRIPTION		W.		
Survey Type: Centerline X Acce	ss Road (explain) Other (	explain)	Field Target: 126	Map #: <u>86</u> Map Date: <u>5/27/</u> /4
Date: 06 - 25 - 14	Project Name & No.: Alaska	LNG 26221306	Feature Id	: W60HT 021
Investigators: Joe Christo	pher, Zoe Meade	e	*	Team No.: W60
State: Alaska	Region: Alaska	Milepost:	130	
Latitude: 62° 31′ 39,96″	Longit	tude: 1500/14	1 19-14"	Datum: WGS84
Logbook No.: 003	Logbook Page No.: 006		P_N,S, pit	, pluq
SITE PARAMETERS		and the first		
Subregion: interior		Landform (hill	Islope, terrace, hummock	s, etc.): Denressivy
Slope (%): 0 - 3		Local relief (c	oncave, convex, none):	CONCAVE
Pre-mapped Alaska LNG/NWI classifica	tion: PEM1F	Soil Map Unit		
Are climatic/hydrologic conditions on the YesX No (if no expl	site typical for this time of year? ain in Notes)	Are "No Yes_ X	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	Irology Significantly Disturb	ped? No X	_(If yes, explain in Notes	
Are Vegetation, Soil, or Hyd	Irology Naturally Problemat	tic? No_X	_ (If yes, explain in Notes	.)
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes_	No	Is the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	No	Wetland Type:	1106	
Wetland Hydrology Present? Yes	No	Alaska Vegetation	Classification (Viereck):	ICZ IICZ I
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow, Centerli	ne, Length of featur	e, Distances from Center	line, Photo Locations, and Survey
PASE C	006 d Los	3600K S	Ser DING	VAUS
See /	some is		lata Com	

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:(  Total Number of Dominant Species Across All Strata:(
1. Betula neoalaskaria	3_	X	FACY	% Dominant Species that are OBL, FACW, or FAC: 50% (A
2. Pic GLAUCH	3	X	FACL	
3.				
4.				Prevalence Index worksheet:
Total Cover:	1		. 1	Total % Cover of: Multiply by:
50% of total cover:		% of total cov	er: <u>//</u>	OBL species: X1 = O
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. Salex beblana	20	V	FAC	UPL speciesX 5 =
2. Rosa asícularis	3		FACU	Column Totals: 108 (A) 347 (B)
3.				PI = B/A = 5.2)
4.				
5.				
6.				
7.				
8.				
9.				
Total Cover: 50% of total cover:	11,5 20	0% of total cov	ver:_ <u>L/, (0</u>	
VEGETATION (use scientific names of plants	)		Ť	The state of the s
Herb Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Veratrum viride	10		FAC	Prevalence Index is ≤ 3.0
2. Streptopus amplexifolius	3		FACM	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Calamagrastis canadensis	90	X	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Equisetum arvense	5	,	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Sanguisorba canadensis	1		FACW	disturbed or problematic
6. Fragaria Virginiana			UPL	
7. Dry opteris expansa	40		FACU	% Bare Ground
8. Geranium crianthum	2		FACY	% Cover of Wetland Bryophytes
9. Equisetum sylvaticum	3 -		FAC	Total Cover of Bryophytes
10. Thalictrum sparsiflorum	1		FACU	% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover	120	1	1, ,	Notes: (If observed, list morphological adaptations below):
50% of total cover		0% of total co	ver: <u> </u>	Notes. (II observed, list morphological adaptations below).

SOIL PROF	II E DESCRIPTION: /F				1HT021		Soil Pit Required (Y/N)/
		Describe	to the depth needed to doo	cument th	e indicator or	confirm the absent	ce of indicators.)
Depth (inches)	Matrix		Redox Features				
<u> </u>	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-4		1110				Fibric	organics
1-6	10.110 111.2	40			-	Fibric	organics
	10 YR 4/3	60				Silt loan	
5-20	10 YR 514	100				Siltloam	few large rocks
				-			
		-				4 4	
Type: C=C	oncentration, D=Deple	tion. RM	=Reduced Matrix, CS=Cov	ered or C	oated Sand G	Grains <sup>2</sup> Location	PL=Pore Lining, M=Matrix.
	IL INDICATORS			0,00 0, 0	outou ouria c	-	FOR PROBLEMATIC HYDRIC SOILS
Histosol or Histel (A1) Alaska Gleyed (A13)							Change (TA4)4
	don (A2)		Alaska Redox (A14) _				Swales (TA5)
	(A3)		Alaska Gleyed Pores			_	with 2.5Y Hue
	ulfide (A4)		7 Hadita Cicyca i dica	(//10)			with 2:51 Flue without 5Y Hue or Redder Underlying
						Layer	
	Surface (A12)	- 19-0				Other (Explain	in Notes) ape position must be present unless
P-SF-SF	Present (Y/N):						
IYDROLOG				)	SECONDAR	Y INDICATORS (2	or more required)
		ORS (a	ny one indicator is sufficient face Soil Cracks (B6)		Water-stained	<u> </u>	or more required)  Stunted or Stressed
Surface Wat	BY PRIMARY INDICAT	Suri	ny one indicator is sufficient ace Soil Cracks (B6) dation Visible on Aerial Ima	OGOD!	Water-stained Leaves (B9) _	<u> </u>	Stunted or Stressed Plants (D1)
Surface Wat	er (A1)	Suri	ny one indicator is sufficient ace Soil Cracks (B6) dation Visible on Aerial Ima	agery	Water-stained Leaves (B9) _ Drainage Pat	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X
Surface Wat	er (A1)	Suri Inur (B7) Spa	ny one indicator is sufficient ace Soil Cracks (B6) dation Visible on Aerial Ima	agery	Water-stained Leaves (B9) _ Drainage Pat	terns (B10)	Stunted or Stressed Plants (D1)
Surface Wat digh Water Taturation (A	er (A1)	Suri Inur (B7) Spa Con	ny one indicator is sufficient ace Soil Cracks (B6) dation Visible on Aerial Ima	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X
Gurface Water Tallingh Water Tallingh Water Tallingh (A	er (A1)  Fable (A2)	Surri Inurr (B7) Spa Con Mar	ny one indicator is sufficient ace Soil Cracks (B6) dation Visible on Aerial Ima rsely Vegetated cave Surface (B8)	agery	Water-stained Leaves (B9) _ Drainage Pate Oxidized Rhiz Living Roots ( Presence of F Iron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Gurface Water 7 Gaturation (A Vater Marks Gediment De	er (A1)  Fable (A2)  (B1)	Surrium Inurrium (B7) Spa Con Mar Hyd Odo Dry-	dation Visible on Aerial Imarsely Vegetated cave Surface (B8)	agery	Water-stained Leaves (B9) _ Drainage Pate Oxidized Rhiz Living Roots ( Presence of F Iron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X  Shallow Aquitard (D3)  Microtopographic
Gurface Water 7  Saturation (A  Vater Marks  Sediment De  Orift Deposit	er (A1)  Fable (A2)  (B1)  Eposits (B2)	Suri Inur (B7) Spa Con Mar Hyd Odo Dry- Wat	dation Visible on Aerial Images Sulface (B8) dation Visible on Aerial Images Sulface (B8) Deposits (B15) rogen Sulfide r (C1) Season	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water Tallingh Water Tarks Saturation (A Vater Marks Sediment De Orift Deposite	FY PRIMARY INDICAT  er (A1)  Fable (A2)  (B1)  posits (B2)  s (B3)	Suri Inur (B7) Spa Con Mar Hyd Odo Dry- Wat	ny one indicator is sufficient face Soil Cracks (B6) dation Visible on Aerial Ima resely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water Tallingh Water Tarks Saturation (A Vater Marks Sediment De Orift Deposite	FY PRIMARY INDICAT  er (A1)  Fable (A2)  (B1)  eposits (B2)  for (B3)  Crust (B4)	Suri Inur (B7) Spa Con Mar Hyd Odo Dry- Wat	ny one indicator is sufficient face Soil Cracks (B6) dation Visible on Aerial Ima resely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Gurface Water Tallingh Water Marks Sediment De Orift Deposite Sigal Mat or	FY PRIMARY INDICAT  er (A1)  Fable (A2)  (B1)  eposits (B2)  for (B3)  Crust (B4)	Suri Inur (B7) Spa Con Mar Hyd Odo Dry- Wat	ny one indicator is sufficient face Soil Cracks (B6) dation Visible on Aerial Ima resely Vegetated cave Surface (B8) Deposits (B15) rogen Sulfide r (C1) Season er Table (C2)	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) tospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Gurface Water Tallingh Water Marks Sediment De Orift Deposits Sigal Mat or Fron Deposits Surface Water	FY PRIMARY INDICAT  er (A1)  Fable (A2)  (B1)  eposits (B2)  crust (B4)  G (B5)	Suri Inur (B7) Spa Con Mar Hyd Odo Dry- Wat	dation Visible on Aerial Images Soil Cracks (B6)	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _X  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Surface Water Table Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Fron Deposits Surface Water Water Table Saturation Pr	Primary indicat  er (A1)  Fable (A2)  (B1)  eposits (B2)  crust (B4)  er Present (Y/N):	Suri Inuri (B7) Spa Con Mar Hyd Odo Dry- Wat	dation Visible on Aerial Images Soil Cracks (B6)	agery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) tospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)X  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, N	I= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall)
	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or ed or Peripheral Cover N/A
Plant Species Diversity (R): Low (< 5 plant	species) Medium (5-25 species) High (>25)
	One or Few Several to Many N/A
1	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
	(0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and interspers	patches, concentric rings) Moderate (broken irregular rings)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol: Fibric Histosol: Hemic Histosol: Sapric Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	X
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No t Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perenn
Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed,	sonally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded
	ce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absent	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No C Return Interval >5 yrs	Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflo	wRestricted OutflowUnrestricted Outflow
Water pH (P): No surface water	Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (Figure 1987) Glacial Till/Not Permeable	P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Basin Topographic Gradient (M): Low	
Evidence of Seeps and Springs (P): No Se	eps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isolat	ed Wetlands within 400m, Not Connected Only Connected Below ed Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e.,	ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural	5-25% Urbanized 25-50% Urbanized >50% Urbanized
	lium (10-100 acres) Large (>100 acres) \
. / 1	GPS Technician QA/QC check:

Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID: <u>W6 01 T 0 2 1</u> Field Target: <u>1 2 6</u> Date: <u>0 6 - 25 -1 4</u>
For a	Il items not checked, please provide detailed explanation in the notes section of data form.
1	. Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	. Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland? wpland
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>Wetland boundaries have been corrected if necessary?</li><li>Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Made	X Spermaelle 06-25-12
Wetland Scientist (print)	Signature / Date
Exc. S. L.	
X we Chuston	~ (X B) P 4/25/14
Field Crew Chief (print)	Signature / Date

# Vegetation Classification Data Form

Date: 06-25-14   Project Name & #: Alaska LNG 26221306   127  Investigators: Joe Christopher, Zoe Meade   Field Target: Joe Christopher, Zoe Meade   W60 H T 0 2 2  Latitude: 62° 31' 22, 46"   Longitude: 160' 14' 25. 84"   Datum: WGS84  Logbook #: Dogbook Page #: P_N, S  Location Description:  Approx_ MP 129.5, West of Highway  Common Species Observed (Scientific Name)	
Investigators: Joe Christopher, Zoe Meade  Latitude:  (2° 31' 22, 46"  Logbook #:  Logbook #:  Logbook #:  Logbook Page #:  P_N, S  Location Description:  Approx_ MP 129.5, West of Highway	
Investigators: Joe Christopher, Zoe Meade  Latitude: 62° 31' 22, 46"  Logbook #:  Logbook #:  Logbook Page #: P_N. S  Location Description:  Approx_ MP 129.5, West of Highway	
Logbook #: 003  Location Description:  Logbook #: 007  Logbook Page #: P_N. S  Location Description:  Approx_ MP 129.5, West of Highway	
Location Description:  Location Description:  Approx_ MP 129.5, West of Highway	STORE .
Location Description:  Location Description:  Approx_ MP 129.5, West of Highway	
Approx_ MP 129.5, West of Highway	7500
Sommon Opedica Observed (Ocientinic Name)	
Equisetum arvense Picea glauca	
Calamagrostis canadensis Betvia neoalaskana	
Salex bebbiana	
Percent Cover of Dominant Structure Level:	1
Habitat Description:	
Trabilat Description.	4. 4
Upland mixed Forrest	
Alaska Vegetation Classification: Level I, Level II, Level III	1000
ICZ #81 IIB2	
Notes:	
A	
Field Crew Chief: Field Scientist/Technician	

# Vegetation Classification Data Form

Level I	Level It	Level III
I. Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleef forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C. Mixed forest	Closed mixed forest     Open mixed forest     Mixed woodland
II Scrub	A. Dwarf tree scrub	Closed dwarf tree scrub     Gpen dwarf tree scrub     Dwarf tree scrub woodland
	B Tali scrub	(1) Closed tall scrub (2) Open tall scrub
	C. Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Wilsow dwarf scrub
III Herbeceous	A Graminoid herbeceous	Dry graminoid herbaceous     Mesic graminoid herbaceous     Wet graminoid herbaceous     (emergent)
	B Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C Bryoid herbaceous	(1) Mosses (2) Lichens
	D. Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceous     Marine aquatic herbaceous

	oriptions of levels I, II, III, and IV follow the	
III.	Trees over 3 meters (10 ft) tall are present and have a canopy cover	
	of 10 percent or more	I Forest
1 b.	Trees over 3 meters (10 ft) tall are absent or nearly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters [10 ft) tall may be present and abundant	
I. Fo	prest	
2a	Over 75 percent of tree cover contributed by needleleaf (conifer) species	I.A Needleleaf forest
2b	Less than 75 percent of tree cover contributed by needleleaf (confler) species	
3a	Tree canopy of 60-100 percent cover	IA.1 Closed needleleaf fore
3b	Tree canopy of 25-59 percent cover	I A.2 Open needleleaf for
3с.		I A.3 Needleleaf woodla
4a	Over 75 percent of tree cover contributed by broadleaf species	I B Broadleaf forest
4b	440 00101	
5a.	Tree canopy of 60-100 percent cover	
5b	Tree canopy of 25-59 percent cover	B.2 Open broadleaf for
5c.	Tree canopy of 10-24 percent cover	I.B 3 Broadleaf woodl
8a	Tree canopy of 60-100 percent cover.	
6b.	Tree canopy of 25-59 percent cover	I.C.2 Open mixed for
6c.	Tree canopy of 10-24 percent cover	LC 3 Mixed wood
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 it] bill]	
7b	Vegetation herbaceous (may have up to 25 percent shrub cover)	

II. Sc	rub	
ва	Vegetation with at least 10 percent cover of dwarf trees	II A Dwarf tree scrub 9
8b_	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	
9a	Dwarf tree canopy of 60-100 percent cover	II.A.1 Closed dwarf tree scrub
9b.	Dwarf tree canopy of 25-59 percent cover	
9c.	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10s	Shrubs more than 1.5 meters (5.ft) tall	II B Tall scrub
	Shrubs less than 1.5 meters (5ft)tall	12
	Shrub canopy cover greater than 75 percent	
	Shrub canopy cover of 25-74 percent	
12a.	Shrubs 20 centimeters to 1.5 meters tall	II.C Low scrub 1
12b	Shrubs under 20 centimeters in height	II.D Dwarf scrub 1
13a	Shrub canopy cover greater than 75 percent	II C I Closed low scru
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	II.C 2 Open low scrub
14a	Dryas species dominant in the dwarf shrub layer	II D 1 Dryas dwarf scru
14b	Ericaceous species dominant in the dwarf shrub layer	II D 2 Ericaceous dwarf scrul
14c	Willow species dominant in the dwarf scrub layer	II D 2 Willow dwarf scrub
III. I	Herbaceous	
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	1
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	III D Aquatic herbaceous 2

16a (	Grasses, sedges, or rushes (graminoid) plants dominant	
16b	Forbs or bryophytes dominant	18
	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by E/ymus spp., Fesfuce spp., and Deschampsia spp.	III A.I Dry graminoid herbaceous
	On moist sites, but usually not with standing water. Usually dominated by Calamagnostis spp. Cerex spp or Eriophorum spp; tussocks often present.	III A 2 Mesic graminoid herbaceous
	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra bogs, marshes, and fens	III A.3 Wet graminoid herbaceous
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)	. III 8 Forb herbaceous 19
18b	Vegetation dominated by mosses or lichens	
19a	On dry sites, usually rocky and well drained; mostly tundra sites	III B 1 Dry forb herbaceous
19b	On moist sites but without standing	
19c	On wet sites, usually with standing water for part of the year	III B.3 Wet forb herbaceous
20a	Vegetation cover dominated by mosses	
20b	Vegetation cover dominated by lichens	
21a	Vegetation submerged or floating in fresh water	III.O 1 Freshwater aquatic herbaceous
21 b	Vegetation submerged or floating in brackish water	III D 2 Brackish water aquatic herbaceous
	Vegetation submerged or floating	III,D 3 Marine aquatic herbaceous

# Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Fe	ature ID: <u>W60 HT</u> 0 2 2 Field	Target:	Date: 06-25	5-14
	r all items not checked, please pi		n in the notes section	——— n of data form.
1.	General Information			
	∠ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓ ✓	ber recorded?		
2.	<b>Location Description</b>			
	Location of site recorded wit	th enough detail to help rel	locate?	
3.	Common Species			
	Scientific name of common s	species recorded?		
	Percent cover of dominant s	tructure level noted?		
4.	Habitat Description			
	Habitat described?			
<b>5</b> .	Classification			
	All three levels of classification	on recorded?		
6.	Field Log Book			
	Field form entries consistent	with log book?		
	Logbook clearly identifies the	e Field Target ID and Feat	ure ID?	
\		V		
7	Zoe Meadle	X Selmer		
Fie	ld Technician (print)	Signature		
(				
X	$A   M \sim$	X	21.01.1	
Fie	ld Crew Chief (print)	Signature	14 hr	

SITE DESCRIPTION			30	oft stu	dy	
Survey Type: Centerline Acce	ss Road (explain)	Other (expl			et: <u>/28</u>	Map #: <u>88</u> Map Date: <u>5/27/</u> /4
Date: 06 - 25 -	Project Name & No.:	Alaska LNG	3 26221306		Feature Id:	W60HT 023
Investigators: Joe Christoph	ier, Zoe Mead	e				Team No.: W60
State: Alaska	Region: Alaska		Milepost:	129		
Latitude: (2,5/53		Longitude	- 150	2521		Datum: WGS84
Logbook No.: 00 3	Logbook Page No.:	0 0 6	Picture No.;		S, pi	t plug
SITE PARAMETERS						1)
Subregion: Interior	-		Landform (hill	Islope, terrac	e. hummocks	s, etc.): hummocks
Slope (%): 3 - 5						COMMOCKS
Pre-mapped Alaska LNG/NWI classifica	ution: UP/and		Soil Map Unit		1 - 10-	COLIMEX
Are climatic/hydrologic conditions on the	e site typical for this time	of year?		rmal Circum	stances" pres	
Yes X No (if no expl			Yes_>			lain in Notes.)
Are Vegetation, Soil, or Hyd	1				lain in Notes)	
Are Vegetation, Soil, or Hyd	Irology Naturally F	Problematic?	No_X	_ (If yes, exp	lain in Notes.	).
Hydrophytic Vegetation Present? Yes_	No. V		the Consoled A		)#/-4110	
Trydrophytic Vegetation Present? Tes_		IS	the Sampled A	rea within a	wetiand?	Yes No
Hydric Soil Present? Yes_	NoX	w	etland Type:	C2,	ILC2	upland
Wetland Hydrology Present? Yes_	No	— Ala	aska Vegetation	Classificatio	on (Viereck):	V
Notes and Site Sketch: Please include D	Directional & North Arrow	v, Centerline,	Length of featur	re, Distances	from Centerl	ine, Photo Locations, and Survey
corridor.						
		1 15				
	1.0 m	10				
	- ' EN.					
	) 4	1-2				
	- 0	3				
	0					
	Diaham					

VEGETATION (use scientific names of plants	)		1700	The second second second
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  (A)  Table New hour of Dominant Species Assess All Strates (C) (R)
1. Betvia neoglaskana	5	X	FACU	Total Number of Dominant Species Across All Strata: (B)  % Dominant Species that are OBL, FACW, or FAC: 166 (A/B)
2. Picea glauca	15	×	FACL	70 Bornmant opecies that are OBE, 17000, 01770.
3.				The second secon
4.				Prevalence Index worksheet:
Total Cover:				Total % Cover of: Multiply by:
50% of total cover:	10 20	% of total cov	er: <del>-</del>	OBL species:X 1 =
Sapling/Shrub Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 =
1. Betula negalaskana	25	X	FACU	UPL species X 5 = O
2. Vaccinium uliginosum	15	X	FAC	Column Totals: 16 3 (A) 38 (B)
3. Rosa asícularis	8		FACU	PI = B/A = 3.70
4. Spirea stevenii	1		FACU	
5. Ribes triste	\$ ()		FAC	
6.			10	100
7-				
8.				
9.				
Total Cover:			11.77	
50% of total cover:	<u>29.5</u> 20	% of total cov	er: <u>//·</u>	
VEGETATION (use scientific names of plants	)			
Herb Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
1. Geranium erithrium	1		FACU	Prevalence Index is ≤ 3.0
2. Veratrum viride	Н		FAC	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Cornus canadensis	5		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Streptopus amplexifolius		×	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Gymnocarpium dryoptens	10	X	FACV	disturbed or problematic.
6. Calamagrostis Canadensis	1		FAC	
			1	() 41 - 4 .

7. % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes 9. 0 % Cover of Water 10. Hydrophytic Vegetation Present (Y/N): \_ Total Cover:\_\_ Notes: (If observed, list morphological adaptations below): 50% of total cover: 14,5 20% of total cover: 5.8

SOIL PROFI	1 F DECARISETES:			nent the	indicator or	+ E 4L 1.	o of indicators )	
	LE DESCRIPTION: (D	escribe		icht the	ilidicator or	contilm the absent	be of indicators.)	
Depth (inches)	Matrix	L	Redox Features		1 2			
	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
0-3	26451					Fibric	organics	
3-5	2.5 Y 5/1				1	Ash	-	
	10 YR 4/4					Silt loam	NAU .	
4-16	10 YR 3/2					Silt loam	1)!	
					-			
Type: C=Co	oncentration, D=Deplet	ion, RN	I=Reduced Matrix, CS=Cover	ed or Co	ated Sand C	Frains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.	
YDRIC SOI	L INDICATORS		1.0	14-		INDICATORS	FOR PROBLEMATIC HYDRIC SO	
istosol or H	istel (A1)		Alaska Gleyed (A13)			Alaska Color (	Change (TA4) <sup>4</sup>	
istic Epiped	on (A2)		Alaska Redox (A14)			Alaska Alpine	Swales (TA5)	
lack Histic (	A3)		Alaska Gleyed Pores (A	15)		Alaska Redox	with 2.5Y Hue	
lydrogen Su	lfide (A4)					Alaska Gleyed	without 5Y Hue or Redder Underly	
	urface (A12)					Other (Explain	in Notos)	
		— ation, o	ne primary indicator of wetland	hvdrok	ogv. and an		in Notes) ape position must be present unless	
sturbed or p	problematic.						,	
Give details	of color change in Note	es.	Depth (inc	2001	11.14			
COTTOUTC LE	yel (ii present). Type.		Deptil (inc	les)	14 / PK			
					,			
lydric Soil F	Present (Y/N):	7						
	Present (Y/N):	7						
Notes:								
lotes:			ge rocks prese	to f				
lotes:			ge rocks prese	nt				
Notes: Refusa	al at 16",	, lar	ge YOCKS prese		BECONDAR	Y INDICATORS (2	or more required)	
Notes: Refuse	al at 16",	, lar	ny one indicator is sufficient)	8	Vater-staine	d	Stunted or Stressed	
Notes: R-Cfvso	al at 16",	ORS (a	ny one indicator is sufficient) face Soil Cracks (B6)	S	Vater-staine		Stunted or Stressed	
Notes:  Refuse  HYDROLOG  Gurface Wate	al at 16",	ORS (a	ny one indicator is sufficient) face Soil Cracks (B6) idation Visible on Aerial Image	- L	Vater-staine eaves (B9)	<u> </u>	Stunted or Stressed Plants (D1)	
Notes:  Refuse  HYDROLOG  Surface Water Tall	Y PRIMARY INDICATOR OF (A1) able (A2)	ORS (a Sur Inur (B7) Spa	ny one indicator is sufficient) face Soil Cracks (B6) idation Visible on Aerial Image	- L	Vater-staine Leaves (B9) Drainage Pat Dxidized Rhi	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _	
Notes:  Refuse  HYDROLOG  Surface Water Tall	y PRIMARY INDICATO	ORS (a Sur Inur (B7) Spa	ny one indicator is sufficient) face Soil Cracks (B6)	- L	Vater-staine Leaves (B9) Orainage Pat	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)	
Notes:  Refuse  HYDROLOG  Surface Water  High Water To	Y PRIMARY INDICATOR OF (A1) able (A2)	ORS (a Sur Inur (B7 Spa Cor	ny one indicator is sufficient) face Soil Cracks (B6) idation Visible on Aerial Image	V L C C L F	Vater-staine Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
IYDROLOGY Surface Water Talesturation (A:	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)	ORS (a Sur Inur (B7 Spa Cor Mar	race Soil Cracks (B6) idation Visible on Aerial Image rsely Vegetated cave Surface (B8)	V L C C C C C C C C C C C C C C C C C C	Water-staine Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Notes:  Refuse  HYDROLOG  Surface Water  High Water Table  Saturation (A:  Vater Marks	Y PRIMARY INDICATO  or (A1)  able (A2)	ORS (a Sur Inur (B7 Spa Cor Mar Hyd	race Soil Cracks (B6)  dation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15)  rogen Sulfide or (C1)	L C F III	Water-stainer Leaves (B9) Prainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
Notes:  Refusor  HYDROLOGY  Surface Water  High Water To  Saturation (A:  Water Marks  Sediment Dep	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)	ORS (a Sur Inur (B7 Spa Cor Mar Hyd Odd Dry:	race Soil Cracks (B6) dation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season	L C F III	Water-staine Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
HYDROLOGY Surface Water To Saturation (A: Water Marks Sediment Deposits	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  posits (B2)  (B3)	ORS (a Sur Inur (B7 Spa Cor Mar Hyd Odd Dry Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season er Table (C2)	L C F III	Water-stainer Leaves (B9) Prainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
HYDROLOGY Surface Water To Saturation (A: Water Marks Sediment Deposits	Y PRIMARY INDICATO  er (A1)  able (A2)  (B1)  posits (B2)	ORS (a Sur Inur (B7 Spa Cor Mar Hyd Odd Dry Wat	race Soil Cracks (B6) dation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season	L C F III	Water-stainer Leaves (B9) Prainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
IVDROLOGY Surface Water Translaturation (A: Vater Marks Sediment Deposits Sigal Mat or Control	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  posits (B2)  (B3)	ORS (a Sur Inur (B7 Spa Cor Mar Hyd Odd Dry Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season er Table (C2)	L C F III	Water-stainer Leaves (B9) Prainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
IVDROLOGY Surface Water Translaturation (A: Water Marks Sediment Deposits Igal Mat or Control	Y PRIMARY INDICATO  er (A1)  able (A2)  (B1)  posits (B2)  Crust (B4)	ORS (a Sur Inur (B7 Spa Cor Mar Hyd Odd Dry Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season er Table (C2)	L C F III	Water-stainer Leaves (B9) Prainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
IYDROLOGY Surface Water Taturation (A: Vater Marks Sediment Deposits Sigal Mat or Connection	Y PRIMARY INDICATO  er (A1)  able (A2)  (B1)  posits (B2)  Crust (B4)	ORS (a Sur Inur (B7 Spa Cor Mar Hydo Odo Dry Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season er Table (C2)	L C F III	Water-stainer Leaves (B9) Prainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
HYDROLOGY  Gurface Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Coron Deposits Surface Water Water Water Marks Surface Water	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N): N	ORS (a Sur Inur (B7 Spa Cor Mar Hydo Odo Dry Wat Oth	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season er Table (C2) er (Explain in Notes)	EPTY CLL FFINANCE S	Water-stainer Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)	
HYDROLOGY Surface Water High Water Table F  Algal Mat or Coron Deposits  Surface Water  Water Table F	Y PRIMARY INDICATO  Per (A1)  able (A2)  (B1)  Dosits (B2)  (B3)  Crust (B4)  (B5)  Present (Y/N): N	ORS (a Sur Inur (B7) Spa Cor Mar Hyd Odd Dry- Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated resely Vegetated reave Surface (B8) regen Sulfide re (C1) Season re Table (C2) rer (Explain in Notes):  Depth (in):	EPTY CLL FFINANCE S	Water-stainer Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)	
HYDROLOGY  Gurface Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Coron Deposits Surface Water Water Water Marks Surface Water	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N):  esent (Y/N):	ORS (a Sur Inur (B7) Spa Cor Mar Hyd Odd Dry- Wat	race Soil Cracks (B6)  race Soil Cracks (B6)  radation Visible on Aerial Image resely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide or (C1) Season er Table (C2) er (Explain in Notes):	EPTY CLL FFINANCE S	Water-stainer Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)	
HYDROLOGY  Gurface Water  High Water Table F  Saturation (A:  Water Marks  Sediment Deposits  Mgal Mat or Coron Deposits  Surface Water  Vater Table F  Saturation Presented	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N):  esent (Y/N):	ORS (a Sur Inur (B7) Spa Cor Mar Hyd Odd Dry- Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated resely Vegetated reave Surface (B8) regen Sulfide re (C1) Season re Table (C2) rer (Explain in Notes):  Depth (in):	EPTY CLL FFINANCE S	Water-stainer Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)	
AYDROLOGY Surface Water Saturation (A: Sediment Deposits Signal Mat or Coon Deposits Surface Water Table F Saturation Presidency Cooperation Presidency Cooperat	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  (B5)  r Present (Y/N): N  Present (Y/N): N  essent (Y/N): N	ORS (a Sur Inur (B7) Spa Cor Mar Hyd Odc Dry Wat	race Soil Cracks (B6) race Soil Cracks (B6) radation Visible on Aerial Image resely Vegetated resely Vegetated reave Surface (B8) regen Sulfide re (C1) Season re Table (C2) rer (Explain in Notes):  Depth (in):	EPTY CLL FFINANCE S	Water-stainer Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)	

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M):
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)           80%)         Very High Density (80-100%)         —
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: W60 HT 023 Field Target: 128 Date: 6-25-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?-wpland
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X yamede 6-25-14	1
Wetland Scientist (print)	Signature / Date	

X Joe Christophy X
Field Crew Chief (print) Sign

Signature / Date

SITE DESCRIPTION		-	30	oft st	evdy	The second second	
Survey Type: Centerline Acce	ss Road (explain)	Other (expla		Field Targ	7 7	Map #: 73 Map Date: 5/27//	
Date: 06-26-14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60HT024	
Investigators: Joe Christop	her, Zoem	reade.				Team No.: W60	
State: Alaska	Region: Alaska	100	Milepost: /	50.5			
Latitude: 62° 46' 22 F		Longitude	:150°02'	43.05"		Datum: WGS84	
Logbook No.: 003	Logbook Page No.:		Picture No.:			plug	
SITE PARAMETERS		20.	The state of				
Subregion: interior			Landform (hill	slope, terrac	e, hummocks	, etc.): depressional	
Slope (%): () - ?						Concave	
Pre-mapped Alaska LNG/NWI classifica	tion: PSS4/12	3	Soil Map Unit			Dricave	
Are climatic/hydrologic conditions on the	site typical for this time		Are "No	rmal Circum	stances" pres	sent:	
YesX         No (if no expl.           Are Vegetation, Soil, or Hyd		ly Dieturbed?	Yes_X		(If no, expl ain in Notes)	lain in Notes.)	
Are Vegetation, Soil, or Hyd		Problematic?					
SUMMARY OF FINDINGS	Tology Naturally F	TODIETTIALICY	140	_ (II yes, exp	lain in Notes.)		
Hydrophytic Vegetation Present? Yes_	Y No.	le t	ha Sampled A	roo within o	Matlemdo	ver V	
			Is the Sampled Area within a Wetland? Yes No				
Hydric Soil Present? Yes	X No	We	Wetland Type: PSS4/1-B				
Wetland Hydrology Present? Yes	X No	— Ala	ska Vegetation	Classificatio	n (Viereck): 🛚	IA2,1182,1162	
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow	, Centerline, L	ength of featur	e, Distances	from Centerli	ne, Photo Locations, and Survey	
AN AN AS	1162 SPL		-HT03	1-1 Ching		Sups A Josephilis ouc	

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Picea mariana	25	Y	FACW	% Dominant Species that are OBL, FACW, or FAC: \\ \( \lambda \) \( \lambda \) (A
1. Picea mariana 2. Congo The & Shop				Vi Bollinani opedice diacare esc, vices, es vices
3. CATEN				
4.				Prevalence Index worksheet:
Total Cover:				Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	rer:	OBL species:
Sapling/Shrub Stratum ( 2 6 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. Betvia nana	5		FAC	UPL species
2. Phododendron tomentosum	2		FACW	Column Totals: (A) 148 (B)
3. Empetrum nigrum	2		FAC	PI = B/A =
4. Vaccinium oxycocc US	1		08 F	
5. vaccinium uliginosum	2		FAC	
6. yaccinium vitis-idaea			FAC	×-1
7,				
8.				
9.				
Total Cover: 50% of total cover		0% of total cov	/er: 7.6	
VEGETATION (use scientific names of plants	)			
Herb Stratum ( 2 6 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0

Herb Stratum ( 26'	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Rubus chamaemorous 2. Cornus canadensis	10 2 35	(1/N) /	FACU OBL	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
3. Carex utriculada 4.	33	7	000	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
6. 7. 8.				% Bare Ground% Cover of Wetland Bryophytes
9.				
Total Cove		0% of total cov	ver: <u>9 : 4</u>	Notes: (If observed, list morphological adaptations below):

COU DECEL			Date 06 26 14	Feature II				Soil Pit Required (Y/N)
SOIL PROFILE DESCRIPTION: (Describe			e to the depth need	ded to docu	ument the	indicator or	confirm the absence	ce of indicators.)
Depth	Matrix	-	Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0 - 30							Fibric -	organics Caturales
								-
		-						
	-					-	-	
						-	-	
Type: C=Co	oncentration, D=Deple	etion, RN	л И=Reduced Matrix	, CS=Cove	red or Co	ated Sand G	Prains. <sup>2</sup> Location	L PL=Pore Lining, M=Matrix.
	L INDICATORS		diam 1					FOR PROBLEMATIC HYDRIC SOILS
istosol or Hi	istel (A1)X		Alaska Gley	ed (A13) _				Change (TA4) <sup>4</sup>
istic Epiped	on (A2)		Alaska Red					Swales (TA5)
lack Histic (	A3)		Alaska Gley	ed Pores (	A15)			with 2.5Y Hue
lydrogen Su	Ifide (A4)							without 5Y Hue or Redder Underlying
	urface (A12)						Other (Explain	in Notes)
One indicato	r of hydrophytic vege	tation, o	ne primary indicate	or of wetlar	nd hydrolo	gy, and an a	appropriate landsca	pe position must be present unless
Give details	of color change in No	ites						, - passage and a process and
estrictive La	yer (if present): Type	e;	_	Depth (in	ches):	_		
		V						
lydric Sail B	Present (Y/N):	y						
iyanc son r	1030110 (1714).							
lotos:								
lotes:				5.				
lotes:	ich 54 }			5.				
lotes:	ick suf	Fis	Stit oug					
lydrology	Y PRIMARY INDICAT	TORS (a	Sriて Oug	sufficient)	1,4		Y INDICATORS (2	
lydrology	ick suf	TORS (a	Stit oug	sufficient)	V	/ater-stained	d l	Stunted or Stressed
Notes:  NYDROLOGY  Surface Wate	Y PRIMARY INDICAT	TORS (a	ny one indicator is face Soil Cracks (Indicator Visible on	sufficient)	V	/ater-stained eaves (B9) _	1	Stunted or Stressed Plants (D1)
IYDROLOGY Surface Wate	Y PRIMARY INDICATOR (A1)  Able (A2)	FORS (a	ny one indicator is face Soil Cracks (Indation Visible on	sufficient)	gery D	Vater-stained eaves (B9) <sub>-</sub> rainage Pat	terns (B10)	Stunted or Stressed Plants (D1)
HYDROLOGY  Gurface Water Ta	Y PRIMARY INDICATOR (A1)  Able (A2)	FORS (a Sur Inui (B7 Spa	ny one indicator is face Soil Cracks (Indicator Visible on	sufficient) 36) Aerial Imaç	gery D	Vater-stained eaves (B9) <sub>-</sub> rainage Pat	terns (B10)	Stunted or Stressed Plants (D1)
IYDROLOGY Surface Water Sigh Water Taleston (A3)	Y PRIMARY INDICAT  IT (A1) X  able (A2) X	FORS (a Sur Inui (B7 Spa Cor	Iny one indicator is face Soil Cracks (indation Visible on )	sufficient) 36) Aerial Imag	gery D	Vater-stained eaves (B9) rainage Patr xidized Rhiz iving Roots ( resence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
IYDROLOGY Surface Water Ligh Water Taleaturation (A3	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) (B1)	FORS (a Sur Inui (B7 Spa Cor Mar	Iny one indicator is face Soil Cracks (Indation Visible on )arsely Vegetated ncave Surface (B8	sufficient) 36) Aerial Imag	gery D	Vater-stained eaves (B9) _ rainage Pati xidized Rhiz iving Roots (	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
AYDROLOGY Surface Water High Water Ta Saturation (A3 Vater Marks (	Y PRIMARY INDICAT  IT (A1) X  able (A2) X	FORS (a Sur Inui (B7 Spa Cor Mar	Iny one indicator is face Soil Cracks (indation Visible on )	sufficient) 36) Aerial Imag	gery D	Vater-stained eaves (B9) _ rainage Pati xidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
AYDROLOGY Surface Water Tage Saturation (A3 Vater Marks (Sediment Dep	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) Cosits (B2)	FORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry	Iny one indicator is face Soil Cracks (indation Visible on arsely Vegetated incave Surface (B8 or Deposits (B15) _ drogen Sulfide or (C1)	sufficient) 36) Aerial Imag	gery D C Li P In	Vater-stained eaves (B9) _ rainage Pati xidized Rhiz iving Roots ( resence of F on (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water Ligh Water Taleaturation (A3 Vater Marks (	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) (B1)	FORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry	iny one indicator is face Soil Cracks (indation Visible on ) arsely Vegetated incave Surface (B8 rl Deposits (B15) _ drogen Sulfide or (C1) _	sufficient) 36) Aerial Imag	gery D C Li P In	Vater-stained eaves (B9) _ rainage Pation   value of Rhiz   va	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water Tage Saturation (A3 Vater Marks ( Sediment Deporift Deposits	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) Cosits (B2)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (indation Visible on arsely Vegetated incave Surface (B8 or Deposits (B15) _ drogen Sulfide or (C1)	sufficient) 36) Aerial Imag	gery D C Li P In	Vater-stained eaves (B9) _ rainage Pation   value of Rhiz   va	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
AYDROLOGY Surface Water Tage atturation (A3 Vater Marks (A2 Sediment Deposits Orift Deposits Igal Mat or Care	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) X (B3) X (C)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (Indation Visible on ) arsely Vegetated incave Surface (B8 or I Deposits (B15) _ drogen Sulfide or (C1)	sufficient) 36) Aerial Imag	gery D C Li P In	Vater-stained eaves (B9) _ rainage Pation   value of Rhiz   va	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water Taleaturation (A3 Vater Marks (A2 Vater Marks (A2 Vater Marks (A2 Vater Marks (A2 Vater Marks (A3 Vate	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) X (B3) X (C)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (Indation Visible on ) arsely Vegetated incave Surface (B8 or I Deposits (B15) _ drogen Sulfide or (C1)	sufficient) 36) Aerial Imag	gery D C Li P In	Vater-stained eaves (B9) _ rainage Pation   value of Rhiz   va	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water Ligh Water Taleaturation (A3 Vater Marks ( ediment Deprift Deposits Igal Mat or Coon Deposits	Y PRIMARY INDICATOR (A1) X able (A2) X (B1) X (B3) X (C)	TORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (Indation Visible on ) arsely Vegetated incave Surface (B8 or I Deposits (B15) _ drogen Sulfide or (C1)	sufficient) 36) Aerial Imag	gery D C Li P In	Vater-stained eaves (B9) _ rainage Pation   value of Rhiz   va	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
AYDROLOGY Surface Water High Water Ta Saturation (A3 Vater Marks ( Sediment Dep Orift Deposits Ligal Mat or Co on Deposits urface Water	Y PRIMARY INDICATOR (A1) X able (A2) X able (A2) X able (B1) X able (B2) X able (B3) X able (B3) X able (B4) X able (B5) X able (B5) X able (B5) X able (B7/N):	FORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (indation Visible on )	sufficient) 36) Aerial Imag	gery D Li P In	Vater-stained eaves (B9) rainage Patroxidized Rhiz ving Roots (resence of Fon (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
AYDROLOGY Surface Water High Water Ta Saturation (A3 Vater Marks ( Sediment Dep Orift Deposits Algal Mat or Co on Deposits Surface Water	Y PRIMARY INDICATOR (A1) X able (A2) X able (A2) X able (B1) X able (B2) X able (B3) X able (B3) X able (B3) X able (B4) X able (B5) X abl	FORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (indation Visible on )	sufficient) 36) Aerial Imag	gery D Li P In	Vater-stained eaves (B9) rainage Patroxidized Rhiz ving Roots (resence of Fon (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY  Gurface Water  High Water Ta  Saturation (A3  Vater Marks (  Sediment Deporift Deposits  Algal Mat or Co  Ton Deposits  Furface Water  Vater Table Proposition Presented	Y PRIMARY INDICATOR (A1)	FORS (a  Sur  Inui (B7  Spa Cor  Mar  Hyd Odd  Dry Wat  Oth	Iny one indicator is face Soil Cracks (Indation Visible on Indation Indicate Indicat	sufficient) 36) Aerial Imag	gery D Li P In	Vater-stained eaves (B9) rainage Patroxidized Rhiz ving Roots (resence of Fon (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
IYDROLOGY Surface Water Ligh Water Tale attraction (A3 Water Marks ( ediment Deprift Deposits Igal Mat or Coon Deposits urface Water Water Table Periodudes capil	Y PRIMARY INDICATOR (A1)	FORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (indation Visible on ) arsely Vegetated neave Surface (B8 or (C1)	sufficient)  36) Aerial Imag	gery D Li P In S N	Vater-stained eaves (B9) rainage Patrixidized Rhiz ving Roots (resence of Fon (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
YDROLOGY urface Water igh Water Ta aturation (A3 dater Marks ( ediment Dep rift Deposits gal Mat or Co on Deposits urface Water ater Table P	Y PRIMARY INDICATOR (A1)	FORS (a Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat	Iny one indicator is face Soil Cracks (indation Visible on ) arsely Vegetated neave Surface (B8 or (C1)	sufficient)  36) Aerial Imag	gery D Li P In S N	Vater-stained eaves (B9) rainage Patrixidized Rhiz ving Roots (resence of Fon (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, I	M= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent_ Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (>	Sapling (<5 dbh, <6m tall) 25 Tall shrub (2-6m) Short shrub (0.5-2m) 7 Im) Short herb (<1m) 47 Moss-Lichen 100 Floating Submerged O
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparso 80%) Very High Density (80-100%	e (0-20%) Low Density (20-40%) Medium Density (40-60%)X High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scatter	100% Cover or Open Water _ X
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species)X High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/AX
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches_	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site 2 Continuous Cover
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	e (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (larg	e patches, concentric rings) Moderate (broken irregular rings)
	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sand	Histosol:Fibric Histosol:Hemic Histosol: Sapric y Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (B): No Inlet/Outlet X	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet
Wet: Perm. Flooded, Intermittently Exposed	asonally Flooded, Temporarily Flooded, SaturatedX , Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence	ence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Abser	nt Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Return Interval >5 yrs	Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outfle	owX Restricted Outflow Unrestricted Outflow
	Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) X pH Reading 3.90
Surficial Glacial Deposit Under Wetland Glacial Till/Not Permeable	(P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Basin Topographic Gradient (M): Lo Evidence of Seeps and Springs (P): No S	w Gradient (<2%) High Gradient (≥2%) seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isola	ated Wetlands within 400m, Not Connected Only Connected Belowcted Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e.	., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural	5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Me	edium (10-100 acres) Large (>100 acres)
Crow Chief OA/OC check: A	GPS Technician QA/QC check:

1 000

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W60 H T 02 4 Field Target: 10 4 Date: 06 - 26 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
	4
1.	Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> </ul>
	Cover calculations are complete and correct?
	All dominant species have been determined and recorded per strata?
	☐ Indicator status is correct for each species? ☐ Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)	Signature / Date	•
X Zoe Meade	X Zormaile	6/26/14

1 /20- //2

Field Crew Chief (print)

Signature / Date

WETLAND DETERMINATION DATA FORM 2000' (orridor SITE DESCRIPTION Field Target: 148 Map #: 103 Map Date: 5/27/14 Access Road (explain)\_\_\_\_ Other (explain)\_ Survey Type: Centerline\_ Feature Id: MIGOT 10 51 WGOHTE Project Name & No.: Alaska LNG 26221306 Investigators: Joe Christopher, Zoe Meade, Abigayle Fisher Team No.: W60 Milepost: 661.7 State: Alaska Region: Alaska Longitude: /50° /5' 50.77 Latitude: 62° 20' 41.48 Datum: WGS84 Picture No .: P\_ N. S, Pit, PIV9 Logbook Page No.: 048-049 Logbook No.: SITE PARAMETERS Landform (hillslope, terrace, hummocks, etc.): depression Subregion: South central Local relief (concave, convex, none): Concave Slope (%): 0-3 Soil Map Unit Name: Pre-mapped Alaska LNG/NWI classification: PSS 4/1/EM 1 C NA Are "Normal Circumstances" present: Are climatic/hydrologic conditions on the site typical for this time of year? No (If no, explain in Notes.) (if no explain in Notes) No X \_(If yes, explain in Notes) Are Vegetation\_\_\_\_, Soil\_ Significantly Disturbed? , or Hydrology\_ No\_\_X\_\_ (If yes, explain in Notes.) Naturally Problematic? Are Vegetation\_ . Soil or Hydrology **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes\_ Is the Sampled Area within a Wetland? Wetland Type: PEM1XC Hydric Soil Present? Wetland Hydrology Present? Νo Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor. In MJ 49 for Skeeps -7 GPS data recorded in the HT spread

Total Cover: 45

50% of total cover: 22.5 20% of total cover: 9

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:(
1.		- Circuit		Total Number of Dominant Species Across All Strata: 5
2.				% Dominant Species that are OBL, FACW, or FAC: 100 (A
3.				Mary Control of the C
4.				Prevalence Index worksheet:
Total Cover	0			Total % Cover of: Multiply by:
50% of total cove	r: <u> </u>	% of total cov	er: <u>O</u>	OBL species: 46 x 1 = 46
Sapling/Shrub Stratum(26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 12
1. Chamaedaphne calyculata	5	У	FACW	UPL species $O$ $X 5 = O$ Column Totals: $6 2$ (A) $8 2$ (B)
2. Picea mariana	2		FACW	Column Totals:6 2(A)8 2(B)
3. Andromeda polifolia	5	У	FACW	PI = B/A =3
4. Betula nana	4 -	У	FAC	
4. Betula nana 5. Vaccinium Oxyroccus	1		OBL	
6.				
7,				
В.				
9,				
Total Cover 50% of total cover		% of total cov	er: <u>3,4</u>	
VEGETATION (use scientific names of plants	s)			
Herb Stratum( <u>26'</u> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Carex aquatilis	35	У	OBL	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. Carex microglochin	10	Y	OBL	Notes)
3.				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic
6.				
7.				% Bare Ground
0				1 ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~
8,				% Cover of Wetland Bryophytes
9.				% Cover of Wetland Bryophytes

Hydrophytic Vegetation Present (Y/N):

Notes: (If observed, list morphological adaptations below):

SOIL Date 7979 Feature ID Host 1979 Feature ID Host	WEILA	MD DETEL	<b>(1VII</b>	NATION D				CAN	
SOIL PROPILE DESCRIPTION. (Describe to the depth needed to document the indicator or confirm the absence of indicators.)    Matrix   Redox Features   Redox Fea	SOIL			Date 7/9/14 Fe	ature ID 4	VGO T	1051		Soil Pit Required (Y/N)
Color (moist)	SOIL PROFILE	DESCRIPTION: (D	escribe	to the depth needed	to docume	nt the i	ndicator or c	confirm the absen	ce of indicators.)
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS+Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS+Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.   HYDRIC SOIL INDICATORS   Malaska Gleyed (A13)	Depth	Matrix		Redox Features					
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Costed Sand Grains. *Location: PL=Pore Lining, M=Matrix, HYDRIC SOIL INDICATORS    INDICATORS   INDICATORS   INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS*	(inches)	Color (moist)	%	Color (moist)	% Ty	/pe <sup>1</sup>	Loc²	Texture	Notes
Histosa or Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosa or Histel (A11) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosa (Change (TA4)* Alaska Change (A12) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue or Redder Underlying Layer.  Thick Dark Surface (A12) Cher (Explain in Notes) Cher (Explain in Notes)  Thick Dark Surface (A12) Cher (Explain in Notes)  Thyper Change in Notes (Cher (Explain in Notes))  Thyper Change in Notes (	0-20							Fibric	organics
Histosa or Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosa or Histel (A11) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosa (Change (TA4)* Alaska Change (A12) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue or Redder Underlying Layer.  Thick Dark Surface (A12) Cher (Explain in Notes) Cher (Explain in Notes)  Thick Dark Surface (A12) Cher (Explain in Notes)  Thyper Change in Notes (Cher (Explain in Notes))  Thyper Change in Notes (									
Histosa or Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosa or Histel (A11) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosa (Change (TA4)* Alaska Change (A12) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue or Redder Underlying Layer.  Thick Dark Surface (A12) Cher (Explain in Notes) Cher (Explain in Notes)  Thick Dark Surface (A12) Cher (Explain in Notes)  Thyper Change in Notes (Cher (Explain in Notes))  Thyper Change in Notes (									
Histoso I Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA5) Alaska Change (TA5) Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska C									
Histoso I Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA5) Alaska Change (TA5) Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska C			-				-		
Histoso I Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA5) Alaska Change (TA5) Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska C			-					-	
Histoso I Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Color Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA4)* Alaska Change (TA5) Alaska Change (TA5) Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (TA6)* Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska Change (A12) Alaska Change (A13) Alaska C	¹Typo: C=Con	centration D-Deple	tion PN	#=Reduced Matrix C	S=Covered	Lor Cos	ted Sand G	rains <sup>2</sup> l ocation	PI =Pore Lining M=Matrix
Histosol or Histel (A1) X   Alaska Gleyed (A13)   Alaska Alpine Swales (TA5)   Histosol or Histel (A2)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Black Histic (A3)   Alaska Gleyed Pores (A15)   Alaska Alpine Swales (TA5)   Hydrogen Sulfide (A4)   Alaska Alpine Swales (TA5)   Alaska Gleyed Without SY Hue or Redder Underlying Layer   Cher (Explain in Notes)   Cher (Explain			tion, Ki	vi-Neduced Watrix, C	0-Covered	1 01 008	aled Danid O		
Histic Epipedon (A2)				Alaska Gleved	(Δ13)				
Black Histic (A3)									
Alaska Gleyed without 5Y Hue or Redder Underlying Layer Thick Dark Surface (A12) Thick Dark Surface (A12) Other (Explain in Notes) One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic. Give details of color change in Notes. Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes:  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient) Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Flants (D1) Flants									
Thick Dark Surface (A12) Other (Explain in Notes)  Secondary an appropriate landscape position must be present unless distance position part and passed unless distance position must be present unless distance position passed unless distance position must be present unless distance position passed unless distance position passed unless distance position passed unles				7 Hadita Gioyac					
Cone indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.   Restrictive Layer (if present): Type:									
disturbed or problematic.  **Glive details of color change in Notes.  **Restrictive Layer (if present): Type:			etion o	no primon, indicator	of wotland l	hydrolo	ay and an a		
Restrictive Layer (if present): Type:	disturbed or pr	oblematic.		one primary indicator	or wettand i	iyaiolo	gy, and an a	ippropriate landsc	ape position must be present unless
Notes:    HyDroLogy Primary Indicators (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)	<sup>4</sup> Give details of	f color change in Not	tes.		enth (inche	acl:			
Notes:    Notes:     Notes:     Notes:     Notes:     Notes:   Not	Restrictive Lay	er (ii present). Type	*		reptii (inciic				
Second Ry Indicator is sufficient   Second Ry Indicator S (2 or more required)	Hydric Soil Pr	esent (Y/N):	У						
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1)  High Water Table (A2)X	Notes:								
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1)  High Water Table (A2)X									
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1)  High Water Table (A2)X									
Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1)  High Water Table (A2)X	HYDROL OGY	PRIMARY INDICAT	ORS (	any one indicator is s	ufficient)	S	ECONDAR	Y INDICATORS (	2 or more required)
Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Plants (D1) Leaves (B10) Leaves (B10) Leaves (B10) Leaves (B10) Plants (D1) Leaves					_				
Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) FAC-Neutral Test (D5) FAC-Neutral Te	Surface Water	(A1)	Su	rface Soil Cracks (B6	j)				
Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) Shallow Aqui	High Water Ta	ble (A2)						terns (B10)	Geomorphic Position (D2)
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)   Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   Drift Deposits (B3) Other (Explain in Notes):  Iron Deposits (B5) Other (Explain in Notes):  Surface Water Present (Y/N):	Saturation (A3	<i>X</i>	Sp	arsely Vegetated	rsely Vegetated				Shallow Aquitard (D3)
Water Marks (B1) Marl Deposits (B15) Iron (C4) Relief (D4)   Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5) Depth (in): Wetland Hydrology Present (Y/N):    Water Table Present (Y/N):	Catalation (710	/	Co	incave Surface (B8) _		_			
Drift Deposits (B3) Dry-Season Water Table (C2) Notes:    Algal Mat or Crust (B4) Other (Explain in Notes):     Iron Deposits (B5) Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Saturation Present (Y/N): PRO-Neutral rest (D3)	Water Marks (I	31)	Ma	1 Deposits (B15)					
Drift Deposits (B3)	Sediment Dep	osits (B2)				s			
Algal Mat or Crust (B4) Other (Explain in Notes):  Iron Deposits (B5)  Surface Water Present (Y/N): NO Depth (in):  Water Table Present (Y/N): Ves Depth (in): 2  Saturation Present (Y/N): Ves Depth (in): 7  Saturation Present (Y/N): Ves Depth (in): 7	Drift Deposits	(B3)	Dr	v-Season		N	lotes:		
Iron Deposits (B5)  Surface Water Present (Y/N): NO Depth (in):  Water Table Present (Y/N): Ves Depth (in): Z  Saturation Present (Y/N): Ves Depth (in): Z  Saturation Present (Y/N): Ves Depth (in): Z						-			
Surface Water Present (Y/N): NO Depth (in):  Water Table Present (Y/N): Ves Depth (in): 2  Saturation Present (Y/N): Ves Depth (in): 7			.   01	mer (Explain in Notes)					
Water Table Present (Y/N): Ves Depth (in): 2  Saturation Present (Y/N): Ves Depth (in): 7  Depth (in): 7	Iron Deposits (	B5)							
Water Table Present (Y/N): Ves Depth (in): 2  Saturation Present (Y/N): Ves Depth (in): 7  Depth (in): 7	Surface Water	Propert (V/N): NI	7	Donth (in)		1			1
Water Table Present (Y/N): Ves Depth (in): Z  Saturation Present (Y/N): Ves Depth (in): Z  (includes capillary fringe)		\ \	,			Wet	tland Hvdro	logy Present (Y/	N):
(includes capillary fringe) / Sopti (iii): Z	Water Table P	resent (Y/N):	e5	Depth (in): 2					
		sent (Y/N):	35	Depth (in): Z					
	Notes:								

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent
Percent Cover (P): Tree (>5 dbh, >6m tall)       U       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         Y         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous CoverX
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) \( \times \) Moderate (broken irregular rings) \( \times \) High (small groupings, diverse and interspersed) \( \times \)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:FibricX Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
TIVADOL COLO VADIADI DO
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Pe
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Index Perenni
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, SaturatedX Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Inte
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

MW

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	W60HT025 60
Featu	re ID: W6071051 Field Target: 148 Date: 7/9/14
For all	l items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	☐ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	☑ Vegetation names are entered legibly for all strata present?
	<ul><li>✓ Cover calculations are complete and correct?</li><li>✓ All dominant species have been determined and recorded per strata?</li></ul>
	☑ Indicator status is correct for each species?
	✓ Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is wetland?
6.	Field Logbook
	☑ Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  ∠ Each logbook page is initialed and dated?
7.	Maps
	✓ Wetland boundaries have been corrected if necessary?
	✓ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

Signature/Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION						
Survey Type: Centerline X Acces	ss Road (explain)	Other (expl	ain)	Field Target:	106	Map #: <u>75</u> Map Date: 5/27//4
Date: 06 - 26 - 14	Project Name & No.:					W60HT026
Investigators: Joe Christoph	ner, Zoe Meac	de				Team No.: W60
State: Alaska	Region: Alaska		Milepost:	149,7		
Latitude: 62° 45' 56. 51"		Longitude	: 150° 04	07-56"		Datum: WGS84
Logbook No.: 003	Logbook Page No.:	13	Picture No.:	P-N, 5	, pit	, pluq
SITE PARAMETERS						
Subregion: Interior		ý.	Landform (hill	Islope, terrace,	hummocks	s, etc.): terrace
Slope (%): 0 - 3			Local relief (c	oncave, convex	c, none):	concave
Pre-mapped Alaska LNG/NWI classifica	tion: upland		Soil Map Unit	Name:	IA	L
Are climatic/hydrologic conditions on the YesX No (if no expl		of year?	Are "No	ormal Circumsta	ances" pres	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	drology Significant	ly Disturbed?		(If yes, explair		
Are Vegetation, Soil, or Hyd	drology Naturally F	Problematic?	No_X	(If yes, explain	n in Notes.	)
SUMMARY OF FINDINGS		100	14.	ME TE	Salphas.	
Hydrophytic Vegetation Present? Yes_	NoX	Is	the Sampled A	rea within a W	etland?	Yes No
Hydric Soil Present? Yes_	NoX	_   w	etland Type:	upland		1020
Wetland Hydrology Present? Yes_	NoX	— Ala	aska Vegetation	Classification (	(Viereck):	IB3, IIB1
Notes and Site Sketch: Please include D corridor.	Pirectional & North Arrow		Length of featur	ءِ اندط	Ste + the	data Correct, e greater polygor eet also.
						= -

Free Stratum (Plot sizes: 26 ')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
Betula neoalaskana	80	Y	FACU	% Dominant Species that are OBL, FACW, or FAC:
2. Picea glauca	8		FACV	70 Bollimant Opecies that are OBE, 1 AOVV, 011 AO.
3.				
l.	1			Prevalence Index worksheet:
Total Cover	. 88			Total % Cover of: Multiply by:
50% of total cover	r: <u>44</u> 20	% of total cov	er: 17.6	OBL species:X 1 =
Sapling/Shrub Stratum(2-©')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0 X 2 = 0 FAC species 19 X 3 = 57 FACU species 132 X 4 = 528
. Sanguisor ba canadensis	ļ		FACAN	UPL species X 5 = 0
Alnus ssp.	15	У	FAC	Column Totals: 151 (A) 585 (B)
B. Picea glauca	3		FACU	PI = B/A = 3.87
111000			FACU	
9	3			
l. Betula neoalaskana	3		WPL	1
Betvla neoglaskana i. Fraxinus Sep	3 T			- CANINUS NOT AN US 451
l. Betula neoalaskana	3 T		WPL	FRATIONS NOT AN US 451
Betvia neodlaskana Fraximus Sep- B. Borbus Scopulina	3 -T		WPL	FRAJINUS NOT AN US 451

Herb Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%			
1. Gymnocarpium dryopteris	10	Y	FACU	Prevalence Index is ≤ 3.0			
2. Chamerion angusto folium	1		FACU	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)			
3. Dryopteris expansa	25	Y	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)			
4. Equisetum sylvaticum	1		FAC-	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unle			
5. Calamagnostis can.	3		FAC	disturbed or problematic.			
6. Cornus canaderisis	2		FACU				
7.				% Bare Ground			
8.	3			% Cover of Wetland Bryophytes			
9.			*	Total Cover of Bryophytes			
10,			147	% Cover of Water			
Total Cover: 50% of total cover:		)% of total cov	ver: 6 , 4	Hydrophytic Vegetation Present (Y/N):  Notes: (If observed, list morphological adaptations below):			

SOIL			Date 06 -26-14 Feature ID V				Soil Pit Required (Y/N)		
SOIL PROFI	LE DESCRIPTION: (	Describe	to the depth needed to docume	ent the	indicator or	confirm the absence	e of indicators.)		
Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (moist) % T	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes		
0 - 5						Fibric	organics, dry		
) - 7							organics, dry Rock/cobble		
1-9	10 YR 5/1	100					Ash		
7 - 20	10 YR 3/3	100				Silt loam	DM		
						1			
						*			
		etion, RM	=Reduced Matrix, CS=Covered	d or Coa	ated Sand G	-11	PL=Pore Lining, M=Matrix,		
	IL INDICATORS						FOR PROBLEMATIC HYDRIC SOILS		
	istel (A1)		Alaska Gleyed (A13)			Alaska Color Cl	nange (TA4) <sup>4</sup>		
listic Epiped	lon (A2)		Alaska Redox (A14)			Alaska Alpine S	wales (TA5)		
Black Histic (	A3)		Alaska Gleyed Pores (A1	5)		Alaska Redox v	vith 2.5Y Hue		
lydrogen Su	lfide (A4)						without 5Y Hue or Redder Underlying		
	urface (A12)					Cthor (Evoluin i	n Notae)		
		tation on	e primary indicator of wetland	hydrolo	ov and an	Other (Explain i	n Notes) De position must be present unless		
listurbed or p	problematic.		o primary indicator or wetland	nyarolo	gy, and an a	appropriate landscap	be position must be present unless		
Give details	of color change in No	tes.		. ,					
estrictive La	ayer (if present): Type	9:	Depth (inch	es):/	VIA				
			observed						
IYDROLOG	Y PRIMARY INDICA	TORS (an	y one indicator is sufficient)	S	ECONDAR	Y INDICATORS (2	or more required)		
Surfaçe Wate	er (A1)		ce Soil Cracks (B6)		Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)		
ligh Water T	able (A2)	Inun (B7)	dation Visible on Aerial Imagery		Drainage Patterns (B10)		Geomorphic Position (D2)		
Saturation (A	3)	Spar	sely Vegetated cave Surface (B8)	O Li	xidized Rhi	zospheres along (C3)	Shallow Aquitard (D3)		
Vater Marks	(B1)		Deposits (B15)	Procons			Microtopographic Relief (D4)		
ediment De	posits (B2)		rogen Sulfide r (C1)		Salt Deposits (C5)		FAC-Neutral Test (D5)		
Orift Deposits	i (B3)	Dry-S Wate	Season er Table (C2)	N	otes:				
dgal Mat or 0	Crust (B4)	Othe	r (Explain in Notes):						
ron Deposits	(B5)					7			
urface Wate	er Present (Y/Ń):	) [	Depth (in):				. I		
Vater Table I	Present (Y/N):		Depth (in):	Wet	land Hydro	logy Present (Y/N)	:N		
Saturation Proincludes cap			Depth (in):						
Notes: No	hydrology	indi	cators present	,					



VEGETATION VARIABLES P= Plot, N	1= Matrix
Forested-Evergreen-Needle-leaved_ Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	Scrub Shrub-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or do or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) _	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (larger High (small groupings, diverse and interspers	patches, concentric rings) Moderate (broken irregular rings) ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
	A .
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No toutlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed,	sonally Flooded, Temporarily Flooded, Saturated Semiperm, Flooded
Evidence of Sedimentation (P): No Evider	ce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absent	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No C Return Interval >5 yrs	Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outfloor	Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water	Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) <b>pH Reading</b>
Surficial Glacial Deposit Under Wetland (F Glacial Till/Not Permeable/	P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Se	
LANDOCADE VARIABLES NO	**
	ed Wetlands within 400m, Not Connected Only Connected Below ed Upstream & Downstream Unknown
	ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural	5-25% Urbanized 25-50% Urbanized >50% Urbanized
	lium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check:	GPS Technician QA/QC check:

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: W 6 0 H T 0 2 6 Field Target: 10 6 Date: 06 - 26 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>Vegetation names are entered legibly for all strata present?</li> <li>Cover calculations are complete and correct?</li> <li>All dominant species have been determined and recorded per strata?</li> <li>Indicator status is correct for each species?</li> <li>Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland? υρισωμ
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

X Zormeade

06-26-14

124/14

Signature / Date

Field Crew Chief (print)

Signature / Date

WETLAND DETERMINATION DATA FORM SITE DESCRIPTION Field Target: 107 Survey Type: Centerline Access Road (explain)\_\_\_\_\_ Other (explain) Feature Id: WOOHTOD Project Name & No.: Alaska LNG 26221306 Date: Team No.: / Investigators: Milepost: 149,7 State: Alaska Region: Alaska Longitude: 150 0 04' 09 - 80' Latitude: 62° 45 '56.25" Datum: WGS84 Picture No .: P\_N, S, pit, plva Logbook No.: 003 Logbook Page No.: SITE PARAMETERS Landform (hillslope, terrace, hummocks, etc.): Terrace Denssion Subregion: In tearer Local relief (concave, convex, none): CDUCAUL Slope (%): Pre-mapped Alaska LNG/NWI classification: Dem. Soil Map Unit Name: Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (If no, explain in Notes.) \_\_\_ (if no explain in Notes) No\_ Are Vegetation\_\_\_\_, Soil\_\_\_\_, or Hydrology\_ No \( \) (If yes, explain in Notes) Significantly Disturbed? Are Vegetation\_ \_, Soil\_ , or Hydrology Naturally Problematic? No <a> (If yes, explain in Notes.)</a> **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes Is the Sampled Area within a Wetland? Wetland Type: PEM1/551 Hydric Soil Present? No Wetland Hydrology Present? Alaska Vegetation Classification (Viereck): Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor. Se PASE 14

Total Cover: 126

7.

8.

9.

10.

VEGETATION (use scientific names of plants	3)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Picea mariana	2		FACW	Total Number of Dominant Species Across All Strata: (I
2.	-de-			% Dominant Species that are OBL, FACW, or FAC: <u> </u>
3.				
4.				Prevalence Index worksheet:
Total Cover				Total % Cover of: Multiply by:
50% of total cover	: 20	% of total cov	er:	OBL species: X 1 =
Sapling/Shrub Stratum ( 2.6 ')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 13 X 2 = 26  FAC species
1. Picea mariana	3_	1	FACW	UPL species
2. Betula nana	<u>3</u> 5	Ý	FAC	Column Totals: 151 (A) 209 (B)
3. empetrum nigrum	10	Y	FAC	PI = B/A = 1 - 38
4. Vaccinium uliginosum	3		FAG	
5. Vaccinium oxycoccus	2		OBL	
6.				
7.				
8.				
9.				
Total Cover 50% of total cover		% of total cov	er:_5	
VEGETATION (use scientific names of plants	3)			
Herb Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Rubus chamaemorous	7	()	FACW	× Prevalence Index is ≤ 3.0
2. Carex Gayatilis	15		OBL	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Pedicularis lobridorica			FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Trichophorum caespitos		Y	OBL	Indicators of hydric soil and wetland hydrology must be present unless
5. Cornus canadensis	3		FACU	disturbed or problematic.
6. Carex Magellanica	60	V	t	
- Carex mayenanica	00		0BL	the second secon

			Date (1)0/14 F	eature ID	1700	36		Soll Pit Required (Y/N)
SOIL PROFI	LE DESCRIPTION: (	Describe	e to the depth neede	d to docum	ent the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix		Redox Features					
inches)	Color (moist)	%	Color (moist)	% -	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-16		10					Fishit	Sent
							1	
Type: C=Co	oncentration, D=Depl	etion, RI	M=Reduced Matrix, (	CS=Covere	d or Co	ated Sand C		: PL=Pore Lining, M=Matrix.
	IL INDICATORS		and the second		-1		INDICATORS	FOR PROBLEMATIC HYDRIC SOIL
	istel (A1)X		Alaska Gleyed				Alaska Color (	Change (TA4) <sup>4</sup>
listic Epiped	lon (A2)		Alaska Redox	(A14)			Alaska Alpine	Swales (TA5)
Black Histic (	(A3)		Alaska Gleyed	Pores (A	5)		Alaska Redox	with 2.5Y Hue
	ılfide (A4)							d without 5Y Hue or Redder Underlying
	urface (A12)						Other (Explain	a in Notes
		etation o	ne primary indicator	of wetland	hydrolo	nov and an		ape position must be present unless
lestrictive La	of color change in No ayer (if present): Typ	e:		Depth (inch	es):	10		
Restrictive La	Present (Y/N):	e:		Depth (inch	ies):	10		
Restrictive La	ayer (if present): Typ	e:						? or more required)
Restrictive Land Hydric Soil Foliation (Notes:	Present (Y/N):	TORS (a		ufficient)	S	SECONDAR Vater-staine	Y INDICATORS (2	? or more required) Stunted or Stressed Plants (D1)
Hydric Soil F Notes: HYDROLOG Surface Wate	Present (Y/N):  Ce at 6	TORS (a	any one indicator is s rface Soil Cracks (Bo undation/Visible on A	ufficient)	V L	BECONDAR Vater-staine eaves (B9)	Y INDICATORS (2	Stunted or Stressed Plants (D1)
Restrictive Land Restri	Present (Y/N):  Ce at 6	TORS (a	any one indicator is s rface Soil Cracks (Bo undation/Visible on A	ufficient) 5)erial Image	S V L	BECONDAR Vater-staine eaves (B9) Orainage Pat	Y INDICATORS (2 d terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Hydric Soil F Notes: HYDROLOG Surface Water T Saturation (A	Present (Y/N):  Or at 16'  Y PRIMARY INDICA  er (A1)  able (A2)	TORS (a	any one indicator is s rface Soil Cracks (Boundation Visible on A	ufficient) 5) erial Image	V L	BECONDAR Vater-staine eaves (B9) Orainage Pat Oxidized Rhi	Y INDICATORS (2 d terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks	Present (Y/N):  Present (Y/N):  Ce at 16  Present (A1)  Table (A2)  3)  And	TORS (a Su Inu (B) Sp Co Ma	any one indicator is s rface Soil Cracks (Boundation Visible on A 7) arsely Vegetated incave Surface (B8)	ufficient) 5) erial Image	SS COLUMN S	Vater-stained eaves (B9) Orainage Pate Dividized Rhidiving Roots Presence of Item (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)X  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
Restrictive Land Restrictive Land Restrictive Land Restrictive Land Restriction Restriction (A Water Marks Restriction (A Rest	Present (Y/N):  OF PRIMARY INDICATION (A1)  Fable (A2)  (B1)	TORS (a Su Inu (B) Sp Co Ma Hy Od	any one indicator is surface Soil Cracks (Be undation Visible on A 7) arsely Vegetated encave Surface (B8) arl Deposits (B15) drogen Sulfide	ufficient) S)erial Image	SS COLUMN S	Vater-stained eaves (B9) Orainage Pate Dividized Rhidiving Roots Presence of Item (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)X  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Present (Y/N):  OF A T TO  OF PRIMARY INDICA  OF (A1)  Fable (A2)  (B1)  posits (B2)	TORS (a Su Inu (B) Sp Co Ma Hy Od Dn Wa	any one indicator is surface Soil Cracks (Be undation Visible on A 7) arsely Vegetated encave Surface (B8) arl Deposits (B15) drogen Sulfide lor (C1)	ufficient)	SS COLUMN S	Vater-stained eaves (B9) Orainage Pate Dividized Rhidiving Roots Presence of Item (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	Present (Y/N):  Present (Y/N):  OF PRIMARY INDICA  OF (A1)  Fable (A2)  (B1)  Posits (B2)  S (B3)	TORS (a Su Inu (B) Sp Co Ma Hy Od Dn Wa	any one indicator is surface Soil Cracks (Be undation/Visible on A 7) arsely Vegetated incave Surface (B8) arl Deposits (B15) drogen Sulfide lor (C1) y-Season ater Table (C2)	ufficient)	SS COLUMN S	Vater-stained eaves (B9) Orainage Pate Dividized Rhidiving Roots Presence of Item (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)X  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or 0 ron Deposits	Present (Y/N):  Present (Y/N):  Ce at lad'  EY PRIMARY INDICA  er (A1)  Fable (A2)  (B1)  posits (B2)  Crust (B4)	TORS (a Su Inu (B) Sp Co Ma Hy Od Dn Wa	any one indicator is surface Soil Cracks (Be undation/Visible on A 7) arsely Vegetated incave Surface (B8) arl Deposits (B15) drogen Sulfide lor (C1) y-Season ater Table (C2)	ufficient)  S) erial Image	SS COLUMN S	Vater-stained eaves (B9) Orainage Pate Dividized Rhidiving Roots Presence of Item (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)X  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or (I	eyer (if present): Type  Present (Y/N):  Ce at 6  Y PRIMARY INDICA  er (A1)  Table (A2)  (B1)  posits (B2)  Crust (B4)  G (B5)	TORS (a Su Inu (B) Sp Co Ma Hy Od Dn Wa Ott	any one indicator is s  rface Soil Cracks (Boundation Visible on A  7)  arsely Vegetated incave Surface (B8)  arl Deposits (B15)  drogen Sulfide for (C1)  y-Season ater Table (C2)  her (Explain in Notes	ufficient)  S) erial Image	SS VL	Vater-stained eaves (B9) Orainage Pate Oxidized Rhinitiving Roots Oresence of Iron (C4) Galt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)X  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) → Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Usuarf shrub (<0.5m) Tall herb (≥1m) Short herb (<1m) 120 Moss-Lichen 100 Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25%">25%</a> Scattered/Peripheral Cover <a href="25%">26-75%</a> Scattered or Peripheral Cover <a href="25%">N/A</a>
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few 😾 Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover_ 🖳
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennia
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed <a href="Sediment Observed">Sediment Observed on Wetland Substrate</a> Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 y
Degree of Outlet Restriction (P): No Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) PH Reading 5.12
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Connected Upstream & Downstream Unknown
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below_K
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below K Only Connected Above Connected Upstream & Downstream Unknown
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown  Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)

GPS Technician QA/QC check:

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W60 HT 037 Field Target: 107 Date: 4/26/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>☑ Vegetation names are entered legibly for all strata present?</li> <li>☑ Cover calculations are complete and correct?</li> <li>☑ All dominant species have been determined and recorded per strata?</li> <li>☑ Indicator status is correct for each species?</li> <li>☑ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION		-		
Survey Type: Centerline X Acces	ss Road (explain) Other	(explain)	Field Target: 092	Map #: <u>64</u> Map Date: <u>5/27/</u> /4
Date: 06 - 27 - 14	Project Name & No.: Alaska	a LNG 26221306	Feature Id:	W60HT028
Investigators: Joe Christo p	her, Zoe Meade			Team No.: W60
State: Alaska	Region: Alaska	Milepost:	166.9	
Latitude: 62° 55' 45.2	ξ'/ Long	gitude: 1490	41 48.590	Datum: WGS84
Logbook No.: 00 3	Logbook Page No.: 15	Picture No.:		plug
SITE PARAMETERS		•		
Subregion: interior		Landform (hil	Islope, terrace, hummocks	s, etc.): [[:] [ < ; &
Slope (%): 7-5 do			concave, convex, none):	Conver
Pre-mapped Alaska LNG/NWI classifica	ition: Upland -	Soil Map Unit	: Name: 14	
Are climatic/hydrologic conditions on the YesX No(if no expl		? Are "No Yes	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	drology Significantly Distu	rbed? No X	(If yes, explain in Notes)	
Are Vegetation, Soil, or Hyd	drology_XNaturally Problem	atic? No	_ (If yes, explain in Notes	) of see pules
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes_	No	Is the Sampled A	Area within a Wetland?	Yes NoX
Hydric Soil Present? Yes	NoX	Wetland Type:	Upland	
Wetland Hydrology Present? Yes_ ト くん ルルル	No_X	Alaska Vegetation	Classification (Viereck):	IC2
Notes and Site Sketch: Please include D	Directional & North Arrow, Cente	rline, Length of featu	re, Distances from Center	line, Photo Locations, and Survey
Su Pg.	15			
* neavy rains n Flood WArnin	vith biased hy	Jarology 1,	ndicatoro	

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Betvia neoalaskana	4	1	FACU	Total Number of Dominant Species Across All Strata: 6
2. Picea glauca	15	X	FACU	% Dominant Species that are OBL, FACW, or FAC: <u>50</u>
3.				
4.				Prevalence Index worksheet:
Total Cover: 50% of total cover:		)% of total cov	rer: <u>3, 8</u>	Total % Cover of: Multiply by:  OBL species:X 1 =
Sapling/Shrub Stratum ( 26 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = FAC species S X 3 = 159 FACU species 7 X 4 = 284
1. Vibur num edule	3		FACU	UPL species X 5 = *
2. Sorbus scopulina	T		FACU	Column Totals: 124 (A) 443 (B)
3. Alnus SSP.	5	X -	FAC	PI=B/A= 3,57
4. Vaccinium uliginosum	3		FAC	
5. Saléx barclayii	5	X	FAC	
6. picea glauca	1		FACU	
7.				141
8.		Discourse of the second		
9.			-	
Total Cover: 50% of total cover:			er: <u>3.4</u>	
VEGETATION (use scientific names of plants	)		· · ·	
Herb Stratum(26/	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
1. Geranium erithrium	2		FACU	Prevalence Index is ≤ 3.0
2. Chamerion angustofolium	3		FALU	Morphological Adaptations¹ (Provide supporting data

Herb Stratum ( 26° )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Geranium erithrium	2		FACU	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Chamerion angustofolium	3		FALU	Notes)
3. Gymnocarpium dryapteris	40	4	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Calamagrostis canodensis	35	X	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Veratrum viride	T		FAC	disturbed or problematic.
6. Equisetum arvense	1		FAC	
7. Rubus pedatus	3		FAC	% Bare Ground
8. Streptopus amplexifoliw	1 =		FAC	% Cover of Wetland Bryophytes
9. Dryopteris expansa	T		FACU	Total Cover of Bryophytes
10. Cornus canadensis	3		FACU	% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover:_ 50% of total cover:_		% of total cov	er. 17. 6	Notes: (If observed, list morphological adaptations below):

			Date 062714 Feature ID					Soll Pit Required (Y/N)_
OIL PROF	-	Describe	to the depth needed to docu	ment the	indicator or o	onfirm the abser	nce of ind	icators.)
Depth	Matrix	-	Redox Features		-			
(inches)	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Note	S
0-1						Fibric		ganics; dry
1-3								ye rock
3-17	10 YR 4/3	10				_		andy loam coarse
		90				gravel + co	parse	sand
		4		-				
Tuno: C=C	oncontration D=Donk	otion DA	//////////////////////////////////////	ad as Ca	atad Sand C	roine <sup>2</sup> l costio	ni DI -Di	ora Linina BA-BAstriy
	IL INDICATORS	etion, Riv	/I=Reduced Iviatrix, C5=Cover	ea or Co	ated Sand G			ore Lining, M=Matrix. ROBLEMATIC HYDRIC SOIL
			Alaska Claused (A12)		100			
	des (A3)		Alaska Gleyed (A13)					(TA4) <sup>4</sup>
	don (A2)		Alaska Redox (A14)			-		(TA5)
	(A3)		Alaska Gleyed Pores (A	(15)	_			Y Hue 5Y Hue or Redder Underlyin
Hydrogen Sı	ulfide (A4)		44			Layer_		. 31 Tide of Nedder Onderlyin
	Surface (A12)					Other (Explai		
One indicat	or of hydrophytic vege problematic.	etation, o	ne primary indicator of wetlan	d hydrolo	gy, and an a	ppropriate lands	cape posi	tion must be present unless
Chie detalle	of salar shaars in Na	Gar.		5				
mito antonio	or color change in No	otes.						
Restrictive L	ayer (if present): Typ	e:	Depth (inc	ches):	NIV	_		
Restrictive L	ayer (if present): Typ	e:		ches):	N/N	-		
Restrictive L	ayer (if present): Typ Present (Y/N):	e: N		- 0				
Restrictive L	ayer (if present): Typ Present (Y/N):	e: N		- 0			· dau	c
Restrictive L	ayer (if present): Typ Present (Y/N):	e: N ed	due to heavy r	- 0			' day	s
Restrictive L	ayer (if present): Typ Present (Y/N):	e: N ed		- 0			, day	s
Restrictive L Hydric Soil Notes:	ayer (if present): Typ  Present (Y/N):  Dils satvrat  — 17/0 0 & 4	e:N ed JArni	due to heavy r	ains	OV EV	past few		
Restrictive L Hydric Soil Notes:	Present (Y/N):  Dils satvrat  Flost 4  PRIMARY INDICA	e: N PARM TORS (a	due to heavy r	ains	OV EV	past few	(2 or more	
Hydric Soil Notes:	ayer (if present): Typ  Present (Y/N):  Dils satvrat  — 17/0 0 & 4	ed  JANN  TORS (a	due to heavy r  nss poskd  any one indicator is sufficient)  rface Soil Cracks (B6)	ains	OV EV	past few	(2 or more	e required)
Restrictive L Hydric Soil Notes: So	Present (Y/N):  Dils satvrat  Flost 4  PRIMARY INDICA	PARMITORS (a	any one indicator is sufficient)  rface Soil Cracks (B6)  Indation Visible on Aerial Image	ains	OV EV  BECONDARY  Vater-stained eaves (B9) _	past few	(2 or more	e required) Stunted or Stressed
Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat	ayer (if present): Typ  Present (Y/N):  Dils satvrat  - 17/0 dd 4  BY PRIMARY INDICA  er (A1)  Table (A2)X	PARMINITORS (a Su Inu	due to heavy r  nss Poskd  any one indicator is sufficient)  rface Soil Cracks (B6)  Indation Visible on Aerial Image  7)	ains  S  L  Jery C	OV €V  BECONDARY  Vater-stained eaves (B9)  Drainage Patt	past few rindicators (	(2 or more	e required) Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat High Water	ayer (if present): Typ  Present (Y/N):  Dils satvrat  - 17/0 dd 4  BY PRIMARY INDICA  er (A1)  Table (A2)X	PARW  TORS (a  Su  Inu  (B7	any one indicator is sufficient)  rface Soil Cracks (B6)  Indation Visible on Aerial Image	ains	OV €V  SECONDARY  Vater-stained eaves (B9)  Drainage Patt	r INDICATORS (I Lerns (B10)	(2 or more	e required) Stunted or Stressed Plants (D1)
Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat High Water T	Present (Y/N):  Present (Y/N):	PAY NO Su Inu (B7 Sp. Co	any one indicator is sufficient)  rface Soil Cracks (B6)  Indation Visible on Aerial Image  7)  arsely Vegetated  ncave Surface (B8)	ains  V L Jery C L	SECONDARY Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots (	r INDICATORS (I Lerns (B10)	(2 or more	e required) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic
Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat High Water Saturation (A	ayer (if present): Typ  Present (Y/N):  DITS SATV FAT  Table (A2)  A3)X  G (B1)	PARMITORS (& Sulland (B7 Co Ma	any one indicator is sufficient)  rface Soil Cracks (B6)  Indation Visible on Aerial Image  range Surface (B8)  rl Deposits (B15)	ains  V L Jery C L	SECONDARY Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots (	r INDICATORS (I Lerns (B10)	(2 or more	e required) Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
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Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat High Water T Saturation (A	Present (Y/N):  Present (A1)  Present (A1)  Present (B1)  Present (B2)	TORS (a Sullander Sp. Co Ma Hy Od Dry	any one indicator is sufficient)  face Soil Cracks (B6)  indation Visible on Aerial Image  7)  arsely Vegetated ncave Surface (B8)  irl Deposits (B15)  drogen Sulfide or (C1)  7-Season	ains  V L Jery C L F II	Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4)	r INDICATORS (I Lerns (B10) cospheres along C3) Reduced (C5)	(2 or more	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat High Water T Saturation (A	ayer (if present): Typ  Present (Y/N):  DITS SATV FAT  Table (A2)  A3)X  G (B1)	TORS (a Sullander Sp. Co Ma Hy Od Dry	any one indicator is sufficient)  rface Soil Cracks (B6)  andation Visible on Aerial Image  racely Vegetated ncave Surface (B8)  rI Deposits (B15)  drogen Sulfide or (C1)	ains  V L Jery C L F II	SECONDARY Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4)	r INDICATORS (I Lerns (B10) cospheres along C3) Reduced (C5)	(2 or more	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
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Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wat High Water T Saturation (A Water Marks Sediment De Drift Deposit	Present (Y/N):  Present (A1)  Present (B1)  Present (B1)  Present (B2)  Present (B3)  Present (B3)	TORS (a Sulface Sulfac	any one indicator is sufficient)  face Soil Cracks (B6)  Indation Visible on Aerial Image  arsely Vegetated Incave Surface (B8)  In Deposits (B15)  Indrogen Sulfide Incorrection of (C1)  Incorrection of the control o	ains  V L Jery C L F II	SECONDARY Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4)	r INDICATORS (I Lerns (B10) cospheres along C3) Reduced (C5)	(2 or more	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
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Restrictive L Hydric Soil Notes: So HYDROLOG Surface Wate High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	Present (Y/N):  Present (A1)  Present (A1)  Present (A2)  Present (A1)  Present (A2)  Present (B1)  Present (B2)  Present (B3)  Crust (B4)	PAY IN INUITION (B7 Co Ma Hyy Od Dry Wa	any one indicator is sufficient)  face Soil Cracks (B6)  Indation Visible on Aerial Image  arsely Vegetated ncave Surface (B8)  If Deposits (B15)  drogen Sulfide or (C1)  /-Season ater Table (C2)  ner (Explain in Notes):	ains  V L Jery C L F III	OV EV  SECONDARY  Vater-stained eaves (B9) _  Orainage Patt  Oxidized Rhiz Living Roots ( Presence of Fron (C4)  Salt Deposits  Notes:	rindicators (I cospheres along C3) Reduced (C5)	(2 or more	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
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VEGETATION VARIABLES P= Plot, I	M= Matrix
Forested-Evergreen-Needle-leaved	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Moss-Lichen Floating Submerged
	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and interspers	patches, concentric rings) Moderate (broken irregular rings)ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depréssional Riverine Estaurine Fringe
COIL WADIADI FO	
Soil Factors (P): Soil Lacking	History Fibris (Bathapilana)
Mineral Consults	
Mineral: Gravelly Mineral: Sandy_	Mineral: Silty Mineral: Clayey
	Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
HYDROLOGIC VARIABLES Inlet/Outlet Class (P): No Inlet/Outlet_	
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet Outlet	
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet_Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Created	
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HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/OutletOutlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absenter Frequency of Overbank Flooding (P): No Oreturn Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water C	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No
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Inlet/Outlet Class (P): No Inlet/OutletOutlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Oketurn Interval >5 yrs	No Inlet/Intermittent Outlet
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Crew Chief QA/QC check:

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#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W60HT028 Field Target: 100 092 Date: 06-27-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>Vegetation names are entered legibly for all strata present?</li> <li>Cover calculations are complete and correct?</li> <li>All dominant species have been determined and recorded per strata?</li> <li>Indicator status is correct for each species?</li> <li>Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>☑ Wetland boundaries have been corrected if necessary?</li><li>☑ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

Field Crew Chief (print)

Signature / Date

hostple

SITE DESCRIPTION					
Survey Type: Centerline X Acce	ss Road (explain)	Other (exp	lain)	Field Target: 093	Map #: <u>65</u> Map Date: <u>5 67</u>
Date: 06-27-14	Project Name & No.:	Alaska LN	G 26221306	Feature Id	:W60HT029
Investigators: Joe Christo	pher, Zoe M	eade			Team No.: W60
State: Alaska	Region: Alaska		Milepost: 164		
Latitude: 62°53′53.95″		Longitude	e: 149° 44	1 19.45"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	16	Picture No.:	PUS.P	10
SITE PARAMETERS	-	- 1-5	to the second		
Subregion: interior			Landform (hill	slope, terrace, hummock	s, etc.): terrace
Slope (%): Plat 0-3 mash	× 20-309	1/0		oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica			Soil Map Unit	/	(4)
Are climatic/hydrologic conditions on the Yes_X_ No (if no expl	site typical for this time ain in Notes)	of year?	Are "No Yes	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	lrology Significant	ly Disturbed	? No_X	_(If yes, explain in Notes	
Are Vegetation, Soil, or Hyd	lrology Naturally F	Problematic?	No_X	_ (If yes, explain in Notes	.)
SUMMARY OF FINDINGS	2	Me		15	
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a Wetland?	Yes NoX
Hydric Soil Present? Yes_	NoX	w	etland Type:	upland	in the Ash
Wetland Hydrology Present? Yes_	NoX	— АІ	aska Vegetation	Classification (Viereck):	IC2, II C1
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow	, Centerline,	Length of featur	re, Distances from Center	line, Photo Locations, and Survey
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Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
1. Picea Clauca	7	X	DACU	% Dominant Species that are OBL, FACW, or FAC:
2. Betvia neoalaskana	3	X.	FACU	50
3.5		194		
4.				Prevalence Index worksheet:
	15-10		2	Total % Cover of: Multiply by:
50% of total cover	7.5 520	% of total cov	er: 3.0	OBL species: X 1 =
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 8
1. Saléx pulchra	5	X	FACW	LIPI species X 5 =
2.				Column Totals: 127 (A) 400 (B)
3.				PI = B/A = 3,/4
4.	1			
5.				
6.				
J.				
7,	1-	1		
	j-			
7. 8. 9.	JE B			
7. 8. 9. Total Cover				
7. 8. 9.		0% of total cov	rer:	
7. 8. 9. Total Cover	:2. 5 20	0% of total cov	ver:	
7. 8. 9. Total Cover 50% of total cover	:2. 5 20	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
7.  8.  9.  Total Cover. 50% of total cover.  VEGETATION (use scientific names of plants	Absolute % Cover	Dominant Species?	Indicator	Dominance Test is > 50%Prevalence Index is ≤ 3.0
7.  8.  9.  Total Cover. 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%
7.  8.  9.  Total Cover. 50% of total cover.  VEGETATION (use scientific names of plants  Herb Stratum ( 7 6 )  1. Calamagrostis Canadensis	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
7.  8.  9.  Total Cover. 50% of total cover.  VEGETATION (use scientific names of plants.  Herb Stratum ( 76 )  1. Calamagrostis Canadensis.  2. Vira trum virid e.  3. Chamerion angustofolivm.	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status FAC FAC	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes)
7.  8.  9.  Total Cover. 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 76 )  1. Calamagrostis Canadensis  2. Viratrum viride  3. Chamerion angustofoliva  4. Equisetum sylvaticum	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FAC FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
7.  8.  9.  Total Cover. 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 76 )  1. Calamagrostis Canadensis 2. Viratrum viride 3. Chamerion angustofolivm 4. Equisetum sylvaticum 5. Equisetum Arvense	Absolute % Cover 8 0 1 5 18	Dominant Species? (Y/N)	Indicator Status  FAC FAC FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
7. 8. 9. Total Cover. 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 76 )  1. Calamagrostis Canadensis 2. Viratrum viride 3. Chamerion angustofoliva 4. Equisetum sylvaticum 5. Equisetum Arvense 6. Mertensia paniculata	Absolute % Cover 80 15 18 10	Dominant Species? (Y/N)	Indicator Status  FAC FAC FAC FAC FAC	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles
7.  8.  9.  Total Cover. 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 76 )  1. Calamagrostis Canadensis 2. Viratrum viride 3. Chamerion angustofolivm 4. Equisetum sylvaticum 5. Equisetum Arvense 6. Mertensia paniculata 7. Sanguisorba Canadensis	Absolute % Cover 80 15 18 10	Dominant Species? (Y/N)	Indicator Status  FAC FAC FAC FAC FAC FAC FAC FAC FAC FA	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
7.  8.  9.  Total Cover. 50% of total cover. 50% of total cover.  VEGETATION (use scientific names of plants. Herb Stratum ( 76 )  1. Calamagrostis Canadensis. 2. Viratrum viride. 3. Chamerion angustofoliva. 4. Equisetum sylvaticum. 5. Equisetum Arvense. 6. Mertensia paniculata. 7. Sanguisorba Canadensis. 8. Viola palustkis.	Absolute % Cover 80 15 18 10 1 2 1	Dominant Species? (Y/N)	Indicator Status  FAC FAC FACU FAC FACU FACU FACU FACW FACW	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic. % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes
7.  8.  9.  Total Cover. 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 76 )  1. Calamagrostis Canadensis 2. Viratrum viride 3. Chamerion angustofolivm 4. Equisetum sylvaticum 5. Equisetum Arvense 6. Mertensia paniculata 7. Sanguisorba Canadensis	Absolute % Cover 80 15 18 10 1 2 1	Dominant Species? (Y/N)	Indicator Status  FAC FAC FAC FAC FAC FAC FAC FAC FAC FA	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic. % Bare Ground% Cover of Wetland Bryophytes

SOIL			06 27 14 Date 961/ Fe	ature I	D W 60	HT029		Soil Pit Required (Y/N)
SOIL PROF	ILE DESCRIPTION: (I						onfirm the absen	
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-5		**					Fibric	
5-9	10 YR 4/3	98					Silt 10am	
		2						
9-14	10 YR 4/4	70		( ) = )			Sandy silt	Sm. gravels
		30						medium gravels
0								0
1- 00							14	
	oncentration, D=Deple	tion, RIV	1=Reduced Matrix, C	S=Cov	ered or Co	ated Sand Gr		: PL=Pore Lining, M=Matrix.
	IL INDICATORS		Tal. I. Ol. II	(1.40)				FOR PROBLEMATIC HYDRIC SOILS
	listel (A1)		Alaska Gleyed					Change (TA4) <sup>4</sup>
	don (A2)		Alaska Redox (					Swales (TA5)
	(A3)		Alaska Gleyed	Pores	(A15)			with 2.5Y Hue
Hydrogen Si	ulfide (A4)						Layer_	l without 5Y Hue or Redder Underlying
	Surface (A12)	_					Other (Explain	in Notes)
One indicat	or of hydrophytic vege problematic.	tation, o	ne primary indicator o	f wetla	ınd hydrolo	ogy, and an a	ppropriate landsc	ape position must be present unless
Notes: No	hydric soils	5 005-0	evved					
HYDROLOG	Y PRIMARY INDICAT	rors (a	ny one indicator is su	fficient	) 5	SECONDARY	INDICATORS (2	or more required)
Surface Wat	er (A1)		face Soil Cracks (B6)		L	Vater-stained ₋eaves (B9) _		Stunted or Stressed Plants (D1)
High Water ⊺	Table (A2)	Inur (B7)	ndation Visible on Aei )	rial Ima	agery [	Drainage Patte	erns (B10)	Geomorphic Position (D2)
Saturation (A	A3)		rsely Vegetated cave Surface (B8)			Oxidized Rhize Living Roots (G	ospheres along C3)	Shallow Aquitard (D3)
Vater Marks	(B1)	Mar	l Deposits (B15)		- F	Presence of Roron (C4)	educed	Microtopographic Relief (D4)
Sediment De	posits (B2)	Hyd Odd	rogen Sulfide or (C1)			Salt Deposits (		FAC-Neutral Test (D5)
Prift Deposits	s (B3)	Dry-	-Season er Table (C2)		N	lotes:		
Algal Mat or	Crust (B4)	Oth	er (Explain in Notes):					
ron Deposits	s (B5)							<u> </u>
Surface Wate	er Present (Y/N):		Depth (in):					
	Present (Y/N):		Depth (in):		We	tland Hydrole	ogy Present (Y/N	n:
	resent (Y/N):		Depth (in):					
Notes:	100 Hildre	1051	OSSIVE					

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P):         Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemlc Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Pere
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inl
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Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent
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Outlet
Outlet Intermittent Inlet/Intermittent Outlet

Crew Chief QA/QC check:

GPS Technician QA/QC check:

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: 640 HT 029 Field Target: 13 Date: 4/27/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?
	Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X Zoc meade

Signature Date

Field (print)

Signature / Date

Christophe

SITE DESCRIPTION			300	ft study	
Survey Type: Centerline Acces	ss Road (explain)	Other (exp		Field Target: <u>694</u>	Map #:Map Date: 5/27/14
Date: 06 - 27 - 14	Project Name & No.:	Alaska LN	G 26221306	Feature Id	: W60HT030
Investigators: Joe Christophi	er, Zoe Med	ide			Team No.: YV 6 0
State: Alaska	Region: Alaska		Milepost:	161	
Latitude: 62°52' 43.05"		Longitude	e: 149° 49	1'32.25"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	017	Picture No.:	P_N,S, gro	und
SITE PARAMETERS			-		
Subregion: interior			Landform (hill	slope, terrace, hummock	s, etc.):
Slope (%): PSS 1 Be mill	0-2%	)	Local relief (c	oncave, convex, none):	Concave
Pre-mapped Alaska LNG/NWI classifica	tion:		Soil Map Unit		
Are climatic/hydrologic conditions on the YesXNo(if no expl	e site typical for this time ain in Notes)	e of year?	Are "No Yes_>	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed	? No_ <i>X</i> _	_(If yes, explain in Notes	)
Are Vegetation, Soil, or Hyd	drology Naturally	Problematic?	No_ <i>X</i>	_ (If yes, explain in Notes	<b>3.</b> )
SUMMARY OF FINDINGS					
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a Wetland?	YesX No
Hydric Soil Present? Yes	X No	w	etland Type:	PSSI/EM1B	
Wetland Hydrology Present? Yes_	X No	A	aska Vegetation	Classification (Viereck):	IC2, II A3
Notes and Site Sketch: Please include D corridor.	Directional & North Arrov	v, Centerline,	Length of featur	re, Distances from Cente	rline, Photo Locations, and Survey
Since Since M	DAS U DAVKS	1	The Remier (1911)	Bira M	ch/spruce Aldr

VEGETATION (use scientific names of plants	s)			
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1,			F 6.	Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC:
3.				
4.				Prevalence Index worksheet:
Total Cover	. 0			Total % Cover of: Multiply by:
50% of total cover	r: <u> </u>	0% of total cov	rer:_0	OBL species:X 1 =X
Sapling/Shrub Stratum ( Z6')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 25 X 2 = 50  FAC species X 3 = 7
1. Spirea Abaglasii	10	100	FACW	FACU species X 4 =
2. Salax (2)	10	*	FAC	UPL species X 5 =
3. Salex fuscescens	15		FACW	Column Totals: 73 (A) 104 (B) PI = B/A = 1, 42
4.	1			11-5//(-
5.				Danalacia
6.				Penlssis Inclusion
7.				Survounding matery is
8.				7 / / / /
9.				more of pemile, standing
Total Cover		0% of total cov	ver: <u>5</u>	4004"
VEGETATION (use scientific names of plant	s)			
Herb Stratum(26 ′)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Carex aquatilis	15	X	OBL	Prevalence Index is ≤ 3.0
2. Comarum palustre	7.5	X	OBL	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Calamagrostis canadensis	+ 3		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Equisetum fluviatile	5		OBL	Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.
6.	1			
7.			-	% Bare Ground
8.	- 1-			% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				<u>3 O</u> _ % Cover of Water
, 22 	94			Hydrophytic Vegetation Present (Y/N):
Total Cove 50% of total cove		0% of total cov	ver: <u>5,6</u>	Notes: (If observed, list morphological adaptations below):

SOIL			Date 06 27 14 Feat					Soli Pit Required (Y/N)
SOIL PROFI	LE DESCRIPTION: (	Describe	to the depth needed to	o docum	ent the	indicator or	confirm the absence	e of indicators.)
Depth	Matrix		Redox Features					+
(inches)	Color (moist)	%	Color (moist)	% Т	ype <sup>1</sup>	Loc²	Texture	Notes
				1	1			
	1	-	A	1/	4			
			111	1/-	1	-		
			10	11				
			7					
O O			D 1 11111 00				20	
	IL INDICATORS	etion, KM:	=Reduced Matrix, CS	=Covere	or Co	ated Sand G		PL=Pore Lining, M=Matrix. FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	istel (A1)		Alaska Gleyed (A	413)				hange (TA4) <sup>4</sup>
	lon (A2)		Alaska Redox (A					Swales (TA5)
	(A3)		Alaska Gleyed P					vith 2.5Y Hue
	ılfide (A4)			·				without 5Y Hue or Redder Underlying
hick Dark S	urface (A12)						Other (Explain i	in Notes)
One indicato	or of hydrophytic vege	etation, on	e primary indicator of	wetland	hydrolo	gy, and an	appropriate landscap	pe position must be present unless
listurbed or p Give details	of color change in No	otes.						
Restrictive La	ayer (if present): Typ	e:	De	pth (inch	es):			
	Present (Y/N):	У						
			due to Vec					
	- Church	2,24	Show! to	4 -7	NO	mul	ery IIIsto:	EU 10 16" (Bbb \$0,
HYDROLOG	Y PRIMARY INDICA	TORS (an	y one indicator is suff	ficient)	S	ECONDAR	Y INDICATORS (2	or more required)
Surface Wate	er (A1)X	Surfa	ace Soil Cracks (B6)			Vater-staine eaves (B9)	d 	Stunted or Stressed Plants (D1)
ligh Water T	able (A2) X	Inun (B7)	dation Visible on Aeri	al Image	ry C	rainage Pat	tterns (B10)	_ Geomorphic Position (D2)
Saturation (A	3)X	Spar Cond	sely Vegetated cave Surface (B8)		L	Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
Vater Marks	(B1)	Marl	Deposits (B15)			resence of lon (C4)		Microtopographic Relief (D4)X
ediment De	posits (B2)		rogen Sulfide r (C1)		S	alt Deposits	i (C5)	FAC-Neutral Test (D5)
Orift Deposits	s (B3)		Season er Table (C2)	_	N	lotes:	1 0 1/ 0	
Algal Mat or (	Crust (B4)	Othe	er (Explain in Notes):			>t4	nding Ital	of perimeter alpens
ron Deposits	(B5)					4 N	Suromo	ing perimeter alpen
Surface Wate	er Present (Y/N):		Depth (in):		1	11		V
Vater Table I	Present (Y/N):	[	Depth (in):		Wet	land Hydro	ology Present (Y/N)	:
Saturation Proincludes cap		. [	Depth (in):					
Notes:		Itro	In perim	reter				

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Broad-leaved Broad-leaved Broad-leaved Broad-leaved
Percent Cover (P): Tree (>5 dbh, >6m tall)       ○       Sapling (<5 dbh, <6m tall)       ○       Tall shrub (2-6m)       ○       Short shrub (0.5-2m)       ○         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species)X High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings)  Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
ACH VARIABLES
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sapric Histosol:
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Peren
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Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W40 HT 030 Field Target: 94 Date: 6/27/19
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	☐ Vegetation names are entered legibly for all strata present? ☐ Cover calculations are complete and correct? ☐ All dominant species have been determined and recorded per strata? ☐ Indicator status is correct for each species? ☐ Dominance Test and Prevalence Index have been completed?
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	☐ Appropriate hydrology indicators are marked? ☐ Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	☐ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	☐ Wetland boundaries have been corrected if necessary? ☐ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)? NO SOIL pit/plug dw to Standing work.
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade Wetland Scientist (print)

Signature / Date

SITE DESCRIPTION					
Survey Type: Centerline X Acces	s Road (explain)	Other (expl	ain)	Field Target: 095	Map #: <u>67</u> Map Date: <u>5/27</u> //
Date: 06 - 28 -14	Project Name & No.:	Alaska LNC	26221306	Feature Id	W60HT031
Investigators: Joe Christo	pher, Zoe 1	Meade			Team No.: W60
State: Alaska	Region: Alaska		Milepost:	160	
Latitude: 62 52 04, 83"		Longitude	: 1490	51'06.27"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	019	Picture No.:	P-E, W. gro	und
SITE PARAMETERS		-			
Subregion: Înteriar			Landform (hi	llslope, terrace, hummock	s, etc.): flood plain
Slope (%): 0-140 (2040)	or Land (			concave, convex, none):	
Pre-mapped Alaska LNG/NWI classificat			Soil Map Uni		The state of the s
Are climatic/hydrologic conditions on the YesX No (if no expla	site typical for this time	of year?		ormal Circumstances" pre	sent:
Are Vegetation, Soil, or Hydi		ly Disturbed?	Yes_X	No (If no, exp (If yes, explain in Notes)	
Are Vegetation, Soil, or Hydi			No X	(If yes, explain in Notes	
SUMMARY OF FINDINGS	reactions 1	Toblematics	140	(ii yes, explain iii Notes	
Hydrophytic Vegetation Present? Yes		Is	the Sampled A	Area within a Wetland?	Yes NoX
Hydric Soil Present? Yes	No ×	_ w	etland Type:	upland	
Wetland Hydrology Present? Yes	No 🟃	— Ala	aska Vegetation	n Classification (Viereck):	IВ1, П с2
Notes and Site Sketch: Please include Di corridor.	rectional & North Arrow	, Centerline,	Length of featu	re, Distances from Center	line, Photo Locations, and Survey
S S	ei pa	3 (	A 23	N-	

VEGETATION (use scientific names of plants	3)		F -	A THE PARTY OF THE
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 2 4 )	% Cover	Species?	Status	No. of Dominant Species that are OBL, FACW, or FAC: (A)
1. Populus baisamifera	40	X	FACU	Total Number of Dominant Species Across All Strata: (B) % Dominant Species that are OBL, FACW, or FAC: (A/B)
2.				(*5)
3.				
4.				Prevalence Index worksheet:
Total Cover			0/	Total % Cover of: Multiply by:
50% of total cover	: <u>) 0</u> 20	% of total cov	/er: <u>8</u>	OBL species:X 1 =
Sapling/Shrub Stratum ( 261 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = FAC species
1. Salex Alevensis	25	*	FAC	LIPI species X 5 =
2. Picea alauca	TR		FACE	Column Totals: 120 (A) 432 (B)
2. Picea glauca 3. CAlil Karcharii	25	X	KAC	PI = B/A = 3.60
4. Schil			,	
5.				
6.				
7-				
8.				
9.	<u></u>			
Total Cover 50% of total cover		)% of total cov	ver: <u>////</u>	
VEGETATION (use scientific names of plants	3)			
Herb Stratum ( 2 6 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1-Eausetum Arvense	20	X	FAL	Prevalence Index is ≤ 3.0  Marchalogical Adoptations 1/Provide currenting data in
2. 2/a/a/Co				Morphological Adaptations¹ (Provide supporting data in Notes)
3. Chamaerion angustofolis	m 3.		Mch	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Arythrium cyclosorum	2:		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Geranium erianthum	3.		FACU	disturbed or problematic.
6. Pyrola aserifolia	25	X	FACU	
7. Streptopus ampiexifoli	5 1 -		FACU	% Bare Ground
8. Gallium Tri Storom	1	<u> </u>	FAC	% Cover of Wetland Bryophytes
9. Heracleum Maximom	TR		Yacu	Total Cover of Bryophytes % Cover of Water
10. Lupinius Archicus	TR		FALL	Hydrophytic Vegetation Present (Y/N):
Total Cover	45 5	5		Notes: (If observed, list morphological adaptations below):
50% of total cover		0% of total co	ver: 9.0	, , , , , , , , , , , , , , , , , , ,
JV	27,5		//	y *

SOL PROFILE DESCRIPTION: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)  Appeth Matrix Redox Features Color (moist) % Color (moist) % Type Loc Texture Notes  Color (moist) % Color (moist) % Type Loc Texture Notes  Type: C-Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, Pype: CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix, PS=Covered or Coa	SOIL PROFIL			Date 26-28-14 Feature ID NA	OHTOSI		Soil Pit Required (Y/N)
Inches)  Color (moist)  % Color (moist)  % Type¹ Loc² Texture Notes  Color (moist)  % Type² Loc² Texture Notes		E DESCRIPTION: (D				confirm the absence	
Type: C-Concentration, D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  **PORIG SOIL INDICATORS**  **INDICATORS FOR PROBLEMATIC HYDRIC SOILS**  **Istosal or Histel (A1)  **Istosal or Histel (A1)  **Istosal or Histel (A1)  **Istosal or Histel (A2)  **Istosal or Histel (A3)  **Istosal or Histel (A4)  **Istosal Alpino Swales (TA4)  **Istosal Alpino Hybrosal Alpino Swales (TA4)  **Istosal Alpi	Depth	Matrix		Redox Features			
Type: C=Concentration. D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *\frac{1}{2}\text{Location: PL=Pore Lining, M=Matrix, PYDRIC SOIL INDICATORS}    INDICATORS   INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS*   Islack Histic (A1)	(inches)	Color (moist)	%	Color (moist) % Type	Loc <sup>2</sup>	Texture	Notes
Type: C-Concentration, D-Depletion, RM-Reduced Matrix, CS-Covered or Coated Sand Grains. *Location: PL-Pore Lining, M-Matrix.  PORIC SOIL INDICATORS  INDICATORS  INDICATORS FOR PROBLEMATIC HYDRIC SOILS*  Istosci or Histel (A1)  Alaska Gleyed (A13)  Alaska Color Change (TA4)*  Istosci Color Histel (A2)  Istosci Color Histel (A3)  Alaska Redox (A14)  Alaska Redox (A14)  Alaska Redox with 2.5 Hue  Indicator of Hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Indicator of problematic.  Indicator	0.5"					Eishi7	DIEST DIES AINT DIE!
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SOILS*  ISLED A Laska Gleyed (A13) Alaska Color Change (TA4)*  Islack Histic Epipedon (A2) Alaska Alpine Swales (TA5).  Islack Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue or Redder Underlying Layer  Islack Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue or Redder Underlying Layer  Islack Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue or Redder Underlying Layer  Islack Gleyed Without SY Hue Or Redder Underlying Layer  Islack Gleyed Without SY Hue Or Redder Underlying Layer  Islack Gleyed Without SY Hue Or Re						Finite	Carpore Inte
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SOILS*  ISLED A Laska Gleyed (A13) Alaska Color Change (TA4)*  Islack Histic Epipedon (A2) Alaska Alpine Swales (TA5).  Islack Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue or Redder Underlying Layer  Islack Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue or Redder Underlying Layer  Islack Histic (A3) Alaska Gleyed Pores (A15) Alaska Gleyed Without SY Hue or Redder Underlying Layer  Islack Gleyed Without SY Hue Or Redder Underlying Layer  Islack Gleyed Without SY Hue Or Redder Underlying Layer  Islack Gleyed Without SY Hue Or Re	15+	84 Su 51					ROLK 1105 He House
INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Isitosol or Histel (A1)		1-1-1					1000
INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Isitosol or Histel (A1)							
INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Isitosol or Histel (A1)						4	
INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Isitosol or Histel (A1)		-					
Alaska Gleyed (A13) Alaska Color Change (TA4)*  Alaska Gleyed (A13) Alaska Alpine Swales (TA5)  Alaska Redox (A14) Alaska Alpine Swales (TA5)  Alaska Alpine Swales (TA5)  Alaska Gleyed Pores (A15) Alaska Alpine Swales (TA5)  Alaska Gleyed Without SY Hue or Redder Underlying Layer  Alaska Gleyed Without SY Hue or Redder Underlying Layer  Alaska Gleyed Without SY Hue or Redder Underlying Layer  Other (Explain in Notes)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isolated or problematic.  Provided End So object change in Notes  Provided End So object change in Notes  Depth (inches):  Provided Soil Present (Y/N):  Depth (inches):  Provided Soil Present (Y/N):  Depth (inches):  Provided Soil Cracks (B6)  Depth (inches):  Provided Soil Cracks (B6)  Depth (Inches):  Provided Soil Cracks (B6)  Divided Soil Cracks (B6)  Di			tion, RM	=Reduced Matrix, CS=Covered or	Coated Sand G	rains. <sup>2</sup> Location:	: PL=Pore Lining, M=Matrix.
Alaska Alpine Swales (TA5)  Alaska Redox (A14)  Alaska Alpine Swales (TA5)  Alaska Gleyed Pores (A15)  Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Other (Explain in Notes)  Original Present (Y/N):  Depth (inches):  Other (Explain in Notes)  Other (Explain in Notes)  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (89)  Plant Plant Plant  Surface Soil Cracks (B6)  Leaves (B9)  Drainage Patterns (B10)  Geomorphic Position (D2)   Jaturation (A3)  Sparsely Vegetated Concave Surface (B8)  Vater Marks (B1)  Marl Deposits (B15)  Dry-Season Water Table (C2)  Water Table (C2)  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Depth (in):				1000			
Alaska Gleyed Pores (A15)  Alaska Gleyed Without 5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Other (E	_					Alaska Color C	change (TA4) <sup>4</sup>
Alaka Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Secondary Indicators (2 or more required)  Water-stained  Leaves (B9)  Stunted or Stressed Plants (01)  Other (Explain in Notes)  Other (Explain				Alaska Redox (A14)		Alaska Alpine	Swales (TA5)
Layer	Black Histic (A	.3)		Alaska Gleyed Pores (A15)			
Construction (A12)  Other (Explain in Notes)  Other (Explain in Notes)	lydrogen Sulf	ide (A4)					without 5Y Hue or Redder Underlying
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isstuded or problematic.  Give details of color change in Notes.  Sestrictive Layer (if present): Type:	Thick Dark Su	rface (A12)					in Notes
Isturbed or problematic.  Sindre details of color change in Notes.  Invaric Soil Present (Y/N):    Depth (inches):   Dep			ation, on	e primary indicator of wetland hyd	Irology, and an a	ppropriate landsca	ape position must be present unless
Depth (inches):	listurbed or pr	roblematic.		NO MARK THE TOP		.,,	
Approximately Continued and the continued and th	Restrictive Lay	er (if present): Type	es.	Depth (inches)	- //		
DATE NAME   Plain - Processing   Processin							
DATE NAME   Plain - Processing   Processin	lydric Soil Pr	resent (Y/N):	N				
MOROLOGY PRIMARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)							
MOROLOGY PRIMARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)	wotes: Fluc	od plain - i	nock.	, cossy under is	" Duy or	85.	
SECONDARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)		O DALL CO	0 4	A d d dd a	V	<i>y</i>	
Surface Soil Cracks (B6)		J Dari M	10/ 20	K S K I I E G			
Surface Soil Cracks (B6)			, ,				
Surface Soli Cracks (B6) Leaves (B9) Plants (D1)	HYDROLOGY	PRIMARY INDICAT			SECONDARY	/ INDICATORS (2	or more required)
Auturation (A3) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3) Shallow			ORS (an	y one indicator is sufficient)	-		
aturation (A3) Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3)			ORS (an	y one indicator is sufficient)	Water-stained	j	Stunted or Stressed
Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)   Vater Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)   ediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   prift Deposits (B3) Dry-Season Water Table (C2)   Unified Mart or Crust (B4) Other (Explain in Notes):  Unified Water Present (Y/N): Depth (in):	Surface Water	(A1)	ORS (an	y one indicator is sufficient) ace Soil Cracks (B6)	Water-stained Leaves (B9) _	<b>I</b>	Stunted or Stressed Plants (D1)
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  ediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  rift Deposits (B3) Other (Explain in Notes):  Igal Mat or Crust (B4) Other (Explain in Notes):  Uurface Water Present (Y/N): Depth (in): Depth (in): Wetland Hydrology Present (Y/N):  atturation Present (Y/N): Depth (in):  Depth (in): Depth (in):  Depth (in): Depth (in):  Depth (in): Depth (in):  Depth (in):	Surface Water High Water Tal	(A1)ble (A2)	Surfa Inun- (B7)	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery	Water-stained Leaves (B9) _ Drainage Patt	terns (B10)	Stunted or Stressed Plants (D1)
ediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   prift Deposits (B3) Dry-Season Water Table (C2) Notes:    Iron (C4) Relief (D4) FAC-Neutral Test (D5)     Iron (C4) Relief (D4) FAC-Neutral Test (D5)     Iron (C4) Relief (D4) FAC-Neutral Test (D5)     Iron (C4) Relief (D4) FAC-Neutral Test (D5)	Surface Water High Water Tal	(A1)ble (A2)	Surfa Inun (B7) Spar	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated	Water-stained Leaves (B9) _ Drainage Patt	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
rift Deposits (B3) Dry-Season Water Table (C2) Notes:    Dry-Season Water Table (C2) Dry-Season (C2) Dry-Season (C2) Dry-Season (C2) Dry-Season (C2) Dry-Season (C2) Dry-Season (C2)	Surface Water High Water Tal Saturation (A3)	ble (A2)	Surfa Inun (B7) Spar Cond	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots (	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Dry-Season Water Table (C2)  Igal Mat or Crust (B4) Other (Explain in Notes):  On Deposits (B5)  Urface Water Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  aturation Present (Y/N): Includes capillary fringe)  Depth (in):	Surface Water High Water Tal Saturation (A3)	ble (A2)	Surfa Inuna (B7) Spar Cond	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Water Table (C2)	Gurface Water High Water Tal Saturation (A3) Water Marks (E	(A1) ble (A2) ) B1)	Surfa Inun (B7) Spar Cond Marl	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
on Deposits (B5)  urface Water Present (Y/N): Depth (in):  //ater Table Present (Y/N): Depth (in):  aturation Present (Y/N): Depth (in):  ncludes capillary fringe)  Depth (in):	Gurface Water High Water Tal Saturation (A3) Water Marks (E	(A1) ble (A2) ) B1) osits (B2)	Surfa Inune (B7) Spar Cone Marl Hydr	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)   Shallow Aquitard (D3)  Microtopographic
on Deposits (B5)  urface Water Present (Y/N): Depth (in):  //ater Table Present (Y/N): Depth (in):  aturation Present (Y/N): Depth (in):  ncludes capillary fringe)  Depth (in):	Gurface Water  High Water Tal  Gaturation (A3)  Water Marks (E  Gediment Depo	(A1) ble (A2) ) B1) osits (B2)	Surfa Inuna (B7) Spar Cond Marl Hydr Odol Dry-S	y one indicator is sufficient)  ace Soil Cracks (B6) dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Season	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
urface Water Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  aturation Present (Y/N):  Depth (in):  Depth (in):	Gurface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo	(A1) ble (A2) ) B1) osits (B2)	Surfa Inun (B7) Spar Cond Marl Hydr Odoi Dry-S	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Geason or Table (C2)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	Gurface Water High Water Tal Saturation (A3) Vater Marks (E Sediment Depo Drift Deposits (	(A1) ble (A2) ) B1) osits (B2) (B3) rust (B4)	Surfa Inun (B7) Spar Cond Marl Hydr Odoi Dry-S	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Geason or Table (C2)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	Gurface Water  High Water Tal  Saturation (A3)  Vater Marks (E  Sediment Depo  Orift Deposits (	(A1) ble (A2) ) B1) osits (B2) (B3) rust (B4)	Surfa Inun (B7) Spar Cond Marl Hydr Odoi Dry-S	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Geason or Table (C2)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	Gurface Water  High Water Tal  Saturation (A3)  Vater Marks (E  Sediment Depo  Orift Deposits (	(A1) ble (A2) ) B1) osits (B2) (B3) rust (B4)	Surfa Inun (B7) Spar Cond Marl Hydr Odoi Dry-S	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Geason or Table (C2)	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
ncludes capillary fringe)  Depth (in):	Gurface Water High Water Tal Saturation (A3) Vater Marks (E Sediment Depo Orift Deposits ( Algal Mat or Cr on Deposits (I	(A1) ble (A2) ) B1) osits (B2) (B3) rust (B4) B5)	Surfa Inuna (B7) Spar Conc Marl Hydr Odor Dry-S Wate	y one indicator is sufficient)  ace Soil Cracks (B6) dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1) Season or Table (C2) r (Explain in Notes):	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) ✓  Shallow Aquitard (D3)  Microtopographic Relief (D4)
ncludes capillary fringe)  Depth (in):	Gurface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Orift Deposits ( Mgal Mat or Cr oron Deposits (I Gurface Water	(A1) ble (A2) ) B1) osits (B2) (B3) rust (B4) B5) Present (Y/N):	Surfa Inuna (B7) Spar Conc Marl Hydr Odoi Dry-S Wate	y one indicator is sufficient)  ace Soil Cracks (B6) dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Season er Table (C2)  r (Explain in Notes):	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits Notes:	terns (B10) cospheres along C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) \( \square \)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
otes: UD His diplosy abstruct Tox of Slove on Fluod Plain	Gurface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Orift Deposits ( Mgal Mat or Cr oron Deposits (I Surface Water Vater Table Pr	(A1) ble (A2) ) B1)  osits (B2)  (B3)  rust (B4)  B5)  Present (Y/N):	Surfa Inun (B7) Spar Conc Marl Hydr Odoi Dry-S Wate	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Season or Table (C2)  r (Explain in Notes):	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits Notes:	terns (B10) cospheres along C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) \( \square \)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
110 Hd an 1031 a herry Tot of Slove on Flood Plain	Surface Water High Water Tal Saturation (A3) Vater Marks (E Sediment Depo Orift Deposits ( Surface Water Vater Table Pr Saturation Pres	(A1) ble (A2) ) B1)  osits (B2)  (B3)  rust (B4)  B5)  Present (Y/N):  resent (Y/N):	Surfa Inun (B7) Spar Conc Marl Hydr Odoi Dry-S Wate	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Season or Table (C2)  r (Explain in Notes):	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of F Iron (C4) _ Salt Deposits Notes:	terns (B10) cospheres along C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) \( \square \)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
	Gurface Water  High Water Tal  Saturation (A3)  Vater Marks (E  Sediment Depo  Orift Deposits (I  Algal Mat or Cr  Ton Deposits (I  Surface Water  Vater Table Pr  Saturation Presidents Capille  Settors	(A1) ble (A2) ) B1) osits (B2) (B3) rust (B4) B5) Present (Y/N): resent (Y/N): sent (Y/N): ary fringe)	Surfa Inun (B7) Spar Cond Marl Hydr Odoi Dry-S Wate	y one indicator is sufficient)  ace Soil Cracks (B6)  dation Visible on Aerial Imagery  sely Vegetated cave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  Season or Table (C2)  r (Explain in Notes):	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of Firon (C4) Salt Deposits Notes:	derns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  :  ::  ::  ::  ::  ::  ::  ::  ::  :

1		
VEGETATION VARIABLES P= Plot, M	f= Matrix	
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-Non-persistent	ent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           m)         Short herb (<1m)	
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even	n
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Dens	ity (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered/Peripheral Cover	ttered or
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)	
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A	7
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site	
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)	
Vegetative Interspersion (P): Low (large High (small groupings, diverse and interspers	e patches, concentric rings) Moderate (broken irregular rings) sed)	
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe	-
	X	
SOIL VARIABLES		
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy_	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Clayey	
HYDROLOGIC VARIABLES		
Inlet/Outlet Class (P): No Inlet/OutletOutlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial I	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No t Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/Perennial Outlet Inlet/Perennial Outlet	Perennial
Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed,	sonally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded	
Evidence of Sedimentation (P): No Evidence Created	nce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sed	liment
Microrelief of Wetland Surface (P): Absent	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)	)
Frequency of Overbank Flooding (P): No C Return Interval >5 yrs	Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs	
	w Restricted Outflow Unrestricted Outflow	
	Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading	
Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable	P): High Permeability Stratified Deposits Low Permeability Stratified Deposits	
Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Se		
LANDOCADE VARIABLES NO		
Wetland Juxtaposition: Wetland Isolat Only Connected Above Connected	ted Wetlands within 400m, Not Connected Only Connected Below ed Upstream & Downstream Unknown	
-	ag.) Low Intensity (i.e. open space)	1
	5-25% Urbanized 25-50% Urbanized >50% Urbanized	1
		-
Size: Small (<10 acres) Med	fium (10-100 acres) Large (>100 acres)	-

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### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W 60 H T O 3 1 Field Target: 095 Date: 06 - 28 - 14
For all i	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
•	✓ Vegetation names are entered legibly for all strata present? ✓ Cover calculations are complete and correct?
	All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? unable to dig due to impermeable 50ils.  Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland? ખૂખી
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
,	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X Semester 06-28-14
Wetland Scientist (print)	Signature / Date
Y	× / /
Field Crew Chief (print)	Signature / Date

SITE DESCRIPTION							
Survey Type: Centerline X Acce	ss Road (explain)	Other (expla	ain)	Field Targ	jet: <u>47</u>	Map #: <u></u>	<u> </u>
Date: 06 - 28 - 14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60	HT032
Investigators: Joe Christ	opher, Zoe	Meac	de			Team No.:	W60
State: Alaska	Region: Alaska			160	-		
Latitude: 62 52 04,	474	Longitude	1490 5		101	Datum: W	/GS84
Logbook No.: O 3	Logbook Page No.:	20	Picture No.:			Dista	
OITE DA DA METEDO						-	
Subregion: I'r) terior			Landform (hill	slone terrac	e hummocke	e etc.): /a	1111
	Sunts ) 70%	Man Ti	Landform (hill		vov. popoli	s, etc.). 12	
Pre-mapped Alaska LNG/NWI classifica		5 400011	Soil Map Unit		vex, none).	COUL	74 (
Are climatic/hydrologic conditions on the	0 1	of year?		V	stances" pres	sent	
Yes_X No (if no exp	ain in Notes)	or your.	YesX		(If no, exp		s.)
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed?	No	_(If yes, exp	lain in Notes)		
Are Vegetation, Soil, or Hyd	drology Naturally	Problematic?	NoX_	_ (If yes, exp	olain in Notes.	.)	
SUMMARY OF FINDINGS		J-		1 may		19-111	and the state of
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a	Wetland?	Yes	No X
Hydric Soil Present? Yes_	No <u> </u>	w	etland Type:	Spc			
Wetland Hydrology Present? Yes	No X	Ala	aska Vegetation	Classification	on (Viereck):	IC2,	#C2
Notes and Site Sketch: Please include I corridor.	Orectional & North Arroy  CONTROL  CONT			131-06		line, Photo L	ocations, and Survey

VEGETATION (use scientific names of plants				
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:   No. of Dominant Species that are OBL, FACW, or FAC: 2
1. Betvia neoalaskana	25	(Y/N)	FACU	Total Number of Dominant Species Across All Strata: 65
2. Populus Balsamifera	5	X W	FACU	% Dominant Species that are OBL, FACW, or FAC: <u>多子</u> (
3. Picea glauca	1		FACV	10
4.			111100	Prevalence Index worksheet:
Total Cover: 50% of total cover:			(a) rer: 3.1	Total % Cover of: Multiply by:  OBL species:X 1 =
Sapling/Shrub Stratum()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = FAC species
1. Empetrum nigrum	35	X	FAC	UPL species 9 X 5 = 45
2. vaccinium - vitis idaea	6		FAC	Column Totals: 119 (A) 414 (B)
3. Betula nana	3		FAC	PI = B/A = 3.54
4. Picea glauca	4		FACU	
5. Vaccinium Uliginosum	5		FAC	
6. Sorbus Scopulina	3		FACU	
7. Alnus SSP.	12	X	FAC	
8. Lycopodium complamatum	9		UPL	
9.				
Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants)	38.5 20	% of total cov	er: 15.4	
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
1. Cornus canadensis	2	1/	FACU	Prevalence Index is ≤ 3.0
2. Lupinus arcticus	3.	X	FACU	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Trientalis Europaea	T		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Geocaulon lividium	2.	V	FACU	Indicators of hydric soil and wetland hydrology must be present unless
5. Gymnocarpium dryopteris	4	*	FACU	disturbed or problematic.
6.				
7,				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				Cover of Water
Total Cover:	11			Hydrophytic Vegetation Present (Y/N):
50% of total cover:		% of total cov	er: 2 . 2	Notes: (If observed, list morphological adaptations below):

SOIL			Date 1/28/19 Feature ID	HTO	232		Soil Plt Required (Y/N)
SOIL PROFI	LE DESCRIPTION: (I		to the depth needed to docu			confirm the absence	
Depth	Matrix		Redox Features				
(inches)	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
2-2						15:5016	120-1
7 - 4		80				Rock Igrams	
7 - 4	10-12-114	20				SANDU LOAD	
0		0				210027201	
Type: C=Co	oncentration, D=Deple	etion, RM	=Reduced Matrix, CS=Cove	red or C	Coated Sand C	Grains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
YDRIC SOI	IL INDICATORS					INDICATORS	FOR PROBLEMATIC HYDRIC SOILS
listosol or H	istel (A1)		Alaska Gleyed (A13) _			Alaska Color (	Change (TA4)⁴
listic Epiped	lon (A2)		Alaska Redox (A14)			Alaska Alpine	Swales (TA5)
Black Histic (	(A3)		Alaska Gleyed Pores (A	A15)		Alaska Redox	with 2.5Y Hue
	ılfide (A4)				Alaska Gleyed without 5Y Hue or Redder Unde		
					Other (Explain in Notes)		
	urface (A12)		e primary indicator of wetlar	nd hydro	ology and an		ape position must be present unless
lotes:	Present (Y/N):		0.15 Obser	rold			
HYDROLOG	Y PRIMARY INDICA	TORS (a	ny one indicator is sufficient)		SECONDAR	Y INDICATORS (2	2 or more required)
Surface Wate	er (A1)	Surl	ace Soil Cracks (B6)		Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)
High Water T	Гable (A2)	Inur (B7)	dation Visible on Aerial Ima	al Imagery Draina		tterns (B10)	Geomorphic Position (D2)
Saturation (A	(3)	Spa	rsely Vegetated cave Surface (B8)		Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
Nater Marks	(B1)	Mar	Deposits (B15)		Presence of Reduced Iron (C4)		Microtopographic Relief (D4)
Sediment De	eposits (B2)	Hydrogen Sulfide Odor (C1)			Salt Deposits (C5)		FAC-Neutral Test (D5)
Drift Deposits	s (B3)	Dry-Season Water Table (C2)			Notes:	Erold Th	dientors of
Algal Mat or Crust (B4) Other (Explain in Notes):			•	446,01051			
Iron Deposits	s (B5)	-				9	
Surface Wate	er Present (Y/N):	/	Depth (in):				
	Present (Y/N):		Depth (in):	v	Vetland Hydro	ology Present (Y/I	N):
	resent (Y/N):		Depth (in):				
Notes:	76 Hydrol	051	OS SIVVES	1			

VECETATION VARIABLES DE BIOL M	la Matrix
VEGETATION VARIABLES P= Plot, M	<i>f</i>
Forested-Evergreen-Needle-leaved	Scrub Shrub-Evergreen-Needle-leaved Scrub Shrub-Persistent Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall) Dwarf shrub (<0.5m) Tall herb (≥1r	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Short
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)_	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (R): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or d or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant s	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
Dead Woody Material (P): Low Abundance ( Abundant (>50% of surface)	0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and intersperse	
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Injet/Outlet	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet Outlet	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet Outlet	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
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Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	Field Target: 97 Date: 6/26/11
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	☐ Vegetation names are entered legibly for all strata present? ☐ Cover calculations are complete and correct? ☐ All dominant species have been determined and recorded per strata?
	☐ Indicator status is correct for each species? ☐ Dominance Test and Prevalence Index have been completed?
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked? MA NO 194 3011
4.	Hydrology
	Appropriate hydrology indicators are marked? Now. Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  □ Each logbook page is initialed and dated?
7.	Maps
	<ul><li>☑ Wetland boundaries have been corrected if necessary?</li><li>☑ Maps are initialed and dated?</li></ul>

O, FI	Olos
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	Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1

soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X speemball 06/28/14
Wetland Scientist (print)	Signature / Date
V	
Field Crew Chief (print)	Signature / Date

SITE DESCRIPTION			30	0' Stud	4	
Survey Type: Centerline Acces	ss Road (explain)	Other (expla	ain)X	Field Targ	et: <u>089</u>	Map #: <u>6   Map Date: 6   26   14</u>
Date: 07-01-2014	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60 HT 033
Investigators: Joe Christo	prier, Zoe M	ead e				Team No.: W60
State: Alaska	Region: Alaska		Milepost:	0636	(nG)	
Latitude: 62° 58'23.41"		Longitude	: 149° 37'	53.20"		Datum: WGS84
Logbook No.: 603	Logbook Page No.:	24	Picture No.:	P_N,	-5,-	- P/P
SITE PARAMETERS						
Subregion: interior			Landform (hil	Islope, terrac	e, hummocks	s, etc.): Depression
Slope (%): 0 - 3			Local relief (c	oncave, con	vex, none):	CONCAIR.
Pre-mapped Alaska LNG/NWI classifica	tion: Pewilssi	13	Soil Map Unit		11/1	
Are climatic/hydrologic conditions on the	1.7		Are "Nes	ormal Circum	stances" pres (If no, exp	sent: olain in Notes.)
Are Vegetation, Soil, or Hyd	drology Significant	tly Disturbed?	No_X	_(If yes, exp	lain in Notes)	
Are Vegetation, Soil, or Hyd	drology Naturally I	Problematic?	NoX	_ (If yes, exp	lain in Notes.	)
SUMMARY OF FINDINGS		Back			71	
Hydrophytic Vegetation Present? Yes_	X No	Is	the Sampled A	Area within a	Wetland?	Yes No
Hydric Soil Present? Yes_	X No	We	etland Type:	P551	1EN	n IB
Wetland Hydrology Present? Yes_	No	— Ala	iska Vegetatioi	n Classification	on (Viereck):	II(Q, III.A3
Notes and Site Sketch: Please include Ecorridor.  Point collected at the Data Ru	2 PLL 4 3	100' Co	midur.	to ste	ry off	RR property

Tree Stratum (Plot sizes: 20)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
1,				% Dominant Species that are OBL, FACW, or FAC: 100
2.				70 Dominant Opecies that are ODE, 1 AOVV, 01 1 AO.
3.				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover:	0 20	% of total cov	er: <u>0</u>	OBL species: <u>66</u> X 1 = <u>66</u>
Sapling/Shrub Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = 24  FAC species X 3 = 73  FACU species X 4 =
1. Picea Mariana	2		FACW	UPL species X 5 =
2. Betvia nana	5		FAC	Column Totals: (A) 164 (B)
3. Rhododendron tomentosum	1		FACW	PI = B/A = 4-57 1,82 w
4. Empetrum nigium	重山	X-	FAI	
5. Salex fuscenscens	T		FALW	
6. Vaccinium oxycoccus	5	X	OBL	Dasifora ferticosa T
	**	The second second		4.3
	T		FALL	In the plot
7. Spirea stevenii				- Emergans Late has mue
7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia	7 2		FALL	- Emergand Late has mue Abbien coverage but the shows
7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia laccinium Total Cover: Ovalifolium 50% of total cover:	7 -20 4 102020	0	FALL	- Emergand Late has mue
7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia laccinium Total Cover: Ovalifolium 50% of total cover:	7 -20 4 102020	% of total cov  Dominant Species?	FALL	The plot  - Emergand Late has more  AGBIRD COURAGE But the Shows  Later to the political mate  Hydrophytic Vegetation Indicators:  - Dominance Test is > 50%
7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia laccinium Total Cover:  Ovalifolium 50% of total cover:  20 Y FAC  VEGETATION (use scientific names of plants  Herb Stratum (26')	200 200 200 200 Absolute % Cover	Dominant Species? (Y/N)	FACW FACW er: 48	- Emergand Late has more AGRIP COURAGE But the Shows 'Later Appears to Be the Dominal That Appears to Be the Dominal Hydrophytic Vegetation Indicators:
7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia accinium Total Cover: Ovalifolium 50% of total cover: 20 Y FAC VEGETATION (use scientific names of plants Herb Stratum (26')	7 20 4 10 20 20	% of total cov  Dominant Species?	FACW FACW er: 48  Indicator Status	The plot  - Emergand Late has more  AGRIP COVERAGE BUT HE Show  Late Appears to Be the point, and  Late Appears to Be the point, and  Hydrophytic Vegetation Indicators:  + Dominance Test is > 50%  + Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia laccinium Total Cover:  Ovalifolium 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 20' )  1. Carex vaginata 2. Comarum palustre	2 20020 10020 10020 10020 10020	Dominant Species? (Y/N)	FALW FALW er: 48  Indicator Status  OBL	The plot  - Emergand Late has muce  AGRINI COURAGE But the Shind  'Late Appears to Be the Dohn of  'Late Appears to Be the Dohn of  Hydrophytic Vegetation Indicators:  - Dominance Test is > 50%  - Prevalence Index is ≤ 3.0  - Morphological Adaptations¹ (Provide supporting data in Notes)
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7. Spirea stevenii 8. Salex pulchra 9. Andiomeda polifolia accinium Total Cover: 0 Valifolium 50% of total cover: 120 V FAC VEGETATION (use scientific names of plants Herb Stratum (20')  1. Carex vaginata 2. Comarum palustre 3. Equisetum arvense 4. VIOI q 5. Carex microglochim	7 2 20020 10020 100 100 100 100	Dominant Species? (Y/N)	FALW FALW er: 48  Indicator Status  OBL	The plot  - Emergand Late has muce  AGRINI COURAGE But the Shind  'Late Appears to Be the Dohn of  'Late Appears to Be the Dohn of  Hydrophytic Vegetation Indicators:  - Dominance Test is > 50%  - Prevalence Index is ≤ 3.0  - Morphological Adaptations¹ (Provide supporting data in Notes)
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SOIL PROFILE DESCRIPTION: (Describe to the depth needed to document the in Depth (Inches)    Matrix	Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SO  Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyit Layer  Other (Explain in Notes)  Cology, and an appropriate landscape position must be present unless
Color (moist) % Color (moist) % Type¹  O - 10  O - 20  Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coate  HYDRIC SOIL INDICATORS  Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15)  Hydrogen Sulfide (A4) Alaska Gleyed Pores (A15)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology instrubed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Hydric Soil Present (Y/N):	Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SO  Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyit Layer  Other (Explain in Notes)  cology, and an appropriate landscape position must be present unless
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coatce HYDRIC SOIL INDICATORS  Histosol or Histel (A1)X	Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SO  Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyit Layer  Other (Explain in Notes)  cology, and an appropriate landscape position must be present unless
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coate HYDRIC SOIL INDICATORS  Histosol or Histel (A1) X Alaska Gleyed (A13)  Histic Epipedon (A2) Alaska Redox (A14)  Black Histic (A3) Alaska Gleyed Pores (A15)  Hydrogen Sulfide (A4)  Thick Dark Surface (A12)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes: Hydric Soil S Observed   1-72 S SWMI	Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SO  Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyit Layer  Other (Explain in Notes)  cology, and an appropriate landscape position must be present unless
Trype: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coate  HYDRIC SOIL INDICATORS  Histosol or Histel (A1) Alaska Gleyed (A13)  Histic Epipedon (A2) Alaska Redox (A14)  Black Histic (A3) Alaska Gleyed Pores (A15)  Hydrogen Sulfide (A4)  Thick Dark Surface (A12)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes: Hydric Soil Present (Y/N):	Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SO  Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyi Layer  Other (Explain in Notes)  cology, and an appropriate landscape position must be present unless
Hydric Soil Indicators  Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15)	Alaska Color Change (TA4) <sup>4</sup>
Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alask	Alaska Color Change (TA4) <sup>4</sup>
Hydric soil indicators  Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15)	Alaska Color Change (TA4) <sup>4</sup>
Hydric Soil Indicators  Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15)	Alaska Color Change (TA4) <sup>4</sup>
Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Redox (A14) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alask	Alaska Color Change (TA4) <sup>4</sup>
Alaska Gleyed (A13)	Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyi Layer  Other (Explain in Notes)  rology, and an appropriate landscape position must be present unless
Alaska Redox (A14)	Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyi Layer  Other (Explain in Notes)  cology, and an appropriate landscape position must be present unless
Alaska Gleyed Pores (A15)	Alaska Redox with 2.5Y Hue  Alaska Gleyed without 5Y Hue or Redder Underlyi Layer  Other (Explain in Notes)  rology, and an appropriate landscape position must be present unless
Hydrogen Sulfide (A4)  Thick Dark Surface (A12)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes: Hydric Soil S Observed   1-7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Alaska Gleyed without 5Y Hue or Redder Underlyi LayerOther (Explain in Notes) rology, and an appropriate landscape position must be present unless
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes: Hydric Soil S Observed   1-7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	Other (Explain in Notes)  rology, and an appropriate landscape position must be present unless
Pone indicator of hydrophytic vegetation, one primary indicator of wetland hydrology disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type:	Other (Explain in Notes) rology, and an appropriate landscape position must be present unless
Hydric Soil Present (Y/N):  Notes: Hydric Soi) S Observed   HZ S Swull	ology, and an appropriate landscape position must be present unless
Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes: Hydric Soi) S Observed   HZ S SW-LI	
Restrictive Layer (if present): Type:	
Notes: Hidric soils observed , 1-25 Smill	
	SECONDARY INDICATORS (2 or more required)
	Water-stained Stunted or Stressed Leaves (B9) Plants (D1)
High Water Table (A2)   Inundation Visible on Aerial Imagery  Dra	Drainage Patterns (B10)  Geomorphic Position (D2)
(Sr)	Ovidized Phizagnhares slang
Concave Surface (B8) Livi	Living Roots (C3) Shallow Aquitard (D3)
	Presence of Reduced Microtopographic Relief (D4)
Hydrogen Sulfide	Salt Deposits (C5) FAC-Neutral Test (D5)
The state of the s	Notes:
774.6. 745.6 (62)	
Algal Mat or Crust (B4) Other (Explain in Notes):	
Algal Mat or Crust (B4) Other (Explain in Notes):  ron Deposits (B5)	
ron Deposits (B5)  Surface Water Present (Y/N): Depth (in):	
ron Deposits (B5)  Surface Water Present (Y/N): Depth (in):	Vetland Hydrology Present (Y/N):

Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)  Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional ★ Riverine Estaurine Fringe
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sapric Histosol:
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial
Outlet X Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial
OutletX
Outlet X Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/Inle
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Outlet X Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/Perennial Inlet/Perennial Outlet Inlet/Perennial Inlet/Perennial Outlet Inlet/Perennial Inlet/Perennial Outlet Inlet/Perennial Outlet Inlet/Perennial Inlet/No Outlet Inlet/Perennial Outlet Inlet
Outlet X Intermittent Inlet/Intermittent Outlet

Crew Chief QA/QC check:

GPS Technician QA/QC check:

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Cook in	re ID: W60 HT 0 33 Field Target: 089 Date: 07 - 01 - 14
	items not checked, please provide detailed explanation in the notes section of data form.
rui aii	nems not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?
	<ul><li>✓ Cover calculations are complete and correct?</li><li>✓ All dominant species have been determined and recorded per strata?</li></ul>
	☐ Indicator status is correct for each species? ☐ Dominance Test and Prevalence Index have been completed?
	Dominance Test and Frevalence index have been completed:
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	☑ Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  ☑ Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X zolmade o	7-01-14
Wetland Scientist (print)	Signature / Date	

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION		30	o'stuc	dy	
Survey Type: Centerline Acces	ss Road (explain) Other (e	explain) X	Field Targ	et: <u>090</u>	Map #: <u>63</u> Map Date: <u>416/14</u>
Date: 07-01-14	Project Name & No.: Alaska	LNG 26221306		Feature Id:	W60HT034
Investigators: Jae Christof	pher, zoemeade			- 1	Team No.: W60
State: Alaska	Region: Alaska	Milepost: 6	07.6 (1	16)	
Latitude: 62° 57' 23.34"	Longit	ude: 149° 39'	01.64"		Datum: WGS84
Logbook No.: 00 3	Logbook Page No.: 35	Picture No.:	PN.	s, pit,	plug
SITE PARAMETERS	3-1-5		-	-	
Subregion: Interior	1	Landform (hil	Islope, terrac	e, hummock	s, etc.):
Slope (%): 0 - 3		Local relief (c	oncave, con	vex, none):	convex
Pre-mapped Alaska LNG/NWI classifica	tion: Upland	Soil Map Unit	Name:	12	
Are climatic/hydrologic conditions on the Yes X No (if no expl	site typical for this time of year? ain in Notes)	Are "No Yes_x		stances" pre (If no, exp	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significantly Disturb	ed? No <u>X</u>	_(If yes, exp	lain in Notes	
Are Vegetation, Soil, or Hyd	rology Naturally Problema	ic? No_X	_ (If yes, exp	olain in Notes	.)
SUMMARY OF FINDINGS			11		
Hydrophytic Vegetation Present? Yes_	No	Is the Sampled A	rea within a	Wetland?	Yes No
Hydric Soil Present? Yes_	Х Nо	Wetland Type:	P451	Em	113
Wetland Hydrology Present? Yes	<u>Х</u> Nо	Alaska Vegetation	Classification	on (Viereck):	ICQ IIAX2
Notes and Site Sketch: Please include Dicorridor.  PSSI  Pem SSI  U  L  L  L  L  L  L  L  L  L  L  L  L	JEM 1B	part S	re, Distances	s from Center	U

Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC: 3
1,				Total Number of Dominant Species Across All Strata: 3  % Dominant Species that are OBL, FACW, or FAC: 100
2,				% Dominant Species that are OBL, FACW, or FAC.
3,				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover		% of total cov	rer:	OBL species: 2 X 1 = 2
Sapling/Shrub Stratum ( 26')	Absolute	Dominant	Indicator	FACW species: 5 X 2 = 10
	% Cover	Species? (Y/N)	Status	FAC species 110 X 3 = 330
1. picea mariana GIANCA	3	(1714)	FACIL	FACU species
2. Betula nana	70	У	FAG	Column Totals: 1\8 (A) 346 (B)
3. vaccinium uliginos um	15	1	FAL	PI = B/A = 2.93
4. Rhododendion ternentosum	1		FALW	
5. Empetrum nigrum	3		FAL	
6. Vaccinium Oxycoccus	2		OBL	
7. Andromeda polifolia	1		FACW	
8.				
9.				
Total Cover:	95			
50% of total cover	47.5 20	% of total cov	rer: 19	

Herb Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50% X Prevalence Index is ≤ 3.0
1. Rubus chamaemorous	3 5		FALM	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. Calamagrostis canadensis	15	У	FAG	Notes)
3. Equisetum ANTINY	7	Y	roc	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Trientalis europaea	12	,	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. pedicularis labradorica	TR		FACW	disturbed or problematic.
6. Cornus canadensis			FACU	
7. Puhus Arctica	rn		VAC4	% Bare Ground
8. Pinquicula villosa	TR		OBL	N P % Cover of Wetland Bryophytes
9. J				100 Total Cover of Bryophytes
10.				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover:		**	E (	Notes: (If observed, list morphological adaptations below):
50% of total cover:	14 20	% of total cov	/er:_ <u>5 ,                                   </u>	

SOIL PROFILE DESCRIPTION: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)    Matrix	Depth (inches) Color (moist) C	SOIL BROEIL	E DESCRIPTION:		Date 7-1-14 Feature ID				Soli Pit Required (Y/N)
Color (moist)	Color (moist) % Color (moist) % Type¹ Loc² Texture Notes  Color (moist) % Type¹ Loc² Texture Notes  Fibric organics  INDICATORS FOR PROBLEMATIC H  INDICATORS FOR PROBLEMA	SOIL PROFIL	_	Describe		ment th	e indicator or o	confirm the absent	ce of indicators.)
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  INDICATORS FOR PROBLEMATIC HYDRIC SC institute of the property	Type: C=Concentration, D=Depleton, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Math PMDRIC SOIL MDICATORS   INDICATORS   INDICATORS   INDICATORS   INDICATORS   INDICATORS   INDICATORS   INDICATORS   INDICATORS   Indicator or Histel (A1)		-				1 .		
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL INDICATORS    INDICATORS FOR PROBLEMATIC HYDRIC SC	Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Mathyproic Soil LNDiCATORS  Histosol or Histel (A1)	(inches)	1	%	Color (moist) %	Type'	Loc²		
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coaled Sand Grains. *Location: PL=Pore Lining, M=Matrix.  **HYDRIC SOIL INDICATORS**    INDICATORS FOR PROBLEMATIC HYDRIC SC	Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matry Procession of PL=Pore Lining, M=Matrix Procession of Plantic Children	3-20	aparameter Man to the same particular particular				_	Fibric	organics
INDICATORS FOR PROBLEMATIC HYDRIC SC   Isistoso or Histel (A1)	INDICATORS FOR PROBLEMATIC IN  Isitoso or Histel (A1) X								,
INDICATORS FOR PROBLEMATIC HYDRIC SCI   Isistos or Histel (A1)   X   Alaska Gleyed (A13)   Alaska Color Change (T/A4)*	INDICATORS FOR PROBLEMATIC IN   X   Alaska Gleyed (A13)   Alaska Color Change (TA4) <sup>4</sup>   Alaska Gloyed (A2)   Alaska Redox (A14)   Alaska Gloyed (A3)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Helot (A3)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Redox with 2.5Y Hue   Alaska Gleyed without 5Y Hue or Reddi Layer   Alaska Gleyed without 5Y Hue   Alaska Gleyed (A15)   Alaska Gleyed without 5Y Hue   Alaska Clev Cherch 19   Alaska Clev Cherch 19   Alaska Clev Cherch 19								
INDICATORS FOR PROBLEMATIC HYDRIC SCI   Isistos or Histel (A1)   X   Alaska Gleyed (A13)   Alaska Color Change (T/A4)*	INDICATORS FOR PROBLEMATIC IN   X   Alaska Gleyed (A13)   Alaska Color Change (TA4) <sup>4</sup>   Alaska Gloyed (A2)   Alaska Redox (A14)   Alaska Gloyed (A3)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Helot (A3)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Redox with 2.5Y Hue   Alaska Gleyed without 5Y Hue or Reddi Layer   Alaska Gleyed without 5Y Hue   Alaska Gleyed (A15)   Alaska Gleyed without 5Y Hue   Alaska Clev Cherch 19   Alaska Clev Cherch 19   Alaska Clev Cherch 19								
INDICATORS FOR PROBLEMATIC HYDRIC SCI   Isistos or Histel (A1)   X   Alaska Gleyed (A13)   Alaska Color Change (T/A4)*	INDICATORS FOR PROBLEMATIC IN   X   Alaska Gleyed (A13)   Alaska Color Change (TA4) <sup>4</sup>   Alaska Gloyed (A2)   Alaska Redox (A14)   Alaska Gloyed (A3)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Helot (A3)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Redox with 2.5Y Hue   Alaska Gleyed without 5Y Hue or Reddi Layer   Alaska Gleyed without 5Y Hue   Alaska Gleyed (A15)   Alaska Gleyed without 5Y Hue   Alaska Clev Cherch 19   Alaska Clev Cherch 19   Alaska Clev Cherch 19			-					
Indicator   Indicators   Indi	INDICATORS FOR PROBLEMATIC IN   Isitoso or Histel (A1)   X   Alaska Gleyed (A13)   Alaska Color Change (TA4) <sup>4</sup>   Alaska Gleyedon (A2)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Hedox (A14)   Alaska Alpine Swales (TA5)   Alaska Hedox with 2.5Y Hue   Alaska Gleyed without 5Y Hue or Reddi Layer   Alaska Gleyed without 5Y Hue   Alaska Gleyed wit   Alaska Gleyed without 5Y Hue or Reddi Layer   Alaska Gleyed w								
INDICATORS FOR PROBLEMATIC HYDRIC SC   Isistoso or Histel (A1)	INDICATORS FOR PROBLEMATIC IN  Isitoso or Histel (A1) X								
INDICATORS FOR PROBLEMATIC HYDRIC Scilistoso or Histel (A1)	INDICATORS FOR PROBLEMATIC IN   Isitoso or Histel (A1)   X   Alaska Gleyed (A13)   Alaska Color Change (TA4) <sup>4</sup>   Alaska Golor Histel (A1)   X   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)   A	Type: C=Cor	ncentration, D=Deple	etion. RN	/I=Reduced Matrix. CS=Cover	red or C	Coated Sand G	rains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
Alaska Color Change (TA4)*  Alaska Color Change (TA4)*  Alaska Redox (A14)	Alaska Gleyed (A13) Alaska Color Change (TA4) <sup>4</sup> Alaska Color Change (TA4) <sup>4</sup> Alaska Color Change (TA4) <sup>4</sup> Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Gleyed Pores (A15) Alaska Alpine Swales (TA5) Alaska Gleyed without 5°Y Hue or Redd Layer Other (Explain in Notes)								
Alaska Alpine Swales (TA5)  Alaska Redox (A14)  Alaska Redox with 2.57 Hue  Alaska Gleyed Pores (A15)  Alaska Gleyed without 57 Hue or Redder Underly Layer  Nick Dark Surface (A12)  Other (Explain in Notes)  The indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Alaska Gleyed without 57 Hue or Redder Underly Layer  Other (Explain in Notes)  The indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Alaska Gleyed without 57 Hue or Redder Underly Layer  Other (Explain in Notes)  Depth (inches):  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9)  Plants (D1)  Inundation Visible on Aerial Imagery  Inundation Visible on Aerial Imagery  Inundation (A3)  Sparsely Vegetated Concave Surface (B8)  Vater Marks (B1)  Marl Deposits (B15)  Presence of Reduced Iron (C4)  Inundation Deposits (B15)  Presence of Reduced  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  Intil Deposits (B3)  Dry-Season  Water Table (C2)  Intil Deposits (B3)  Other (Explain in Notes):  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Vater Table Present (Y/N):  Depth (in):  Opeth (in):	Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Alpine Swales (TA5) Alaska Histic (A3) Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue or Reddi Layer Done indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be presisturbed or problematic. Sive details of color change in Notes.  Sive details of color change in Notes.  Sestrictive Layer (if present): Type: Depth (inches):  VYPROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  VPROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Vater Table (A2) X (B1)  Inundation Visible on Aerial Imagery  (B1)  Druinage Patterns (B10) Geomorphic Position (A3)  Vater Table (A3) X Sparsety Vegetated  Concave Surface (B8)  Living Roots (C3)  Vater Marks (B1)  Mari Deposits (B15)  Presence of Reduced Inform (C4)  Vater Marks (B2)  Odor (C1)  Salt Deposits (C5)  FAC-Neutral Test (D4)  Votes:  Vetland Hydrology Present (Y/N):  Vater Table Present (Y/N):  Vetland Hydrology Present (Y/N):  Vetland Hydrology Present (Y/N):				Alaska Gleved (A13)	10			
Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue	Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue bydrogen Sulfide (A4) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue or Reddictary of Notes (A12) Other (Explain in Notes) Other (Expla								
Alaka Gleyed without SY Hue or Redder Underly Layer.  Other (Explain in Notes)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Indicator of Reduced Into (C4)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Shallow Aquitard (D3)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  S	Alaska Gleyed without 5Y Hue or Reddictayer  Alaska Gleyed without 5Y Hue or Reddictayer  Other (Explain in Notes)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be presisturbed or problematic.  Sive details of color change in Notes.  Sestrictive Layer (if present): Type:  Depth (inches):  Depth (inches):  Depth (inches):  PYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Soil Cracks (B6)  Water-stained Leaves (B9)  Stunted or Stress Plants (D1)  Inundation Visible on Aerial Imagery  (B7)  Auturation (A3)  Sparsely Vegetated Concave Surface (B8)  Vater Marks (B1)  Marl Deposits (B15)  Presence of Reduced Iron (C4)  Relief (D4)  Relief (D4)  PAC-Neutral Test  Other (Explain in Notes):  Other (Explain in Notes):  On Deposits (B5)  Dry-Season  Water Table (C2)  Other (Explain in Notes):  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Vater Table Present (Y/N):  Depth (in):  Alaska Gleyed without 5Y Hue or Reddictayer  Dother (Explain in Notes):  Other (Explain in Notes):  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Vater Table Present (Y/N):  Vater Table Present (Y/N):  Depth (in):  Other (Explain in Notes):  Other (Explain in Notes):  Other (Explain in Notes):  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Vater Table Present (Y/N):  Depth (in):  Other (Explain in Notes):  Other							_	
Layer   Other (Explain in Notes)   Content (Explain in Notes)   Other (Explain in Notes)	Layer   Company   Layer   Company   Layer   Company	slack Histic (A	A3)		Alaska Gleyed Pores (A	115)			
Thick Dark Surface (A12) Other (Explain in Notes)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless issurbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type:	Thick Dark Surface (A12) Other (Explain in Notes) One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be preside to details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):	lydrogen Sulf	fide (A4)	_					I without 5Y Hue or Redder Underlying
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic problematic filter to problematic problematic filter to problematic problematic filter to problematic problematic filter to problematic	One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be presilisturbed or problematic.  Restrictive Layer (if present): Type:								in Notes)
isturbed or problematic. Give details of color change in Notes. Restrictive Layer (if present): Type: Depth (inches):	isturbed or problematic. Give details of color change in Notes. Restrictive Layer (if present): Type: Depth (inches):			etation. o	ne primary indicator of wetlan	d hvdro	ology, and an a		•
Restrictive Layer (if present): Type: Depth (inches):	Restrictive Layer (if present): Type: Depth (inches):	listurbed or p	roblematic.					.pp.op.iato iaiiaoo	apo pooliton maot bo procent amoco
Address Soil Present (Y/N):    Surface Water (A1)	Addric Soil Present (Y/N):    Propositic Researce (Y/N):	Give details of	of color change in No	otes.	Donth /inc	oboo\.			
AVEROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1)  Surface Water Table (A2) X Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3)  Vater Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Arediment Deposits (B2) Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Separation Present (Y/N): Depth (in): 3  Wetland Hydrology Present (Y/N): Depth (in): 3  Wetland Hydrology Present (Y/N): Depth (in): 0	Approach (Art Control of Service)  Approach (Art Control of Art Control of Service)  Approach (Art Control of Art Control of Service)  Approach (Art Control of Art Control of Service)  Approach (Art Control of Art Control	restrictive La	yer (ii present). Typ	<u>_</u>	Deptir (inc	cries)			
Second Content   Seco	AVDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)	lydric Soil P	resent (Y/N):	λ					
AYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)	AYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)	Notes:			,				
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)	HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Stunted or Stress Plants (D1) Plants (D1) Geomorphic Posit (B7)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Divided Rhizospheres along Living Roots (C3) Shallow Aquitard Iron (C4) Presence of Reduced Iron (C4) Relief (D4) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (B3) Div-Season Water Table (C2) Notes:  Surface Water Present (Y/N): N Depth (in): N/A Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N):	11.1	1-17 5121/5	09	SOULL				
Surface Water (A1)	Surface Water (A1)	1-1-1	CVIC	C	20.00				
Surface Water (A1)	Surface Water (A1)								
Surface Voter (A1)	Surface Water (A1)	HYDROLOGY	PRIMARY INDICA	TORS (a	ny one indicator is sufficient)		SECONDAR	Y INDICATORS (2	? or more required)
Surface Valet (A1)	Surface Vater (A1)	f 184-4-	- (0.4)		for a 0-11 O to (D0)		Water-stained	1	Stunted or Stressed
Saturation (A3)	Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard Presence of Reduced Iron (C4) Relief (D4) Sediment Deposits (B2) Other (Explain in Notes):  Dry-Season Water Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N): Depth (in): 1/4  Water Table Present (Y/N): Depth (in): 3  Drianage Patterns (B10) Geomorphic Position (C4)	surface vvate	r (A1)	Sui	rface Soil Cracks (B6)	-	Leaves (B9)		
Saturation (A3)	Saturation (A3) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard Concave Surface (B8) Presence of Reduced Iron (C4) Relief (D4) Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test Deposits (B3) Other (Explain in Notes):  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Y Depth (in): 3  Wetland Hydrology Present (Y/N): Present (Y/N): Augustant Shallow Aquitard Concave Surface (B8)	-ligh Water Ta	able (A2) X			gery	Drainage Pat	terns (B10)	Geomorphic Position (D2)
Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Salt Deposits (C5) FAC-Neutral Test (D5)   Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Fourface Water Present (Y/N): Depth (in): N/A  Water Table Present (Y/N): Depth (in): 3  Saturation Present (Y/N): Depth (in): O  Depth (in): O  Depth (in): O  Depth (in): O	Concave Surface (B8)  Water Marks (B1)  Marl Deposits (B15)  Sediment Deposits (B2)  Drift Deposits (B3)  Algal Mat or Crust (B4)  For Deposits (B5)  Other (Explain in Notes):  Surface Water Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Salt Deposits (C3)  Presence of Reduced Indicate Microtopographic Relief (D4)  Salt Deposits (C5)  FAC-Neutral Test  Notes:  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):		.5.0 (* 12)	-					
Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Presence of Reduced Iron (C4) Present (D5) Presence of Reduced Iron (C4) Presence of Reduced Iron (C5) Present (D5) Presence of Reduced Iron (C5) Present (D5) Present (D5) Present (D5) Present (D5) Present (D5) Present (D5)	Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Microtopographic Relief (D4)   Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test   Dry-Season Water Table (C2) Notes:   Algal Mat or Crust (B4) Other (Explain in Notes):   Fourface Water Present (Y/N): N Depth (in): N/A Wetland Hydrology Present (Y/N):    Wetland Hydrology Present (Y/N):	Saturation (A3	3) <u>X</u>						Shallow Aquitard (D3)
Iron (C4)	Iron (C4)					_			
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  FAC-Neutral Test (D5)   Notes:  Other (Explain in Notes):  FAC-Neutral Test (D5)   Notes:  Water Table (C2)   FAC-Neutral Test (D5)   Notes:  Wetland Hydrology Present (Y/N):	Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test  Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  FAC-Neutral Test  Notes:  Surface Water Present (Y/N): N Depth (in): N/A  Nater Table Present (Y/N): Depth (in): 3  Wetland Hydrology Present (Y/N):	Nater Marks (	B1)	Ma	rl Deposits (B15)				
Odor (C1) Salt Deposits (B2) Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Algal Mat or Crust (B4) Other (Explain in Notes):  Other (Explain in Notes):  FAC-Neutral Test (D5) Salt Deposits (C5) FAC-Neutral Test (D5) Salt Deposits (C5) Motes:  Notes:  Other (Explain in Notes):  FAC-Neutral Test (D5) Salt Deposits (C5) Motes:  Notes:  Other (Explain in Notes):  FAC-Neutral Test (D5) Salt Deposits (C5) Motes:  Notes:  Other (Explain in Notes):  FAC-Neutral Test (D5) Salt Deposits (C5) Motes:  Notes:  Other (Explain in Notes):	Odor (C1) Salt Deposits (C5) PAC-Neutral Test  Orift Deposits (B3) Other (Explain in Notes):  Other (Explain in Notes):  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): N Depth (in): 3  Wetland Hydrology Present (Y/N):	Dadies 1 D	anita (DO)	Hve	drogen Sulfide				
Algal Mat or Crust (B4) Other (Explain in Notes):  For Deposits (B5)  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Depth (in): 3  Saturation Present (Y/N): Depth (in): O  Depth (in): O	Algal Mat or Crust (B4) Other (Explain in Notes):  ron Deposits (B5)  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): N Depth (in): 3  Wetland Hydrology Present (Y/N):	Sealment Dep	oosits (B2)				Salt Deposits	(C5)	FAC-Neutral Test (D5)
Algal Mat or Crust (B4) Other (Explain in Notes):  Fron Deposits (B5)  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Depth (in): 3  Saturation Present (Y/N): Depth (in): 0  Depth (in): 0	Algal Mat or Crust (B4) Other (Explain in Notes):  ron Deposits (B5)  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Y Depth (in): 3  Wetland Hydrology Present (Y/N):	Orift Denocite	(B3)	Dry	r-Season		Notes:		4
Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Depth (in): 3  Saturation Present (Y/N): Depth (in): 0	Four Deposits (B5)  Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Y Depth (in): 3  Wetland Hydrology Present (Y/N):	Jilit Deposits	(100)	Wa	iter Table (C2)	14			
Surface Water Present (Y/N): N Depth (in): N/A Water Table Present (Y/N): Depth (in): 3  Saturation Present (Y/N): Depth (in): 0	Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Y Depth (in): 3  Wetland Hydrology Present (Y/N): Y	Algal Mat or C	rust (B4)	Oth	ner (Explain in Notes):	- 4			
Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Depth (in): 3  Saturation Present (Y/N): Depth (in): 0	Surface Water Present (Y/N): N Depth (in): N/A  Water Table Present (Y/N): Depth (in): 3  Wetland Hydrology Present (Y/N):						1		
Water Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	Water Table Present (Y/N):  Depth (in):  3  Wetland Hydrology Present (Y/N):	ron Deposits	(B5)		10	- (			
Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in):			100	. Sp			MINE TO STATE	
Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in):	Surface Water	Present (Y/N):	1	Depth (in): N/A				N
Water Table Present (Y/N):  Saturation Present (Y/N):  Depth (in):  Depth (in):	Water Table Present (Y/N):	A	\ \	1		_ v	Vetland Hydro	logy Present (Y/I	v):
(includes capillary fringe) Depth (in): ()	Seturation Propert (V/AI):	Nater Table P	Present (Y/N):	,	Depth (in): 5			,	
(includes capillary fringe) Depth (in): ()	aannannn Fresen (1791 - \ /	Saturation Pro	sent (Y/N)·						
				X	Depth (in):				
NOTES:	Notes:		/						

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water 3 <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral C
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading N/K
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading N/ Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading N Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable High Gradient (≥2%) High Gradient (≥2%)
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading N Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable High Gradient (≥2%) High Gradient (≥2%)  Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading N Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable High Gradient (≥2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below
Water pH (P): No surface water
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading N/ Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable Low Gradient (M): Low Gradient (<2%) High Gradient (≥2%)  Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring  LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated X Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown  Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)

m

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	PID: WOOHT034 Field Target: 090 Date: 7-1-14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>△ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>△ Vegetation names are entered legibly for all strata present?</li> <li>△ Cover calculations are complete and correct?</li> <li>△ All dominant species have been determined and recorded per strata?</li> <li>△ Indicator status is correct for each species?</li> <li>△ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>☑ Wetland boundaries have been corrected if necessary?</li><li>☑ Maps are initialed and dated?</li></ul>

#### 8. Photos

- ☑ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

  Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X soemeads 7-1-14
Wetland Scientist (print)	Signature / Date
X Toe Christopher	x /2 7/1/14
Field Crew Chief (print)	Signature / Date

SITE DESCRIPTION		132.00	30	o' stuc	14	
Survey Type: Centerline Acce	ss Road (explain)	_ Other (expl	ain)_ <b>Z</b>	Field Targ	et: <u>098</u>	Map #: <u>68</u> Map Date: <u>6/27</u> //
Date: 07-01-14	Project Name & No.:	: Alaska LNG	26221306		Feature Id	:W60HT035
Investigators: Joe Christo	pher, Zoe Med	ade				Team No.: W60
State: Alaska	Region: Alaska		Milepost:	617.8	LNG	
Latitude: 62° 51' 47.16"		Longitude	:149°52'	20.80"		Datum: WGS84
Logbook No.: 00 3	Logbook Page No.:	026	Picture No.:	P_ N, S	, pit, p	lug
SITE PARAMETERS						
Subregion: interior			Landform (hil	Islope, terrac	e, hummock	s, etc.): Depression
Slope (%): 0 - 1	,		Local relief (c	concave, conv	ex, none): (	CON CAUR.
Pre-mapped Alaska LNG/NWI classifica	ition: PSS/EM1	B	Soil Map Unit		111	Col ( GO C
Are climatic/hydrologic conditions on the Yes No (if no expl		of year?	Are "No Yes_X	ormal Circum No		sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed?	Nο_ <i>X</i>	_(If yes, expl	ain in Notes	)
Are Vegetation, Soil, or Hyd	drology Naturally I	Problematic?	No_X	_ (If yes, exp	lain in Notes	.)
SUMMARY OF FINDINGS		THE REAL PROPERTY.			10,	
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a	Wetland?	Yes No
Hydric Soil Present? Yes		We	etland Type:	PEMS	52/B	(PEMI/SSIB)
Wetland Hydrology Present? Yes_	No	— Ala	aska Vegetatior	n Classificatio	n (Viereck):	ШАЗ, ДС2
Notes and Site Sketch: Please include E corridor.	Directional & North Arrov	v, Centerline, I	Length of featur	re, Distances	from Center	line, Photo Locations, and Survey
Tons of Bear Sign. Frash sig	- / D	DATES	s yell	/		
, ,	Contract of the contract of th	Aby, "Co	36/			
& Bedding Areas	Oceny Silv	(B)	//	/		
EST, Sow + CUSS.	Josep !	w/				
your sompet	1		/ /	/		$\Lambda \cup I$
From Here	94	//	1 49			//\/ /
(FT98) AS	10	11	Ox,			1/\/
We WAIKED Daus	(10)		* /			/ V
PAth lead forward	Jan J	. 11				
12599	4)1	0				
Did put 40 to 8730	$\smile$ ,	5				

VEGETATION (use scientific names of plan	ts)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1.				% Dominant Species that are OBL, FACW, or FAC: 100
2.				% Dominant Species that are OBL, FACW, or FAC.
3.				
4.				Prevalence Index worksheet:
Total Cove	er: 0			Total % Cover of: Multiply by:
50% of total cove	er: <u> </u>	% of total cov	rer:	OBL species: 103 X1 = 103
Sapling/Shrub Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 3
1. Salex pulchra	3	У	FACW	UPL species
2. Alnus ssp.	1		FAC	Column Totals: 115 (A) 138 (B)
3. Picea glauca	TR		FACV	PI = B/A = 1 · 2
4. Spirea stevenii	TR		FACU	
5.				Plot Had Low Shrus
6.				Domin ance by matrix of
7.				1 1000 1101 ()
8.				Dominany by matrix of Area Had Shows Dominance >> pem/ss
9.				7 pem/55
Total Cove				
50% of total cove	er: <u>2</u> 20	% of total cov	/er:0 ,	

Herb Stratum( <u>26</u> ′)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
1. Comarum palustre 2. Equisetum fluviatile	18		OBL	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Trientalis europaea  4. Carex aquatilis	70	У	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)  1 Indicators of hydric soil and wetland hydrology must be present unless
5. Mertensia paniculata 6. Calamagrostis canadonsis	TR - 5		FACU FAC	disturbed or problematic
7. heracleum maximum 8. yeratrum viride	1		FAC4 FAC	% Bare Ground  N
9. Chameri on angus tofolium 10.	TR		FACU	Mydrophytic Vegetation Present (Y/N):
Total Cover:_ 50% of total cover:_		% of total cov	ver: <u>22, 2</u>	Notes: (If observed, list morphological adaptations below):  Standing wat er in adjacent be aver pand = 100 ft.

			Date	eature it	W/O)	<b>エレン</b> ド		Soll Pit Required (Y/N)
OIL PROFI	LE DESCRIPTION: (	Describe	e to the depth need	ed to docu	ıment the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix		Redox Features					
inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0 - 20				-			Floric	Sla
_	-	-	-				+	
						-	-	
		1				-11	+	
ype: C=Co	oncentration, D=Depl	etion, R	л M=Reduced Matrix,	CS=Cove	red or Co	ated Sand G	Grains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
YDRIC SOI	IL INDICATORS						INDICATORS	FOR PROBLEMATIC HYDRIC SOILS
stosol or H	istel (A1)		Alaska Gleye	d (A13) _			Alaska Color	Change (TA4)⁴
stic Epiped	lon (A2)		Alaska Redo	(A14)			Alaska Alpine	Swales (TA5)
ack Histic (	A3)		Alaska Gleye	d Pores (	A15)		Alaska Redox	with 2.5Y Hue
ydrogen Su	ılfide (A4)						Alaska Gleyed Layer	without 5Y Hue or Redder Underlying
hick Dark S	urface (A12)						Other (Explain	ı in Notes)
One indicato	or of hydrophytic vege	etation, c	one primary indicato	r of wetlar	nd hydrolo	gy, and an		ape position must be present unless
	oroblematic. of color change in No	otes.				10		
estrictive La	ayer (if present): Typ	e: <i>V</i>	ione	Depth (in	ches):	14		
ydric Soil F	Present (Y/N):	Y						
lotoni	Present (Y/N):							
lotoni								
lotoni	Present (Y/N):						-	
otes:	1125 04	W					-	
otes:		W		sufficient)	S	ECONDAR	Y INDICATORS (2	2 or more required)
YDROLOG	1125 04	TORS (a			V	Vater-staine	d	Stunted or Stressed
YDROLOG urface Wate	Y PRIMARY INDICA	TORS (a	any one indicator is	6)	V	Vater-staine eaves (B9)	d	Stunted or Stressed Plants (D1)
YDROLOG urface Wate	Y PRIMARY INDICA	TORS (a	any one indicator is rface Soil Cracks (E	6)	gery C	Vater-staine eaves (B9) Orainage Pa	tterns (B10)	Stunted or Stressed Plants (D1)
IYDROLOG Turface Water T	Y PRIMARY INDICA er (A1)  Table (A2)	Su Inc. (B)	any one indicator is  rface Soil Cracks (E  indation Visible on A  7) Vegetated	6)	gery C	Vater-staine eaves (B9) Prainage Pat Oxidized Rhi	d tterns (B10)	Stunted or Stressed Plants (D1)
YDROLOG urface Water igh Water T	Y PRIMARY INDICA er (A1) X fable (A2) X	TORS (a	any one indicator is  rface Soil Cracks (E  indation Visible on A  7) Vegetated ncave Surface (B8)	6)	gery C	Vater-staine eaves (B9) Orainage Pa	tterns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
YDROLOG urface Water ligh Water T aturation (A	Y PRIMARY INDICA er (A1)  Table (A2)	TORS (a Su Int (B) Co	any one indicator is  rface Soil Cracks (E  indation Visible on A  7) Vegetated incave Surface (B8)  irl Deposits (B15)	6)	gery C	Vater-staine eaves (B9) Orainage Par Oxidized Rhi Living Roots Presence of	tterns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
WDROLOG urface Water ligh Water T aturation (A	Y PRIMARY INDICA er (A1) X fable (A2) X	TORS (a	any one indicator is  rface Soil Cracks (E  Indation Visible on A  7) V  arsely Vegetated ncave Surface (B8)  Irl Deposits (B15)  drogen Sulfide	6)	gery C	Vater-staine leaves (B9) Orainage Pat Oxidized Rhi living Roots Presence of Yon (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Intes:  IYDROLOG  Furface Water  Igh Water T  Faturation (A  Water Marks  Fediment De	Y PRIMARY INDICA er (A1)  fable (A2)  (B1)  posits (B2)	Su Int. (B' Sp Co Ma	any one indicator is  rface Soil Cracks (E indation Visible on A 7)	6)	gery C	Vater-staine leaves (B9) Orainage Pat Oxidized Rhi living Roots Presence of Yon (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Intes:  IYDROLOG  Furface Water  Igh Water T  Faturation (A  Water Marks  Fediment De	Y PRIMARY INDICA er (A1)  Table (A2)  (B1)	Su Int. (B' Sp Co Ma	any one indicator is  rface Soil Cracks (E indation Visible on A 7)	6)	gery C	Vater-staine eaves (B9) Drainage Pat Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
YDROLOG  urface Water  digh Water T  aturation (A  water Marks  ediment De	Y PRIMARY INDICA er (A1)  fable (A2)  (B1)  posits (B2)	Su Int. (B) Sp Co Ma	any one indicator is  rface Soil Cracks (E indation Visible on A 7)	6)	gery C	Vater-staine eaves (B9) Drainage Pat Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
YDROLOG urface Water igh Water T aturation (A /ater Marks ediment De rift Deposits	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  Crust (B4)	Su Int. (B) Sp Co Ma	any one indicator is  rface Soil Cracks (E  Indation Visible on A  7) V  arsely Vegetated ncave Surface (B8)  Irl Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)	6)	gery C	Vater-staine eaves (B9) Drainage Pat Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
YDROLOG urface Water igh Water T aturation (A //ater Marks ediment De rift Deposits	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)	Su Int. (B) Sp Co Ma	any one indicator is  rface Soil Cracks (E  Indation Visible on A  7) V  arsely Vegetated ncave Surface (B8)  Irl Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)	6)	gery C	Vater-staine eaves (B9) Drainage Pat Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
yDROLOG urface Water igh Water T aturation (A /ater Marks ediment De rift Deposits	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  Crust (B4)	Su Int. (B) Sp Co Ma	any one indicator is  rface Soil Cracks (E indation Visible on A 7)	6)	gery E	Vater-staine eaves (B9) Drainage Pal Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits Iotes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Intes:  IYDROLOG  Furface Water  Igh Water Traduration (A  Water Marks  Fediment De  Fift Deposits  Igal Mat or (Control Deposits)  Uniface Water  Uniface Water	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  crust (B4)  G(B5)	Su Int. (B) Sp Co Ma	any one indicator is  rface Soil Cracks (E  Indation Visible on A  7) V  arsely Vegetated ncave Surface (B8)  Irl Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)	6)	gery E	Vater-staine eaves (B9) Drainage Pal Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits Iotes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
IVDROLOG Surface Water Sigh Water T Saturation (A Vater Marks Sediment De Drift Deposits Sulgal Mat or (Con Deposits Surface Water Vater Table II Saturation Pr	Y PRIMARY INDICA  er (A1)  Table (A2)  (B1)  posits (B2)  crust (B4)  er Present (Y/N):	Su Int. (B) Sp Co Ma	any one indicator is  rface Soil Cracks (E  Indation Visible on A  7)	6)	gery E	Vater-staine eaves (B9) Drainage Pal Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits Iotes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
yDROLOG urface Water igh Water T aturation (A /ater Marks ediment De rift Deposits urface Water /ater Table I aturation Pr includes cap	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  crust (B4)  er Present (Y/N):  Present (Y/N):	TORS (a Su Int. (B) Sp Co Ma Hy Od Dn Wa	any one indicator is  rface Soil Cracks (E  Indation Visible on A  7)  arsely Vegetated ncave Surface (B8)  Ind Deposits (B15)  drogen Sulfide for (C1)  y-Season ater Table (C2)  ner (Explain in Note  Depth (in): a ja (	6)	gery E	Vater-staine eaves (B9) Drainage Pal Dxidized Rhi iving Roots Presence of ron (C4) Salt Deposits Iotes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         ○         Sapling (<5 dbh, <6m tall)         ○         Tall shrub (2-6m)         □         Short shrub (0.5-2m)         ○           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover 575% Scattered or Peripheral Cover 64.
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) X One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches_X_ Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) X Moderately Abundant (25-50% of surface) Low Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) X Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
Soil Variables  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sap
Soil Factors (P): Soil Lacking Histosol:Fibric_A Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Outlet
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Inlet/Intermittent Outlet
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated   Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated   Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded   Evidence of Sedimentation (P): No Evidence Observed   Sediment Observed on Wetland Substrate   Fluvaquent Soils Sediment Created   Microrelief of Wetland Surface (P): Absent   Poorly Developed (6in.)   Well Developed (6-18in.)   Pronounced (>18in.)
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated   Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated   Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded   Evidence of Sedimentation (P): No Evidence Observed   Sediment Observed on Wetland Substrate   Fluvaquent Soils Sediment Created   Microrelief of Wetland Surface (P): Absent   Poorly Developed (6in.)   Well Developed (6-18in.)   Pronounced (>18in.)
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Inlet/Intermittent Outlet       Perennial Inlet/Perennial Outlet         Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded         Evidence of Sedimentation (P): No Evidence Observed       ✓ Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment Created         Microrelief of Wetland Surface (P): Absent       Poorly Developed (6in.)       Well Developed (6-18in.)       Pronounced (>18in.)         Frequency of Overbank Flooding (P): No Overbank Flooding       Return Interval 1-2 yrs       Return Interval 2-5 yrs         Return Interval 2-5 yrs         Degree of Outlet Restriction (P): No Outflow       Restricted Outflow       Munication (P): No Outflow       Restricted Outflow       Munication (P): No Outflow
Inlet/Intermittent Outlet
Inlet/Intermittent Outlet
Inlet/Intermittent Outlet

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

ea	iture	Field Target: 098 Date: 07-01-14
		tems not checked, please provide detailed explanation in the notes section of data form.
	1.	Site Description
		☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
	2.	Vegetation
		At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
	3.	Soil
		Soil profile is complete?  Appropriate hydric soil indicators are marked?
	4.	Hydrology
		Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
	5.	Functions and Values
		Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6.	Field Logbook
		Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
	7.	Maps
		Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	Р	h	o	t	n	S

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe meade	X ZayMeall 7-1-14
Wetland Scientist (print)	Signature / Date
	1 day
X Joe Christophe	X 1/1/14
Field Crew Chief (print)	Signature / Date

# Vegetation Classification Data Form

Site Description		To WY				
Date:	Project Name & # Alaska LNG 2622			Field Target:		
Investigators:	istopher, 2	e Mead	le	Feature ID: W 60 H T 0 3 6		
Latitude: 62° 51' 46, 92	atitude: Longitude:			Datum: WGS84		
	Logbook #: 003 Logbook P			Picture #: $\mathcal{P}_{-}$ $\mathcal{N}$ , $\mathcal{S}$		
<b>Location Description</b>						
SE of F	T 098 -	ni IIsi	de			
Common Species Ob	served (Scientific	Name)	Betula no	edalaskana		
Gymnocarpiv	m dryopt	evis	Viburn	um edule		
Picea glo	iuca		Cornus canidensis			
Veratrum V			Calamagrostis canadensis			
Streptopus	umplexifoli	W	Dryopten's expans.			
Percent Cover of Domi	nant Structure Lev	el: 40 %	forres	t		
Habitat Description:	Y L					
upland m	nixed form	est, 101	N open &	shrub understory		
Alaska Vegetation Cla	assification: Leve	el I, Level II,	Level III			
IC2	1	IC2	,			
Notes:						
10-15010 5	1ppe					
	10					

Field Crew Chief: Field Scientist/Technician Zoe Meade

# Vegetation Classification Data Form

Lavel I	Level II	Level III
l. Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B Broadlesf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C. Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland
II Scrub	A Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland
	B Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C. Low scrub	(1) Closed low scrub (2) Open low scrub
	D Owarf scrub	(1) Dryas dwarf scrub (2) Ericaceous dwarf scrub (3) Willow dwarf scrub
III. Herbeceous	A Graminoid herbaceous	Dry graminoid herbaceous     Mesic graminoid herbaceous     Wet graminoid herbaceous     (emergent)
	8 Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C Bryoid herbaceous	(1) Mosses (2) Lichens
	D Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marine aquatic herbaceous

Des	criptions of levels I, II, III, and IV follow the classification table
la.	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more
1 b	Trees over 3 meters (10 ft) tall are absent or nearly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters (10 ft) tall may be present and abundant
i Fo	vrest
20	Over 75 percent of tree cover contributed by needleleaf (conifer) species
2b	Less than 75 percent of tree cover contributed by needleleaf (conifer) species
3a_	Tree canopy of 90-100 percent cover
3b.	Tree canopy of 25-59 percent cover LA 2 Open needleteaf fores
3с	Tree canopy of 10-24 percent cover LA.3 Needleleef woodland
4a	Over 75 percent of tree cover contributed by broadleaf species
4b	Broadleef or needleleef species contribute 25 to 75 percent of the tree cover
5a	Tree canopy of 60-100 percent cover I.B.1 Closed broadleaf forest
5b.	Tree canopy of 25-59 percent cover
5c	Tree canopy of 10-24 percent cover
ва.	Tree canopy of 60-100 percent cover I.C 1 Closed mixed forest
6b.	Tree canopy of 25-59 percent coverI.C.2 Open mixed forest
6c	Tree canopy of 10-24 percent cover
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 till tall).
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover) 15

II. Sc	rub
8a	Vegetation with at least 10 percent cover of dwarf trees
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees
9a	Dwarf tree canopy of 60-100 percent cover
9b	Dwarf tree canopy of 25-59 percent cover II.A.2 Open dwarf tree scrub
9c	Dwarf tree canopy of 10-24 percent cover II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall
10b,	Shrubs less than 1.5 meters (5ft) tall
11 a	Shrub canopy cover greater than 75 percent
11 b	Shrub canopy cover of 25-74 percent     B 2 Open tall scrub
12a	Shrubs 20 centimeters to 1.5 meters tall
12b	Shrubs under 20 centimeters in height
13a	Shrub canopy cover greater than 75 percent II C I Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present
14a	Dryas species dominant in the dwarf shrub layer
14b	Ericaceous species dominant in the dwarf shrub layer
14c.	Willow species dominant in the dwarf scrub layer
High	lerbaceous
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water

16a	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant 18
17a	Grasslands of well-drained dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by E/ymus spp., Festuce spp., and Deschampsia spp
17b	On moist sites, but usually not with standing water. Usually dominated by Calemagrostis spp.  Cerex spp. or Enophorum spp; tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet fundra bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails) III.8 Forb herbaceous 19
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b	On moist sites but without standing water, mostly within forested areas
19c	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses
20Ы	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water squatic herbaceous
210	Vegetation submarged or floating in salt water . III D.3 Marine aquatic herbaceous

#### Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Feature ID: <u>W601+T036</u> Field Target: <u>098</u> Date: <u>07-01-14</u>
For all items not checked, please provide detailed explanation in the notes section of data form
4. Canaral Information
1. General Information
☐ Location data recorded?
Photo taken and photo number recorded?
2. Location Description
∠ Location of site recorded with enough detail to help relocate?
3. Common Species
Scientific name of common species recorded?
☐ Percent cover of dominant structure level noted?
4. Habitat Description
☑ Habitat described?
5. Classification
☑ All three levels of classification recorded?
6. Field Log Book
☐ Field form entries consistent with log book?
☑ Logbook clearly identifies the Field Target ID and Feature ID?
X Zoe meade X Zalle 7-1-14
Field Technician (print) Signature
X 02 Chustoh X 1 7/1/14
Field Crew Chief (print) Signature

SITE DESCRIPTION	2000 ' study
Survey Type: Centerline Access Road (explain) Other	(explain) X Field Target: 099 Map #: 68 Map Date: 05-27
Date: 07-02-14 Project Name & No.: Alask	a LNG 26221306 Feature Id: W60HT037
Investigators: Joe Christopher, Zoe Meade, Abi	gail Fisher Team No.: W60
State: Alaska Region: Alaska	Milepost: 617,9
Latitude: 62° 51' 47. 01"	gitude:  49° 52' 27. 05" Datum: WG\$84
Logbook No.: 003 Logbook Page No.: 28	Picture No.: P_N,S, pit, plug
SITE PARAMETERS	
Subregion: in terior	Landform (hillslope, terrace, hummocks, etc.):
Slope (%): 0 - 2	Local relief (concave, convex, none): COn Cave
Pre-mapped Alaska LNG/NWI classification: PEM 55 1/B	Soil Map Unit Name:
Are climatic/hydrologic conditions on the site typical for this time of year Yes X No (if no explain in Notes)	? Are "Normal Circumstances" present: Yes X No (If no, explain in Notes.)
Are Vegetation, Soil, or Hydrology Significantly Distu	
Are Vegetation, Soil, or Hydrology Naturally Problem	
SUMMARY OF FINDINGS	
Hydrophytic Vegetation Present? YesX No	Is the Sampled Area within a Wetland? YesX No
Hydric Soil Present? Yes_X No	Wetland Type: PSS 1/EM18
Wetland Hydrology Present? YesX No	Alaska Vegetation Classification (Viereck): IFB1, III. A \$ 2
	erline, Length of feature, Distances from Centerline, Photo Locations, and Survey
corridor. Site statch on	pg. 28 in logbook 003
	19 20 111 129 000 1 000
1.47	
27 10 10 10 10 10 10 10 10 10 10 10 10 10	N/2
2.,	

VEGETATION (use scientific names of plants	3)			
Tree Stratum (Plot sizes: 26 )  1. 2.	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3 (A)  Total Number of Dominant Species Across All Strata: 3 (B)  % Dominant Species that are OBL, FACW, or FAC: 100 (A)
3.				Parker I de la
4. Table	: 0			Prevalence Index worksheet:
Total Cover 50% of total cover		10/ aftatal ac.		Total % Cover of: Multiply by:  OBL species: X 1 = 7
Sapling/Shrub Stratum ( 26')	Absolute % Cover	% of total cov Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. Salex barclayii	65	Y	FAC	UPL speciesOX 5 =O
2. Picea glauca	12		FACU	Column Totals: 121 (A) 351 (B)
3.				PI = B/A = 2.90
4.				
5.				
6.				
7.				
8. /				
9.				
Total Cover				
50% of total cover	: <u>33.5</u> 20	% of total cov	er: 13.4	
VEGETATION (use scientific names of plants	3)	- 0.5		alling a second and the second
Herb Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%
1. Comarum palustre	7	, ,	OBL	Prevalence Index is ≤ 3.0
2. Equisetum arvense	12	У	FAC	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Calamagrostis Canadensis	35	γ.	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. viola palustris	TR		FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless

Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Comarum palustre	7		OBL	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. Equisetum arvense	12	Y	FAC	Notes)
3. Calamagrostis Canadensis	35	Y +	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. viola palustris	TR		FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				No.
7,				5 % Bare Ground
8.				_N A _ % Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water
Total Cover 50% of total cover		l 0% of total cov	ver:_10. 8	Hydrophytic Vegetation Present (Y/N):  Notes: (If observed, list morphological adaptations below):

SOIL		4	Date 7 - 2 - 14 Fe	eature II	D W60	HT037		Soll Pit Required (Y/N)
SOIL PROFIL	E DESCRIPTION: (D	escribe	to the depth needed	d to doc	ument the	indicator or	confirm the absenc	e of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	1%	Color (moist)	1 %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture,	Notes
0-9		-		-			Fibric	organics
9-20	10 YR 2/2						silt loam	wood/root fragments
	10 /1 - / -						011(100111	VVVVIII TI AT
					t			
					1			
<sup>1</sup> Type: C=Con	centration, D=Deplet	tion, RM	1=Reduced Matrix, (	CS=Cove	ered or Co	oated Sand G	Grains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
HYDRIC SOIL				100				FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
Histosol or His	tel (A1)		Alaska Gleyed	(A13) _			Alaska Color C	hange (TA4) <sup>4</sup>
	n (A2)X		Alaska Redox				Table 1	Swales (TA5)
	3)		Alaska Gleyed					with 2.5Y Hue
	ide (A4)				`			without 5Y Hue or Redder Underlying
		_					Layer	
Thick Dark Sur			100000000			6.200	Other (Explain	
disturbed or pr		ation, o	ne primary indicator	or wetta	na nyarok	ogy, and an a	appropriate landsca	pe position must be present unless
<sup>4</sup> Give details o	f color change in Not	es.				A + 17 =		
Restrictive Lay	er (if present): Type	-		Depth (ir	nches):	MA	-	
Hydric Soil Pr	resent (Y/N):	Y						
Notes:								
HYDROLOGY	PRIMARY INDICAT	ORS (a	ny one indicator is s	ufficient	) !	SECONDAR	Y INDICATORS (2	or more required)
Surface Water	(A1)	Sur	face Soil Cracks (B6	6)		Water-staine Leaves (B9)		Stunted or Stressed Plants (D1)
High Water Ta	ble (A2)X	Inui (B7	ndation Visible on Ad	erial Ima	igery [	Drainage Pat	terns (B10)	Geomorphic Position (D2)
Saturation (A3)	) <u>X</u>		arsely Vegetated ncave Surface (B8) _			Oxidized Rhi: Living Roots	zospheres along (C3)	Shallow Aquitard (D3)
Water Marks (I	B1)	Mai	rl Deposits (B15)			Presence of I Iron (C4)	Reduced	Microtopographic Relief (D4)
Sediment Depo	osits (B2)	Hyd Odd	drogen Sulfide or (C1)			Salt Deposits	i (C5)	FAC-Neutral Test (D5)
Drift Deposits (	(B3)	Dry	-Season ter Table (C2)		1	Notes:	1	<b>*</b>
Algal Mat or Cr	rust (B4)	111-	er (Explain in Notes		7			
Iron Deposits (	B5)							
		-						
Surface Water	Present (Y/N): N		Depth (in): N/A					V
Water Table Pr	resent (Y/N):		Depth (in):		We	etland Hydro	ology Present (Y/N	):/
Saturation Pres			Depth (in):					
Notes:								

VEGETATION VARIABLES P= Piot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P):         Tree (>5 dbh, >6m tall)         ○         Sapling (<5 dbh, <6m tall)         2         Tall shrub (2-6m)         ○         Short shrub (0.5-2m)         ○           Dwarf shrub (<0.5m)
Number of Wetland Types (M): 2 Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even X
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A 25% Scattered or Peripheral Cover 26-75% Scattered Or P
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A X
Cover Distribution of Dominant Layer (P):       No Veg       Solitary, Scattered Stems       1 or More Large Patches; Parts of Site         OpenX       Small Scattered Patches       Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface)X
Vegetative Interspersion (P): Low (large patches, concentric rings) X Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty_X Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed X Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): Absent X Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding X Return Interval 1-2 yrs Return Interval 2-5 yrsReturn Interval >5 yrs
Degree of Outlet Restriction (P): No Outflow X Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits_X  Glacial Till/Not Permeable
Books Tonographic Condinat (88). Low Oradiout (2001) Y Llink Condinat (2001)
Basin Topographic Gradient (M):       Low Gradient (<2%)
Evidence of Seeps and Springs (P): No Seeps or Springs_X Seeps Observed Intermittent Spring Perennial Spring
Evidence of Seeps and Springs (P): No Seeps or Springs X Seeps Observed Intermittent Spring Perennial Spring  LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated X Wetlands within 400m, Not Connected Only Connected Below
Evidence of Seeps and Springs (P): No Seeps or Springs_X Seeps Observed Intermittent Spring Perennial Spring  LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland IsolatedX Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown
LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated X Wetlands within 400m, Not Connected Downstream Unknown  Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space) X

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: <u>W60HT037</u> Field Target: <u>099</u> Date: <u>07-02-14</u>
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	✓ Soil profile is complete?  ✓ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>☑ Appropriate hydrology indicators are marked?</li><li>☑ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	✓ Wetland boundaries have been corrected if necessary? ✓ Maps are initialed and dated?

#### 8. Photos

- ☑ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	Xyoemeade	07-02-14
Wetland Scientist (print)	Signature / Date	
X \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	$\sqrt{\mathbf{x}}$	-11/4
Field Crew Chief (print)	Signature / Date	11411

SITE DESCRIPTION	3/0/					The second second
Survey Type: Centerline Acce	ss Road (explain)	Other (expl	ain)	Field Targ	et: <u>                                    </u>	Map #: <u>70</u> Map Date: <u>5/27/14</u>
Date: 7 /2 / 14	Project Name & No.:	Alaska LNG	26221306	-	Feature Id:	W60HT038
Investigators: Joe Christa	pher, Zoe Mea	de, Allo	igail F	ioher		Team No.: W60
State: Alaska	Region: Alaska		Milepost: 6			
Latitude: 62° 50 ' 26.87'		Longitude	:149°53	21.0	12"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	29	Picture No.:	P_ N,	s, pit,	Plug
SITE PARAMETERS		- 1				,
Subregion: Sulch Cont	101		Landform (hill	slope, terrac	e, hummocks	s, etc.): Deprission
Slope (%): 0 - 3	, ,		Local relief (c	oncave, con	/ex, none): /	ancoul
Pre-mapped Alaska LNG/NWI classifica	tion: PEM1/S	SIB	Soil Map Unit		2/0	ov jed bet
Are climatic/hydrologic conditions on the		of year?			stances" pre	
Are Vegetation, Soil, or Hyd		lv Disturbed?	Yes	`	(If no, exp lain in Notes)	plain in Notes.)
Are Vegetation, Soil, or Hyd					lain in Notes	
SUMMARY OF FINDINGS				_ ( ) 00, 0		
Hydrophytic Vegetation Present? Yes_	No	_ ls	the Sampled A	rea within a	Wetland?	Yes No
Hydric Soil Present? Yes_	No	_ w	etland Type:	PEM1	1881	8 F
Wetland Hydrology Present? Yes_	No_	— Ala	aska Vegetation	Classification	on (Viereck):	IIA Š. II C 2
Notes and Site Sketch: Please include D	irectional & North Arrow	, Centerline,	Length of featur	e, Distances	from Center	line, Photo Locations, and Survey
corridor,	Sul	2 /	MJO.	99		
		*				

5.01	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 50')	% Cover	Species?	Status	No. of Dominant Species that are OBL, FACW, or FAC:
1.		(Y/N)		Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC: 100%
3.				
4.	-			Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover		% of total cov	er:_ O	OBL species: 156 x1=156
Sapling/Shrub Stratum ( 50)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 3 X 2 = 6  FAC species 3 X 3 = 69  FACU species 3 X 4 = 53
1. Betula nana	15	Y	FAC	UPL species X 5 =
2. Myrica gale	35	Y	OBL	Column Totals: 197 (A) 285 (B)
3. Dasaphora fruticosa	4		FAC	PI = B/A = 1.45
4. Picea glauca	8		FACU	
5. Vaccinium oxycoccus	1		OBL	
6. Spirea Stevenii	5		FACU	
7. Andromeda polifolia	TR		FACW	
				1
8.		1		
9.	6			
9. Total Cover 50% of total cover	34 20	0% of total cov	ver: <u>13.6</u>	
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants	34 20	Dominant Species?	rer: 3.6 Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 50' )	34 20 3) Absolute	Dominant	Indicator Status	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 50' )  1. Equisety marvense	Absolute % Cover	Dominant Species?	Indicator	Dominance Test is > 50%
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 50' )  1. Equisety m arvense 2. Carex aquatiiis	3-1 20  Absolute  Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (50')  1. Equisety marvense 2. Carex aquatiiis 3. Carex microglochin	34 20 Absolute % Cover	Dominant Species?	Indicator Status FAC OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 50' )  1. Equisetym arvense 2. Carex aquatiiis 3. Carex microglochin 4. Pedicularis labradorica	Absolute % Cover 2 4 0 8 0 2	Dominant Species?	Indicator Status FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
9.  Total Cover 50% of total cover  VEGETATION (use scientific names of plants Herb Stratum (50')  1. Equisety marvense 2. Carex aquatilis 3. Carex microglochin 4. Pedicularis labradorica 5. Comarum palustre	Absolute % Cover 2 4 0 8 0	Dominant Species?	Indicator Status  FAC  OBL  OBL  FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover  VEGETATION (use scientific names of plants Herb Stratum (50')  1. Equisetum arvense 2. Carex aquatilis 3. Carex microglochin 4. Pedicularis labradorica 5. Comarum palustre 6. Rubus Chamaemorous	Absolute % Cover 2 4 0 8 0 2	Dominant Species?	Indicator Status  FAC  OBL  OBL  FACW  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover  VEGETATION (use scientific names of plants Herb Stratum (50')  1. Equisety marvense 2. Carex aquatilis 3. Carex microglochin 4. Pedicularis labradorica 5. Comarum palustre 6. Rubus chamaemorous 7. Trientalis europaea	Absolute % Cover 2 4 0 8 0 2 1	Dominant Species?	Indicator Status  FAC  OBL  OBL  FACW  OBL  FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cover 50% of total cover  VEGETATION (use scientific names of plants Herb Stratum (50')  1. Equisetum arvense 2. Carex aquatilis 3. Carex microglochin 4. Pedicularis labradorica 5. Comarum palustre 6. Rubus Chamaemorous 7. Trientalis europaea 8. Drosa rotundifolia	34 20 Absolute % Cover 2 40 80 2 1 TR	Dominant Species?	Indicator Status  FAC  OBL  OBL  FACW  OBL  FACW  FACW  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes
Total Cover 50% of total cover  VEGETATION (use scientific names of plants Herb Stratum (50')  1. Equisetum arvense 2. Carex aquatilis 3. Carex microglochin 4. Pedicularis labradorica 5. Comarum palustre 6. Rubus chamaemorous 7. Trientalis europaea 8. Drosa rotundifolia 9. Rubus articus	34 20 Absolute % Cover 2 40 80 2 1 TR	Dominant Species?	Indicator Status  FAC  OBL  OBL  FACW  OBL  FACW  FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes  % Cover of Water
Total Cover 50% of total cover  VEGETATION (use scientific names of plants Herb Stratum (50')  1. Equisetum arvense 2. Carex aquatilis 3. Carex microglochin 4. Pedicularis labradorica 5. Comarum palustre 6. Rubus Chamaemorous 7. Trientalis europaea 8. Drosa rotundifolia	34 20 3) Absolute % Cover 2 40 80 2 1 TR TR Z	Dominant Species?	Indicator Status  FAC  OBL  OBL  FACW  OBL  FACW  FACW  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes

HYDRIC SOIL I Histosol or Histo Histic Epipedon Black Histic (A3 Hydrogen Sulfic Thick Dark Surf One indicator of disturbed or pro	indicators  el (A1)/  in (A2)  de (A4)  face (A12)	% etion, RM=	Redox Features Color (moist)		INDICATORS	Notes  Organics  PL=Pore Lining, M=Matrix.  FOR PROBLEMATIC HYDRIC SOILS		
Type: C=Conc HYDRIC SOIL I Histosol or Hister Histic Epipedon Black Histic (A3 Hydrogen Sulfic Thick Dark Surf One indicator of isturbed of pro-	centration, D=Deple INDICATORS rel (A1) n (A2) de (A4) face (A12)	etion, RM=	Reduced Matrix, CS=Covered  Alaska Gleyed (A13)  Alaska Redox (A14)	or Coated Sand G	Fibric Fibric  Fibric  INDICATORS	organics  PL=Pore Lining, M=Matrix.  FOR PROBLEMATIC HYDRIC SOILS		
Type: C=Conc IYDRIC SOIL I listosol or Histe listic Epipedon lack Histic (A3 lydrogen Sulfic hick Dark Surf One indicator pro	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)	or Coated Sand G	irains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix. FOR PROBLEMATIC HYDRIC SOILS		
ydric soil i istosol or Histo istic Epipedon lack Histic (A3 ydrogen Sulfic hick Dark Surf One indicator of isturbed or pro-	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)		irains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix. FOR PROBLEMATIC HYDRIC SOILS		
ydric soil i istosol or Histo istic Epipedon lack Histic (A3 ydrogen Sulfic nick Dark Surf One indicator of sturbed or pro-	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)		INDICATORS	FOR PROBLEMATIC HYDRIC SOILS		
ydric soil i istosol or Histo istic Epipedon lack Histic (A3 ydrogen Sulfic nick Dark Surf One indicator of sturbed or pro-	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)		INDICATORS	FOR PROBLEMATIC HYDRIC SOILS		
ydric soil i istosol or Histo istic Epipedon lack Histic (A3 ydrogen Sulfic nick Dark Surf One indicator of sturbed or pro-	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)		INDICATORS	FOR PROBLEMATIC HYDRIC SOILS		
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yDRIC SOIL I istosol or Histo istic Epipedon lack Histic (A3 ydrogen Sulfic hick Dark Surf Dne indicator of sturbed or pro-	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)		INDICATORS	FOR PROBLEMATIC HYDRIC SOILS		
listosol or Histo listic Epipedon lack Histic (A3 lydrogen Sulfic hick Dark Surf One indicator of isturbed or of	indicators  el (A1)/  in (A2)  de (A4)  face (A12)		Alaska Gleyed (A13) Alaska Redox (A14)		INDICATORS	FOR PROBLEMATIC HYDRIC SOILS		
istosol or Histe istic Epipedon lack Histic (A3 ydrogen Sulfic hick Dark Surf One indicator of isturbed or pro-	de (A1)/ n (A2) de (A4) face (A12)		Alaska Redox (A14)					
istic Epipedon lack Histic (A3 ydrogen Sulfic hick Dark Surf One indicator of sturbed or pro	n (A2) B) de (A4) face (A12)		Alaska Redox (A14)		Alaska Color C	Phonon (TAA)4		
lack Histic (A3 ydrogen Sulfic hick Dark Surf One indicator of sturbed or pro	3) de (A4) face (A12)				Alaska Color Change (TA4) <sup>4</sup>			
ydrogen Sulfichick Dark Surf Dne indicator of Sturbed or pro	de (A4) face (A12)		Alaska Gleved Pores (A15)	<del></del>	Alaska Alpine Swales (TA5)			
hick Dark Surf One indicator of sturbed or pro	face (A12)			A15) Alaska Redox with 2.5Y Hue				
One indicator of isturbed or pro					Alaska Gleyed without 5Y Hue or Redder Underl			
One indicator of isturbed or pro					Cothor (Evaluis in Notes)			
isturbed or pro		tation one	primary indicator of wetland by	Other (Explain in Notes) hydrology, and an appropriate landscape position must be present unle				
Sive details of	oblematic.		printing moration of trouble in	and an e	ppropriate fariacot	apo position must be present unless		
	color change in No	ites.	Depth (inches	N N 10				
estrictive Laye	er (ii present). Typi	J	Deptif (inches	1. IN IN				
	dir Soll							
PROLOGY PRIMARY INDICATORS (any one indicator is sufficient)			SECONDAR	Y INDICATORS (2	? or more required)			
urface Water (	(A1)X		ce Soil Cracks (B6)	Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)		
igh Water Tab	ole (A2)X	(B7)	lation Visible on Aerial Imagery	Drainage Pat	terns (B10)	Geomorphic Position (D2)		
aturation (A3)	X		sely Vegetated ave Surface (B8)	Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)		
/ater Marks (B	31)	Marl	Deposits (B15)	Presence of F		Microtopographic Relief (D4)		
ediment Depor	sits (B2)	Hydro Odor	ogen Sulfide (C1)	Salt Deposits	(C5)	FAC-Neutral Test (D5)		
rift Deposits (E	33)		Season r Table (C2)	Notes:				
lgal Mat or Cru	ust (B4)	Other	(Explain in Notes):					
on Deposits (B	35)							
urface Water F	Present (V/N)	У р	anth (in):					
/ater Table Pre		,	epth (in):	Wetland Hydrology Present (Y/N):				
aturation Presenciudes capilla	ent (Y/N):		epth (in):			*		
lotes:		1010	tivitie, the of s	. 15				

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent       Emergent-Non-persistent
Percent Cover (P): Tree (>5 dbh, >6m tall)       O       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       O       Short shrub (0.5-2m)       6 O         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">— &lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional _X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perenn
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inl
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perenn
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outl
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet_ Perennial Inlet/Perennial Outlet_ Perennial Inlet/Perennial Outlet_ Perennial Inlet/Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/Intermittent Outlet_ Perennial Inlet/Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Inlet/No Outlet_ Perennial Outlet_ Perennial Outlet_ Perennial Outlet_ Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Outlet_ Perennial Outlet_ Perennial Outlet_ Perennial Outlet_ Perennial Inlet/No Outlet_ Perennial Outlet_ Perennial Inlet/No Ou
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W 60H 1038 Field Target: 100 Date: 7/2/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION				
Survey Type: Centerline Acces	ss Road (explain) Other	r (explain) X	Field Target: 100	Мар #: <u>69</u> Мар Date: <u>5/27/1</u> 4
Date: 7   2   1 4	Project Name & No.: Alaska	a LNG 26221306	Feature Id:	: W60 HT039
Investigators: Joe Christop	ner, Zoe Meade.	Abigail Fist	ver	Team No.: W60
State: Alaska	Region: Alaska	Milepost:	19.5 (LAS) -	1157-5 PANKS
Latitude: 62° 50' 24.91"	Long	gitude: 149° 53	19.85"	Datum: WGS84
Logbook No.: 003	Logbook Page No.: 29/30		P_ N, S, pi7, p	
SITE PARAMETERS				
Subregion: South Central		Landform (hill	lalana tamana humana lu	4-1: 1 ^11 ·
Slope (%): 7 - 10				s, etc.): hillstope
	tion: 1101 our		oncave, convex, none):	Convex
Pre-mapped Alaska LNG/NWI classificat  Are climatic/hydrologic conditions on the			Name: VA	
Yes_X No (if no expla	ain in Notes)	Yes_X	ormal Circumstances" pres No (If no, exp	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significantly Distu	rbed? No X	_(If yes, explain in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally Problem	atic? No_X	_ (If yes, explain in Notes.	.)
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes	NoX	Is the Sampled A	rea within a Wetland?	Yes NoX
Hydric Soil Present? Yes	No X	Wetland Type:	upland	
Wetland Hydrology Present? Yes	NoX	Alaska Vegetation	Classification (Viereck):	1003, II B2
Notes and Site Sketch: Please include Dicorridor.	irectional & North Arrow, Cente	rline, Length of featur	e, Distances from Center	line, Photo Locations, and Survey
	Sel properties of the second s	The 2	9 AN 139 / PAV 15/	

Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC  Total Number of Dominant Species Across All Strata:
1. Betula neoalaskana	65	Y	FACU	% Dominant Species that are OBL, FACW, or FAC:
2. Populus balsamifera	2		FACU	// Definition operate that are obej viterije.
3.				
4,				Prevalence Index worksheet:
Total Cove 50% of total cove		% of total cov	rer: 13,4	OBL species: X 1 = O
Sapling/Shrub Stratum ( 2 6 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. Alnus ssp.	35	Y	FAC	UPL species
2. Picea glauca	TR		FACU	Column Totals: 216 (A) 814 (B)
3. Ripes triste	5		FAC	PI = B/A = 3.77
4.				
5.				
6.				
7.				
8.				
9.				
Total Cove 50% of total cove		0% of total cov	/er:8	

Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Gymnocarpium dryopter	s 75	У	FACV	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. Dryopteris expansa	20		FACU	Notes)
3. Chamerion angustofolium			FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Calamagnostis Canadensis	10	U_	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Streptopus amplexifolius	3		FACU	disturbed or problematic.
6.				
7.				% Bare Ground
8.	/			% Cover of Wetland Bryophytes
9.		(F		O Total Cover of Bryophytes
10.				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover: 50% of total cover		0% of total cov	ver: 21.8	Notes: (If observed, list morphological adaptations below):

Depth inches)  O-2  O-2  O-2  O-2  O-2  O-2  O-3  O-3	13 100	Redox Features  Color (moist)		Texture Fibric Coarse san	Notes organic	
Type: C=Concentration, E	- 13 100			Fibric	organic	
O-2 2-20 IOYR 3  Type: C=Concentration, D	- 13 100	Color (moist) % Tyi		Fibric	organic	
Type: C=Concentration, E						
Type: C=Concentration, D						
IYDRIC SOIL INDICATOR	=Deplation PA					
IYDRIC SOIL INDICATOR	=Depletion PA					
IYDRIC SOIL INDICATOR	=Depletion RN					
IYDRIC SOIL INDICATOR	=Depletion PA					
IYDRIC SOIL INDICATOR	=Depletion RM					
IYDRIC SOIL INDICATOR	=Depletion RA					
		M=Reduced Matrix, CS=Covered	or Coated Sand G	rains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
listosol or Histel (A1)					OR PROBLEMATIC HYDRIC SOILS <sup>3</sup>	
	Histosol or Histel (A1) Alaska Gleyed (A			Alaska Color Ch	ange (TA4)⁴	
listic Epipedon (A2)	Alaska Redox (A14)		Alaska Alpine S	wales (TA5)		
Black Histic (A3)		Alaska Gleyed Pores (A15)		Alaska Redox with 2.5Y Hue		
lydrogen Sulfide (A4)					vithout 5Y Hue or Redder Underlying	
hick Dark Surface (A12) _				Other (Explain in	Notes)	
One indicator of hydrophyt		ne primary indicator of wetland hy	drology, and an a		e position must be present unless	
isturbed or problematic. Give details of color chang						
estrictive Layer (if present	Type:	Depth (inches	A 14 :(a			
			r-ii-jix			
lydric Soil Present (Y/N):	N					
lotes:	:01/ 1/					
lotes: NO 134 Eric	50113 00	server				
			-			
YDROLOGY PRIMARY I	DICATORS (a	iny one indicator is sufficient)	SECONDARY	INDICATORS (2 o	r more required)	
Surface Water (A1) Surface		face Soil Cracks (B6)	Water-stained		Stunted or Stressed	
	Inu	ndation Visible on Aerial Imagery				
igh Water Table (A2)	—— (B7		Drainage Patte	Geomorphic Position (D2)		
aturation (A3)	Spa	arsely Vegetated	Oxidized Rhizospheres along Shallow		Shallow Aquitard (D3)	
	Cor	ncave Surface (B8)	Living Roots (C3)			
/ater Marks (B1)	_ Mar	rl Deposits (B15)	Presence of Reduced Microtopographic Iron (C4) Relief (D4)		Microtopographic	
adianant Dananita (DO)	Hvo	drogen Sulfide	1			
ediment Deposits (B2)		or (C1)	Salt Deposits (	FAC-Neutral Test (D5)		
rift Deposits (B3)	Dry	-Season	Notes:			
	— vvai	ter Table (C2)	-			
lgal Mat or Crust (B4)	Oth	er (Explain in Notes):				
			-			
on Deposits (B5)			107			
on Deposits (B5)		Donath (in)				
	· N I	LIEDTO CIDA:		D 4 0//ND	N	
on Deposits (B5)	: N	Depth (in):	Wetland Hydrole	DOV Present (Y/N)		
		Depth (in): Depth (in):	Wetland Hydrole	ogy Present (Y/N):		
urface Water Present (Y/N/	N	Depth (in):	Wetland Hydrol	ogy Present (Y/N):		
urface Water Present (Y/N	N		Wetland Hydrok	ogy Present (Y/N):		
urface Water Present (Y/N) /ater Table Present (Y/N): aturation Present (Y/N): ncludes capillary fringe)	N	Depth (in): Depth (in):		ogy Present (Y/N):		
urface Water Present (Y/N) /ater Table Present (Y/N): aturation Present (Y/N): ncludes capillary fringe)	N	Depth (in):		ogy Present (Y/N):		

upland

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking     Forested-Deciduous-Needle-leaved     Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved     Scrub Shrub-Deciduous-Broad-leaved     Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved     Scrub Shrub-Evergreen-Needle-leaved     Emergent-Non-persistent     Emergent-Non-persistent       Persistent     Aquatic Bed
Percent Cover (P):         Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered Peripheral Cover 275% Scattered Peripheral Cover 26-75% Scattered Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High,(>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inl
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (F): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs Return Interval
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Aoid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Above Only Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use:         0-5% Rural
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check:  GPS Technician QA/QC check:  Page

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Fe	eatur	re ID: <u>W60H T 0 3 9</u> Field Target: 100 Date: 7/2/14
Fo	or all	items not checked, please provide detailed explanation in the notes section of data form.
	1.	Site Description
		<ul> <li>✓ Site description, site parameters and summary of findings are complete?</li> <li>✓ A detailed site sketch is included in logbook?</li> </ul>
	2.	Vegetation
		<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
	3.	Soil
		<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
	4.	Hydrology
		<ul> <li>✓ Appropriate hydrology indicators are marked?</li> <li>✓ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
	5.	Functions and Values
		✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6.	Field Logbook
		<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
	7.	Maps
		<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade X

Wetland Scientist (print)

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION						
Survey Type: Centerline Acces	ss Road (explain)	Other (expla	ain)	Field Targ	et: <u>/0 </u>	Map #: <u>\$2</u> Map Date: <u>5/27//4</u>
Date: 7/2/14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60 HT O 40
Investigators: Joe Chrislop	her, Zoe Meao	Le, Abro	gayle Fist	ner		Team No.: W 60
State: Alaska	Region: Alaska		Milepost: 6	20.3		
Latitude: 42,8324		Longitude	-149.	8980		Datum: WGS84
Logbook No.: 003	Logbook Page No.: 2	30	Picture No.:	P_N, 5,	pit, p	lug
SITE PARAMETERS					1	
Subregion: South Centra	(		Landform (hill	slope, terrac	e, hummocks	, etc.):
Slope (%): 0 - \			Local relief (co	oncave, conv	ex, none);	concave
Pre-mapped Alaska LNG/NWI classifica	tion: PEM1\$51B		Soil Map Unit		A	
Are climatic/hydrologic conditions on the Yes_X No (if no expl.	site typical for this time ( ain in Notes)	of year?			stances" pres	sent: lain in Notes.)
Are Vegetation, Soil, or Hyd		y Disturbed?			ain in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally P	roblematic?	No_X	_(If yes, exp	lain in Notes.	)
SUMMARY OF FINDINGS	1					
Hydrophytic Vegetation Present? Yes_	X No	Is t	he Sampled A	rea within a	Wetland?	Yes No
Hydric Soil Present? Yes	X No	_ We	tland Type:	PEM1/	SS 1 B	FOR
Wetland Hydrology Present? Yes	X No	— Ala	ska Vegetation	Classificatio	n (Viereck):	111 A 3 11 C 2
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow,	Centerline, L	ength of featur	e, Distances	from Centerl	ine, Photo Locations, and Survey
	Gel PA	530	``	÷		
4						

Total Cover: 105

50% of total cover: 52.5 20% of total cover: 21

9.

10.

VEGETATION (use scientific names of plan	ts)			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2 (A)
1,-				Total Number of Dominant Species Across All Strata: 2 (E % Dominant Species that are OBL, FACW, or FAC: 100 (A/
2.				W Dominant Species that are OBL, FACW, of FAC(A)
3.	-			
4.				Prevalence Index worksheet:
Total Cove	er:0		17.	Total % Cover of: Multiply by:
50% of total cove	er:020	% of total cov	er: <u> </u>	OBL species: 143 x 1 = 143
Sapling/Shrub Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 2
1. Myrica gale	45	Y	OBL	UPL species
2. Betula nana	5		FAC	Column Totals: 158 (A) 186 (B)
3. Dasiphora fruticosa	1		FAC	PI = B/A = 1 . 18
4. Andromeda polifolia	7年2		FACW	
5.				
6.				
7.				
8.		8.	4	
9.				
Total Cove	er: <u>26.5</u> 20	)% of total cov	rer: 10 .6	
VEGETATION (use scientific names of plan	_	r	1	Turk to the Market to the Mark
Herb Stratum( <u>26′</u> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:
1. Carex magellanica	20		OBL	Morphological Adaptations¹ (Provide supporting data in
2. Comarum palustre	5		OBL	Notes)
3. viola SSP.	TR		FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4 Trichophorum cespitos	um 70	Y	OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Trientalis arcticus	5		FAC	disturbed or problematic.
6. Equisetum fluviatile	3.		OBL	
	100	-		
	TR		FACW	% Bare Ground
7. Equisetum pratense 8. Cal can.	TR 2		FACW	% Bare Ground  N/A % Cover of Wetland Bryophytes  7.5 Total Cover of Bryophytes

Total Cover of Bryophytes

\_\_% Cover of Water

Notes: (If observed, list morphological adaptations below):

95

Hydrophytic Vegetation Present (Y/N):

Depth	Matrix Color (moist)	%	Redox Features  Color (moist)	to docur	nent the	indicator or c	confirm the absenc	e of indicators.)
(inches)		%						
	Color (moist)	76	Color (moist)	10/	<del>-</del> 1	1, 2	1	
0-22				%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
							Fibric	organics SAT.
							1	
Ir.ma. C=Conos	-tration D-Dank	the DA	Ded administration				2,	
110-		ation, Kiv	/I=Reduced Matrix, C	S=Covere	ed or Coa	ated Sand G		PL=Pore Lining, M=Matrix.
HYDRIC SOIL IN								FOR PROBLEMATIC HYDRIC SOILS
	(A1) <u>X</u>		Alaska Gleyed				Alaska Color C	
Histic Epipedon (			Alaska Redox					Swales (TA5)
Black Histic (A3)			Alaska Gleyed	Pores (A	15)		Alaska Redox v	
Hydrogen Sulfide	e (A4)						Alaska Gleyed Layer	without 5Y Hue or Redder Underlying
Thick Dark Surfac	ce (A12)						Other (Explain	in Notes)
One indicator of	hydrophytic vege	tation, or	ne primary indicator	of wetland	hydrolo	gy, and an a	ppropriate landsca	ape position must be present unless
disturbed or probl	lematic.							P P P
Restrictive Layer	(if present): Type	les.		enth (inc	nes).	NIA		
	· · · · · · · · · · · · · · · · · · ·			CP. C.		<del></del>		
Hydric Soil Pres	ent (Y/N):	Y						
	-							
Notes:								
1								
HYDROLOGY PE	RIMARY INDICAT	rors (a	ny one indicator is su	ufficient)	S	ECONDARY	/ INDICATORS (2	or more required)
Surface Water (A					3.0	Vater-stained		Stunted or Stressed
Sullace Mater (2	1)		face Soil Cracks (B6		—   Le	Leaves (B9)		Plants (D1) X
High Water Table	(A2) X		ndation Visible on Ae	rial Image	ery D	Drainage Patterns (B10)		Geomorphic Position (D2) X
		(B7) Spa	rsely Vegetated			Oxidized Rhizospheres along		
Saturation (A3) _	X	Con	icave Surface (B8) _		Li	iving Roots (	C3)	Shallow Aquitard (D3)
Nater Marks (B1)			Deposits (B15)			resence of R		Microtopographic
vater warts (D.,						on (C4)		Relief (D4) X
Sediment Deposit	ts (B2)	Hyd	rogen Sulfide		S	alt Deposits	(C5)	FAC-Neutral Test (D5)
		040	or (C1) -Season			lotes:	(00)	
Orift Deposits (B3	)	Wat	er Table (C2)		14	oles.		
Vaal Mat or Cruei	t (B4)				-			
Algai Mat or Grusi	(B4)	Othe	er (Explain in Notes):					
	)X							
ron Deposits (B5)					1	L'ETE		
ron Deposits (B5)			Depth (in): 2					N.
ron Deposits (B5) Surface Water Pre	esent (Y/N): Y				Wet	land Hydrold	D (V/A))	V
	<u> </u>		Depth (in):			and Hydron	ogy Present (Y/N)	:
Surface Water Pre	ent (Y/N):		^				ogy Present (Y/N)	:
Surface Water Pre	ent (Y/N):		Depth (in):				ogy Present (Y/N)	:

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) 53  Dwarf shrub (<0.5m) Short herb (<1m) Moss-Lichen Floating Submerged O
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       X       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sapric Histosol:
Soil Factors (P): Soil Lacking Histosol: Fibric Histosol: Hemic Histosol: Sapric Histosol:
HYDROLOGIC VARIABLES  No. 14 Colors (Dy. No. Interfed to the Control of the Color o
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Peren
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenni
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/No O
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenni
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/No O
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermi
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitte
Inlet/Outlet Class (P): No Inlet/Outlet

m

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID: <u>W00HT040</u> Field Target: 101 Date: 7/2/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☑ Site description, site parameters and summary of findings are complete? ☑ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> </ul>
	Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>☑ Appropriate hydrology indicators are marked?</li> <li>☑ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	✓ Wetland boundaries have been corrected if necessary? ✓ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zue Meade

X Splittle 7/2/14

Wetland Scientist (print)

Signature / Date

X July Christoph

X July Christoph

Signature / Date

SITE DESCRIPTION	THE PARTY OF THE P					
Survey Type: Centerline Acce	ss Road (explain) C	Other (expla	ain)	Field Targ	et: <u>\()</u>	Map #: <u>71</u> Map Date: <u>5/5</u> 7
Date: 7/2 / 14	Project Name & No.: A	laska LNG	26221306		Feature Id:	W60HT041
Investigators: 5 CM (150	pher ZMe	cole	AFIS	N.er		Team No.: W60
State: Alaska	Region: Alaska			521,4		
Latitude: 62" 49' 16.3	127	Longitude:	149 55	10.6	7"	Datum: WGS84
Logbook No.: 003		) \				Pit, Aug, N", S
SITE PARAMETERS	and the second					
Subregion: South central			Landform (hills	slope, terrac	e, hummocks	, etc.): Flat
Slope (%):			Local relief (co	oncave, conv	/ex, none): 〈	Tat
Pre-mapped Alaska LNG/NWI classifica	tion: PEMIF		Soil Map Unit	Name:		
Are climatic/hydrologic conditions on the YesX No (if no expl	site typical for this time of ain in Notes)	year?	Are "No Yes	rmal Circum No	stances" pres	sent: lain in Notes.)
Are Vegetation, Soil, or Hyd		Disturbed?	No_X		ain in Notes)	idii iir Notes.)
Are Vegetation, Soil, or Hyd	Irology Naturally Pro	blematic?	No_X	_ (If yes, exp	lain in Notes.	)
SUMMARY OF FINDINGS				3163	30	
Hydrophytic Vegetation Present? Yes_	No	_ ls t	he Sampled A	rea within a	Wetland?	Yes No
Hydric Soil Present? Yes_	Y- No	We	tland Type:	Peni	1551F	
Wetland Hydrology Present? Yes_	No	Alas	ska Vegetation	Classificatio	n (Viereck):	II (3, II 62 )
Notes and Site Sketch: Please include D	irectional & North Arrow, C					
corridor,	PAJL.				(	IIIA3,ICQ)

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1.				Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACVV, or FAC: 7000
3.				
4.				Prevalence Index worksheet:
Total Cove	Γ:	ul/ of total pay	or:	Total % Cover of: Multiply by:  OBL species:
Sapling/Shrub Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species
1. Betula nana	20	X	FAC	UPL species X 5 =
2. Empetrum nigrum	95		FAL	Column Totals: 150 (A) 241 (B)
3. Vaccinium oxycoccus	3		OBL	PI = B/A = \ . 6
4. Picea glauca	5		FACU	
5.				
6,				
7.				
8.				
9.				
Total Cove		)% of total cov	rer: 6.6	
VEGETATION (use scientific names of plan			- 77	Name of the last o
Herb Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Drosa rotundifolia	11		OBI	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data ii
	40.	X	OBL	Notes)
3. Friannoum vaginatum	7 /		FALINI	Problematic Hudrophytic Vagatation (Evaluin)

Herb Stratum(2 6 ')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Drosa rotundifolia	40.1	X	OBL	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Eriophorum vaginatum	3/		FAIN	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Pedicularis labradorica	1 1		FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Trichophorum cespitosum	601	X	OBI	disturbed or problematic.
6. Rubus Chamaemoro us	7 ,		FACEN	
7. Cornus Suecica	10 /	4	FAC	% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				
10.				SO % Cover of Water
Total Cover: 50% of total cover:	117 58.5 20	% of total cov	rer: <u>23,4</u>	Hydrophytic Vegetation Present (Y/N):  Notes: (If observed, list morphological adaptations below):

SOIL			Date 07/2					Soll Pit Required (Y/N)
SOIL PROFII	LE DESCRIPTION:	Describe	to the dep	th needed to docu	nent the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix		Redox Fe	eatures				
(inches)	Color (moist)	%	Color (mo	oist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
1-10							Fisher	Sylva St-d
de								
						N.		
			S					
1								
	ncentration, D=Depl	etion, RM	/I=Reduced	Matrix, CS=Cover	ed or Co	oated Sand G		: PL=Pore Lining, M=Matrix.
	L INDICATORS							FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)			(a Gleyed (A13)				Change (TA4) <sup>4</sup>
	on (A2)			ka Redox (A14)			Alaska Alpine	Swales (TA5)
Black Histic (A	43)		Alask	ka Gleyed Pores (A	15)			with 2.5Y Hue
Hydrogen Sul	lfide (A4)		= 17					without 5Y Hue or Redder Underlying
Thick Dark Su	urface (A12)						Other (Explain	in Notes)
		tation, o	ne primary	indicator of wetlan	hydrolo	ogy, and an a	appropriate landsc	ape position must be present unless
disturbed or p	roblematic.			303200		3),	ppropriate fariage	apo position must be present unless
Restrictive La	of color change in No yer (if present): Typ	otes.	1/13	Depth (inc	heel:	11		
	, (	-	-	Boptii (inc		7 11 1		
	V 1							
Hydric Soil P	resent (Y/N):							
	resent (Y/N):							
	resent (Y/N):							
	resent (Y/N):							
	Present (Y/N):							
Notes:	(	TORS (a	ny one indi	cator is sufficient)		BECONDAR	/ INDICATORS (2	or more required)
Notes:	PRIMARY INDICA							or more required)
Notes:	PRIMARY INDICA			cator is sufficient)	V	SECONDAR'  Vater-stained  Leaves (B9)	i	Stunted or Stressed
Notes:  HYDROLOGY  Surface Water	Y PRIMARY INDICA	Sur	face Soil C		— L	Water-stained Leaves (B9) _	1	Stunted or Stressed Plants (D1)
Notes:  HYDROLOGY  Surface Water  High Water Ta	r (A1)able (A2)	Sur Inu (B7	face Soil C ndation Visi	racks (B6) ible on Aerial Imag	U L	Vater-stained Leaves (B9) _ Orainage Patt	terns (B10)	Stunted or Stressed Plants (D1)
Notes:  HYDROLOGY  Surface Water  High Water Ta	r (A1)able (A2)	Sur Inu (B7 Spa	face Soil C	racks (B6) ible on Aerial Imag	- L	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz	terns (B10)	Stunted or Stressed Plants (D1)
Notes:  HYDROLOGY  Surface Water  High Water Ta	r (A1)able (A2)	Sur Inu (B7 Spa Cor	face Soil C ndation Visi ) arsely Vege ncave Surfa	racks (B6) ible on Aerial Imag tated ace (B8)	- L	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Notes:  HYDROLOGY  Surface Water  High Water Ta	r (A1)able (A2)	Sur Inu (B7 Spa Cor	face Soil C ndation Visi ) arsely Vege ncave Surfa	racks (B6) ible on Aerial Imag	V L	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3)  Water Marks (	r (A1)	Sur Inu (B7 Spa Cor Mai	face Soil C ndation Visi ) arsely Vege ncave Surfa rl Deposits	racks (B6) ible on Aerial Imag tated ace (B8) (B15)	— L F II	Water-stained Leaves (B9) _ Drainage Pate Dxidized Rhiz Living Roots ( Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep	r (A1)able (A2) B1)	Sur Inu (B7 Spa Cor Mai	face Soil C Indation Vision Indation Ind	racks (B6) ible on Aerial Imag tated ace (B8) (B15)	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	r (A1)	Sur Inu (B7 Spa Cor Mai Hyc	face Soil C Indation Visi The property of the control of the contr	racks (B6) ible on Aerial Imag stated ace (B8) (B15)	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Pate Dxidized Rhiz Living Roots ( Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits	r (A1)	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa	face Soil C Indation Vision  arsely Vege Incave Surfa I Deposits I Deposits I Organ Sulfa I Corgan Sulfa I Corg	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	r (A1)able (A2) B1)	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa	face Soil C Indation Visi The property of the control of the contr	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	PRIMARY INDICA  (A1)  able (A2)  (B1)  posits (B2)  (B3)  crust (B4)	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa	face Soil C Indation Vision  arsely Vege Incave Surfa I Deposits I Deposits I Organ Sulfa I Corgan Sulfa I Corg	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	PRIMARY INDICA  (A1)  able (A2)  (B1)  posits (B2)  (B3)  crust (B4)	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa	face Soil C Indation Vision  arsely Vege Incave Surfa I Deposits I Deposits I Organ Sulfa I Corgan Sulfa I Corg	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep  Drift Deposits  Algal Mat or C  ron Deposits	PRIMARY INDICA  (A1)  able (A2)  (B1)  posits (B2)  (B3)  crust (B4)	Sur Inuu (B7 Spa Cor Man Hyc Odd Dry Wa	face Soil C Indation Visi ) Arrsely Vege Incave Surfa If Deposits If Deposits If Occupant Sulfi If Call Incapent If Call Inca	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide in Notes):	— V L PRINCE CONTRACTOR CONTRACTO	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep  Drift Deposits  Algal Mat or C  ron Deposits (  Surface Water	r (A1)	Sur Inuu (B7 Spa Cor Man Hyc Odd Dry Wa	face Soil C Indation Vision  arsely Vege Incave Surfa I Deposits I Deposits I Organ Sulfa I Corgan Sulfa I Corg	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide in Notes):	Pery C C L F III	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits ( Surface Water Water Table P Saturation Pre	r (A1) able (A2)  (B1)  cosits (B2)  (B3)  frust (B4)  (B5)  r Present (Y/N):	Sur Inuu (B7 Spa Cor Mai Hyc Odd Dry Wa Oth	face Soil C Indation Visi  Arsely Vege Incave Surfa If Deposits of Irrogen Sulfi Irrog	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide  C2) in Notes):	Pery C C L F III	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	derns (B10) cospheres along C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits ( Surface Water Water Table P Saturation Pre includes capil	r (A1)  able (A2)  able (A2)  (B1)  cosits (B2)  (B3)  rust (B4)  (B5)  r Present (Y/N):	Sur Inuu (B7 Spa Cor Man Hyc Odd Dry Wa Oth	face Soil C Indation Visi	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide  C2) in Notes):	Pery C C L F III	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	derns (B10) cospheres along C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Water Marks ( Sediment Dep  Orift Deposits  Algal Mat or C  ron Deposits ( Surface Water  Water Table P  Saturation Pre	r (A1)  able (A2)  able (A2)  (B1)  cosits (B2)  (B3)  rust (B4)  (B5)  r Present (Y/N):	Sur Inuu (B7 Spa Cor Man Hyc Odd Dry Wa Oth	face Soil C Indation Visi	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide  C2) in Notes):	Pery C C L F III	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	derns (B10) cospheres along C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Vater Marks ( Sediment Dep  Orift Deposits  Higal Mat or C  Ton Deposits ( Surface Water  Vater Table P  Saturation Presidudes capil	r (A1) able (A2)  (B1)  cosits (B2)  (B3)  frust (B4)  (B5)  r Present (Y/N):	Sur Inuu (B7 Spa Cor Man Hyc Odd Dry Wa Oth	face Soil C Indation Visi	racks (B6) ible on Aerial Imag stated ace (B8) (B15) ide  C2) in Notes):	Pery C C L F III	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (Presence of Fron (C4)	derns (B10) cospheres along C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Short shrub (0.5-2m) Short shrub (0.5-2m) Short shrub (0.5-2m) Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Per
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet _
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Inlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermit
Inlet/Outlet Class (P): No Inlet/Outlet

GPS Technician QA/QC check:

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W60 HT 0 41 Field Target: 102 Date: 7/2/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>Vegetation names are entered legibly for all strata present?</li> <li>Cover calculations are complete and correct?</li> <li>All dominant species have been determined and recorded per strata?</li> <li>Indicator status is correct for each species?</li> <li>Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>✓ Appropriate hydrology indicators are marked?</li> <li>✓ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X ZOR Meade X Zymlade
Wetland Scientist (print) Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION						
Survey Type: Centerline_X Acce	ess Road (explain)	Other (exp	lain)	Field Targ	et: 103	Map #: <u>72</u> Map Date: <u>5/27//4</u>
Date: 07-03-14	Project Name & No.:	Alaska LNO	3 26221306		Feature Id	: WOHTO 42
Investigators: Joe Christoph	er, Zoe Mead	e, Awie	gayle Fis	her		Team No.: W60
State: Alaska	Region: Alaska		Milepost: (		5	
Latitude: 62°48′ 16.95	11	Longitude	:149° 57	58.7	6"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	32	Picture No.:	P_ N,	s, pit	, plug
SITE PARAMETERS		S1 - 3		1,200	- 0	
Subregion: South central			Landform (hill	slope, terrac	e, hummock	s, etc.):
Slope (%): 0 - 3			Local relief (c	oncave, con	vex, none):	concave
Pre-mapped Alaska LNG/NWI classific	ation: PSS 4/1 B		Soil Map Unit	Name: N	A	
Are climatic/hydrologic conditions on the YesX No (if no exp	e site typical for this time plain in Notes)	of year?	Are "No Yes_X	rmal Circum		sent: plain in Notes.)
Are Vegetation, Soil, or Hy	drology Significant	ly Disturbed?	No_X	_(If yes, exp	lain in Notes	)
Are Vegetation, Soil, or Hy	drology Naturally F	Problematic?	No_X	_ (If yes, exp	lain in Notes	i.)
SUMMARY OF FINDINGS			10 000		Herita	The state of the s
Hydrophytic Vegetation Present? Yes_	X No	ls	the Sampled A	rea within a	Wetland?	YesX No
Hydric Soil Present? Yes_	<u>X</u> No	w	etland Type:	PS51	В	
Wetland Hydrology Present? Yes_	X No	AI	aska Vegetation	Classification	n (Viereck):	IC2, III A3
Notes and Site Sketch: Please include corridor.		, Centerline,	Length of featur	e, Distances	from Center	line, Photo Locations, and Survey

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3  Total Number of Dominant Species Across All Strata: 3
1.			and the same of th	% Dominant Species that are OBL, FACW, or FAC: 100 (A
2.				70 Dominant Openies that are OBE, 17000, 011700.
3.				
4.				Prevalence Index worksheet:
Total Cove	r:O			Total % Cover of: Multiply by:
50% of total cove	r: <u> </u>	% of total cov	rer:_ 0	OBL species:
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 10
1. myrica gale	80	Y	OBL	UPL species
2. Betula nana	10		FAC	Column Totals: 134 (A) 247 (B)
3. Spiraea stevenii	15		FACV	PI = B/A = 1 , 8 L)
4. Picea mariana	10		FACW	
5. Empetrum níanum	3		FAC	
6. Vaccinium uliginosum	7		FAC	
7. Andromeda polifolia	TR		FACW	
8.				
9.				
Total Cove	r: 125		-	
50% of total cove		0% of total cov	/er: <u>25</u>	

Herb Stratum( <u>26</u>	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
1 Equise tum ar vense	4	Y	FAC	Morphological Adaptations¹ (Provide supporting data in
2. Calamagrostis canadensi.	- 5	Y	FAC	Notes)
3. Comarum palustre	TR		0BL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Trientalis arcticus	TR		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				
7.				% Bare Ground
8.				NA % Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				O % Cover of Water
Total Cover: 50% of total cover:		)% of total cov	ver: 1 · 8	Hydrophytic Vegetation Present (Y/N):  Notes: (If observed, list morphological adaptations below):

SOIL						HT042		Soil Pit Required (Y/N)
SOIL PROF	ILE DESCRIPTION:	Describe	to the depth needed	to docun	ent the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Γype¹	Loc <sup>2</sup>	Texture	Notes
0-20		-					Fibric	organic
								U
		- 1						
						-		
		177						
<sup>1</sup> Type: C=C	oncentration, D=Depl	etion, RN	/I=Reduced Matrix, C	S=Covere	d or Co	oated Sand G	Grains. <sup>2</sup> Location	PL=Pore Lining, M=Matrix.
HYDRIC SO	IL INDICATORS						INDICATORS	FOR PROBLEMATIC HYDRIC SOILS
Histosol or H	listel (A1) X		Alaska Gleyed	(A13)			Alaska Color (	Change (TA4)⁴
Histic Epipe	don (A2)		Alaska Redox					Swales (TA5)
	(A3)		Alaska Gleyed					with 2.5Y Hue
	ulfide (A4)			·				without 5Y Hue or Redder Underlying
							Layer	
	Surface (A12)	1.0					Other (Explain	
disturbed or	or or nydropnytic vege problematic.	etation, o	ne primary indicator	of wetland	hydrole	ogy, and an a	appropriate landsc	ape position must be present unless
Give details	of color change in No	otes.					- /	
Restrictive L	ayer (if present): Typ	e:		epth (incl	nes):	NJA	/	
		7						
Hydric Soil	Present (Y/N):	/						
Notes:								
HYDROLOG	Y PRIMARY INDICA	TORS (a	nny one indicator is s	ufficient)		SECONDAR	Y INDICATORS (2	2 or more required)
Surface Wat	er (A1)	Sui	rface Soil Cracks (B6	)		Water-stained		Stunted or Stressed
				ion Vieible on Aerial Imagen		Leaves (B9)	_	Plants (D1)
High Water	Table (A2)X	(B7		lation Visible on Aerial Imagery		Drainage Patterns (B10)		Geomorphic Position (D2)
Saturation (A	(3) <u>X</u>	Spa	arsely Vegetated		(	Oxidized Rhiz	zospheres along	Challan Amitant (DO)
Saturation (A	(3)	Co	ncave Surface (B8) _		. 1	Living Roots	(C3)	Shallow Aquitard (D3)
Water Marks	(B1)	Ma	rl Deposits (B15)			Presence of Reduced		Microtopographic
						Iron (C4)		Relief (D4)
Sediment De	posits (B2)	- Hyd	drogen Sulfide or (C1)		1	Salt Deposits (C5) FAC-Neutral Tes		FAC-Neutral Test (D5)
		_	-Season		1	Notes:		
Drift Deposit	s (B3)		ter Table (C2)					
Algal Mat or	Crust (B4)	Oth	er (Explain in Notes)					
riigai iviat oi	Oldst (D4)	-   011	iei (Explain in Notes)	•				
Iron Deposits	s (B5)							
		200			-			
Surface Wate	er Present (Y/N):		Depth (in):					\ I
A/-4 T-61-	D				We	tland Hydro	logy Present (Y/N	1):
vvater i adie	Present (Y/N):		Depth (in): 2			-		
Saturation P	resent (Y/N):		Donath (in)		n n			
	illary fringe)		Depth (in):					
Notes:					-			

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       ○       Sapling (<5 dbh, <6m tall)       I of tall shrub (2-6m)       ○       Short shrub (0.5-2m)       I of tall shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) X Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
COLL VADIABLES
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric X Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIARI ES
HYDROLOGIC VARIABLES   Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inle
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perenn
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Inlet/N
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Inle
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Intermittent Inlet/Intermitt
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/No
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermitten
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X       No Inlet/Intermittent Outlet       No Inlet/Intermittent       No Inlet/Perennial Outlet       Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent       No Inlet/Intermittent Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W 60 H T 0 4 2 Field Target: 10 3 Date: 7/3/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> </ul>
	<ul> <li>☐ Cover calculations are complete and correct?</li> <li>☐ All dominant species have been determined and recorded per strata?</li> <li>☐ Indicator status is correct for each species?</li> <li>☐ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	☐, Wetland boundaries have been corrected if necessary? ☐ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zue Meade	X yourneade 7/3/14
Wetland Scientist (print)	Signature / Date
X tos Chustoh	(X / 7/3/14
Field Crew Chief (print)	Signature Date

# Vegetation Classification Data Form

Site Description	8		Liver		
Date: 3 / / 4				Field Target: 103	
Investigators:	M, AF			Feature ID: W60 HT 043	
Latitude: Longitude: 149°				Datum: WGS84	
	Logbook #: 003 Logbook Pa			Picture #: P_ N, S	
Location Descripti	on:			(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	
500 ft N	of HTI	03 in L	ipland m	nixed forrest	
Common Species	Observed (Scienti	fic Name)		EL EL VIII DE LA CONTRACTION D	
Alnus s	sρ.		Oplopa	nax horridus	
Betula neo			Sambucus racemosa		
Arythrum	cyclosoru	m			
Gymnocar					
Percent Cover of Do	ominant Structure L	evel: 30°/	o Bet n	0.	
Habitat Description	1:	1/4	7.	Note that the second of	
Mixed	forrest				
Alaska Vegetation	Classification: Le	vel I, Level II	, Level III		
ICZ IBI					
Notes:		FOR ALL			
Field Crew Chief:	M	F	ield Scientist/1	echnician_ZoeMeade	

# Vegetation Classification Data Form

Level I	Level II	Level III
I. Forest	A. Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C. Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland
Il Scrub	A. Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	(1) Dryas dwarf scrub (2) Ericaceous dwarf scrub (3) Willow dwarf scrub
III Herbeceous	A Graminoid herbeceous	Try graminoid herbaceous     Wesic graminoid herbaceous     Wet graminoid herbaceous     (emergent)
	B Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C Bryoid herbaceous	(1) Mosses (2) Lichens
	D Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marine aquatic herbaceous

la.	Trees over 3 meters (10 ft) tall are
la .	present and have a canopy cover
	of 10 percent or more
1 b	Trees over 3 meters (10 ft) tall are
	absent or nearly so, Less than 10 percent cover (Dwarf trees, less
	than 3 meters [10 ft] tall may be
	present and abundant
I Fo	prest
2a	Over 75 percent of tree cover
	contributed by needleleaf (conifer) species
2b	Less than 75 percent of tree
20	cover contributed by needleleaf
	(conifer) species
За.	Tree canopy of 60-100 percent
	cover
3b	Tree canopy of 25-59 percent cover
Зс.	Tree canopy of 10-24 percent cover I A.3 Needleleaf woodle
4a	Over 75 percent of tree cover
	contributed by broadleaf species
4b.	Broadleaf or needleleaf species
	contribute 25 to 75 percent of the tree cover
e -	Tree canopy of 60-100 percent cover
5a.	Tree canopy of 25-59 percent cover
5b	
5c.	Tree canopy of 10-24 percent cover I,B,3 Broadleaf wood
6a	Tree canopy of 60-100 percent cover
6b.	Tree canopy of 25-59 percent cover
6c.	Tree canopy of 10-24 percent cover
7a,	Vegetation with at least 25 percent cover of erect to decumbent shrubs
	or with at least 10 percent cover
	of dwarf trees (less than 3 meters
	[10 @] tolf)
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover)

II. Sc	rub
ва	Vegetation with at least 10 percent cover of dwarf trees
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees
9a	Dwarf tree canopy of 60-100 percent cover
9b.	Dwarf tree canopy of 25-59 percent cover
9c	Dwarf tree canopy of 10-24 percent cover II.A.3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall
10b	Shrubs less than 1,5 meters (5ft)tall
	Shrub canopy cover greater than 75 percent
11 b	Shrub canopy cover of 25-74 percent II B 2 Open tall scru
12a	Shrubs 20 centimeters to 1.5 meters tall
12b	Shrubs under 20 centimeters in height
13a	Shrub canopy cover greater than 75 percent II C I Closed low scru
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present
14a	Dryas species dominant in the dwarf shrub layer
14b	Ericaceous species dominant in the dwarf shrub layer II D 2 Encaceous dwarf scrul
14c	Willow species dominant in the dwarf scrub layer
10, 1	Herbaceous
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water

16a	Grasses, sedges, or rushes (graminoid) plents dominant
16b	Forbs or bryophytes dominant18
	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by El/mus spp., Festuca spp. and Deschampsia spp.
	On moist sites, but usually not with standing water Usually dominated by Calamagrostis spp.  Carex spp. or Enophorum spp: tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra, bogs, marshes, and fens
16a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails) III.8 Forb herbaceous 19
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b	On moist sites but without standing water, mostly within forested areas
19c	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses
20b	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water
21c	Vegetation submerged or floating in salt water III.D.3 Marine aquatic herbaceous

#### **Vegetation Classification Data Form QA/QC Checklist**

This form is to be completed before leaving the field site.

Fea	Feature ID: <u>W60 HT</u> 0 43 Field Target: <u>10</u>	Date: 1/3/14
For	For all items not checked, please provide detaile	d explanation in the notes section of data form.
	1. General Information	
,	Location data recorded?	
	☑ Photo taken and photo number recorded?	
	2. Location Description	
,		ail to help relocate?
3.	3. Common Species	
,	☑ Scientific name of common species record	ded?
,	→ Percent cover of dominant structure level	noted?
4.	4. Habitat Description	
-		
5.	5. Classification	
-	All three levels of classification recorded?	
6.	6. Field Log Book	
1	Field form entries consistent with log book	?
1	Logbook clearly identifies the Field Target	ID and Feature ID?
	V.	
X	X Zoe Miade X	Johnsoll 7/3/14
Fiel	Field Technician (print) Signature	
	V	
X	X tos cl., X	12/10
Fiel	Field Crew Chief (print) Signature	714/1

SITE DESCRIPTION			corrido	
Survey Type: Centerline	s Road (explain) Other (e	explain) X Field	arget: 108	Map #: つん Map Date: ケーカーハ
Date: 7/2/14	Project Name & No.: Alaska l	NG 26221306	Feature Id	1: W60 HT0 44
Investigators: Joe Christopher	. Zoe Meade, Abic	gayle Fisher		Team No.: W 60
State: Alaska	Region: Alaska	Milepost: 628	•	
Latitude: $62^{9}$ $45^{9}$ $29$ .	4y' Longit	ude: 150° 08'	34.91"	Datum: WGS84
Logbook No.: 003	Logbook Page No.: 3명	Picture No.: P_ N		
SITE PARAMETERS				
Subregion: South central		Landform (hillslope, te	rrace, hummock	ss, etc.): Depression/Meadow
Slope (%): 6-1		Local relief (concave,		
Pre-mapped Alaska LNG/NWI classificati	on: Perul /55/13	Soil Map Unit Name:	1/0	
Are climatic/hydrologic conditions on the YesX No (if no expla	site typical for this time of year?	Are "Normal Cir Yes X No	cumstances" pre	
Are Vegetation, Soil, or Hydr		``	explain in Notes	
Are Vegetation, Soil, or Hydr	ology Naturally Problemat	ic? No <u>X</u> (If yes	explain in Notes	s.)
SUMMARY OF FINDINGS		45		
Hydrophytic Vegetation Present? Yes	XNo	Is the Sampled Area with		YesX No
Hydric Soil Present? Yes	X No	Wetland Type: PSS	1B -	PEMI/SSIB
Wetland Hydrology Present? Yes	X No			III A3, II C2
Notes and Site Sketch: Please include Discorridor.	rectional & North Arrow, Centerlin		ces from Cente	rline, Photo Locations, and Survey

ree Stratum (Plot sizes: 26′)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3  Total Number of Dominant Species Across All Strata: 3
Picea	1		FACW	% Dominant Species that are OBL, FACW, or FAC: 100 (A
2,				V Bollman operior that are obligation of the control of the contro
3.				
4.				Prevalence Index worksheet:
Total Cover:	+			Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	er:	OBL species: <u>85</u> x 1 = <u>85</u>
Sapling/Shrub Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:       5       X 2 =       10         FAC species:       17       X 3 =       51         FACU species:       0       X 4 =       0
1. Betula nana	10	У	FAC	UPL species
2. picea mariana	5	ý	FACW	Column Totals: 107 (A) 146 (B)
3.				PI = B/A = 1 · 3 6
4.				
5.				
6.				Tree streetyn added to shrun strutt
7.				sing There was 45 % courts
8.				3.49 1.50 8
9.				
	+5 +6-4	15/16	-	
50% of total cover:	4 4 6	7 80	er: 3.2	3
		8	3.2	Ų N
VEGETATION (use scientific names of plants	)			
Herb Stratum ( 261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  _X_ Dominance Test is > 50%  X_ Prevalence Index is ≤ 3.0
1. Trichophorum caespito	rum 85	У	OBL	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. Iris setosa	TR		FAC	Notes)
3. Pedicularis labradorica	†R		FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Calamagrostis canadensis	3		FACIL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
	TR		FACW	disturbed or problematic.
V Y			OBL	
*5. Platanthera aquilonis	TR			
6. Platanthera dauilonis 6. Prosa rotundofolia	TR		FACW	% Bare Ground
6. Platanthera aquilonis 6. Prosa rotundofolia 7. viola ssp.			FACW	
6. Platanthera dauilonis 6. Prosa rotundofolia	TR			
8. Cornus Suecica M	TR			_ パトト % Cover of Wetland Bryophytes
6. Platanthera davibnis 7. Viola ssp. 8. Cornus Suecica M	TR 4			<u>NIA</u> % Cover of Wetland Bryophytes  100 Total Cover of Bryophytes

inches) Color (moist)  % Color (moist)  % I Type* Loo* Texture Notes	SOIL		t	Date 7/3/14 Featur	re ID W6	0HT044		Soll Pit Required (Y/N)
Type: C-Concentration, D-Depletion, RM=Reduced Matrix, C5-Covered or Coated Sand Grains. *Location: PL=Pore Lining, M-Matrix.  Type: C-Concentration, D-Depletion, RM=Reduced Matrix, C5-Covered or Coated Sand Grains. *Location: PL=Pore Lining, M-Matrix.  PVDRIC SOIL NIDICATORS    INDICATORS FOR RROBELMATTIC HYDRIC SOILS* itstood or Histed (A1)	SOIL PROF	ILE DESCRIPTION: (	Describe	to the depth needed to d	document t	he indicator or	confirm the absen	ce of indicators.)
Type: C-Concentration, D-Depletion, RM=Reduced Matrix, CS-Covered or Coated Sand Grains. *Location: PL=Pore Lining, M-Matrix.  INDICATORS FOR PROBLEMATIC HYDRIG SOILS*  Istodos of Histel (A1)	Depth	Matrix		Redox Features				
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, Cs=Covered or Coated Sand Grains. *\frac{1}{2}\text{Location: PL=Pore Lining, M=Matrix.}  INDICATORS FOR PROBLEMATIC HYDRIC SOILS' listion of Histel (A1)	inches)	Color (moist)	%	Color (moist)	% Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, Cs=Covered or Coated Sand Grains. *\frac{1}{2}\text{Location: PL=Pore Lining, M=Matrix.}  INDICATORS FOR PROBLEMATIC HYDRIC SOILS' listion of Histel (A1)	7-42		-				Fibric	organics
INDICATORS FOR PROBLEMATIC HYDRIC SOILS	, -							0
INDICATORS FOR PROBLEMATIC HYDRIC SOLLS								
INDICATORS FOR PROBLEMATIC HYDRIC SOILS								
INDICATORS FOR PROBLEMATIC HYDRIC SOILS								
INDICATORS FOR PROBLEMATIC HYDRIC SOLLS								
INDICATORS FOR PROBLEMATIC HYDRIC SOLLS								
Alaska Gleyed (A13) Alaska Color Change (TA4)*    Alaska Clepedon (A2)   Alaska Redox (A14)   Alaska Alpine Swales (TA5)			etion, RM	=Reduced Matrix, CS=C	Covered or	Coated Sand G	Grains. <sup>2</sup> Location	n: PL=Pore Lining, M=Matrix.
Alaska Redox (A14)				-			INDICATORS	FOR PROBLEMATIC HYDRIC SOILS
Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15)  Alaska Redox with 2.5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Other (Explain in Notes)  Depth (inches):  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9)  Plaints (D1)  Alaska Redox with 2.5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Depth (inches):  Other (Explain in Notes)  Depth (inches):  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9)  Plaints (D1)  Alaska Redox with 2.5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Depth (inches):  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9)  Plaints (D1)  Alaska Redox with 2.5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9)  Plaints (D1)  Alaska Redox with 2.5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Depth (inches):  Other (Explain in Notes):  Other (Explain	listosol or H	listel (A1)					Alaska Color (	Change (TA4) <sup>4</sup>
Alack Caleyed without SY Hue or Redder Underlying Layer  Other (Explain in Notes)  Other idicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Give details of color change in Notes.  Depth (inches):	listic Epiped	don (A2)		Alaska Redox (A14	4)		Alaska Alpine	Swales (TA5)
Layer   Layer   Direct   Carl   Direct   Direc	lack Histic	(A3)		Alaska Gleyed Por	es (A15) _		Alaska Redox	with 2.5Y Hue
Type Color Primary indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type:    Depth (inches):	lydrogen Su	ılfide (A4)					1 .	without 5Y Hue or Redder Underlying
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless listurbed or problematic.  Give details of color change in Notes.  (testrictive Layer (if present): Type:								in Notos)
isturbed or problematic. Gine details of color change in Notes.  Pythoric Soil Present (Y/N):    Value   Value			tation, on	e primary indicator of w	etland hydr	ology and an a		
Depth (inches):   Depth (inc	isturbed or	problematic.		- p		ology, and an	appropriate fairees	apo position made sa prodont amous
Inundation (Visible on Aerial Imagery (B7)  Surface Soil Cracks (B6)  Inundation (Visible on Aerial Imagery (B7)  Surface Water (A1)  Surface Water (B8)  Surface (B8)  Surface (B8)  Oxidized Rhizospheres along  Living Roots (C3)  Shallow Aquitard (D3)  Vater Marks (B1)  Marl Deposits (B15)  Indicator (B8)  Surface (B8)  Oxidized Rhizospheres along  Living Roots (C3)  Shallow Aquitard (D3)  Sediment Deposits (B2)  Other (Explain in Notes):  Salt Deposits (C5)  Notes:  Wetland Hydrology Present (Y/N):  Vater Table Present (Y/N):	Give details	of color change in No	ites.	Denti	h (inches):			
VDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)	COCHOLIVO E	ayor (ii procent). Typ		Бери	i (iiioiics)			
Application	lydric Soil I	Present (V/N)	Y					
SECONDARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)								
SECONDARY INDICATORS (any one indicator is sufficient)   SECONDARY INDICATORS (2 or more required)	Notes:	II Thatie 1	116	d 6-14-6 col	12 bsevs	ined		
Surface Soil Cracks (B6)	+10	Tr March	000	1				
Surface Soil Cracks (B6)								
Surface Soil Cracks (B6)	YDROLOG	Y PRIMARY INDICA	TORS (ar	v one indicator is suffici	ient)	SECONDAR	Y INDICATORS (2	or more required)
Leaves (B9)								
Sparsely Vegetated Concave Surface (B8)	Surface Wate	er (A1)	Surf	ace Soil Cracks (B6)				
Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3) Shallow Aqui	tigh Water T	Table (A2) X		dation Visible on Aerial	Imagery	Drainage Pat	terns (R10)	
Concave Surface (B8)  Living Roots (C3)  Shallow Adultard (D3)  Vater Marks (B1)  Marl Deposits (B15)  Presence of Reduced Iron (C4)  Relief (D4)  Hydrogen Sulfide Odor (C1)  Dry-Season Water Table (C2)  Other (Explain in Notes):  Other (Explain in Notes):  Vater Table Present (Y/N):  Vater Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Other (Explain in Notes):	ng// vvacor i	(12) <u></u>	-	127 (11)				Geomorphic F osition (B2)
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Salt Deposits (B2) FAC-Neutral Test (D5) Notes:    Dry-Season Water Table (C2) Notes:   Dry-Season Water Table (C2) Presence of Reduced Iron (C4) Relief (D4)	Saturation (A	(3) <u>X</u>	Con	sely vegetated cave Surface (B8)				Shallow Aquitard (D3)
Iron (C4)		(D.4)						Microtopographic
Prift Deposits (B3) Dry-Season Water Table (C2) Notes:    Dry-Season Water Table (C2) Depth (in):	vater Marks	(B1)	Mari	Deposits (B15)				
Dry-Season Water Table (C2)  Indigal Mat or Crust (B4)  Other (Explain in Notes):  On Deposits (B5)  Furface Water Present (Y/N):  Vater Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in):  Other (Explain in Notes):	Sediment De	posits (B2)	Hydi	ogen Sulfide		Salt Deposits (C5) FAC-Neutral Test (D5		
Water Table (C2)  Indigal Mat or Crust (B4) Other (Explain in Notes):  On Deposits (B5)  Furface Water Present (Y/N):			Out				(00)	1710 11041141 1001 (50)
Algal Mat or Crust (B4) Other (Explain in Notes):  For Deposits (B5) Other (B5) Othe	Orift Deposits	s (B3)	Dry-	Season er Table (C2)		Notes;		
on Deposits (B5)  Furface Water Present (Y/N):								
Surface Water Present (Y/N): N Depth (in):  Water Table Present (Y/N): Depth (in): Y  Saturation Present (Y/N): Depth (in): O  Depth (in): O	Ngal Mat or	Crust (B4)	_ Othe	er (Explain in Notes):				
Water Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	on Deposits	s (B5)						
Water Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):			1					The Contract of the Contract o
Water Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	Surface Water	er Present (Y/N):	1 [	Depth (in):				\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
aturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	~	D (040)			V	Vetland Hydro	logy Present (Y/N	v):
ncludes capillary fringe) / Depth (In): ()	vater i able	Present (Y/N):		Depth (In):		1		
ncludes capillary fringe) / Depth (In): ()	Saturation Pr	resent (Y/N):		Conth (in):				
Sportssian Q fol of small stoppe				Depth (III):				
Horshin & told of small sold	lotes:		. 0		AT 1."		18301	
		100 16< 24 OF	1	tot a	SM	7911 51	W/ K	

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)       X
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">26-75% Scattered or Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover <25% Scattered/Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) X High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
COIL VADIADI FO
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol:
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perenn
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Return Interval >5 yrs
Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Return Interval >5 yrs
Degree of Outlet Restriction (P): No Outflow
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow   Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5)

Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: <u>W60HT044</u> Field Target: <u>/08</u> Date: <u>7/3//4</u>
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	✓ Wetland boundaries have been corrected if necessary? ✓ Maps are initialed and dated?

#### 8. Photos

☑ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

Zoe Meade

Wetland Scientist (print)

Signature / Date

SITE DESCRIPTION			aleval si			
Survey Type: Centerline X Acces	ss Road (explain) Oth	n <b>er</b> (expla	ain)	Field Target:	109	Map #: 77 _Map Date: 5/27/14
Date: 7/3/14	Project Name & No.: Ala	ska LNG	26221306	F	eature Id:	W60HT 045
Investigators: JC, ZM, A	F					Team No.: W60
State: Alaska	Region: Alaska		Milepost: (	031		
Latitude: 62,73765	Lo	ongitude	+150,140	656		Datum: WGS84
Logbook No.: 003	Logbook Page No.: 34	-35	Picture No.:	P_ N. S.	Pit,	plug
SITE PARAMETERS				13	2 / 3 89	
Subregion: South centra	1		Landform (hills	slope, terrace, h	nummocks	, etc.): Terroce / Seeps
Slope (%): 3 - 5			Local relief (co	ncave, convex	, none): /	on caul
Pre-mapped Alaska LNG/NWI classifica	tion: UPIand		Soil Map Unit I		_	The Vital III
Are climatic/hydrologic conditions on the YesX No (if no expl		ear?	Are "No Yes_X	mal Circumsta No		ent: lain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significantly Di	sturbed?	No_X	_(If yes, explain	in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally Proble	ematic?	No_X	(If yes, explair	n in Notes.	)
SUMMARY OF FINDINGS			4-			
Hydrophytic Vegetation Present? Yes_	X No	ls t	he Sampled A	rea within a W	etland?	Yes No
Hydric Soil Present? Yes	X No	We	tland Type: [	PEMI/SS	18	(sceps)
Wetland Hydrology Present? Yes	× No	Ala	ska Vegetation	Classification (	∏ Viereck): 	TAZ, II CZ
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow, Cer	nterline, L	ength of feature	e, Distances fro	m Centerl	ine, Photo Locations, and Survey
Somes.	Sel PF Notes	3	3-35	- Cer		
	5 00 10		N	` 01		
	Molas	1	Draw	11/1/		
A PAPER birch	WAS SAI	1.4	Pn			
· •	LAYOV +			1+		
Sur gro	ups In Pl	10+	+ mat	MY		
W1'	th mourto	1071	al A	JAPT	la tr	one (changed to FAC)
	owing In				1	
* See W60 HT					'	*

	Absolute	Dominant	Indicator
Tree Stratum (Plot sizes: 26 )	% Cover	Species?	Status
*Betula neoalaskana	5	(Y/N)	FAC
in the second se		V (3)	
2. Betula neoalaskana	3	A R	FACU
3. Picea glauca	3	- 08	FACU
4.			
Total Cover	11		
50% of total cover	: 5.5 20	% of total cov	er: 2.2
Sapling/Shrub Stratum ( 26 )	Absolute	Dominant	Indicator
	% Cover	Species? (Y/N)	Status
1. Spiraea stevenii	10	У	FACU
2. Alnus SSP.	15	V	FAC
3.	10	/	
4.			
5.			
6.			
7,			
7, 8. 9.			

Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Comarum palvotre	25	7	OBL	X_ Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Equisetum sylvaticum	1		FAC	Notes)
3. Cornus canadensis		-	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Calamagrostis canadonsis	45	У	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Chamerion angustofolium	T		FAC	disturbed or problematic.
6. Carex magellanica	4		OBL	
7. Equisetum arvense	3		FAC	% Bare Ground
8. Rubus chamaemorous	1		FACW	N N N Cover of Wetland Bryophytes
9. Viola Ssp.	TR			Total Cover of Bryophytes
10.		1		% Cover of Water
Total Cover 50% of total cover		0% of total cov	ver: 17, 2	Hydrophytic Vegetation Present (Y/N):/  Notes: (If observed, list morphological adaptations below):
3373 37 (8)(4) 33731				11.5

SOIL			Date 7/3/14 Feature ID W	60HT 045		Soil Pit Required (Y/N)
SOIL PROFIL	.E DESCRIPTION: (	Describe	to the depth needed to docume	nt the indicator	or confirm the absence	e of indicators.)
Depth	Matrix		Redox Features			
(inches)	Color (moist)	%	Color (moist)  % Ty	rpe <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
0-9					Fibric	organics,
9-20	10 YR 2/2	100			Silt loam	
		tion, RN	/I=Reduced Matrix, CS=Covered	or Coated Sar		PL=Pore Lining, M=Matrix.
	INDICATORS		Section Alberta			FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed (A13)			hange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)		Alaska Alpine S	Swales (TA5)
Black Histic (/	A3)		Alaska Gleyed Pores (A15	j)		with 2.5Y Hue
Hydrogen Sulfide (A4)					Alaska Gleyed	without 5Y Hue or Redder Underlying
Thick Dark Su	ırface (A12)				Other (Explain	in Notes)
Title Control		— tation, o	ne primary indicator of wetland h	ydrology, and		pe position must be present unless
disturbed or p	roblematic.	· o o				
Restrictive La	of color change in No	tes.	Depth (inche	s):		
			- 1770	-		
Hydric Soil P	resent (Y/N):	1				
Notes:						
HYDROLOG	PRIMARY INDICAT	TORS (a	any one indicator is sufficient)	SECOND	ARY INDICATORS (2	or more required)
Surface Wate	r (A1)	Su	rface Soil Cracks (B6)	Water-sta	ined 39)	Stunted or Stressed Plants (D1)
		Inu	ndation Visible on Aerial Imagen			
High Water Ta	able (A2)X	(B7		Drainage	Patterns (B10)	Geomorphic Position (D2)
Saturation (A:	B) X		arsely Vegetated		Rhizospheres along	Shallow Aquitard (D3)
		Co	ncave Surface (B8)	Living Roots (C3)		
Water Marks	(B1)	Ma	rl Deposits (B15)	Presence of Reduced Iron (C4)		Microtopographic Relief (D4)
Sodiment Dor	oosits (B2)	Hy	drogen Sulfide		osits (C5)	FAC-Neutral Test (D5)
Sediment Def	JUSIES (DZ)	_	or (C1)		)Sits (C3)	FAC-Neutral Test (D3)
Drift Deposits	(B3)		y-Season	Notes:	2 2 01	1 7 110
			ter Table (C2)	- S	eps pre	sent But NO
Algal Mat or C	rust (B4)	Oth	ner (Explain in Notes):	11	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	
Iron Deposits	(B5)				anding 14	$\mathcal{O}$
	()					
Surface Wate	r Present (Y/N):	J	Depth (in):	T		` /
				Wetland Hy	drology Present (Y/N	):
Water Table F	Present (Y/N):		Depth (in):	,		
Saturation Pre			Depth (in):			
Notes: Riv	-ch pu	adar	olld But Stres	so d		
-09	S. RUSB					

	f = Matrix
Forested-Evergreen-Needle-leaved	ackingForested-Deciduous-Needle-leavedForested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leavedScrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leavedEmergent-Non-persistentEmergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) O  Moss-Lichen Floating O Submerged
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly Uneven _XModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or ed or Peripheral Cover N/A
	species) Medium (5-25 species)X High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A_X
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
<b>Dead Woody Material (P)</b> : Low Abundance Abundant (>50% of surface)	(0-25% of surface)X Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and interspers	patches, concentric rings) Moderate (broken irregular rings)ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Silty_X Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Inlet/Outlet Class (P): No Inlet/OutletOutletIntermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In	Outlet X Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Inlet/Perennial Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed,  Evidence of Sedimentation (P): No Eviden	Outlet X Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Inlet/Perennial Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Verland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed,	Outlet X Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Ou
Inlet/Outlet Class (P): No Inlet/OutletOutletIntermittent Inlet/Intermittent Inlet/Intermittent OutletPerennial Inwetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evidence Created	Outlet X Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Pootlet Perennial Inlet/No Outlet Inlet/No Outlet Perennial Inlet/No Outlet Inlet/No O
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet Created Intermittently Exposed, Sevidence of Sedimentation (P): No Evident Created Interval Outlet Outl	Outlet X   Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Per
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Eviden Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No O Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water C	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pe
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Eviden Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No O Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water C	Outlet X   Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet   Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perenn
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet Intermittently Exposed, In	Outlet X Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Inlet/Perennial Outlet Perennial Outl
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet_Inlet/Intermittent Inlet/Intermittent Intervious Intermittent Intervious Intermittent Intervious Inte	Outlet X Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Inlet/Perennial Outlet Perennial Outl
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Interview Intermittent Interview Intervie	Outlet
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Interview Intermittent Interview Intervie	Coutlet
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Intermittent	Coutlet
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Intermittent	Outlet

Crew Chief QA/QC check:

Technician QAVQC check:

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W60 HT 0 45 Field Target: 10 9 Date: 7/3/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil  Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Me ade

Wetland Scientist (print)

Signature / Date

SITE DESCRIPTION						
Survey Type: Centerline X Acces	ss Road (explain) C	Other (explai	in)	Field Targ	jet: <u>// ()</u>	Map #: 77 Map Date: 5/27/14
Date: 7/3/14	Project Name & No.: A	Alaska LNG	26221306		Feature Id:	W60HT046
Investigators: Joe Christophi	er, Zoe Meac	de, Ab	igayle	Fisher		Team No.: W60
State: Alaska	Region: Alaska		Milepost:	631		
Latitude: 62° 44' 14. 46	0	Longitude:	150008	50.71	н	Datum: WGS84
Logbook No.: 003	Logbook Page No.: 34		Picture No.:			P
SITE PARAMETERS			-			
Subregion: South central			Landform (hills	slope, terrac	e, hummocks	, etc.): Slary Terrace
Slope (%): 0 - 5						Convex
Pre-mapped Alaska LNG/NWI classifica	ation: PSS1/EM1		Soil Map Unit			COTTVEX
Are climatic/hydrologic conditions on the YesX No (if no expl.	e site typical for this time of		-	rmal Circum	stances" pres	ent: lain in Notes.)
Are Vegetation, Soil, or Hyd		Disturbed?			lain in Notes)	
Are Vegetation, Soil, or Hyd			No_X		olain in Notes.	
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Yes_		_ ls th	he Sampled A	rea within a	Wetland?	YesX No
Hydric Soil Present? Yes	X No	Wet	tland Type:	PS5 2,	IEM I	В
Wetland Hydrology Present? Yes	X No	- Alas	ska Vegetation	Classification	on (Viereck):	IC2, III AZ
Notes and Site Sketch: Please include D corridor.			ength of feature	1	from Centeri	ine, Photo Locations, and Survey

Total Cover: 58

50% of total cover: 49

10.

VEGETATION (use scientific names of plants	s)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1.				Total Number of Dominant Species Across All Strata: 2 (
2.				% Dominant Species that are OBL, FACW, or FAC:(A
3.				
4.				Prevalence Index worksheet:
Total Cover	0			Total % Cover of: Multiply by:
50% of total cover	20	% of total cov	rer:	OBL species: 103 x1 = 103
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. myrica gale	60	Y	OBL	UPL species
1. myrica gale 2. Betvia nana	07		FAC	Column Totals: 130 (A) 189 (B)
3. Spiraed Stevenii	5		FACU	PI = B/A = /.45
4.				. ,
5.				
6.				
7.				
8.				
9.				
Total Cover 50% of total cover	36 20	)% of total cov	ver: 14,4	
VEGETATION (use scientific names of plants	s)	N/I		
Herb Stratum ( 2 6	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Calamagrostis carradensis	10		FAIC	Y Prevalence Index is ≤ 3.0
2. Carex microglochin	40	X	OBL	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3. Equisetum grvense	5		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Comarum palustre	3		OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic,
6.				
7.				% Bare Ground
				0/ 0 of 10/-tld D
8.				% Cover of Wetland Bryophytes

20% of total cover: //. 6

(Cover of Water

Notes: (If observed, list morphological adaptations below):

Hydrophytic Vegetation Present (Y/N):



SOIL PROFIL	E DECORIETION	D "	Date 07   3/14 Fe	4- 4	M 1	e	Soil Pit Required	V
OIL PROFIL	1	Describe	e to the depth needed	to document	t the indicator or	confirm the absen	ce of indicators.)	
epth	Matrix	T	Redox Features	1	4   0			
nches)	Color (moist)	%	Color (moist)	% Typ	e <sup>1</sup> Loc <sup>2</sup>	Texture	Notes	
7-20						Fibric	organics - we	t
Type: C=Co	ncentration, D=Dept	etion, Ri	M=Reduced Matrix, C	S=Covered o	r Coated Sand (	Grains. <sup>2</sup> Location	n: PL=Pore Lining, M=Matrix.	
	L INDICATORS		-				FOR PROBLEMATIC HYDR	IC SOILS
istosol or Hi	stel (A1)X		Alaska Gleyed	(A13)			Change (TA4) <sup>4</sup>	
	on (A2)		Alaska Redox			_	Swales (TA5)	
						_		
	A3)		Alaska Gleyed	Pores (A15)			with 2.5Y Hue	and and all also as
ydrogen Sul	lfide (A4)	-				Layer_	d without 5Y Hue or Redder U	naeriying
hick Dark Su	urface (A12)					Other (Explain	n in Notes)	
One indicato	r of hydrophytic vege		one primary indicator of	of wetland hy	drology, and an		cape position must be present	unless
sturbed or p	roblematic.							
estrictive La	of color change in No	otes.	D	enth (inches	١٠			
	., ( p							
				epin (inches				
	December (M/N).	V		eptii (iiiches				
	Present (Y/N):	V		epin (inches				
ydric Soil P	Present (Y/N):	V		epui (inches				
ydric Soil P	resent (Y/N):	V		epui (mones				
ydric Soil P	Present (Y/N):	V		epin (mones				
ydric Soil P	Present (Y/N):	V		epin (mones				
ydric Soil P lotes:		У				Y INDICATORS (2	2 or more required)	0. ( 30)
ydric Soil Potes:	Y PRIMARY INDICA	TORS (a	any one indicator is su	ifficient)			2 or more required) Stunted or Stressed	94 P. S.
ydric Soil Potes:		TORS (a	any one indicator is su	ifficient)	SECONDAR	d		4 ( 10)
lydric Soil P lotes: IYDROLOGY	Y PRIMARY INDICA	TORS (a	any one indicator is surface Soil Cracks (B6)	ifficient)	SECONDAR Water-staine Leaves (B9)	d	Stunted or Stressed Plants (D1)	(D2)
lydric Soil P lotes: IYDROLOGY	Y PRIMARY INDICA	Su Inu	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae	ifficient)	SECONDAR Water-staine Leaves (B9) Drainage Pa	tterns (B10)	Stunted or Stressed Plants (D1)	(D2)
lydric Soil P lotes: IYDROLOGY surface Wate	Y PRIMARY INDICA  r (A1)  able (A2)X	Su Inu (B)	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae 7)	ifficient)	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi	d tterns (B10)	Stunted or Stressed Plants (D1)	
lydric Soil P lotes: lyDROLOGY urface Wate ligh Water Ta aturation (A3	Y PRIMARY INDICA (A1) able (A2)X 3)X	Su Inu (B) Sp Co	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7)arsely Vegetated ncave Surface (B8)	ifficient)	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots	tterns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)	
lydric Soil P lotes: lyDROLOGY surface Wate ligh Water Ta	Y PRIMARY INDICA  r (A1)  able (A2)X	Su Inu (B) Sp Co	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae 7)	ifficient)	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic	
lydric Soil P lotes: LYDROLOGY urface Water ligh Water Ta aturation (A3	Y PRIMARY INDICA (A1) able (A2)X (B1)	Su Inu (BT Sp Co	rface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) irl Deposits (B15)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
lydric Soil P lotes: lyDROLOGY surface Water ligh Water Ta aturation (A3	Y PRIMARY INDICA (A1) able (A2)X 3)X	Su Inu (BT Sp Co	rface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) irl Deposits (B15)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic	)
lydric Soil P lotes: lyDROLOGY Surface Wate ligh Water Ta saturation (A3 Vater Marks (	Y PRIMARY INDICA  r (A1)  able (A2)X  B)X  (B1)  posits (B2)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) trl Deposits (B15) drogen Sulfide lor (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
Hydric Soil P Notes: HYDROLOGY Surface Wate High Water Ta Saturation (A3 Vater Marks (	Y PRIMARY INDICA (A1) able (A2)X (B1)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7)arsely Vegetated incave Surface (B8)trl Deposits (B15)drogen Sulfide or (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
lydric Soil P lotes:  IYDROLOGY  Surface Wate ligh Water Ta saturation (A3 Vater Marks ( Sediment Dep	Y PRIMARY INDICA  r (A1)  able (A2)X  B)X  (B1)  posits (B2)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) trl Deposits (B15) drogen Sulfide lor (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
lydric Soil P lotes:  IYDROLOGY  Surface Wate ligh Water Ta saturation (A3 Vater Marks ( Sediment Dep	Y PRIMARY INDICA  (A1) able (A2)X  (B1)  posits (B2)  (B3)  Crust (B4)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae (7) arsely Vegetated incave Surface (B8) drip Deposits (B15) drogen Sulfide for (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
lydric Soil P lotes:  IYDROLOG)  urface Wate ligh Water Ta aturation (A3 vater Marks ( ediment Dep	Y PRIMARY INDICA  (A1)  able (A2)X  (B1)  posits (B2)  (B3)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae (7) arsely Vegetated incave Surface (B8) drip Deposits (B15) drogen Sulfide for (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
lydric Soil P lotes:  IYDROLOG)  urface Wate ligh Water Ta aturation (A3 vater Marks ( ediment Dep	Y PRIMARY INDICA  (A1) able (A2)X  (B1)  posits (B2)  (B3)  Crust (B4)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae (7) arsely Vegetated incave Surface (B8) drip Deposits (B15) drogen Sulfide for (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
lydric Soil P lotes:  IYDROLOGY Surface Water ligh Water Taleaturation (A3 Vater Marks (A3 Vat	Y PRIMARY INDICA  (A1) able (A2)X  (B1)  posits (B2)  (B3)  Crust (B4)	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6) indation Visible on Ae (7) arsely Vegetated incave Surface (B8) drip Deposits (B15) drogen Sulfide for (C1)	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5	)
lydric Soil P lotes:  IYDROLOGY  Burface Water  ligh Water Ta  Baturation (A3  Vater Marks ( Bediment Deposits  Igal Mat or Coon Deposits  urface Water	Y PRIMARY INDICA  r (A1)  able (A2)X  (B1)  cosits (B2)  (B3)  (B3)  (B5)  r Present (Y/N): N	Su Inu (B) Sp Co Ma Hy Odd Dry Wa	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) drogen Sulfide for (C1) y-Season ater Table (C2) ner (Explain in Notes):	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
Hydric Soil Polotes:  HYDROLOGY  Surface Water Table  Gaturation (A3  Vater Marks (Control Deposits  Algal Mat or Control Deposits  Gurface Water  For Deposits  For Deposits	Y PRIMARY INDICA  (A1)  able (A2)X  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)	Su Inu (B) Sp Co Ma Hy Odd Dry Wa	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2) are (Explain in Notes):	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5	)
Hydric Soil Polotes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Vater Marks	Y PRIMARY INDICA  r (A1)  able (A2)X  (B1)  posits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N): Y	Su Inu (B) Sp Co Ma Hy Odd Dry Wa	any one indicator is surface Soil Cracks (B6) indation Visible on Ae (P) arsely Vegetated incave Surface (B8) drogen Sulfide for (C1) season ater Table (C2) incer (Explain in Notes):  Depth (in):  Depth (in):	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5	)
lydric Soil P lotes:  IYDROLOGY  Furface Water  Igh Water Taleaturation (A3  Vater Marks (  Indicated water to be a second to	Y PRIMARY INDICA  (A1)  able (A2)  (B1)  (B3)  (B3)  (Crust (B4)  (B5)  T Present (Y/N): Y  esent (Y/N): Y	Su Inu (B) Sp Co Ma Hy Odd Dry Wa	any one indicator is surface Soil Cracks (B6) indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) drogen Sulfide for (C1) y-Season ater Table (C2) ner (Explain in Notes):	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5	)
lydric Soil P lotes:  IYDROLOGY urface Water ligh Water Taturation (A3 vater Marks ( ediment Deprift Deposits lgal Mat or Coon Deposits urface Water vater Table F aturation Presented	Y PRIMARY INDICA  (A1)  able (A2)  (B1)  (B3)  (B3)  (Crust (B4)  (B5)  T Present (Y/N): Y  esent (Y/N): Y	Su Inu (B) Sp Co Ma Hy Odd Dry Wa	any one indicator is surface Soil Cracks (B6) indation Visible on Ae (P) arsely Vegetated incave Surface (B8) drogen Sulfide for (C1) season ater Table (C2) incer (Explain in Notes):  Depth (in):  Depth (in):	rial Imagery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rhi Living Roots Presence of Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5	)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/N
Inlet/Outlet Class (P): No Inlet/Outlet

m

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID:	W60 HT 0 46 Field Target: 110 Date: 1/3/14
For all	item	s not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	e Description
		Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
		At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	So	il San
		Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
	#	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	<b>#</b>	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	4	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate? Each logbook page is initialed and dated?
7,	Ма	ps
	#	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

中	Four photos were taken for each Wetland Determination Data Form (2 vegetat	ion, 1
	soil pit, 1 soil plug)?	

Two photos were taken for each Observation Point (vegetation/site overview)?

X	Zoe Meade	X helles
Wetla	and Scientist (print)	Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION				ME - Section
Survey Type: Centerline Acces	ss Road (explain) Other	(explain) X	Field Target: 149	Map #: 151 Map Date: 3/1/1/
Date: 7/9/14	Project Name & No.: Alaska	a LNG 26221306	Feature Id	1: W60T1052 WWOHT
Investigators: Joe Christoph	er, Zoe Meade, Abic	gayle Fisher		Team No.: W60
State: Alaska	Region: Alaska	Milepost:	661.7	
Latitude: 610 20 40.40	Long	gitude: / SU / /6	1 14.87"	Datum: WGS84
Logbook No.: 003	Logbook Page No.: 050	Picture No.:	P-N, S, pit,	plug
SITE PARAMETERS				
Subregion: South central		Landform (hil	Islope, terrace, hummock	(s, etc.): hummucks
Slope (%): 0 - 3	8504B 9/1	Local relief (c	oncave, convex, none):	11 Ned
Pre-mapped Alaska LNG/NWI classificat		Soil Map Unit		pooc
Are climatic/hydrologic conditions on the YesXNo(if no expla	site typical for this time of year ain in Notes)	? Are "No Yes_>	ormal Circumstances" pre	esent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significantly Distu	rbed? No X	_(If yes, explain in Notes	
Are Vegetation, Soil, or Hyd	rology Naturally Problem	atic? No_X	_ (If yes, explain in Notes	s.)
SUMMARY OF FINDINGS		-		
Hydrophytic Vegetation Present? Yes	<u> </u>	Is the Sampled A	rea within a Wetland?	YesX No
Hydric Soil Present? Yes	X No	Wetland Type:	PF04/551E	3
Wetland Hydrology Present? Yes	X No	Alaska Vegetation	Classification (Viereck):	ГА2, ЦС2
Notes and Site Sketch: Please include Dicorridor.	rectional & North Arrow, Center	rline, Length of featur	re, Distances from Cente	rline, Photo Locations, and Survey
Site Sketch Jata on pg	on pg. 049 . 50	Log book	003	
			į.	

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes: 26 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FA  Total Number of Dominant Species Across All Strata:
1. Picea mariana	50	7	FACW	% Dominant Species that are OBL, FACW, or FAC: _
2.				76 Bollinant Species that are OBE, 171000, St. 1710.
3.				
4.				Prevalence Index worksheet:
Total Cover:	50			Total % Cover of: Multiply by:
50% of total cover:	25 20	% of total cov	er: <u>10</u>	OBL species: 5 X 1 = 5
Sapling/Shrub Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 122
1. vaccinium vitis - idaea	5.		FAC	UPL species
2. Vaccinivm oxycoccus	TR		OBL	Column Totals: 173 (A) 389 (
3. Betula nana	TR		FAC	PI = B/A = 2 - 2 5
4. Rhododendron tomentosum	4		FACW	
5. Empetrum nigrum	3		FAC	
6. Vaccinium uliginosum	35	Y	FAC	
7. Betula neoalas kana	1		FACV	
8. Picea mariama	3		FACW	
9,				
Total Cover:				
50% of total cover:	<u>25.5</u> 20	% of total cov	ver: 10 · 2	ļ
VEGETATION (use scientific names of plants	3)			

Herb Stratum( <u>26</u> 1	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
1. Rubus chamaemorous	65	Y	FACW	Morphological Adaptations¹ (Provide supporting data in
2. Geocaulon lividum			FACY	Notes)
3. Equisetum sylvaticum	1		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Carex microglochin	5		OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic
6.				
7.				O% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				
10.				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cove		0% of total cov	ver: 14 - 4	Notes: (If observed, list morphological adaptations below):

Saturation Present (Y/N): (includes capillary fringe)

Notes:

Depth (in):

glunds somewhat.

SOIL			Date 7/9/14 Feature ID	NOO T	1052		Soil Pit Required (Y/N)
	E DESCRIPTION		to the depth needed to docum			confirm the absent	
	Matrix	Describe	Redox Features	ent the	indicator or	Committe absent	be of indicators.)
Depth (inches)	Color (moist)	1%		Гуре <sup>1</sup>	Loc <sup>2</sup>	Tavitus	National
0-15	Color (moist)	70		ype	LOC	Texture	Notes
15 - 20		-				Fibric	organics, wet
10 - 20		-			-	Hemic	Organics, Wet
				_	-		
		-					4
Type: C=Co	centration D=Deni	etion PM-	Reduced Matrix, CS=Covere	d or Co	otod Cond C	Project 21 continu	Dispersion 84 84 sec.
	INDICATORS	etion, Kivi-	-Neduced Matrix, CS-COVER	d of Co	aled Sand C		: PL=Pore Lining, M=Matrix,
	stel (A1) X		Alaska Olavad (A42)				FOR PROBLEMATIC HYDRIC SOILS
			Alaska Gleyed (A13)				Change (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)				Swales (TA5)
	(3)		Alaska Gleyed Pores (A1	5)	-		with 2.5Y Hue
Hydrogen Sul	fide (A4)					Layer_	without 5Y Hue or Redder Underlying
	rface (A12)					Other (Explain	in Notes)
One indicator	of hydrophytic vege	etation, on	e primary indicator of wetland	hydrolo	gy, and an	appropriate landsc	ape position must be present unless
disturbed or p <sup>t</sup> Give details o	roblematic. If color change in Ni	otes.					
Restrictive La	er (if present): Typ	e:	Depth (inch	es):			
		V					
Hydric Soil P	resent (Y/N):	_/					
Notes:							
HYDROLOGY	PRIMARY INDICA	TORS (an	y one indicator is sufficient)	8	SECONDAR	Y INDICATORS (2	or more required)
Surface Water	(A1)	Surfa	ace Soil Cracks (B6)		Vater-staine		Stunted or Stressed
		lound	dation Visible on Aerial Image	n/			Plants (D1)
High Water Ta	ble (A2) X	(B7)		.   [		terns (B10)	Geomorphic Position (D2)
Saturation (A3	) X		sely Vegetated		Oxidized Rhiz	zospheres along	Shallow Aquitard (D3)
		Conc	cave Surface (B8)		iving Roots		
Water Marks (	B1)	Mari	Deposits (B15)		Presence of I	Reduced	Microtopographic Relief (D4)
Cadimant Dan	it- (DO)	Hydr	ogen Sulfide				
Seament Dep	osits (B2)	Odoi	(C1)			(C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)		Season	N	lotes:		
			r Table (C2)	-			
Algal Mat or C	rust (B4)	Othe	r (Explain in Notes):				
ron Denosits	B5)						
	/						
Surface Water	Present (Y/N):	1 10	Pepth (in):	T	-1		la l
			~Par (111)=	Wet	tland Hydro	logy Present (Y/N	): <u> </u>
Water Table P	resent (Y/N);		epth (in): 2			37	

VEGETATION VARIABLES P= Plot, M=	= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	ckingForested-Deciduous-Needle-leavedForested-Deciduous-Broad-leavedScrub Shrub-Deciduous-Broad-leavedScrub Shrub-Evergreen-Needle-leavedEmergent-Non-persistentEmergent-
	Short herb (<1m) 72 Moss-Lichen 100 Floating 0 Submerged 0
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (80%) Very High Density (80-100%)_	0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattered	100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or deripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant s	pecies) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/AX
Cover Distribution of Dominant Layer (P): 1 Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance (C Abundant (>50% of surface)	0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large parties High (small groupings, diverse and intersperse	patches, concentric rings) Moderate (broken irregular rings)
HGM Class (P): Slope FlatX_	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Soil Factors (P): Soil Lacking	Histosol:Fibric X Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy	Mineral: Silty Mineral: Clayey Mineral: Clayey
HYDROLOGIC VARIABLES	
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet  Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Intermitten	No Inlet/Intermittent OutletNo Inlet/Perennial OutletIntermittent Inlet/No OutletIntermittent Inlet/Perennial OutletPerennial Inlet/No OutletPerennial let/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Perennial Inlet/Intermittent Perennial Inle	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Perennial Inlet/Intermittent Outlet Ou	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Inlet/No Outlet Pe
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Perennial Inlet/Intermittent Outlet  Wetland Water Regime (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent_	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Pe
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Drier: Seaso Wetland Water Regime (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent_ Frequency of Overbank Flooding (P): No Oversetter (P): No Oversetter (P): No Oversetter (P): No Oversetter (P): No Outflow Degree of Outlet Restriction (P): No Outflow	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Peren
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Wetland Water Regime (P): Drier: Season Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Ove	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial let/Perennial Inlet/Perennial Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Outlet Inlet/Intermittent Outlet Perennial Inl Wetland Water Regime (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Outflow Water pH (P): No surface water  Surficial Glacial Deposit Under Wetland (P): Glacial Till/Not Permeable	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Doublet Inlet/Intermittent Class (P): Doublet Inlet/Intermittent Class (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Overbank Flooding (P): N	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Doublet Inlet/Intermittent Class (P): Doublet Inlet/Intermittent Class (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Overbank Flooding (P): N	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent of Inlet/Intermittent Outlet Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Wetland Water Regime (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Overbank Flooding (P	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial let/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Ponally Flooded Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Perennial Perennial Sediment Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Pronounced (>18in.) Perennial Perennial Sediment
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Doublet Inlet/Intermittent Class (P): Intermittent Inlet/Intermittent Class (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Overbank Flooding	OutletIntermittent Inlet/Perennial OutletPerennial Inlet/No OutletPerennial let/Perennial OutletPerennial OutletPerennial OutletPerennial OutletPerennial OutletPonally Flooded, SaturatedX
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Class (P): Doublet Inlet/Intermittent Class (P): Intermittent Inlet/Intermittent Class (P): Drier: Seaso Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Evidence Created  Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Overbank Flooding	Outlet
Inlet/Outlet Class (P): No Inlet/Outlet	Outlet

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#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W60T1062 Field Target: 149 Date: 7/9/14
r Or all	items not checked, please provide detailed explanation in the notes section of data form.
4	Site Description
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?
	Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?
	Indicator status is correct for each species?
	☐ Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
,	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

Signature / Date

X Juliani 7/9/14

Signature / Date

SITE DESCRIPTION			2000 corridor					
Survey Type: Centerline Acce	ss Road (explain)	Other (exp	olain)_X	Field Target: 1/2	Map #: 79 Map Date: 5/27/14			
Date: 7/5//4	Project Name & No.:	: Alaska LN	G 26221306	Feature le	1: W60HT048			
Investigators: Joe Christop	her, Zoe Med	ade, A	bigayle	Fisher	Team No.: W60			
State: Alaska	Region: Alaska		Milepost: (	640,35				
Latitude: 62° 37′ 34.6	3 "	Longitud	e: 150 <sup>8</sup> 13	3'42.64"	Datum: WGS84			
Logbook No.: 003	Logbook Page No.:	38	Picture No.:	P_ N, S. pit,	Plug			
SITE PARAMETERS								
Subregion: South centra	I		Landform (hi	llslope, terrace, hummoc	ks, etc.): Flood plain			
Slope (%):				concave, convex, none):				
Pre-mapped Alaska LNG/NWI classifica	tion: PSSIA		Soil Map Unit	t Name: NJA				
Are climatic/hydrologic conditions on the YesX No (if no expl		e of year?		ormal Circumstances" pr				
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed	? No_X	(If yes, explain in Notes	s)			
Are Vegetation, Soil, or Hyd	irology Naturally I	Problematic?	No_X	_ (If yes, explain in Note	s.)			
SUMMARY OF FINDINGS				TEL COLUMN				
Hydrophytic Vegetation Present? Yes_	No	Is	Is the Sampled Area within a Wetland? Yes NoX					
Hydric Soil Present? Yes	NoX	_   v	etland Type:	upland				
Wetland Hydrology Present? Yes	Nο <u> Χ</u>	A	laska Vegetatior	n Classification (Viereck):	IB1			
Notes and Site Sketch; Please include D corridor.		v, Centerline,	Length of featu	re, Distances from Cente	erline, Photo Locations, and Survey			
Man	a Floo	d pli	AM N	le4v				
Graves	# ADO	TI	Accor	es to				
CJA 12	Sour	Pa	Trouse	esone Cr	reck			

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 26 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3 (  Total Number of Dominant Species Across All Strata: 4 (
1. Populus balsamifera	70	Y	FACU	% Dominant Species that are OBL, FACW, or FAC: 75 (A
2.				70 Dominant openies that are OBE, 1710-19, 611710.
3.				
4.				Prevalence Index worksheet:
Total Cove	r:70			Total % Cover of: Multiply by:
50% of total cove	r:_35 20	% of total cov	/er: <u>14</u>	OBL species: X 1 = O
Sapling/Shrub Stratum ( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0
1. AINUS ESP.	4		FAC	UPL species
2. Salex scouleriana	20	Y	FAC	Column Totals: 116 (A) 423 (B)
3. Ribes triste	1		FAC	PI = B/A = 3.65
4. Rosa asicularis	5		FACU	
5.				
6.				
7.				
8.				
9.				
Total Cove 50% of total cove		0% of total co	ver:6	

Herb Stratum( <u>26/</u> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  _X Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Equisetum arvense	6	У	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. calamagrostis canadons	- 10	Y	FAC	Notes)
3. Chamaerion angustofoliv	N TR		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Galium triflorum	TP		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Dryopteris expansa	TR		FACU	disturbed or problematic.
6.				
7,				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water
Total Cover		Notes: (If observed, list morphological adaptations below):		

	Matrix		to the depth needed Redox Features				T	
epth nches)		%		T 0/ T	<b>T</b>	12	Tentura	Near
	Color (moist)	70	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
7-3				-			Coarse sa	nd/grave/
+							- Large co	oble - refusal
						1	+	
Type: C≕Co	oncentration, D=Depl	etion, RN	M=Reduced Matrix, C	S=Cover	ed or Co	ated Sand G	rains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
	IL INDICATORS						INDICATORS	FOR PROBLEMATIC HYDRIC S
istosol or H	istel (A1)		Alaska Gleyed	(A13)			Alaska Color (	Change (TA4) <sup>4</sup>
stic Epiped	lon (A2)		Alaska Redox (	A14)			Alaska Alpine	Swales (TA5)
lack Histic (	A3)		Alaska Gleyed	Pores (A	15)			with 2.5Y Hue
ydrogen Su	lfide (A4)							without 5Y Hue or Redder Underl
hick Dark S	urface (A12)						Other (Explain	in Notes)
One indicate	or of hydrophytic vege	<del></del> etation, o	ne primary indicator o	f wetlan	d hydrolo	gy, and an a		ape position must be present unles
sturbed or	problematic.							30-10-00-00-00-00-00-00-00-00-00-00-00-00
estrictive L	of color change in No	otes.	cobble D	onth (inc	hes):	3		
	iver or present a rivo	A CHE ME						
estrictive Li	ayer (ii present): Typ	e. Lurge		eptii (iiic	· -			
		N 1		eptii (iiic				
lydric Soil I	Present (Y/N):	N 1		ерит (пто	, ====			
lydric Soil I		N 1		eptri (ilic				
lydric Soil I		N 1		epur (inc				
ydric Soil I		N 1		epur (inc				
lydric Soil I	Present (Y/N):	V	ny one indicator is su				/ INDICATORS (2	or more required)
lydric Soil I	Present (Y/N):	TORS (£	ny one indicator is su	fficient)	S	BECONDAR\ Vater-stained		or more required) Stunted or Stressed
lydric Soil I	Present (Y/N):	TORS (£	iny one indicator is su	fficient)	S	BECONDAR\ Vater-stained		
Hydric Soil I Notes: HYDROLOG Surface Wate	Present (Y/N):	TORS (a	iny one indicator is surface Soil Cracks (B6)	fficient)	V L	SECONDARY Vater-stained eaves (B9) _		Stunted or Stressed Plants (D1)
lydric Soil I lotes: IYDROLOG Surface Water ligh Water T	Present (Y/N):  Y PRIMARY INDICA er (A1)  Table (A2)	Sui	iny one indicator is su face Soil Cracks (B6) ndation Visible on Aei	fficient)	S V L L ery C	BECONDARY Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Hydric Soil I Notes: HYDROLOG Surface Water T	Present (Y/N):  Y PRIMARY INDICA	Sur Inu (B7	iny one indicator is surface Soil Cracks (B6)	fficient) rial Imag	S V L L ery C	BECONDARY Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz	 	Stunted or Stressed Plants (D1)
lydric Soil I lotes: IYDROLOG Surface Water ligh Water T	Present (Y/N):  Y PRIMARY INDICA er (A1)  Table (A2)	Sur Inu (B7 Sp. Co	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer	fficient) rial Imag	ery C	BECONDAR) Vater-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots (	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)	Sur Inu (B7 Sp. Co)	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer () Indation Vegetated Incave Surface (B8) Indeposits (B15)	fficient) rial Imag	ery C	BECONDARY Vater-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4)	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A	Y PRIMARY INDICA er (A1)  Table (A2)  3)	Suinu (B7 Sp. Co.	Iny one indicator is surface Soil Cracks (B6) Indation Visible on Aer Indicator Visible on Aer Indicator Vegetated Incave Surface (B8)	fficient)	ery C	BECONDARY Vater-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4)	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)	Suinu (B7 Sp. Co. Ma  Hyo Od  Dry	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer () I	fficient)	SS V L L C C L L F III	BECONDARY Vater-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4)	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De	Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)	Suinu (B7 Sp. Co. Ma  Hyo Od  Dry	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aeronal Cracks (B8) Indation Visible on Aeronal Cracks (B8) Indicave Surface (B8) Indicator (B15) Indicator is surface (B15) Indicator is surfa	fficient)	SS V L L C C L L F III	Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)	Sui Inu (B7 Spa Col Ma Hyw	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer () I	fficient)	SS V L L C C L L F III	Nater-stained eaves (B9) _ Orainage Patt Dxidized Rhiz iving Roots ( Presence of Fron (C4)	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  for (B3)  Crust (B4)	Sui Inu (B7 Spa Col Ma Hyw	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aei  arsely Vegetated Incave Surface (B8) Indicator is	fficient)	SS V L L C C L L F III	Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Iydric Soil I Iotes: IYDROLOG Surface Water Idigh Water T Saturation (A Vater Marks Sediment De Orift Deposits	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  6 (B3)	Sui Inu (B7 Spa Coi Ma Hyy Od Dry Wa	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aei  arsely Vegetated Incave Surface (B8) Indicator is	fficient)	SS V L L C C L L F III	Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Orift Deposits Mgal Mat or or	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  crust (B4)  is (B5)	Sullinu (B7 Cool Ma Dry Wa	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer (1) Indation Visible on Aer (2) Indation Visible on Aer (3) Indation Visible on Aer (4) Indation Visible on Aer (5) Indation Visible on Aer (6) Indation Visible on Aer (6) Indation Visible on Aer (7) Indation Visible on Aer (7) Indation Visible on Aer (8) Indation Visible on Aer (9) Indation Visible on Aer (1) Indation Vi	fficient)	SS V L L C C L L F III	Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Orift Deposits Higal Mat or the	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  Crust (B4)  er Present (Y/N):	Sun- Inu (B7 Spp Cool Ma — Hyo Od Dry Wa — Oth	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer () Indation Visible on Aer () Indation Visible on Aer () Index on Care (B8) Index or (C1) Index or (C1) Index or (C2) Index or (Explain in Notes): Index on Care (B6) In	fficient)	ery C	Vater-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Drift Deposits Mgal Mat or the	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  crust (B4)  is (B5)	Sun- Inu (B7 Spp Cool Ma — Hyo Od Dry Wa — Oth	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer (1) Indation Visible on Aer (2) Indation Visible on Aer (3) Indation Visible on Aer (4) Indation Visible on Aer (5) Indation Visible on Aer (6) Indation Visible on Aer (6) Indation Visible on Aer (7) Indation Visible on Aer (7) Indation Visible on Aer (8) Indation Visible on Aer (9) Indation Visible on Aer (1) Indation Vi	fficient)	ery C	Vater-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) cospheres along C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Hydric Soil I Notes: HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Orift Deposits Ngal Mat or e Fron Deposits Surface Water Vater Table	Present (Y/N):	Sun- Inu (B7 Spp Cool Ma — Hyo Od Dry Wa — Oth	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer () Indation Visible on Aer () Indicator Visible on Aer () Indicator Visible on Aer () Indicator Visible on Aer (Indicator Visible	fficient)	ery C	Vater-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) cospheres along C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
IyDROLOG  Surface Water  Igh Water T  Saturation (A  Vater Marks  Sediment De  Orift Deposits  Son Deposits  Surface Water  Vater Table  Saturation Pr	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  Crust (B4)  er Present (Y/N): N	Sun- Inu (B7 Spp Cool Ma — Hyo Od Dry Wa — Oth	riny one indicator is surface Soil Cracks (B6) Indation Visible on Aer () Indation Visible on Aer () Indation Visible on Aer () Index on Care (B8) Index or (C1) Index or (C1) Index or (C2) Index or (Explain in Notes): Index on Care (B6) In	fficient)	ery C	Vater-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) cospheres along C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

# WETLAND DETERMINATION DATA FORM Upland



VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved_ Forested-Deciduous-Broad-leaved_ Forested-Evergreen-Needle-leaved_ Scrub Shrub-Deciduous-Needle-leaved_ Scrub Shrub-Deciduous-Broad-leaved_ Scrub Shrub-Evergreen-Needle-leaved_ Emergent-Non-persistent_ Emergent-Persistent_ Aquatic Bed_ Forested-Deciduous-Needle-leaved_ Emergent-Non-persistent_ Emergent-Non-persistent_ Emergent-Non-persistent_ Forested-Deciduous-Broad-leaved_
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Per
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below         Only Connected Above Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use:         0-5% Rural         5-25% Urbanized         25-50% Urbanized         >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)

Crew Chief QA/QC check GPS Technician QA/QC check:

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: <u>W60HT048</u> Field Target: 1/2 Date: 7/5/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>☑ Vegetation names are entered legibly for all strata present?</li> <li>☑ Cover calculations are complete and correct?</li> <li>☑ All dominant species have been determined and recorded per strata?</li> <li>☑ Indicator status is correct for each species?</li> <li>☑ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>Appropriate hydrology indicators are marked?</li><li>Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X Jumen 7/5/14
Wetland Scientist (print)	Signature / Date
V / 1	V () - 1-1111

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION	- 0		30	o' study			
Survey Type: Centerline Acce	ss Road (explain)	Other (expl	ain)X	Field Target: 118	Map #: 84 Map Date: 5/27		
Date: 7/5/14	Project Name & No.:	Alaska LNC	3 26221306	Feature Id	:W60HT049		
Investigators: JC, ZM.	AF				Team No.: VV 6 0		
State: Alaska	Region: Alaska		Milepost: 6	,46.8			
Latitude: 62° 32' 45, 40	11	Longitude	: 150° 15'	02.27"	Datum: WGS84		
Logbook No.: 003	Logbook Page No.:	39	Picture No.:	P-N, S, pit	plug		
SITE PARAMETERS		-11					
Subregion: South centra	1		Landform (hill	slope, terrace, hummock	s, etc.): Flat		
Slope (%): 0 - 3			Local relief (co	oncave, convex, none):	Nane		
Pre-mapped Alaska LNG/NWI classifica	tion: PF04/583	LB		Name: N/A			
Are climatic/hydrologic conditions on the YesX No (if no expl	e site typical for this time ain in Notes)	of year?		ormal Circumstances" pre ≺ No (If no, ex			
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed?	? No_X	_(If yes, explain in Notes	)		
Are Vegetation, Soil, or Hyd	drology Naturally I	Problematic?	NoX	_ (If yes, explain in Notes	5.)		
SUMMARY OF FINDINGS		7.9			. The second		
Hydrophytic Vegetation Present? Yes_	X No	ls	Is the Sampled Area within a Wetland? Yes No				
Hydric Soil Present? Yes_	X No	w	Wetland Type: PFO 4/552B				
Wetland Hydrology Present? Yes_	X No	— АІ	Alaska Vegetation Classification (Viereck):				
Notes and Site Sketch: Please include E							
PAS 39 5	sprice Art.	1 2	O'TAI	, Classifil	A5 PFO 4/55113)		

VEGETATION (use scientific names of plants)					
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status		heet: that are OBL, FACW, or F nt Species Across All Strate
1. Picea mariana	15	Y	FACW		nt Species Across Ali Strati t are OBL, FACW, or FAC:
2.				% Dominant Species tha	tale OBL, PACVV, OF PAC.
3.					
4.				Prevalence Index works	sheet:
Total Cover:	15			Total % Cover of:	Multiply by:
50% of total cover:	7.5 20	% of total cov	rer:3	OBL species: 60	
Sapling/Shrub Stratum ( 2 6 1 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 32  FAC species 40  FACU species	X3= 120
1. Alnus 58p-	10	γ	FAC	UPL species	
2. Betula nana	20	Y	FAC		(A) 244
3. Empetrum nigrum	3		FAC	PI = B/A = 1 · 85	
4. Vaccinium uliginosum	7		FAC		
5. Chamaedaphne calyculata	7		FACW		
6.					
7.					
8.					
9.					
Total Cover:	47				
50% of total cover:	23.5 20	% of total cov	ver: 9 , 4		

Herb Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: X_ Dominance Test is > 50% X_ Prevalence Index is ≤ 3.0
1. Carex aquatilis	60	Y	OBL	Morphological Adaptations¹ (Provide supporting data in
2. Rubus chamaemorous	10		FACW	Notes)
3,				Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5,				disturbed or problematic.
6.				
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				
10.				Cover of Water
Total Cover:	76 35 20	Hydrophytic Vegetation Present (Y/N):/  Notes: (If observed, list morphological adaptations below):		

SOIL			Date 7/5/14 Fe	eature ID_V	160	4040		Soll Plt Required (Y/N)
SOIL PROF	ILE DESCRIPTION: (	Describ	e to the depth needed	d to docume	nt the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix	,	Redox Features					
(inches)	Color (moist)	%	Color (moist)	% Ty	pe <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-18							Fíbri c	organics saturated
18								Refusal large roots
							1	9
	4							
			LL-					
		-						
1= 0.0	The second secon	" D	10.0		_		21	
		etion, Ri	M=Reduced Matrix, C	CS=Covered	or Coa	ated Sand G		n: PL=Pore Lining, M=Matrix.
	OIL INDICATORS			. (4.40)	100			FOR PROBLEMATIC HYDRIC SOILS
	distel (A1) X		Alaska Gleyed					Change (TA4) <sup>4</sup>
	don (A2)		Alaska Redox					Swales (TA5)
	(A3)		Alaska Gleyed	Pores (A15	<u> </u>			with 2.5Y Hue
Hydrogen S	ulfide (A4)						Layer_	d without 5Y Hue or Redder Underlying
Thick Dark S	Surface (A12)						Other (Explain	n in Notes)
3One indicat	or of hydrophytic vege	tation, o	one primary indicator	of wetland h	ydrolo	gy, and an	appropriate landsc	ape position must be present unless
	problematic. s of color change in No	ntes						
Restrictive L	ayer (if present): Typ	e:10	irge roots	Depth (inche	s):	18		
		,						
Hydric Soil	Present (Y/N):	<u> </u>						
Notes:								
HYDROLOG	BY PRIMARY INDICA	TORS (	any one indicator is s	ufficient)	S	ECONDAR	Y INDICATORS (2	2 or more required)
Surface Wat	er (A1)	Su	rface Soil Cracks (B6	5)		Vater-staine		Stunted or Stressed
			undation Visible on A			Leaves (B9)		
High Water	Table (A2)X	(B		enai imager		rainage Pat	terns (B10)	Geomorphic Position (D2)
Saturation (/	A3) X	Sp	arsely Vegetated			Oxidized Rhizospheres along		Shallow Aquitard (D3)
	,	Co	ncave Surface (B8)			iving Roots		
Water Marks	s (B1)	Ma	arl Deposits (B15)			resence of on (C4)	Reduced	Microtopographic Relief (D4)
0 11 10	'( (DO)	Hv	drogen Sulfide					
Sediment De	eposits (B2)		lor (C1)		S	Salt Deposits (C5) FAC-Neutral Test (D5		
Drift Deposit	s (B3)	Dr	y-Season	Season Notes:				
	- ()	Wa	ater Table (C2)		-1			
Algal Mat or	Crust (B4)	_ Oti	her (Explain in Notes)	):				
Iron Denosit	s (B5)	_						
поп ворозк	3 (55)							
Surface Wat	er Present (Y/N):	1	Depth (in):		1			1
Ouridoc Wat	cri resent (1714).	-	Deptii (iii),		Wet	land Hydro	logy Present (Y/I	W).
Water Table	Present (Y/N):	/	Depth (in):				nogy i rodoni (i n	
Saturation P	resent (Y/N):							
	resent (Y/N): pillary fringe)		Depth (in): 5					
Notes:					1			

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) /≤ Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) / Short shrub (0.5-2m) 3 7  Dwarf shrub (<0.5m) Tall herb (≥1m) Short herb (<1m) Moss-Lichen Floating Submerged Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope FlatX    Lacustrine Fringe Depressional    Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P):       Soil Lacking       Histosol:Fibric       X       Histosol:Hemic       Histosol: Sapric         Mineral:       Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet V_ No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial I
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed X Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): AbsentPoorly Developed (6in.)XWell Developed (6-18in.)Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding X Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow X Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits X Glacial Till/Not Permeable
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits         Glacial Till/Not Permeable         Basin Topographic Gradient (M): Low Gradient (<2%)X High Gradient (≥2%)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits         Glacial Till/Not Permeable         Basin Topographic Gradient (M): Low Gradient (<2%)X High Gradient (≥2%)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits         Glacial Till/Not Permeable         Basin Topographic Gradient (M): Low Gradient (<2%)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable   Basin Topographic Gradient (M): Low Gradient (<2%)X
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable   Basin Topographic Gradient (M): Low Gradient (<2%) X High Gradient (≥2%)   Evidence of Seeps and Springs (P): No Seeps or Springs X Seeps Observed Intermittent Spring Perennial Spring   LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream X Unknown   Only Connected Below Only Connected Deposits X Unknown X Unknown X Unknown X Y Y Y Y Y Y
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable   Basin Topographic Gradient (M): Low Gradient (<2%)

Page 4 of 4

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Fea	iture	e ID: W 6 0 H T 0 4 9 Field Target: 1 8 Date: 7 5 1 14
		items not checked, please provide detailed explanation in the notes section of data form.
	1.	Site Description
		Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
	2.	Vegetation
		<ul> <li>         \[ \textstyle \text{At least 80% of onsite vegetation has been keyed to species, or collected for later identification?     </li> <li>         \[ \text{Vegetation names are entered legibly for all strata present?}     \]     </li> <li>         \[ \text{Cover calculations are complete and correct?}     \]     </li> <li>         \[ \text{All dominant species have been determined and recorded per strata?}     \]     </li> <li>         \[ \text{Indicator status is correct for each species?}     \]     </li> <li>         \[ \text{Dominance Test and Prevalence Index have been completed?}     \] </li> </ul>
	3.	Soil
		<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
	4.	Hydrology
		<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
	5.	Functions and Values
		✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6.	Field Logbook
		<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
	7.	Maps
		<ul><li>☑ Wetland boundaries have been corrected if necessary?</li><li>☑ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)	Signature / Date	1 1	
X Zoc meade	X-youmeade 7	151	14

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION			2000' Cor	ridor	
Survey Type: Centerline Acces	ss Road (explain)	Other (expla	ain) X Field Tar	get: <u>//9</u>	Map #: <u>8 4</u> Map Date: <u>5/27//4</u>
Date: 7/6/14	Project Name & No.:	Alaska LNG	26221306	Feature Id:	W60 HT 0 50
Investigators: Joe Christoph	er, Zoe Meade	z, Abigo	yle Fisher		Team No.: W60
State: Alaska	Region: Alaska		Milepost: 64.6.8	(us)	
Latitude: (1 3) 471	26"	Longitude	1500 14/ 5818.	2	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	40	Picture No.: $P - N$ , S	S, Pit, F	Plug
SITE PARAMETERS					
Subregion: South central			Landform (hillslope, terra	ce, hummocks	s, etc.): FAT
Slope (%): 0 - 3			Local relief (concave, cor	vex, none):	
Pre-mapped Alaska LNG/NWI classifica	tion: upland		Soil Map Unit Name: N		,
Are climatic/hydrologic conditions on the Yes X No (if no expl.		of year?	Are "Normal Circur Yes X No		
Are Vegetation, Soil, or Hyd	· · · · · · · · · · · · · · · · · · ·	y Disturbed?			blain in Notes.)
Are Vegetation, Soil, or Hyd			\	plain in Notes	
SUMMARY OF FINDINGS	O Manual V				
Hydrophytic Vegetation Present? Yes_	X No	Is t	the Sampled Area within	a Wetland?	Yes No
	X No	We	etland Type: PF0 ゴ	4/551B	
Wetland Hydrology Present? Yes_	X No	— Ala	ska Vegetation Classificati	on (Viereck):	IC2, II B2
Notes and Site Sketch: Please include Decorridor.  Birch Do M.			Length of feature, Distance		

ree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or
Picea mariana	5		FACW	Total Number of Dominant Species Across All Stra % Dominant Species that are OBL, FACW, or FAC
Betula ncoalas Kana *	30	Y	FACS	% Dominant Species that are Obt., FACW, of FAC.
				Prevalence Index worksheet:
Total Cover	:_ 35			Total % Cover of: Multiply by
50% of total cover	r: <u>17-5</u> 20	% of total cov	/er:7	OBL species: 4 X 1 = 4
sapling/Shrub Stratum(26/)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 5 X 2 = 10  FAC species 74 X 3 = 222  FACU species 2523 X 4 = +0.0 4
				17.00 000000
· Alnus ssp.	25	Y	FAC	UPL species 0 X 5 = 0
	25	У	FACU	UPL species
Spiraea stevenii	-	У	-	UPL species
Spiraea stevenii B.Ribes triste	2	У	FACU	Column Totals: +08 10 (A) 336 3 PI = B/A = 3 - 1
Spiraea stevenii Ribes triste L	2	У	FACU	Column Totals: +08 10 (A) 336 3 PI = B/A = 3 - 1
2. Spiraea stevenii 3. Ribes triste 1.	2	У	FACU	Column Totals: +08 10 (A) 336 3 PI = B/A = 3 - 1
1. Alnus ssp. 2. Spiraea stevenii 3. Ribes triste 4. 5.	2	У	FACU	Column Totals: +08 10 (A) 336 3 PI = B/A = 3 - 1
Spiraea stevenii B.Ribes triste L. S.	2	У	FACU	Column Totals: +0-8 10 (A) 3-36-3

Herb Stratum(26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. comarum palvstre	4		OBL	Morphological Adaptations¹ (Provide supporting data in
2. Gymno carpium dryopteris	8		FACU	Notes)
3. Cornus canadensis	2		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Dryopteris expansa	10	У	FACU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Streptopus amplexifolius			FACU	disturbed or problematic.
6. Equisetum arvense	15	У	FAC	
7. Equisetum sylvaticum	2	-	FAC	5 % Bare Ground
8.				% Cover of Wetland Bryophytes
9.				20 Total Cover of Bryophytes
10.				Cover of Water
Total Cover:		la e	0 4	Hydrophytic Vegetation Present (Y/N):/  Notes: (If observed, list morphological adaptations below):
50% of total cover:	· V   20	% of total cov	ver: 0 · 7	

SOIL			Date 7/5/14 Fea	ture II	D W60	<u>H7</u> 050		Soil Pit Required (Y/N)
SOIL PROF	ILE DESCRIPTION:	Describe	to the depth needed	to doc	ument the	e indicator or	confirm the abser	nce of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc²	Texture	Notes
0-20				_			- Fibric	organic
							1000	
							-	
<sup>1</sup> Type: C=C	oncentration, D=Dep	etion, RN	//≡Reduced Matrix, C	S=Cov	ered or C	oated Sand C	Grains. <sup>2</sup> Locatio	n: PL=Pore Lining, M=Matrix.
HYDRIC SC	OIL INDICATORS						INDICATOR	S FOR PROBLEMATIC HYDRIC SOILS
Histosol or I	Histel (A1)		Alaska Gleyed	(A13) _			Alaska Color	Change (TA4) <sup>4</sup>
Histic Epipe	don (A2)		Alaska Redox (				_	e Swales (TA5)
	(A3)		Alaska Gleyed	Pores	(A15)		Alaska Redo	x with 2.5Y Hue
	ulfide (A4)						Alaska Gleye	ed without 5Y Hue or Redder Underlying
							Layer	
	Surface (A12)			£alla		lagy and an	Other (Expla	in in Notes) cape position must be present unless
	problematic.	etation, o	ne primary indicator o	r wella	ina nyaro	logy, and an	appropriate lanos	cape position must be present unless
<sup>4</sup> Give details	of color change in N	otes.	VA DO			1/1		
Restrictive L	ayer (if present): Typ	e:/	DO DO	epth (ii	nches):	/11		
		V						
Hydric Soil	Present (Y/N):	/	<del></del>					
Notes:								
								*
					- 17			
HYDROLOG	BY PRIMARY INDICA	TORS (a	any one indicator is su	fficient	t)	SECONDAR	Y INDICATORS	(2 or more required)
Surface Wa	ter (A1)	Su	rface Soil Cracks (B6)			Water-staine Leaves (B9)		Stunted or Stressed Plants (D1)
		Inu	Indation Visible on Aei	rial Ima	2000			
High Water	Table (A2)X	- (B7		iai iiii	agery	Drainage Par	tterns (B10)	Geomorphic Position (D2)
Saturation (	A3)X	Sp	arsely Vegetated			Oxidized Rhi	zospheres along	Shallow Aquitard (D3)
		Co	ncave Surface (B8) _			Living Roots		
Water Mark	s (B1)	Ma	rl Deposits (B15)			Presence of Iron (C4)		Microtopographic Relief (D4)
		Hv	drogen Sulfide					
Sediment D	eposits (B2)		or (C1)			Salt Deposits	s (C5)	FAC-Neutral Test (D5)
Drift Dancai	ts (B3)	Dry	/-Season			Notes:		P
Dilit Deposi	is (B3)	Wa	ater Table (C2)					
Algal Mat or	Crust (B4)	Ott	ner (Explain in Notes):					
Iron Deposit	s (B5)							
0.4.144			- 445		-17-		100	
Surface Wat	ter Present (Y/N):	_	Depth (in):					Y
Water Table	Present (Y/N):		Depth (in): 4		W	etland Hydro	ology Present (Y	/N):/
Saturation F	Present (Y/N):		Donth (:-):					
	pillary fringe)		Depth (in): 3					
Notes:								

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) 3 5       Sapling (<5 dbh, <6m tall) 0
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenXHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species)X High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems, 1 or More Large Patches; Parts of Site OpenX Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat_X    Lacustrine Fringe Depressional    Riverine    Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric X Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Intermittent Inlet/Intermittent Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet No Inlet/Intermittent Inlet/Intermitten
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inle
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Peren
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet In
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perenn
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Pe
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Inlet/Perennial Outlet Inlet/Perennial Outlet Inlet/Perennial Outlet Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Inlet/Perennial Outlet Inlet/Perennial Outlet Inlet/No Outlet Inlet/No Outlet Inlet/No Outlet Inlet/No Outlet Inlet/Perennial Outlet Inlet/Perennial Outlet Inlet/No Outlet Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent I
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermitten
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet
Inlet/Outlet Class (P): No Inlet/Outlet

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: W60HT050 Field Target: 119 Date: 7/5/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?
	<ul><li>✓ Cover calculations are complete and correct?</li><li>✓ All dominant species have been determined and recorded per strata?</li></ul>
	☑ Indicator status is correct for each species? ☑ Dominance Test and Prevalence Index have been completed?
2	Soil
3.	5011
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul><li>Wetland boundaries have been corrected if necessary?</li><li>Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X Januar 7/5/11
Wetland Scientist (print)	Signature / Date
X-Joe Christoph	X 177/5/1
Field Crew Chief (print)	Signature / Date

SITE DESCRIPTION			30	00' cor	ridor	
Survey Type: Centerline Acces	ss Road (explain)	Other (expl	ain)X	Field Targ	et: 12 3	Map #: <u>85</u> Map Date: <u>5/27/パ</u>
Date: 7/5/14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	: W60 HT 051
Investigators: Joe Christop	her, Zoe Mec	ide, Ak	oigayle	Fishe	1	Team No.: W60
State: Alaska	Region: Alaska		Milepost:			
Latitude: 62° 31′ 58.84	1"	Longitude	: 150' 14	0 13.85	"	Datum: WGS84
Logbook No.: 003	Logbook Page No.:	040	Picture No.:	P-N,	s, wat	er
SITE PARAMETERS						
Subregion: South central			Landform (hill	Islope, terrac	e, hummocks	s, etc.): Demossion
Slope (%): 1 - 3		t of	Local relief (c	oncave, conv	ex, none):	Concave
Pre-mapped Alaska LNG/NWI classifica	tion: upland		Soil Map Unit	Name:	V/A	
Are climatic/hydrologic conditions on the YesX No (if no expla		of year?		ormal Circum		sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	Irology Significant	ly Disturbed?	No_X	_(If yes, exp	ain in Notes	
Are Vegetation, Soil, or Hyd	Irology Naturally I	Problematic?	No_X	_ (If yes, exp	lain in Notes	s.)
SUMMARY OF FINDINGS		عبرة الأب				
Hydrophytic Vegetation Present? Yes_	No	ls	the Sampled A	rea within a	Wetland?	YesXNo
Hydric Soil Present? Yes_	X No	w	etland Type:	PEN	11/0	
Wetland Hydrology Present? Yes	X No	— Ali	aska Vegetatior	n Classificatio	n (Viereck):	Ш АЗ
Notes and Site Sketch: Please include D corridor.  AAA 40	virectional & North Arrow	, Centerline,		re, Distances	from Center	rline, Photo Locations, and Survey

VEGETATION (use scientific names of plan	ts)		
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status
1.			
2,			
3.			
4.			
Total Cove			
50% of total cove	er: <u> </u>	% of total cov	er:O
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status
1. Salex bar clayi	TR	N	FAC
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
Total Cove	er:		
50% of total cover	er: 20	0% of total cov	er:

Herb Stratum( 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Comarum palustre	351	*	OBL	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Carex aquatilis	251		OBL	Notes)
3. Equisetum arvense	18		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Equisetum sylvaticum	31.		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Viola palustris	101		FACW	disturbed or problematic.
6. carex magellanica	51		OBL	
7. carex limosa	101		OBL	% Bare Ground
8. Calamagrostis Canadensis	501	A Y	FAC	% Cover of Wetland Bryophytes
9.				7 Dotal Cover of Bryophytes
10.				30 % Cover of Water
Total Cover: 50% of total cover:		0% of total cov	ver. <u>31, λ</u>	Notes: (If observed, list morphological adaptations below):

SOIL		D	ate 7/2//4 Feat	ure ID W	60H	1051		Soll Pit Required (Y/N)		
SOIL PROFIL	LE DESCRIPTION: (	escribe t	o the depth needed to	documer	t the in	dicator or c	onfirm the absence	of indicators.)		
Depth	Matrix	Redox Features								
(inches)	Color (moist)	%	Color (moist)	% Ту	pe <sup>1</sup>	Loc²	Texture	Notes		
						1				
		-								
		4		_						
1- 0.0	1	. 514	D   111   12   00	01		- 4 0 4 0	i 21 costions	PL=Pore Lining, M=Matrix.		
	ncentration, D=Deple	tion, RIVI=	Reduced Matrix, CS	=Covered	or Coat	ea Sana G				
	L INDICATORS		Alaska Clayed (/	112\		INDICATORS FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup> Alaska Color Change (TA4) <sup>4</sup>				
	istel (A1)		Alaska Gleyed (A							
	on (A2)		Alaska Redox (A							
	A3)		Alaska Gleyed P	ores (A15	)	Alaska Redox with 2.5Y Hue Alaska Gleyed without 5Y Hue or Redder Underlying				
Hydrogen Su	Ifide (A4)						Layer			
	urface (A12)	_					Other (Explain in Notes)			
<sup>3</sup> One indicato		tation, on	e primary indicator of	wetland h	ydrolog	y, and an a	ppropriate landscap	e position must be present unless		
40:	2002220	tes.								
Restrictive La	of color change in No ayer (if present): Type	:	De	pth (inche	s):	_				
		V								
Hydric Soil F	Present (Y/N):	1								
ASSURED HIdric BASIS on Standing HOO of 5- Singer										
HYDROLOG	Y PRIMARY INDICA	TORS (an	y one indicator is suf	ficient)	SE	CONDAR	Y INDICATORS (2 o	r more required)		
Surface Wate	er (A1)X	Surfa	Surface Soil Cracks (B6)			Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)		
High Water T	able (A2) X	Inun (B7)	Inundation Visible on Aerial Imagery (B7)		Dra	Drainage Patterns (B10)		Geomorphic Position (D2)		
Saturation (A	3)X	Sparsely Vegetated Concave Surface (B8)			Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)			
Water Marks	(B1)			Pro	Presence of Reduced Iron (C4)		Microtopographic Relief (D4)			
Sediment De	posits (B2)	Hydrogen Sulfide Odor (C1)				(C5)	FAC-Neutral Test (D5)			
Drift Deposits	s (B3)	Dry-	Dry-Season Water Table (C2)		Notes:					
Algal Mat or	Mat or Crust (B4) Other (Explain in Notes):									
Iron Deposits	s (B5)									
		1 1		1.	1					
Surface Water	er Present (Y/N):	/ [	Depth (in): 2-4	11	141-41	Wetland Hydrology Present (Y/N):		Υ		
Water Table	Present (Y/N):	1	Depth (in):		vveti	and Hydro	plogy Present (Y/N)			
Saturation Pr (includes cap		Depth (in):								
Notes:	epussi un						,	•		

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent X Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)  Sapling (<5 dbh, <6m tall)  Tall shrub (2-6m)  Short shrub (0.5-2m)  Short shrub (0.5-2m)  Submerged  Submerg
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A_
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface)X
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey ASSUMED
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inl
Outlet Intermittent Inlet/Intermittent Outlet
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Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet I
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your

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: <u>W60H1051</u> Field Target: 123 Date: 7/5/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
	Each logbook page is initialed and dated?
7.	Maps
	✓ Wetland boundaries have been corrected if necessary? ✓ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

  Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meadi	X Joe Made 7/5/14
Wetland Scientist (print)	Signature/Date
X Tre Minloy	X // 7/5//4
Field Crew Chief (print)	Signature / Date

# Vegetation Classification Data Form

Site Description						
Date: 7   5   14	Project Name & # Alaska LNG 2622	: 1306		Field Target: W60HT052 Feature ID:		
Investigators: JC,	ZM, AF					
Latitude: 62° 31′ 58.35″		Longitude: 150 9/4' / /	,36"	Datum: WGS84		
Logbook #:		Logbook Page #:		Picture #: P_N, S		
Location Description:						
E of 123	- on C	enter	line			
Common Species Ob	served (Scientific	Name)				
Betula nec	o alas kana		Veratro	m viride		
Picea gl	avca		Sambu	cus racemosa		
Vaccinium	uliginos	om .	Sorbus	scopulina		
Viburnum	edule		Alnus	55 p		
Percent Cover of Domi	nant Structure Lev	el: 25°	10 Pic	gla, Bet neo		
Habitat Description:						
Mixed fo	rrest			3)		
Alaska Vegetation Cla	ssification: Leve	el I, Level II,	Level III			
IC2	II	B2				
Notes:						
3-7% hills	ide slope	, 30' k	pirch			
Field Crew Chief:		Fi	eld Scientist/¯	Technician 1		

# Vegetation Classification Data Form

Lavel I	Level II	Level III
l Forest	A. Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C. Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland
II. Scrub	A. Dwarf tree scrub	(1) Closed dwarf tree scrub (2) Open dwarf tree scrub (3) Dwarf tree scrub woodland
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C Low scrub	(1) Closed low scrub (2) Open low scrub
	D. Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub
III Herbaceous	A Graminoid herbeceous	(1) Dry graminoid herbaceous     (2) Mesic graminoid herbaceous     (3) Wet graminoid herbaceous     (emergent)
	B. Forb herbaceous	Dry forb herbaceous     Mesic forb herbaceous     Wet forb herbaceous (emergent)
	C. Bryoid herbeceous	(1) Mosses (2) Lichens
	D. Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceou     Marine aquatic herbaceous

Des	criptions of levels I, II, and IV follow the classification table
ia.	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more ! Forest 2
1 b	Trees over 3 meters (10 ft) tall are absent or nearly so, Less than 10 percent cover (Dwarf trees, less than 3 meters [10 ft) tall may be present and abundant 7
I Fo	prest
28	Over 75 percent of tree cover contributed by needleleef (conffer) species
2b	Less than 75 percent of tree cover contributed by needlelesf (confler) species
3e.	Tree canopy of 60-100 percent cover I.A.1 Closed needleleaf forest
3b.	Tree canopy of 25-59 percent cover
3с	Tree canopy of 10-24 percent cover I.A.3 Needleleaf woodland
4a	Over 75 percent of tree cover contributed by broadlesf species
4b	Broadleef or needleleaf species contribute 25 to 75 percent of the tree cover
Sa,	Tree canopy of 60-100 percent cover
5b.	Tree canopy of 25-59 percent cover LB 2 Open broadleaf forest
5c	Tree canopy of 10-24 percent cover
6a	Tree canopy of 60-100 percent cover LC 1 Closed mixed fores
6b.	Tree canopy of 25-59 percent cover I.C.2 Open mixed fores
6c	Tree canopy of 10-24 percent cover
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 fi] tall).
7b	Vegetation herbaceous (may have up to 25 percent shrub cover)

11 50	arub.	
8a	Vegetation with at least 10 percent cover of dwarf trees	II.A Dwarf tree scrub 9
8b.	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	
9a.	Dwarf tree canopy of 60-100 percent cover	II.A.1 Closed dwarf tree scrub
9b.	Dwarf tree canopy of 25-59 percent cover	II.A.2 Open dwarf tree scrub
9c.	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall	II B Tall scrub 11
10b	Shrubs less than 1.5 meters (5ft)tall	12
11 a	Shrub canopy cover greater than 75 percent	il 8.1 Closed tall scrub
11 b	. Shrub canopy cover of 25-74 percent	Il B 2 Open tali scrub
12a	Shrubs 20 centimeters to 1.5 meters tall	II C Low scrub 13
12b	Shrubs under 20 centimeters in height .	ILD Dwarf scrub 14
13a	Shrub canopy cover greater than 75 percent	II.C.I Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	II C 2 Open low scrub
14a	Dryas species dominant in the dwarf shrub layer	li D 1 Dryas dwarf scrub
14b	Ericaceous species dominant in the dwarf shrub layer	II D.2 Encaceous dwarf scrub
14c.	Willow species dominant in the dwarf scrub layer	II D 2 Willow dwarf scrub
III i	Herbaceous	
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	16
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	

16a	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant 18
17a	Grasslands of well-drained dry sites, such as south-facing bluffs, old beaches, and sand dunes. Typically (but not always) dominated by E/mus spp, Festuca spp, and Deschampsia spp
17b	On moist sites, but usually not with standing water Usually dominated by Calemagrosis spp., Carex spp. or Eniophorum spp; tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet fundra, bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b	On moist sites but without standing water, mostly within forested areas III B 2 Mesic forb herbaceou
19c	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses
20b	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water aquatic herbaceout III D 2 Brackish water aquatic herbaceout
21c	Vegetation submerged or floating in salt water IILD 3 Marine equatic herbaceou

## Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Feature ID: W60HT0 52 Field Targ	et: 124 Date: 7/5/14
For all items not checked, please provide	le detailed explanation in the notes section of data form.
1. General Information	
Photo taken and photo number in the properties of the propertie	recorded?
2. Location Description	
Location of site recorded with er	ough detail to help relocate?
3. Common Species	
✓ Scientific name of common specentific name of common specinific name of common spe	ies recorded?
	ture level noted?
4. Habitat Description	
5. Classification	
All three levels of classification r	ecorded?
6. Field Log Book	
Field form entries consistent with	
Logbook clearly identifies the Fig	eld Target ID and Feature ID?
V -	V 1
X Zoe Meadl	X Samel 7/5/14
Field Technician (print)	Signature
X fee classich	X/////////////////////////////////////
Field Crew Chief (print)	Signature

SITE DESCRIPTION							
Survey Type: Centerline Acces	ss Road (explain)	Other (expla	ain)X	Field Targ	et: <u>138</u>	Map #:Map Date: 5/27/14	
Date: 7/8/14	Project Name & No.: A	Alaska LNG	26221306		Feature Id:	WGOHT060053	
Investigators: Joe Chris to ph	er, Zoe Meade,	Abigay	gle Fisher			Team No.: W60	
State: Alaska	Region: Alaska		Milepost:	23 (PH	)		
Latitude: 62° 25' 50	1.5911	Longitude	: 150° 16'	07.58"	′	Datum: WGS84	
Logbook No.: 003	Logbook Page No.: ધૃ	17	Picture No.:	P- N. S	s, pit, p	lug	
SITE PARAMETERS		- 111					
Subregion: South Centra		Landform (hillslope, terrace, hummocks, etc.): depression					
Slope (%): 0 - 2		Local relief (co	oncave, conv	/ex, попе):	concave		
Pre-mapped Alaska LNG/NWI classifica	tion: PEM1B		Soil Map Unit	Name: N	l A		
Are climatic/hydrologic conditions on the Yes X No (if no expl		of year?	Are "No Yes_X		stances" pres (If no, exp	sent: lain in Notes.)	
Are Vegetation, Soil, or Hyd	Irology Significantly	Disturbed?	No_X	_(If yes, expl	lain in Notes)		
Are Vegetation, Soil, or Hyd	irology Naturally Pro	oblematic?	No_X	_ (If yes, exp	lain in Notes.	)	
SUMMARY OF FINDINGS							
Hydrophytic Vegetation Present? Yes	X No	ls t	the Sampled A	rea within a	Wetland?	YesX No	
Hydric Soil Present? Yes	X No		etland Type:				
Wetland Hydrology Present? Yes	X No	- Ala	aska Vegetation	Classificatio	n (Viereck):	HAZ, III A 3	
Notes and Site Sketch: Please include Dicorridor.	FWY Curric		Length of featur	e, Distances	from Centeri	ine, Photo Locations, and Survey	
	(4)						

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2  Total Number of Dominant Species Across All Strata: 2
1.				
2.				% Dominant Species that are OBL, FACW, or FAC: 100
3.				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover:	<u>O</u> 20	% of total cov	er:O	OBL species:X 1 =/
Sapling/Shrub Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:       65       X 2 = 130         FAC species       7       X 3 = 21         FACU species       0       X 4 = 0
1. Chamaedaphne calyculata	65	Y	FACW	UPL speciesOX 5 =O
2. Betula nana	5		FAC	Column Totals: 113 (A) 192 (B)
3. Vaccinium oxycoccus			OBL	PI = B/A = 1, 6 7
4. Vaccinium uliginosum	2		FAC	
5.,				
6.				
7				1
8.				1
9,				1
Total Cover:	73		8	
50% of total cover:		% of total cov	er: 14, 46	

Herb Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
1. Carex microglochin	40	Y	OBL	Morphological Adaptations <sup>1</sup> (Provide supporting data in
2. Menyanthes trifoliata	TR		OBL	Notes)
3. Pedicularis labradorica	TR			Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				N. Control of the Con
7,				% Bare Ground
8.				Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				Cover of Water
Total Cove		l 0% of total cov	rer:	Hydrophytic Vegetation Present (Y/N):

Depth	DESCRIPTION: (	Describe	e to the depth ne	eded to docu	ment the	indicator or o	onfirm the absen	ce of indicators.)
pepul			1			illulcator or c	The about	
inches)	Matrix	-	Redox Feature	s		-		
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-20	-						Fibric	organics
								· ·
		-						
		-						
				-			1	
Type: C=Conce	entration, D=Depl	etion, RN		ix, CS=Cove	red or Co	ated Sand G	rains. <sup>2</sup> Location	n: PL=Pore Lining, M=Matrix.
YDRIC SOIL IN							7	FOR PROBLEMATIC HYDRIC SOIL
listosol or Histe	el (A1)X		Alaska Gle	eyed (A13) _			Alaska Color	Change (TA4)⁴
	(A2)			dox (A14)				Swales (TA5)
Black Histic (A3)	)		Alaska Gle	eyed Pores (/	A15)			with 2.5Y Hue
	e (A4)							d without 5Y Hue or Redder Underlying
hick Dark Surfa			-				Other (Explain	n Notes)
	· · · · · · · · · · · · · · · · · · ·	etation, o	ne primary indica	ator of wetlar	nd hydrolo	gv. and an a		ape position must be present unless
listurbed or prob	blematic.		The same of the same					and the process of the contract of the contrac
Sive details of c	color change in No r (if present): Typ	otes.		Depth (in	ches):			
	sent (Y/N):	λ						
Hydric Soil Pres	sent (Y/N):	У	-16					
Notes:	sent (Y/N): PRIMARY INDICA		- 16	is sufficient)	S	BECONDARY	INDICATORS (	2 or more required)
Notes:	PRIMARY INDICA	TORS (a	any one indicator	(B6)	V	SECONDARY Vater-stained eaves (B9) _		2 or more required) Stunted or Stressed Plants (D1)
Notes:	PRIMARY INDICA	TORS (a	any one indicator rface Soil Cracks	(B6)	V	Vater-stained eaves (B9) _		Stunted or Stressed Plants (D1)
Notes:  NYDROLOGY P  Surface Water (A	PRIMARY INDICA A1) le (A2)X	Su Inu (B)	any one indicator rface Soil Cracks	n Aerial Ima	gery C	Vater-stained eaves (B9) _ Orainage Patt	erns (B10)	Stunted or Stressed Plants (D1)
Notes:  NYDROLOGY P  Surface Water (A	PRIMARY INDICA A1) le (A2)X	Su Inu (B) Sp Co	any one indicator rface Soil Cracks indation Visible of 7) arsely Vegetated incave Surface (B	(B6) n Aerial Imag 38)	gery C	Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY P Surface Water (A digh Water Table Saturation (A3) _	PRIMARY INDICA A1) le (A2)X	Su Inu (BT Sp Co Ma	any one indicator rface Soil Cracks indation Visible of 7) arsely Vegetated incave Surface (E irl Deposits (B15) drogen Sulfide or (C1)	s (B6) in Aerial Imag 38)	gery C L Fit	Vater-stained eaves (B9) _ Prainage Patt Dividized Rhiz iving Roots ( Presence of Ron (C4) Salt Deposits	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOGY P Surface Water (A digh Water Table Saturation (A3) _	PRIMARY INDICA  A1)  le (A2)X   1)  sits (B2)	Su Inu (B) Sp Co Ma	any one indicator rface Soil Cracks indation Visible of 7) arsely Vegetated incave Surface (Birl Deposits (B15) drogen Sulfide	s (B6) n Aerial Imag 38)	gery C L Fit	Vater-stained eaves (B9) _ Orainage Patt Oxidized Rhiz iving Roots ( Presence of Fron (C4)	erns (B10) ospheres along C3) leduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY P Surface Water (A High Water Table Saturation (A3) _ Vater Marks (B1 Sediment Depos Orift Deposits (B)	PRIMARY INDICA A1) le (A2)X 1) sits (B2) ast (B4)	Su Inu (B7 Sp Co Ma Hy Od Dry Wa	any one indicator  rface Soil Cracks indation Visible of 7) arsely Vegetated incave Surface (B irl Deposits (B15) drogen Sulfide or (C1) y-Season	38)	gery C L Fit	Vater-stained eaves (B9) _ Prainage Patt Dividized Rhiz iving Roots ( Presence of Ron (C4) Salt Deposits	erns (B10) ospheres along C3) leduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY P Surface Water (A High Water Table Saturation (A3) _ Vater Marks (B1 Sediment Depos Drift Deposits (B)	PRIMARY INDICA A1) le (A2)X 1) sits (B2) ast (B4)	Su Inu (B7 Sp Co Ma Hy Od Dry Wa	any one indicator rface Soil Cracks Indation Visible of 7) arsely Vegetated Incave Surface (B Ind Deposits (B15) drogen Sulfide or (C1) y-Season ater Table (C2)	38)	gery C L Fit	Vater-stained eaves (B9) _ Prainage Patt Dividized Rhiz iving Roots ( Presence of Ron (C4) Salt Deposits	erns (B10) ospheres along C3) leduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY P  Gurface Water (A  High Water Table  Saturation (A3) _  Vater Marks (B1  Sediment Depos  Orift Deposits (B3  Algal Mat or Cruston Deposits (B3  Ton Deposits (B3	PRIMARY INDICA A1) le (A2)X 1) sits (B2) st (B4) 5)	Su Inu (B) Co Ma Hy Od Dry Wa	any one indicator  rface Soil Cracks  Indation Visible of  arsely Vegetated Incave Surface (E  In Deposits (B15)  drogen Sulfide Ior (C1)  y-Season Inter Table (C2)  Ther (Explain in No	38)	gery C L Fit	Vater-stained eaves (B9) _ Prainage Patt Dividized Rhiz iving Roots ( Presence of Ron (C4) Salt Deposits	erns (B10) ospheres along C3) leduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY P Surface Water (A High Water Table Saturation (A3) _ Vater Marks (B1 Sediment Depos Orift Deposits (B)	PRIMARY INDICA A1) le (A2)X 1) sits (B2) st (B4) 5)	Su Inu (B) Co Ma Hy Od Dry Wa	any one indicator rface Soil Cracks indation Visible of 7) arsely Vegetated incave Surface (E ind Deposits (B15) drogen Sulfide or (C1) y-Season ater Table (C2) her (Explain in No	38)	gery C L F In	Vater-stained eaves (B9) _ Orainage Patt Dividized Rhiz iving Roots (Presence of Fron (C4) _ Calt Deposits lotes:	erns (B10) ospheres along C3) educed (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY P  Gurface Water (A  High Water Table  Saturation (A3) _  Vater Marks (B1  Sediment Depos  Orift Deposits (B3  Algal Mat or Cruston Deposits (B3  Ton Deposits (B3	PRIMARY INDICA A1) le (A2)X 1) sits (B2) st (B4) 5) Present (Y/N): N	Su Inu (B) Co Ma Hy Od Dry Wa	any one indicator  rface Soil Cracks  indation Visible of  7)  arsely Vegetated ncave Surface (E  ind Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)  ner (Explain in No	(B6)	gery C L F In	Vater-stained eaves (B9) _ Orainage Patt Dividized Rhiz iving Roots (Presence of Fron (C4) _ Calt Deposits lotes:	erns (B10) ospheres along C3) educed (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       O       Sapling (<5 dbh, <6m tall)       O       Tall shrub (2-6m)       O       Short shrub (0.5-2m)       7 2         Dwarf shrub (<0.5m)
Number of Wetland Types (M): 3 Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       X       High Density (60-80%)         80%)       Very High Density (80-100%)       Very High Density (80-100%)       Very High Density (80-100%)       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M); Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover X
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric X Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
ITTOROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial O
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Outlet Peren
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Peren
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennia
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		53
Feat	ıre I	D: W60 HT 0 66 Field Target: 138 Date: 7   8   14
For a	II ite	ms not checked, please provide detailed explanation in the notes section of data form.
1	. 8	Site Description
	Į.	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2	. <b>\</b>	/egetation
		At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	Æ	Vegetation names are entered legibly for all strata present?
	2	Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?
		Indicator status is correct for each species?
	k	Dominance Test and Prevalence Index have been completed?
3	. S	Soil
	<u> </u>	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4	. н	łydrology
	<u> </u>	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5	. F	unctions and Values
	Ø	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6	. F	ield Logbook
	Þ	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
	Ç	Z Each logbook page is initialed and dated?
7	'. N	Maps
	ĮŽ	Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X Myllledle 7/8/14
Wetland Scientist (print)	Signature / Date
X Joe Christoph	x / 18/14
Field Crew Chief (print)	Signature / Date

SITE DESCRIPTION			200	oo'stu	dy	14091	
Survey Type: Centerline Acces	ss Road (explain)	Other (expl	ain)X	Field Targ	jet: <u>130</u>	Map #: <u>90</u> Map Date: <u>5/2フ/</u> 14	
Date: 7/6/14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60HT054	
Investigators: Joe Christop	ner. Zoe Mea	de, Alo	rigayle	Fisher		Team No.: VV60	
State: Alaska	Region: Alaska	1	Milepost: (	51.5			
Latitude: 62 ° 29 ' 18.85	H	Longitude	e: 150°16' 21-58"			Datum: WGS84	
Logbook No.: 003	Logbook Page No.:	042	Picture No.: P_ N, S, pit, plug				
SITE PARAMETERS	- STATE		2020	15-5		** A SECOND TO THE RESERVE OF THE RE	
Subregion: South (entr	al	Landform (hil	Islope, terrac	ce, hummocks	s, etc.): depression		
Slope (%): 0 - 2			Local relief (c	concave, con	vex, none):	concave	
Pre-mapped Alaska LNG/NWI classifica	tion: PSSI/EMI	В	Soil Map Unit	Name: N	/A		
Are climatic/hydrologic conditions on the YesX No (if no expl	e site typical for this time	of year?			nstances" pres	sent: blain in Notes.)	
Are Vegetation, Soil, or Hyd		y Disturbed?			lain in Notes)		
Are Vegetation, Soil, or Hyd	drology Naturally P	roblematic?	No_ <i>X</i>	_ (If yes, exp	olain in Notes	.)	
SUMMARY OF FINDINGS	THE STATE		Sign :	1	-	St. Marketter	
Hydrophytic Vegetation Present? Yes_	X No	ls	the Sampled A	Area within a	a Wetland?	YesX No	
Hydric Soil Present? Yes	X No	_ w	Wetland Type: PEM/SS 2F				
Wetland Hydrology Present? Yes_	X No	— Al	Alaska Vegetation Classification (Viereck): TLA 3, IT C 2				
Notes and Site Sketch: Please include E corridor.	Directional & North Arrow	, Centerline,	Length of featu	ire, Distance	s from Center	line, Photo Locations, and Survey	
Sita Cic Lara dia		d		A.1.5			
Site Sketch an					OT L	-09600R 003	
Distured pow	erine R.C	), W	to 6	rest.			
0							
2.							

GETATION (use scientific names of plants	3)						
e Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status		Species th	at are OBL, FACW	
				1		Species Across All	
				% Dominant Speci	les that a	re OBL, FACW, or I	-AC:
	Ny to any many distance in				1		
		-		Prevalence Index	workshe	eet:	
Total Cover	:0			Total % Cover of:		Multip	ly by:
50% of total cover	: <u> </u>	% of total cov	/er:O	OBL species: _		_X1=80	
oling/Shrub Stratum(26′)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: FAC species FACU species	10	_x3= 330	_
Betula nana	25	У	FAC	UPL species			
Salex pulchra	10	У	FACW			(A) 442	(B)
Spiraea stevenii	3		FACU	PI = B/A = 2			
						,	
				1			
Total Cover							

Herb Stratum( <u>26</u> ′)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Comarum palustre	30		0BL	Morphological Adaptations¹ (Provide supporting data in
2. Equi setum arvense	40	Y	FAC	Notes)
3. Carex aquatilis	30		OBL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Carex canescens	10		OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Carex magellanica	10		OBL	disturbed or problematic.
6. Calamagrostis canadensis	45	У	FAC	
7.				% Bare Ground
8.				
9.				100 Total Cover of Bryophytes
10.				8 % Cover of Water
Total Cover: 50% of total cover:		% of total cov	er: 33	Hydrophytic Vegetation Present (Y/N):/  Notes: (If observed, list morphological adaptations below):

SOIL			Date 7/6//4 Fe	ature l	D W601	T054		Soil Pit Required (Y/N)
SOIL PROFILE	E DESCRIPTION: (D	escribe	to the depth needed	to doc	ument the	indicator or	confirm the abser	nce of indicators.)
Depth	Matrix		Redox Features		7			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-20		_		-			Fibric	saturated organics
								J
							la contraction	
		ion, RN	M=Reduced Matrix, C	S=Cov	ered or Co	ated Sand G		n: PL=Pore Lining, M=Matrix.
HYDRIC SOIL				3-1-	4500	30		S FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	tel (A1)X		Alaska Gleyed				Alaska Color	Change (TA4) <sup>4</sup>
Histic Epipedor	n (A2)		Alaska Redox (	A14) _			Alaska Alpine	e Swales (TA5)
Black Histic (A	3)		Alaska Gleyed	Pores	(A15)		Alaska Redox	x with 2.5Y Hue
Hydrogen Sulfi	ide (A4)							d without 5Y Hue or Redder Underlying
Thick Dark Sur							Other (Explai	n in Notes)
		— ation, o	ne primary indicator o	f wetla	and hydrolo	ogv. and an a		cape position must be present unless
disturbed or pre	oblematic.		, , , , , , , , , , , , , , , , , , , ,		,,	3,,		po position in the process of the pr
Restrictive Lav	f color change in Not	es.	D	enth (i	nches).			
	( p,,) p			· ·				
Hydric Soil Pr	esent (Y/N):							
Notes:								
51	AGNUM BR	04						
	•							
HYDROLOGY	PRIMARY INDICAT	ORS (a	any one indicator is su	fficien				2 or more required)
Surface Water	(A1) <u>X</u>		rface Soil Cracks (B6)		L	Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)
High Water Tal	ble (A2)X	Inu (B7	ndation Visible on Ae ')	rial Ima	agery [	Drainage Patterns (B10)		Geomorphic Position (D2)
Saturation (A3)	<u> </u>	Spa	arsely Vegetated ncave Surface (B8)	-	C	Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
Water Marks (E	31)	Ма	rl Deposits (B15)			Presence of I	Reduced	Microtopographic Relief (D4)
Sediment Depo	osits (B2)		drogen Sulfide or (C1)				(C5)	FAC-Neutral Test (D5)
Drift Deposits (	B3)	Dry	r-Season ter Table (C2)		١	Votes:		
Algal Mat or Cr	rust (B4)	1	ner (Explain in Notes):					
Iron Deposits (I	B5)							
		-						
Surface Water	Present (Y/N):		Depth (in):		10			Y
Water Table Pr	resent (Y/N):		Depth (in):		We	tland Hydro	logy Present (Y/	N):/
Saturation Pres			Depth (in):					
Notes:	MSSIM d	Dea	INAN Through	1	Non	2001.010		
Dab	vassim d	W A	I HYDOG	5	DYNY	ssion,		

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       X       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       O       Sapling (<5 dbh, <6m tall)       O       Tall shrub (2-6m)       O       Short shrub (0.5-2m)       3 €         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) \( \sum \) Moderate (broken irregular rings) \( \sum \) High (small groupings, diverse and interspersed) \( \sum \)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
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Page 4 of 4

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W60HT054 Field Target: 130 Date: 7/6/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> <li>✓ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	<ul><li>☑ Soil profile is complete?</li><li>☑ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- ✓ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zor Meade X Signature / Date

Wetland Scientist (print)

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION		00	tside 2000'	corridor		
Survey Type: Centerline Acces	ss Road (explain) Other		Field Target: 132	Map #: 92 Map Date: 5/27/14		
Date: 7/6/14	Project Name & No.: Alaska	LNG 26221306	Feature Id	:W60 HT 0 57 055		
Investigators: JC, ZM, A	F			Team No.: W60		
State: Alaska	Region: Alaska	Milepost: \	)4.1 (PAIKS)			
Latitude: 62° 28' 38.43"	Longi	tude: 150° 16'	18-12"	Datum: WGS84		
Logbook No.: 003	Logbook Page No.: 이식니	Picture No.:	P_N, S, pit,	plug		
SITE PARAMETERS	170	114	10.5			
Subregion: South central		Landform (hill	slope, terrace, hummock	s, etc.): depression		
Slope (%): ) - 2		Local relief (co	oncave, convex, none):	Concave		
Pre-mapped Alaska LNG/NWI classifica	tion: PSSIE	Soil Map Unit				
Are climatic/hydrologic conditions on the YesX No (if no expl	site typical for this time of year? ain in Notes)	Are "No Yes_X	rmal Circumstances" pre No (If no, ex			
Are Vegetation, Soil, or Hyd	rology Significantly Distur	bed? No <u>X</u>	_(If yes, explain in Notes	)		
Are Vegetation, Soil, or Hyd	Irology Naturally Problema	itic? No X	_ (If yes, explain in Notes	i.)		
SUMMARY OF FINDINGS				BY TEXA		
Hydrophytic Vegetation Present? Yes_	<u>У</u> No	is the Sampled A	rea within a Wetland?	YesX No		
Hydric Soil Present? Yes	XNo	Wetland Type: PEM1F				
Wetland Hydrology Present? Yes	<u> </u>	Alaska Vegetation	Classification (Viereck):	Ш А З		
Notes and Site Sketch: Please include Dicorridor.  Pay Locale  Point Locale	JENEROUS  JOU-15 de Journ			line, Photo Locations, and Survey		

EGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: 26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3 (  Total Number of Dominant Species Across All Strata: 3 (
1. Betula neoalaskana	2		FACU	% Dominant Species that are OBL, FACW, or FAC: (A
2. Picea glavea			FACU	75 Bollimant openies that are GBE, 1776-1776.
3.				
4.				Prevalence Index worksheet:
Total Cover:	_		Nr.	Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	er:	OBL species: $X = \frac{1}{100}$
Sapling/Shrub Stratum(26')	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 15
1. Alnus sso.	3	У	FAC	UPL species
2.				Column Totals: (A) (B)
3.				PI = B/A = 2 - 4/6
4.				
5.				
6.				
7.				Tree snatum added to shrub snatur
1.0				TASE 2 HOLDIN SUCREY TO 2 NAME 2 HOLDING
8.				and They was 45% cover
8. 9. Total Cover:	-	0% of total cov	er: 1-2	
8. 9. Total Cover: 50% of total cover:	3 20	% of total cov	er:	
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants	3 20	0% of total cov	er: 1 · 2	
8.  9.  Total Cover:  50% of total cover:  VEGETATION (use scientific names of plants	3 20	Dominant Species?		Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6 ' )	) Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6′ )  1. Comarum palustre	3 20 ) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
8.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre 2. Equisetum arvense	3 20 ) Absolute % Cover 40 20	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6' )  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadensis	3 20 ) Absolute % Cover 40 20	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:
8.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 26' )  1. Comarum palustre 2. Equisetum Grvense	3 20 Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6' )  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadensi 4. viola palustre Palustres	3 20 Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 26')  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadonsi.  4. viola palustre Palustres 5.	3 20 Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6' )  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadansi 4. viola palustre Palustris 5. 6.	3 20 Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6' )  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadansi.  4. viola palustre industre  5.  6.  7.	3 20 Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6' )  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadansi.  4. viola palustre Palustres 5. 6. 7. 8. 9.	3 20 Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:
8.  9.  Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 2.6' )  1. Comarum palustre 2. Equisetum arvense 3. Calamagrostis canadansi 4. viola palustre Palustris 5. 6. 7. 8.	3 20 ) Absolute % Cover 40 20 90	Dominant Species? (Y/N)	Indicator Status  OBL FAC	Hydrophytic Vegetation Indicators:

SOIL		I	Date 16 14 Feature ID	W601	1057		Soil Pit Required (Y/N)
OIL PROFIL	LE DESCRIPTION: (	Describe	to the depth needed to docur	nent the	indicator or	confirm the absence	ce of indicators.)
Depth	Matrix		Redox Features				
inches)	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
)-10						Fibric	
10 - 20	10 YR 2/1	100				Silt loam	
Type: C=Co	ncentration, D=Deple	tion, RM	=Reduced Matrix, CS=Cover	ed or Co	oated Sand C	Brains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
	L INDICATORS						FOR PROBLEMATIC HYDRIC SOILS
Histosol or Hi	stel (A1)		Alaska Gleyed (A13)			Alaska Color C	Change (TA4) <sup>4</sup>
Histic Epiped	on (A2)		Alaska Redox (A14)			Alaska Alpine	Swales (TA5)
3lack Histic (A	A3)		Alaska Gleyed Pores (A	.15)		Alaska Redox	with 2.5Y Hue
Hydrogen Sul	lfide (A4)						without 5Y Hue or Redder Underlying
	urface (A12)	_				Other (Explain	in Notes)
	` '	<del>—</del> tation, or	e primary indicator of wetland	d hvdrol	ogv. and an		ape position must be present unless
disturbed or p	problematic.		, , , , , , , , , , , , , , , , , , , ,	1	- 37,		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
'Give details (	of color change in No	tes.	Depth (inc	hee).			
1.1.0.11	Present (Y/N):	1					
HADBOI OCI	V DDIMA DV INDICAT	TORE (a)	ny one indicator is sufficient)		RECONDAR	RY INDICATORS (2	) or more required)
HIDROLOG	FRIMARI INDICA	OKS (al	ly one indicator is sufficiently				
Surface Wate	er (A1)X	Surf	ace Soil Cracks (B6)		Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)
High Water T	able (A2)X	Inur (B7)	dation Visible on Aerial Imag		Drainage Patterns (B10)		
Saturation (A	3)X		rsely Vegetated cave Surface (B8)		Oxidized Rhi Living Roots	izospheres along (C3)	Shallow Aquitard (D3)
Water Marks	(B1)		Deposits (B15)		Presence of Iron (C4)		Microtopographic Relief (D4)
Sediment Der	posits (B2)		rogen Sulfide r (C1)			s (C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)	Dry-	Season		Notes:		
	Crust (B4)		er Table (C2)er (Explain in Notes);				
	(B5)	.   0	CAPILITI II TOOS)	-			
	(30)						
Surface Wate	er Present (Y/N):	/	Depth (in): 2 - 4				\
Water Table F	Present (Y/N):		Depth (in):	We	etland Hydro	ology Present (Y/N	N):
Saturation Pre (includes capi			Depth (in):				
Notes:	, 5-/						
	1550565	***					

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">— &lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
TI BROLOGIO TARRALLO
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial
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#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: W60 HT 05 \$ 5 Field Target: 13 Z Date: 7/6/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> </ul>
	Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade X Gullease 7/6/14

Wetland Scientist (print) Signature / Date

X X X O a Christoph X De 9/6/14

SITE DESCRIPTION	20	000' (	ornidor		
Survey Type: Centerline Access Road (explain) Other (exp	olain) <u>X</u>	Field Targe	et: 139	Map #: <u>11</u> Map Date: <u>5/21/</u> /4	
Date: Project Name & No.: Alaska LNo	Project Name & No.: Alaska LNG 26221306 Feature I				
Investigators: JC, ZM, AF				Team No.: W 60	
State: Alaska Region: Alaska	Milepost: 6	56			
Latitude: 62 2 2 5 1 3 5 . 8 2 11 Longitude	e: 150 ° 16 1	03,3	6"	Datum: WGS84	
Logbook No.: 003 Logbook Page No.: 045	Picture No.:	P- M.S	,	pluq	
SITE PARAMETERS				,	
Subregion: South central	Landform (hills	slope, terrace	e. hummocks	, etc.): [1a]	
Slope (%): 🐧\	Local relief (co				
Pre-mapped Alaska LNG/NWI classification:	Soil Map Unit			1 10111	
Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in Notes)	1 7	rmal Circums	stances" pres	ent: lain in Notes.)	
Are Vegetation, Soil, or Hydrology Significantly Disturbed	? No_X				
Are Vegetation, Soil, or Hydrology Naturally Problematic?	No_X	(If yes, expl	ain in Notes		
SUMMARY OF FINDINGS		- 6		100	
	the Sampled A			Yes No	
Hydric Soil Present? Yes No W	Wetland Type: PSS1EM 1B				
	Alaska Vegetation Classification (Viereck): X C2 III A X v				
Notes and Site Sketch: Please include Directional & North Arrow, Centerline, corridor.  P45 Ser Skutch	, Length of feature	e, Distances	from Centerli	ine, Photo Locations, and Survey	

7. 8. 9. 10.

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3
1.				Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC: 100 (/
3.				
4.				Prevalence Index worksheet:
Total Cover:	Ō			Total % Cover of: Multiply by:
50% of total cover:	0 20	% of total cov	er:0	OBL species:X 1 =X
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:       6   X 2 = 12 2         FAC species       8   X 3 = 2 4         FACU species       0   X 4 = 0
1. Chamaedaphne calypulata	20	У	FACW	UPL species
2. Rhododendron tomentosum	20	У	FACW	Column Totals: 12 (A) 198 (B)
3. Empetrum nigrum	5		FAC	PI = B/A = 1. 6 L)
4. Betula nana	3		FAC	
5. Picea mariana	5		FACW	
6. Vaccinium occycoccus	2		OBL	
7. Vaccinium Vitis-idaea	TR		FAC	
8.				
9.				
Total Cover:				
50% of total cover:	27.5 20	% of total cov	er: <u>}</u>	
VEGETATION (use scientific names of plants)				
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Carex micro chaeta	10		FACW	Morphological Adaptations¹ (Provide supporting data in
2. Cavex microviochin	50	Y	086	Notes)
3. Rubus Chamaemorous	6		FACW	Problematic Hydrophytic Vegetation¹ (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				

naemorous	()		FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic
Total Cover 50% of total cover		% of total cov	er: 13.2	

	E DECODIDATION.	/Danamila		Feature ID			antima the about	Soil Pit Required (Y/N)	
	E DESCRIPTION: (	(Describe	Redox Feature		nent the	indicator or c	confirm the absent	e of indicators.)	
Depth (inches)	Color (moist)	1 %	Color (moist)		Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
7-20	Color (moist)	/0	Color (moist)		1,700	200	Fibric		
7							1,6,10	organies, saturated	
							1		
Type: C=Co	ncentration, D=Depl	letion, RI	M=Reduced Mat	rix, CS=Cover	ed or Co	ated Sand G		: PL=Pore Lining, M=Matrix.	
	LINDICATORS							FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>	
	stel (A1)		Alaska G	eyed (A13)		_	Alaska Color (	Change (TA4) <sup>4</sup>	
listic Epiped	on (A2)			edox (A14)			Alaska Alpine	Swales (TA5)	
Black Histic (A	43)		Alaska G	eyed Pores (A	.15)				
lydrogen Sul	fide (A4)	_					Alaska Gleyed	without 5Y Hue or Redder Underlying	
hick Dark Su	urface (A12)						Other (Explain	in Notes)	
One indicato	r of hydrophytic veg	etation, c	one primary indic	ator of wetland	d hydrole	ogy, and an a		ape position must be present unless	
listurbed or p	roblematic. of color change in N	otes							
Restrictive La	yer (if present): Typ	otes.		Depth (inc	hes):				
lydric Soil F	resent (Y/N):	$\vee$							
		/							
Notes:									
HYDROLOGY	Y PRIMARY INDICA	ATORS (	any one indicato	r is sufficient)		SECONDAR	Y INDICATORS (2	or more required)	
					1	Water-stained	d	Stunted or Stressed	
Surface Wate	r (A1)	Su	rface Soil Crack	s (B6)	_ \\		d	Stunted or Stressed Plants (D1)	
Surface Wate		Su	rface Soil Crack	s (B6)		Water-stained Leaves (B9) _	d	Stunted or Stressed Plants (D1)	
Surface Wate	r (A1) able (A2)X	Su Inc (B'	rface Soil Crack undation Visible 7) arsely Vegetate	s (B6) on Aerial Imag	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)	
Surface Wate	r (A1) able (A2)X	Su Inc (B'	rface Soil Crack undation Visible 7)	s (B6) on Aerial Imag	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)	
Surface Wate High Water To	r (A1) able (A2)X	Su Int (B' Sp Cc	rface Soil Crack undation Visible 7) arsely Vegetate	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhia Living Roots Presence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
Surface Water Table  High Water Table  Saturation (A:  Water Marks	r (A1) able (A2)X 3) (B1)	Su Inu (B' Sp Co	rface Soil Crack undation Visible 7) arsely Vegetate oncave Surface ( arl Deposits (B15	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4)	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table High Water Table Saturation (A: Water Marks	r (A1) able (A2)X 3)	Su Inu (B' Sp Co Ma	rface Soil Crack undation Visible 7) arsely Vegetate ncave Surface (	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
Surface Water Table High Water Table Saturation (A: Water Marks Sediment Dep	r (A1) able (A2) 3) (B1) posits (B2)	Su Inu (B' Sp Co Ma Hy Oo	rface Soil Crack undation Visible 7) arsely Vegetate encave Surface ( arl Deposits (B15) drogen Sulfide for (C1) y-Season	s (B6) on Aerial Imag d B8) 5)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4)	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table High Water Table Saturation (A: Water Marks Sediment Dep	r (A1) able (A2)X 3) (B1)	Su Inu (B' Sp Co Ma Hy Oo	rface Soil Crack undation Visible 7) arsely Vegetate encave Surface ( arl Deposits (B15 drogen Sulfide lor (C1)	s (B6) on Aerial Imag d B8) 5)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table High Water Table Saturation (A: Water Marks Sediment Deposits	r (A1) able (A2) 3) (B1) posits (B2)	Su Inu (B Sp Cc Mae Hy) Oc Dry Wa	rface Soil Crack undation Visible 7) arsely Vegetate encave Surface ( arl Deposits (B15) drogen Sulfide for (C1) y-Season	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table High Water Table Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C	r (A1) able (A2)  (B1)  posits (B2)  (B3)	Su Inu (B Sp Cc Mae Hy) Oc Dry Wa	urface Soil Crack undation Visible 7) uarsely Vegetate uncave Surface ( arl Deposits (B15 drogen Sulfide dor (C1) y-Season ater Table (C2)	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table High Water Table Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C	r (A1) able (A2) 3) (B1) posits (B2)	Su Inu (B Sp Cc Mae Hy) Oc Dry Wa	urface Soil Crack undation Visible 7) uarsely Vegetate uncave Surface ( arl Deposits (B15 drogen Sulfide dor (C1) y-Season ater Table (C2)	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table High Water Table Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or C ron Deposits	r (A1) able (A2)X  3) (B1)  posits (B2) (B3)  Crust (B4) (B5)	Su Inu (B Sp Cc Mae Hy) Oc Dry Wa	urface Soil Crack undation Visible 7) uarsely Vegetate uncave Surface ( arl Deposits (B15 drogen Sulfide dor (C1) y-Season ater Table (C2)	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table  High Water Table  Saturation (A:  Water Marks  Sediment Deposits  Algal Mat or Coron Deposits  Surface Water	r (A1) able (A2)X  3) (B1)  posits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N): 1	Su Inu (B' Sp Cc Mae Hy Oc Dr Wa	rface Soil Crack undation Visible 7) arrsely Vegetate oncave Surface ( arl Deposits (B15 drogen Sulfide dor (C1) y-Season ater Table (C2) her (Explain in N	s (B6) on Aerial Imag d B8) i) lotes):	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)X	
Surface Water Table  High Water Table  Saturation (A:  Water Marks  Sediment Deposits  Algal Mat or Coron Deposits  Surface Water	r (A1) able (A2)X  3) (B1)  posits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N): 1	Su Int (B Sp Cc Ma Hy Oc Dr Wa Otl	rface Soil Crack undation Visible 7) varsely Vegetate oncave Surface ( arl Deposits (B15 drogen Sulfide dor (C1) y-Season ater Table (C2) her (Explain in N	s (B6) on Aerial Imag d B8)	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)X  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X	
Surface Water Table F Saturation (A: Water Marks Sediment Deposits Algal Mat or C ron Deposits Surface Water	r (A1) able (A2)X  able (A2)X  Ball (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N):	Su Inu (B' Sp Cc Mae Hy Oc Dr Wa	undation Visible (7)  Jarsely Vegetate (arl Deposits (B15) (drogen Sulfide (for (C1) (for (C1) (for (Explain in Note) (for (Explain in No	s (B6) on Aerial Imag d B8) 5) lotes):	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)X	
Surface Water Table  Saturation (A:  Water Marks  Sediment Deposits  Algal Mat or Coron Deposits  Surface Water	r (A1) able (A2)  (B1)  posits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N): esent (Y/N):	Su Inu (B' Sp Cc Mae Hy Oc Dr Wa	rface Soil Crack undation Visible 7) arrsely Vegetate oncave Surface ( arl Deposits (B15 drogen Sulfide dor (C1) y-Season ater Table (C2) her (Explain in N	s (B6) on Aerial Imag d B8) i) lotes):	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)X	
Surface Water Table Foaturation Pre- Gaturation (A: Water Marks of Proposits Algal Mat or Coron Deposits Surface Water Table Foaturation Pre- Gaturation Pre- includes capi	r (A1) able (A2)  (B1)  posits (B2)  (B3)  Crust (B4)  (B5)  r Present (Y/N):  Present (Y/N):  esent (Y/N):  ellary fringe)	Su Su Inu (B' Sp Cc Ma Hy Oc Dr Wa	rface Soil Crack undation Visible 7) rarsely Vegetate rarsely Vegetate rarsely Surface ( arl Deposits (B15 rdrogen Sulfide rdr	s (B6) on Aerial Imag d B8) 5) lotes):	ery	Water-stained Leaves (B9) _ Drainage Pat Oxidized Rhiz Living Roots Presence of F Iron (C4) Salt Deposits Notes:	terns (B10) cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)X  FAC-Neutral Test (D5)X	
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VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):     Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) O Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m) Sapling (<5 dbh, <6m tall) O Short shrub (0.5-2m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even X
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)           80%)         X         Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M):         Absent (none)         One or Few         Several to Many         N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover_ X
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:FibricX_ Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/OutletX No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Per
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/I
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/No Ou
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded Intermittently Exposed, Semiperm. Flooded
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet In
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Intermittent Inlet/No Outlet No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Intermittent Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/I
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/I
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

Zm

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	e ID:W60H7586 Field Target: 139 Date: 7/6/14
	items not checked, please provide detailed explanation in the notes section of data form.
i Oi aii	nems not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>         ☐ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?     </li> <li>         ☐ Vegetation names are entered legibly for all strata present?     </li> </ul>
	☐ Cover calculations are complete and correct?
	☐ All dominant species have been determined and recorded per strata? ☐ Indicator status is correct for each species?
	☑ Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	☐ Wetland boundaries have been corrected if necessary? ☐ Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade	X Joshbys	7/6/14
Wetland Scientist (print)	Signature / Date	, ,

Field Crew Chief (print)

Signature / Date

August and a second a second and a second an					
SITE DESCRIPTION	<b>5</b> 1/ 1/ )	<b>-</b>		I	T
Survey Type: Centerline Acce		Other (exp		Field Target: 202	Map #: _\Map Date: 8/29/14
Date: 9/3/2014	Project Name & No.:	Alaska LNO	3 26221306	Feature Id	1: W60 HT 052 57 (2)
Investigators: 3C, 5A	j'-		7		Team No.: W60
State: Alaska	Region: Alaska		Milepost: 6	64.6	
Latitude: 62° 21' 14.69		Longitude	: 150° 161	28.25	Datum: WGS84
Logbook No.: WWO - B	Logbook Page No.:	4	Picture No.:	W60	
SITE PARAMETERS			100		
Subregion: South central			Landform (hill	Islope, terrace, hummoc	ks, etc.):
Slope (%): O			Local relief (c	oncave, convex, none):	CONCAVE
Pre-mapped Alaska LNG/NWI classifica	ation: U/A			Name: N/A	
Are climatic/hydrologic conditions on the Yes_X No (if no exp		e of year?	Are "No Yes_>	ormal Circumstances" pr	
Are Vegetation, Soil, or Hy	drology Significant	tly Disturbed?	No_X	_(If yes, explain in Note	s)
Are Vegetation, Soil, or Hy	drology Naturally F	Problematic?	No_X	_ (If yes, explain in Note	s.)
SUMMARY OF FINDINGS	9.00		100		
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a Wetland?	YesX No
Hydric Soil Present? Yes_	X No	_ w	etland Type: Ţ	PemilssiB	
Wetland Hydrology Present? Yes_	X No	— AI	aska Vegetation	Classification (Viereck)	: III A 3/II C 2
Notes and Site Sketch: Please include I corridor.	Directional & North Arrow	v, Centerline,	Length of featur	re, Distances from Cente	erline, Photo Locations, and Survey
	Gel		)	PI Brok	

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 7
1. Partie and the second			Tan a	Total Number of Dominant Species Across All Strata: 2 (
2.				% Dominant Species that are OBL, FACW, or FAC: \\\ \(\DO\frac{f}{\infty}\) (A
3.				
4.				Prevalence Index worksheet:
Total Cover			Li	Total % Cover of: Multiply by:
50% of total cover	20	% of total cov	er:	OBL species: <u>63</u> X1 = <u>63</u>
Sapling/Shrub Stratum ( )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 35 X2 = 70  FAC species
1. Picea mariana	5/.		Far W	UPL species O X 5 = O
2. Rhadoden drum grænlandicum			Fac	Column Totals: 119 (A) 201 (B)
3. Retula nana	7.1.		Far.	PI = B/A = 1.68
4. chamaedathně ralyculata	301	4	Far W	
5. Empetrum nigrum	3%		Fac	
6. Picea glauca	51.		Facu	
7.				
8.				
9.				
Total Cover				
50% of total cover		% of total cov	er: tt: [	
VEGETATION (use scientific names of plants	27,5		- 11	
Herb Stratum ()	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
	% Cover	Species? (Y/N)	Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0
1. carey limosa	60	Y	001	Morphological Adaptations¹ (Provide supporting data in
2. carex microglochin	31.		onl	Notes)
3 calamagrostis conndensis	17/		Fac	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.	7			disturbed or problematic.
6.	/			
7,	/			O % Bare Ground
8.				% Cover of Wetland Bryophytes
9.				<u>\O O</u> Total Cover of Bryophytes
10.				% Cover of Water
	(atr)			Hydrophytic Vegetation Present (Y/N):
Total Cover 50% of total cover		)% of total cov	ver: <u>12, 8</u>	Notes: (If observed, list morphological adaptations below):

SOIL			Date 9 3 14 Feature ID V	HAD NOT	051	2	Soil Pit Required (Y/N)
	F DESCRIPTION: (I	Describe	e to the depth needed to docume		ator or co	nfirm the absent	
	Matrix	DOGGIND	Redox Features	in the male	01 00	Thirti are absent	of indicators.)
Depth (inches)	Color (moist)	1 %		pe <sup>1</sup> L	oc²	Texture	Notes
0-20	Total (molety	1	Gold (moley)				Saturated
0~20						Fibric	SAGINATEU
		etion, RN	M=Reduced Matrix, CS=Covered	or Coated	Sand Gra	I CONTRACTOR OF THE PARTY OF TH	: PL=Pore Lining, M=Matrix.
Manifest Control of the Control	LINDICATORS		T			A CONTRACTOR OF THE PARTY OF TH	FOR PROBLEMATIC HYDRIC SOILS
	stel (A1) X		Alaska Gleyed (A13)				Change (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)				Swales (TA5)
	A3)		Alaska Gleyed Pores (A15	)			with 2.5Y Hue  I without 5Y Hue or Redder Underlying
Hydrogen Sul	fide (A4)		4			Layer	— — — — — — — — — — — — — — — — — — —
Thick Dark Su		_				Other (Explain	
disturbed or p	roblematic.		ne primary indicator of wetland h	ydrology, a	and an ap	propriate landsc	ape position must be present unless
	of color change in No yer (if present): Type		Depth (inche	s): Na			
Hydric Soil P	resent (Y/N):						
Notes:	^					1	
	HT DE	1.1	Luc 80115 1	140	1	1	
	De	44	Char 2011)	122	VV		
HYDROLOGY	Y PRIMARY INDICA	TORS /	any one indicator is sufficient)	SECO	ONDARY	INDICATORS /2	or more required)
				Wate	r-stained		Stunted or Stressed
Surface Wate	r (A1)	Su	rface Soil Cracks (B6)				
High Water Ta	able (A2)	Inu (B7	ndation Visible on Aerial Imagery	Drain	age Patte	rns (B10)	Geomorphic Position (D2)
Saturation (A3	3)	Sp	arsely Vegetated ncave Surface (B8)		zed Rhizo Roots (C	spheres along	Shallow Aquitard (D3)
NA	(5.4)			_	ence of Re		Microtopographic
vvater Marks	(B1)		rl Deposits (B15)		C4)		Relief (D4) X
Sediment Dep	oosits (B2)		drogen Sulfide or (C1)	-	Salt Deposits (C5) FAC-Neutral Test (D5)		
Drift Deposits	(B3)	Dry Wa	/-Season ater Table (C2)	Notes	3:		
Algal Mat or C	Crust (B4)	Oth	ner (Explain in Notes):				
Iron Deposits	(B5)						
				40			
Surface Wate	r Present (Y/N): 1		Depth (in): H a				🗸
	Present (Y/N): /		Depth (in): ○ <sup>I</sup>	Wetland	d Hydrolo	gy Present (Y/N	N):
Saturation Pre (includes capi	esent (Y/N):	Depth (in): O					
Notes:							
		1 2	1005+ 065	010			

Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent       Emergent-Persistent
Percent Cover (P): Tree (>5 dbh, >6m tall) ○ Sapling (<5 dbh, <6m tall) \( \bigcirc \) Tall shrub (2-6m) Short shrub (0.5-2m) \( \bigcirc \) Dwarf shrub (<0.5m) \( \bigcirc \) Tall herb (≥1m) \( \bigcirc \) Short herb (<1m) \( \bigcirc \) Moss-Lichen \( \bigcirc \) Floating \( \bigcirc \) Submerged \( \bigcirc \)
Number of Wetland Types (M): 3 Evenness of Wetland Type Distribution (M): EvenHighly Uneven X Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover_X
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
<b>Vegetative Interspersion (P)</b> : Low (large patches, concentric rings) <u>X</u> Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Pronounced (>18in.) Return Interval 1-2 yrs Return Interval 2-5 yrs Retu
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Pronounced (>18in.) Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs Pronounced (>18in.) Return Interval 2-5 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Microrelief of Wetland Surface (P): Absent

Page 4 of 4

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	Field Target: 202 Date: 9/3/14
	items not checked, please provide detailed explanation in the notes section of data form.
4	Site Description
	Site Description
	☐ Site description, site parameters and summary of findings are complete? ☐ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?  ✓ Cover calculations are complete and correct?
	All dominant species have been determined and recorded per strata?
	☐ Indicator status is correct for each species? ☐ Dominance Test and Prevalence Index have been completed?
	the contract of the contract o
3.	Soil
	☐ Soil profile is complete?
	Appropriate hydric soil indicators are marked?
4.	Hydrology
	☐ Appropriate hydrology indicators are marked? ☐ Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>☑ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>☑ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	☐ Wetland boundaries have been corrected if necessary? ☐ Maps are initialed and dated?

8. Photos	
soil pit, 1 soil plug)?	for each Wetland Determination Data Form (2 vegetation, of for each Observation Point (vegetation/site overview)?
X to almal.	X Alala
Wetland Scientist (print)	Signature / Date
X Quantity (print)	X Jennifer Anderson 9/3/14 Signature / Date

# Vegetation Classification Data Form

Field Crew Chief: \_\_

#: 21306		Field Target: 20ス
		Feature ID: WGO HTO 5 9 8
Longitude:		Datum: WGS84
Logbook Pa	ige #:	Picture #:  NE, SW
c Name)		
	Retula.	NeoAlasKAna
ris	LICOPO	dium SAP
2		
/el:		
$\sim$		
el I, Level II, I	Level III	
	É	
	Longitude: Logbook Pa  Name)	Longitude: Logbook Page #:  Retula  Lycopo S eel:

Field Scientist/Technician

# Vegetation Classification Data Form

Level I	Level II	Level III
I Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Sroadleaf woodland
	C Mixed forest	Closed mixed forest     Open mixed forest     Mixed woodland
II Scrub	A Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland
	B Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub
III Herbaceous	A Graminoid herbaceous	Dry graminoid herbaceous     Mesic graminoid herbaceous     Wet graminoid herbaceous     (emergent)
	B Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C Bryoid herbaceous	(1) Mosses (2) Lichens
	D. Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceous     Marine aquatic herbaceous

II. Sc	crub	
8a	Vegetation with at least 10 percent cover of dwarf trees	9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	10
9a.	Dwarf tree canopy of 60-100 percent cover	ub
9b	Dwarf tree canopy of 25-59 percent cover	rub
9c	Dwarf tree canopy of 10-24 percent cover	and
10a	Shrubs more than 1.5 meters (5 ft) tall	11
10b	Shrubs less than 1.5 meters (5ft)tali	12
11 a	Shrub canopy cover greater than 75 percent	ub
11 b	Shrub canopy cover of 25-74 percent II.B 2 Open tall sc	rub
12a.	Shrubs 20 centimeters to 1.5 meters tall II.C Low scrub	13
12b.	Shrubs under 20 centimeters in height	14
13a.	Shrub canopy cover greater than 75 percent	rub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	ub
14a	Dryas species dominant in the dwarf shrub layer	rub
14b	Ericaceous species dominant in the dwarf shrub layer	rub
14c	Willow species dominant in the dwarf scrub layer II D.2 Willow dwarf scrub	ub
III H	Herbaceous	
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	.16
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water III D Aquatic herbaceous	21

Des	escriptions of levels I, II, III, and IV follow the classification table.	
la.	present and have a canopy cover	_ I Forest
1 b	Trees over 3 meters (10 ft) tail are absent or nearly so, Less than 10 percent cover. (Ovarif trees, less than 3 meters [10 ft) tail may be present and abundant.	
I F	Forest	
2a.	Over 75 percent of tree cover contributed by needleleaf (conifer) species I A Nee	deleaf forest
2b.	Less than 75 percent of tree cover contributed by needleleaf (conifer) species	
3a	Tree canopy of 60-100 percent cover IA 1 Closed n	eedleleaf forest
3Ь	Tree canopy of 25-59 percent cover	needleleaf fores
3с	Tree canopy of 10-24 percent cover I A.3 Needl	leleaf woodland
4a	Over 75 percent of tree cover contributed by broadleaf species	adleaf forest
4b	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover	6
5a	Tree canopy of 60-100 percent cover I.B.1 Closed	broadleaf fores
5b	Tree canopy of 25-59 percent cover IB.2 Open	broadleaf fores
5с	Tree canopy of 10-24 percent cover LB.3 Bros	deaf woodland
6a	Tree canopy of 60-100 percent cover I C 1 Clos	sed mixed fores
6b.	Tree canopy of 25-59 percent cover	en mixed fores
6c.	Tree canopy of 10-24 percent cover LC.3	Mixed woodland
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 it] tall)	8
7b		
	up to 25 percent shrub cover)	.15

	up to 25 percent shrub cover)
16a.	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant
17a	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by Elymus spp., Festuca spp., and Deschampsia spp
17b	On moist sites, but usually not with standing water. Usually dominated by Calamagrostis spp., Cerex spp. or Eriophorum spp.; tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra, bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)
18b	Vegetation dominated by mosses or lichens
19a.	On dry sites, usually rocky and well drained; mostly tundra sites
19b.	On moist sites but without standing water, mostly within forested areas
19c.	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses III.C.1 Bryoid moss
20b.	Vegetation cover dominated by lichens
21a.	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water aquatic herbaceous
21c	Vegetation submerged or floating in salt water III D 3 Marine aquatic herbaceous

#### Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site. WEOHTOS 89 Field Target: 257 Feature ID: 200 For all items not checked, please provide detailed explanation in the notes section of data form. 1. General Information ☑ Location data recorded? Photo taken and photo number recorded? 2. Location Description ☐ Location of site recorded with enough detail to help relocate? 3. Common Species Scientific name of common species recorded? Percent cover of dominant structure level noted? 4. Habitat Description ☐ Habitat described? 5. Classification ☑ All three levels of classification recorded? 6. Field Log Book Field form entries consistent with log book? ☑ Logbook clearly identifies the Field Target ID and Feature ID?

SITE DESCRIPTION				
Survey Type: Centerline X Acce	ss Road (explain) Other (ex	kplain)	Field Target: 253	Map #: 2 Map Date: 8/29/14
Date: 9/3/14	Project Name & No.: Alaska L		-	WGO HTOS 9
Investigators: JC , JA				Team No.: W (ot)
State: Alaska	Region: Alaska	Milepost: 6	66-43	
Latitude: 62° 19' 47-61"	Longitu	ide: 1500 16	1 35.51"	Datum: WGS84
Logbook No.: W60 - 1	Logbook Page No.: 3		WKOHT059_	
SITE PARAMETERS			100000000000000000000000000000000000000	
Subregion: South Can		Landform (hill	slope, terrace, hummock	s, etc.): Tracks
Slope (%): 2 - 540	<del></del>		oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	ation: 1/A	Soil Map Unit	4 11	
Are climatic/hydrologic conditions on the		Are "No Yes_X	ormal Circumstances" pre No (lf no, ex	
Are Vegetation, Soil, or Hy	drology Significantly Disturbe	ed? No_X	_(If yes, explain in Notes	)
Are Vegetation, Soil, or Hy	drology Naturally Problemati	c? No <u></u> ★	_ (If yes, explain in Notes	s.)
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes_	No	Is the Sampled A	Area within a Wetland?	Yes NoX
Hydric Soil Present? Yes_	X No	Wetland Type:	UPL	
Wetland Hydrology Present? Yes_	X No	Alaska Vegetation	Classification (Viereck):	IC2, IC2
Notes and Site Sketch: Please include I corridor.  Recent heavy To	do.	ne, Length of featu	re, Distances from Cente	rline, Photo Locations, and Survey

Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Picea glaura 2. Betula nepalaskana	10 %	4	Fac U	Total Number of Dominant Species Across All Strata: 5  % Dominant Species that are OBL, FACW, or FAC: 40/1
Betula nepalaskana	25%	.7	Facu	
4.				Prevalence Index worksheet:
Total Cove	er: 35 /.			Total % Cover of: Multiply by:
50% of total cov	er: <u>17 5</u> 20	% of total cov	ver:77	OBL species:X1 =
Sapling/Shrub Stratum ( )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 15
1. Sheperdia canadensis	25%	Y	For U	UPL species X 5 =
2. Spiraea Stevenji	5%	- 1	Facu	Column Totals: 190 (A) 635 (B)
3.				PI = B/A = 3.34
4.				
5.				
6.	٨			
7.				
3.				
9.				
Total Cove	er: <u>301.</u>			
50% of total cove	er: <u>457.</u> 20	% of total cov	er: <u>6/</u>	
VEGETATION (use scientific names of plan	ts)		1 0	
Herb Stratum()	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Athurium cuclosorum	35%	(Y/N)	FO	Prevalence Index is ≤ 3.0

Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Athyrium cyclosorum	35%	4	Far	Prevalence Index is ≤ 3.0  A 2 Manufaction 1/Drawide according data in
2. Calamagrastis camdensis	50%	Y	Fac	Morphological Adaptations¹(Provide supporting data in Notes)
3. Rubus Chamaemarus	15%		Facen	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. corn 5US canadensis	151		FORU	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Equisetum Sylvaticum	10%		Fac	disturbed or problematic.
6.			1.00	
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.		7		% Cover of Water
Total Cover: 50% of total cover:		% of total cov	er: <u>25/.</u>	Hydrophytic Vegetation Present (Y/N):  Notes: (If observed, list morphological adaptations below):

SOIL			Date 913/19 Fea	ature ID	WEDL	159		Soil Pit Required (Y/N)	
OIL PROF	ILE DESCRIPTION: (	Describe	to the depth needed	to docu	ment the	indicator or	confirm the abser	nce of indicators.)	
Depth	Matrix		Redox Features						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
)-9"							FILORIC	Saturated	
1-20"	10 YR 2/2	100					SL		
								4.4	
	4								
			- 1 - 4						
				-		-			
Type: C=C	ncentration D=Denk	etion RN	 /I=Reduced Matrix, CS	S=Cove	red or Co	ated Sand G	Prains <sup>2</sup> Locatio	n: PL=Pore Lining, M=Matrix.	
	IL INDICATORS	enon, rav	i-reduced matrix, oc	3-00VC	160 01 00	ateu oanu e	- A M	FOR PROBLEMATIC HYDRIC SOILS	
The state of the state of	listel (A1)		Alaska Gleyed	(A13)			No. of Concession, Name of Street, or other Persons, Name of Street, Name of S	Change (TA4) <sup>4</sup>	
	don (A2)		Alaska Redox (					e Swales (TA5)	
Black Histic			Alaska Gleyed I					x with 2.5Y Hue	
	ulfide (A4)				,			d without 5Y Hue or Redder Underlying	
				_			Layer		
	surface (A12)	etation o	ne primary indicator o	f wetlan	nd hydrolo	av and an	Other (Explain in Notes) appropriate landscape position must be present unles		
disturbed or	problematic.		no primary maleator o	i wedan	ia riyarolo	gy, and an	арргорнаю каназ	sape position must be present amous	
Give details	of color change in No	otes.	De	onth (in	chee): N	1.7Δ			
TOOLITOLITO E	ayor (ii prodont). Typ	o		opan (m	5110071	1.1.1.			
			likely influ				dicator.		
lotes: Red	cent heavy k	eains	likely influ	<u>ken</u> (	ing f	ield in	dicator.		
Notes: Red	cent heavy k	eains		<u>ken</u> (	ing f	ield in	dicator,	2 or more required)	
HYDROLOG	cent heavy k	tors (a	likely influ	en (	ing f	ield in	dicator, Y INDICATORS		
Notes: Red	er (A1)	TORS (a	invery in fla	Men (	s s	ECONDAR Vater-staine eaves (B9)	dicator.  Y INDIGATORS	2 or more required) Stunted or Stressed Plants (D1)	
HYDROLOG Surface Water	er (A1)	TORS (a	invery in fla	fficient)	s v L L gery C	ECONDAR Vater-staine eaves (B9)	dicator, Y INDICATORS	2 or more required) Stunted or Stressed Plants (D1) Geomorphic Position (D2)	
HYDROLOG Surface Water T	er (A1)	TORS (a	invery in fla	fficient)	Sery C	ECONDAR Vater-staine eaves (B9) Orainage Pa Oxidized Rhi iving Roots	Y INDICATORS d  tterns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)	
HYDROLOG Surface Wat High Water T	er (A1)	TORS (a Sur - Inu (B7 Spa Coi	invery in fla	fficient)	gery C	ECONDAR Vater-staine eaves (B9) Orainage Pa Oxidized Rhi iving Roots	Y INDICATORS of terms (B10)	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
HYDROLOG Surface Water To Baturation (A	er (A1)  Table (A2)  (B1)	TORS (a Sur Inu (B7 Spa Con Ma	inv one indicator is surface Soil Cracks (B6) Indation Visible on Aer  arsely Vegetated Incave Surface (B8)	fficient)	gery C	ECONDAR Vater-staine eaves (B9) Drainage Pa Dxidized Rhi iving Roots Presence of ron (C4)	Y INDICATORS of terns (B10) zospheres along (C3) Reduced	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
HYDROLOG Surface Water T Saturation (A	er (A1)  Table (A2)	TORS (a Sur Inu (B7 Cor Ma Hyo	inv one indicator is surface Soil Cracks (B6) Indation Visible on Aer  arsely Vegetated Incave Surface (B8) Independent of the control of the	fficient)	gery C	ECONDAR Vater-staine eaves (B9) Orainage Pa Oxidized Rhi iving Roots Presence of ron (C4)	Y INDICATORS of terms (B10)	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
HYDROLOG Surface Water High Water Teaturation (A	er (A1)  Table (A2)  (B1)	Sur	inverse in file	fficient)	gery C	Presence of ron (C4) Salt Deposits lotes:	y INDICATORS of terns (B10) zospheres along (C3) Reduced	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
HYDROLOG Surface Water High Water Saturation (A Water Marks Sediment De	EPOSITS (B2)	Sur	inverse in file	aen (	gery C	Presence of ron (C4) Salt Deposits lotes:	y INDICATORS of terns (B10) zospheres along (C3) Reduced	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
AYDROLOG Surface Water T Saturation (A Water Marks Sediment De	er (A1)  Table (A2)  (B1)  eposits (B2)	Sur	inverse in file	aen (	gery C	Presence of ron (C4) Salt Deposits lotes:	y INDICATORS of terns (B10) zospheres along (C3) Reduced	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
HYDROLOG Gurface Water High Water Saturation (A Water Marks Gediment De Drift Deposit	EPOSITS (B2)	Sur	inverse in file	aen (	gery C	Presence of ron (C4) Salt Deposits lotes:	y INDICATORS of terns (B10) zospheres along (C3) Reduced	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
HYDROLOG Gurface Water High Water Saturation (A Water Marks Gediment De Drift Deposit	er (A1)  Fable (A2)  (B1)  eposits (B2)  crust (B4)	Sur	inverse in file	aen (	gery C	Presence of ron (C4) Salt Deposits lotes:	y INDICATORS of terns (B10) zospheres along (C3) Reduced	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
HYDROLOG Surface Water To Saturation (A Water Marks Sediment De Drift Deposite Algal Mat or ron Deposite	er (A1)  Fable (A2)  (B1)  eposits (B2)  crust (B4)	Sur	inverse in file	aen (	gery C	ECONDAR Vater-staine eaves (B9) Drainage Pa Dxidized Rhi iving Roots Presence of fron (C4) Salt Deposits Iotes:	y INDICATORS of terms (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  RAMS  Field In dic. for	
HYDROLOG Surface Water High Water To Saturation (A Water Marks Sediment De Drift Deposite Algal Mat or ron Deposite Surface Water	er (A1)  Fable (A2)  (B1)  eposits (B2)  crust (B4)  s (B5)	Sur	inv one indicator is surface Soil Cracks (B6) Indation Visible on Aeronause Surface (B8) In Deposits (B15) Indrogen Sulfide or (C1) Inv-Season atter Table (C2) Inter (Explain in Notes):	aen (	gery C	ECONDAR Vater-staine eaves (B9) Drainage Pa Dxidized Rhi iving Roots Presence of fron (C4) Salt Deposits Iotes:	y INDICATORS of terms (B10) zospheres along (C3) Reduced s (C5)	2 or more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposite Algal Mat or ron Deposits Surface Water Water Table Saturation P includes cap	er (A1)  Table (A2)  (B1)  Posits (B2)  Crust (B4)  er Present (Y/N): H  Present (Y/N): V  resent (Y/N): Oillary fringe) ×	TORS (a Sur Inu (B7 Spa Coi Ma Dry Wa Oth	inv one indicator is surface Soil Cracks (B6) Indation Visible on Ael  arsely Vegetated Incave Surface (B8) Indrogen Sulfide Incorrection of C1) Incorrection of C2) Incorrection of C2) Incorrection of C2) Incorrection of C2 Incorrection of C	aen (	gery C	ECONDAR Vater-staine eaves (B9) Drainage Pa Dxidized Rhi iving Roots Presence of fron (C4) Salt Deposits Iotes:	y INDICATORS of terms (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  RANG  Field In dic. for	
NYDROLOG Surface Water Tale Saturation (A Vater Marks Sediment De Orift Deposite Surface Water Table Saturation Pencludes cap	er (A1)  Fable (A2)  (B1)  Posits (B2)  Crust (B4)  S (B5)  er Present (Y/N): H  Present (Y/N): H  resent (Y/N): J	TORS (a Sum Inu (B7 Spa Con Ma — Hyc Od Dry Wa — Oth	inverse in file	aen (	gery C	ECONDAR Vater-staine eaves (B9) Drainage Pa Dxidized Rhi iving Roots Presence of fron (C4) Salt Deposits Iotes:	y INDICATORS of terms (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  RANG  Field In dic. for	

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Aquatic Bed
Percent Cover (P):         Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Sifty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Intermittent Outlet
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Intermittent Outlet
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitte
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/I
Inlet/Outlet Class (P): No Inlet/Dutlet
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Intermittent Clutter Class (P): No Inlet/Outlet

Page 4 of 4

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	EID: 100 HT059 Field Target: 903 Date: 9/3/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>□ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>□ Vegetation names are entered legibly for all strata present?</li> <li>□ Cover calculations are complete and correct?</li> <li>□ All dominant species have been determined and recorded per strata?</li> <li>□ Indicator status is correct for each species?</li> <li>□ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values Opland
į.	☐ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	Ph	otos
----	----	------

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson X Jak 9/3/14
Wetland Scientist (print)
Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION	11-1-1	Hooks	20	60	130
Survey Type: Centerline Acc	cess Road (explain)	Other (exp	olain)	Field Target: 053	Map #:Map Date:
Date: 6 27/111	Project Name & No.	: Alaska LN	G 26221306	Feature Id	W61 HT 001
Investigators: K DEGUTY	J Andusin	^	A Fisher		Team No.: Wo
State: Alaska	Region: Alaska			522.8	000 1
Latitude: 63° 53 08.0	43"	Longitud	e: 149° 0	4' 30.719"	Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:	f			Plug SWINE
SITE PARAMETERS		16-17-3-31	T		0
Subregion: Interior			Landform (hill	slope, terrace, hummocks	s, etc.): FIAF
Slope (%):			Local relief (co	oncave, convex, none):	Hous
Pre-mapped Alaska LNG/NWI classifi	cation: PS: 4B		Soil Map Unit	Name:	
Are climatic/hydrologic conditions on t		e of year?	Are "No Yes_	ormal Circumstances" pre No (If no, exp	
Are Vegetation, Soil, or H	ydrology Significan	tly Disturbed	? No 10	_(If yes, explain in Notes)	
Are Vegetation, Soil, or H	ydrology Naturally l	Problematic?	No D	(If yes, explain in Notes	)
SUMMARY OF FINDINGS				The set of the set of	
Hydrophytic Vegetation Present? Yes	No	ls	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes_	<u>р</u> No	v	etland Type:	P5513	PSSI/4B
Vetland Hydrology Present? Yes	P No_	— А	laska Vegetation	Classification (Viereck):	ICI IFAX3
lotes and Site Sketch: Please include orridor.	Directional & North Arrow	v, Centerline	Length of feature	e, Distances from Center	line, Photo Locations, and Survey
	See 1	orbook	W61-2	-, page 1	for Sketch
2		5	nates		
and the second		1			
1					

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: Z6)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
1. Picea gionea	15	Y	FACU	Total Number of Dominant Species Across All Strata:  % Dominant Species that are OBL, FACW, or FAC: (A
2. 0				7 Bornman oposios tratalis s = 1, 11 a s , 12 a
3.				
1_				Prevalence Index worksheet:
Total Cover:			_	Total % Cover of: Multiply by:
50% of total cover:	<u>7.5</u> 20	% of total cov	er: <u>3</u>	OBL species: X1 = X1
Sapling/Shrub Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
Behila glandulosa	80	Y	FAC	UPL speciesX 5 =
2 Vaccinium vitis-idaeu	10	- 1	FAC	Column Totals: (A) 509 (B)
VACCINIUM VIGLASSUM	30		FAC	PI = B/A =
4. Picea glaves	10		FACU	
5. Salir Bardan	15		FAC	
5.				
7.				
7. 8. 9.	.26			
7. 8.		)% of total cov	ver: <u>27</u>	
Total Cover 50% of total cover	67.5 20	% of total cov		
7. 3. 9. Total Cover. 50% of total cover	67.5 20	Dominant Species? (Y/N)	ver: 27 Indicator Status	Hydrophytic Vegetation Indicators:
Total Cover.  50% of total cover.  VEGETATION (use scientific names of plants.)	: (7.5 20 s) Absolute	Dominant Species?	Indicator	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
Total Cover 50% of total cover vegetation (use scientific names of plants Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:Dominance Test is > 50%
Total Cover.  50% of total cover.  VEGETATION (use scientific names of plants Herb Stratum ( )  1- Petas fes Gizides  2- Calamagnstis Calabadin Signature.	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
Total Cover 50% of total cover 50% of total cover wegetation (use scientific names of plants Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cover 50% of total cover VEGETATION (use scientific names of plants Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
Total Cover.  50% of total cover.  VEGETATION (use scientific names of plants.)  1- Petas des Gizides.  2- Calendaristis Calendaris.  3.  4.  5.	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover 50% of total cover WEGETATION (use scientific names of plants Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles
Total Cover.  Total Cover.  50% of total cover.  VEGETATION (use scientific names of plants.)  Herb Stratum ( )  Colombia post is Calculated and Signature of the control o	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes
Total Cover.  Total Cover.  50% of total cover.  VEGETATION (use scientific names of plants.)  Herb Stratum ( )  1 Petasiles Fisiales.  2 Calendaristis Calendin Sign.  3.  4.	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:
7.  8.  9.  Total Cover. 50% of total cover.  VEGETATION (use scientific names of plants.  Herb Stratum ( )  1. Petasites Frigidus 2. Calamagostis Calamagostis 3. 4. 5. 6. 7. 8.	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes

Type: C=Concentration, D:  HYDRIC SOIL INDICATOR  Histosol or Histel (A1)  Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)	t) %  ** toyles 3 9  ** toyles 3 9  **Depletion, RM	Redox Features Color (moist)  7.542 5 8  Reduced Matrix, CS=	o document % Typ 10 C	t the indicator or one let Loc²	Texture  Fibric  SANGE IMAN	Notes Saturated
Depth (inches)  Color (mois  Co	t) % Hoves 3 9 LOO	Redox Features Color (moist)  7.542 5 8  Reduced Matrix, CS=	% Typ	Loc²	Texture Fibric SANLE LOAM	Notes  Saturated
Type: C=Concentration, D:  HYDRIC SOIL INDICATOR: Histosol or Histel (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)	Depletion, RM	TISTIR 5 B	10 C	im M	Fibric SANLEY LOAD	Notes Saturated
Type: C=Concentration, D:  HYDRIC SOIL INDICATOR:  Histosol or Histel (A1)  Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)	Depletion, RM	7,5 VR 5 B  =Reduced Matrix, CS=	40 C	, M	SANLEY LOAN	1
Type: C=Concentration, D:  HYDRIC SOIL INDICATOR:  Histosol or Histel (A1)  Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)	Depletion, RM	7,5 VR 5 B  =Reduced Matrix, CS=	40 C	, M	SANLEY LOAN	1
Type: C=Concentration, D:  HYDRIC SOIL INDICATOR:  Histosol or Histel (A1)  Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)	Depletion, RM	=Reduced Matrix, CS= Alaska Gleyed (A		, M	5.14	Southerested
Type: C=Concentration, D=  HYDRIC SOIL INDICATOR: Histosol or Histel (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)		Alaska Gleyed (A	=Covered o	r Coated Sand C		
Type: C=Concentration, D=  HYDRIC SOIL INDICATOR:  Histosol or Histel (A1)  Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)		Alaska Gleyed (A	=Covered o	r Coated Sand C		4
HYDRIC SOIL INDICATOR Histosol or Histel (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)		Alaska Gleyed (A	=Covered o	r Coated Sand C		
HYDRIC SOIL INDICATOR Histosol or Histel (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)		Alaska Gleyed (A	=Covered o	r Coated Sand C		
HYDRIC SOIL INDICATOR Histosol or Histel (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)		Alaska Gleyed (A	=Covered o	r Chatad Cand O		
Histosol or Histel (A1) Histic Epipedon (A2) Black Histic (A3) Hydrogen Sulfide (A4)		Alaska Gleyed (A		ovaled Sand G		PL=Pore Lining, M=Matrix
Histic Epipedon (A2)  Black Histic (A3)  Hydrogen Sulfide (A4)		Alaska Gleyed (A				OR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
Black Histic (A3)		1	(13)			ange (TA4) <sup>4</sup>
Hydrogen Sulfide (A4)		Alaska Redox (A				vales (TA5)
		Alaska Gleyed Po	ores (A15)			th 2.5Y Hue
T1:15 10 1 10 1					Alaska Gleyed w Layer	ithout 5Y Hue or Redder Underlying
Thick Dark Surface (A12)					Other (Explain in	Notes)
One indicator of hydrophytic	vegetation, or	ne primary indicator of	wetland hyd	drology, and an a	ppropriate landscap	e position must be present unless
disturbed of propietifalic.						410
<sup>4</sup> Give details of color change Restrictive Layer (if present)	Type: FR	DEN Der	oth (inches)	6		
Hydric Soil Present (Y/N):	4					
Notes:						
HYDROLOGY PRIMARY IN	DICATORS (ar	ny one indicator is suffi	cient)	SECONDARY	INDICATORS (2 or	more required)
Surface Water (A1)	_ Surf	ace Soil Cracks (B6) _		Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)
High Water Table (A2)	Inun (B7)	dation Visible on Aeria	Imagery		erns (B10)	
Saturation (A3)	Spai Con	rsely Vegetated cave Surface (B8)		Oxidized Rhize Living Roots (	ospheres along C3)	Shallow Aquitard (D3)
Water Marks (B1)	. Marl	Deposits (B15)		Presence of R		Microtopographic Relief (D4)
Sediment Deposits (B2)		ydrogen Sulfide dor (C1)		Salt Deposits	(C5)	FAC-Neutral Test (D5)
Drift Deposits (B3)	Dry-	Season er Table (C2)		Notes:		4
gal Mat or Crust (B4) Other (Explain in Notes):				1		
Algal Mat or Crust (B4)						
	-					
Iron Deposits (B5)	У	Depth (in):				1.0
Algal Mat or Crust (B4)  Iron Deposits (B5)  Surface Water Present (Y/N):  Water Table Present (Y/N):	1	10		Wetland Hydrol	ogy Present (Y/N):	7
Iron Deposits (B5)  Surface Water Present (Y/N):  Water Table Present (Y/N):  Saturation Present (Y/N):	4 0	Depth (in):		Wetland Hydrol	ogy Present (Y/N):	<u> </u>
Surface Water Present (Y/N):  Water Table Present (Y/N):  Saturation Present (Y/N): includes capillary fringe)	4 0			Wetland Hydrol	ogy Present (Y/N):	
Iron Deposits (B5) Surface Water Present (Y/N): Water Table Present (Y/N):	4 0	Depth (in):		Wetland Hydrol	ogy Present (Y/N):	<u> </u>
For Deposits (B5)  Surface Water Present (Y/N):  Water Table Present (Y/N):  Saturation Present (Y/N): includes capillary fringe)	4 0	Depth (in):		Wetland Hydrol	ogy Present (Y/N):	<u> </u>

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
/egetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (630%) Very High Density (80-100%)
nterspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site  Dipen Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat \( \sum_{\text{Lacustrine Fringe}} \) Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Paturn Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
LANUSCAFE VARIADLES IVII
Only Connected Relay
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Upstream & Downstream Unknown
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Upstream & Downstream Unknown
Wetland Juxtaposition: Wetland Isolated
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown         Wetland Land Use:       High Intensity (i.e., ag.)       Moderate Intensity (i.e., forestry)       Low Intensity (i.e. open space)

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID:_ <i>W@  }</i>	DOI_	Field Target:	053	Date:_	6/27/1	4
For all	l items not ched	cked, please prov	vide detailed exp	lanation in the	notes sectio	n of data fo	orm.
1.	Site Descri	ption					
	Site des	cription, site pa	rameters and s included in log	summary of f gbook?	indings are	complete?	
2.	Vegetation			0 2			
	Vegetati Cover ca All domin	80% of onsite value of on names are ealculations are chant species have status is corrected to the contract of the corrected to the corrected	entered legibly complete and c ove been deterr ct for each spe	for all strata orrect? <sup>1</sup> nined and re cies?	present?	strata?	l for later
3.	Soil				1		
	Soil profi	le is complete? ate hydric soil i	ndicators are m	narked?	-		
4.	Hydrology	1 . 1					
-	Appropri	ate hydrology ir water, water tak	ndicators are mole, and saturat	arked? ion depths a	re recorded	if present	?
5.		nd Values on, soil, hydrolo	gic variables a	and landscan	ne variahles	complete i	if site is a
	wetland?		g.e va.iabioo, e	ina lanasaap	c variables	complete	i site is a
6.	accuracy	ok ve been record of pre-mapped book page is ini	wetland bound	dary as appr	eneral desci	ription, ske	etch, and
7.	Maps						
	Wetland I	boundaries hav	e been correct	ed if necessa	ary?		

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderen X
Welland Scientist (print) Signs

etland Scientist (print) Signature / Date

Mim VEGITIS

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION					1130
Survey Type: Centerline Acce	ss Road (explain) O	ther (expl	ain)	Field Target: 060	Map #: 3 Map Date: 5 21
Date: 6 29 14	Project Name & No.: Al	laska LNG	26221306	Feature Id	
Investigators: L Decoris	J Anderson	J	A Fisher		Team No.: W6
State: Alaska	Region: Alaska		Milepost:	547.5	we)
Latitude: 63° 36 26.7	6" L	ongitude	148° L	16 21.20"	Datum: WGS84
Logbook No.: W6 - Z	Logbook Page No.:	4			Pt; Plux SW'SE
SITE PARAMETERS		100			0, ,
Subregion: hteron			Landform (hill	slope, terrace, hummock	is, etc.): Flat Slope
Slope (%): 2				oncave, convex, none):	NONE
Pre-mapped Alaska LNG/NWI classification	tion: VOLAND		Soil Map Unit	Name:	1-010-2
Are climate/hydrologic conditions on the YesNo(if no expla	site typical for this time of y	year?	Are "No Yes	mal Circumstances" pre	esent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significantly D	Disturbed?	No P	_(If yes, explain in Notes	)
Are Vegetation, Soil, or Hyd	rology Naturally Prob	lematic?	No_Y	(If yes, explain in Notes	s.)
SUMMARY OF FINDINGS					
Hydrophytic Vegetation Present? Yes	No	Is	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	> No	We	etland Type:	PF04 5515	3 PSS / 43 PSS 4
Wetland Hydrology Present? Yes	No	Ala	iska Vegetation	Classification (Viereck):	IA2, ICI
Notes and Site Sketch: Please include Di corridor.	rectional & North Arrow, Ce	enterline, L	ength of feature	e, Distances from Cente	line, Photo Locations, and Survey
	Wel-Z, page ste stetch & no	e 4 tis		/	
î	D. L. Commission	1			*
Altha	Frac		menline		
no now	20				1
IW HOLD	IB				
Lokedy PSS	NO				

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes: 26	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 5 (
1. Piceus morianes	20	4	FOLM	Total Number of Dominant Species Across All Strata:( % Dominant Species that are OBL, FACW, or FAC:(A
3.				The state of the s
4.	00		1	Prevalence Index worksheet:  Total % Cover of: Multiply by:
Total Cover:_ 50% of total cover:_	10	% of total cov	er:	OBL species: X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $60 \times 2 = 160$ FAC species $\times 3 = 375$ FACU species $\times 4 = 375$
1. Botula nana	35	X	FAC	UPL species X 5 =
2. Phododerdian groenlandicum		Y	FAC	Column Totals: (A) 535 (B)
3. VArcinium Ulisinesum	30	Y	FAC	PI = B/A = 2.6
4. VACCINIUM VIPS-idaea	20	-	FAC	
5. Empetrum nispum	8		Fac	
6. Salix Pulchrae	5		FacW	
7. Picea Mariana	25		FOC W	
8.				
9.				
	20 10			
Total Cover: 50% of total cover: VEGETATION (use scientific names of plants	76.5 20	9% of total cov	ver: <u>30.6</u>	
50% of total cover:  VEGETATION (use scientific names of plants	76.5 20	0% of total cov	ver:30.6	Hydrophytic Vegetation Indicators:
50% of total cover:	76.5 20	Dominant Species?		Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
VEGETATION (use scientific names of plants Herb Stratum ( )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	
VEGETATION (use scientific names of plants  Herb Stratum ( )	16.5 20 ) Absolute	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
VEGETATION (use scientific names of plants Herb Stratum ( 20 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status FACW Fac U	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 20 )  1. Rubus Chancemarana  2 Cancardon Lividium  3 Refasites Engicins	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW  Fac U  For IV	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 20 )  1. Rubus Champemorous  2 Geocaulon Lividium  3 Refusites Engiclis  4. Carex SPP	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status FACW Fac U	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 20 )  1. Rubus Champemorous  2 Geocaulon Lividium  3 Refusites Engiclis  4. Carex SPP	Absolute % Cover 25	Dominant Species? (Y/N)	FACW FACU FOLL WASSING	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( )  1. Rubus Champemorous  2 Concaulor Lividium  3. Petasites fraicis  4. Carex SPP  5. Rubus Champemorous	Absolute % Cover 25	Dominant Species? (Y/N)	FACW FOLL  WASSING FOLL  MA	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 20 )  1. Rubus Champemorous  2 Geocaulon Lividium  3 Refusites Engiclis  4. Carex SPP	Absolute % Cover 25	Dominant Species? (Y/N)	FOR W	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 20 )  1. Rubus Champemorous  2 Character Fugicits  4. Carex SPP  5. Rubus Champemorous  6. Calamagnosts anadensis	Absolute % Cover 25	Dominant Species? (Y/N)	FOR W	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  3 % Bare Ground  Cover of Wetland Bryophytes
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( 20 )  1. Rubus Champemorous  2 Concaulon Lividium  3. Retasites fregicis  4. Carex SPP  5. Rubus Champemorous  6. Calamagnishs canadensis  7.	Absolute % Cover 25	Dominant Species? (Y/N)	FACW FOR W  Wassing For W  For W  For W  For W  For W	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  3 % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( )  1. Pubus Chamerous  2. Cancardon lividium  3. Petasites fregiclis  4. Carex SPP.  5. Paragraphs canadensis  6. Calamagraphs canadensis  7.	Absolute % Cover 25	Dominant Species? (Y/N)	FACW FOR W  Wassing For W  For W  For W  For W  For W	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  3 % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes  % Cover of Water
50% of total cover:  VEGETATION (use scientific names of plants  Herb Stratum ( )  1. Rubus Chamararana  2. Cancardon Lividium  3. Retastes Evigidis  4. Carex SPP  5. Rubus Chamararana SPP  6. Calamagnish's canadensis  7.  8.  9.	Absolute % Cover 25 T 2	Dominant Species? (Y/N)	FACW FOR W  Wassing For W  For W  For W  For W  For W	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  3 % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes

SOIL PROFIL	E DESCRIPTION	Dogorib	Date 6 12 11 Feature			A1	- John Filtroqu	uired (Y/N)
	Matrix	Describe	e to the depth needed to doo	ument the	e indicator or	confirm the absence	e of indicators.)	
Depth (inches)	Color (moist)	1 %	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	T. 1		
0-7"	Total (moist)	70	Odioi (illoist) 78	Type	LOC	Texture	Notes	
0 1						Fibric	Saturated	
7"	FROZEN							
					4			
1-								
		etion, RN	M=Reduced Matrix, CS=Cov	ered or C	oated Sand G	rains. <sup>2</sup> Location:	PL=Pore Lining, M=Ma	atrix.
	INDICATORS			- 1		INDICATORS	FOR PROBLEMATIC H	IYDRIC SOILS <sup>3</sup>
Histosol or His			Alaska Gleyed (A13)				hange (TA4)⁴	
Histic Epipedo			Alaska Redox (A14) _				Swales (TA5)	
Black Histic (A			Alaska Gleyed Pores	(A15)			with 2.5Y Hue	
Hydrogen Sulfi	ide (A4)					Alaska Gleyed Layer_	without 5Y Hue or Redo	der Underlying
Thick Dark Sur						Other (Explain	in Notes)	
One indicator disturbed or pro	of hydrophytic vege	tation, o	ne primary indicator of wetla	nd hydrol	ogy, and an a	ppropriate landsca	pe position must be pre	sent unless
distalled of bit	f color change in No er (if present): Type				_11			
Restrictive Lav	er (if present): Type	9: TE	Depth (in	nches):				
,								
		V						
	esent (Y/N):	4						
	esent (Y/N):	7						
Hydric Soil Pro	esent (Y/N):	7						
Hydric Soil Pro	esent (Y/N):	7						
Hydric Soil Pro Notes:		Y TORS (a	ny one indicator is sufficient		SECONDARY	/ INDICATORS (2	or more required)	
Hydric Soil Pro Notes: HYDROLOGY	PRIMARY INDICAT		ny one indicator is sufficient			/ INDICATORS (2		- U
Hydric Soil Pro Notes: HYDROLOGY		Sur	face Soil Cracks (B6)		SECONDARY Water-stained Leaves (B9)		Stunted or Stress	
Hydric Soil Pro Notes: HYDROLOGY	PRIMARY INDICAT	Sur	face Soil Cracks (B6)		Water-stained Leaves (B9) _		Stunted or Stress Plants (D1)	
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water of the control of	PRIMARY INDICAT	Sur Inui (B7	face Soil Cracks (B6) ndation Visible on Aerial Ima )	gery	Water-stained Leaves (B9) _ Orainage Patt	erns (B10)	Stunted or Stress Plants (D1)  Geomorphic Posi	ition (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water	PRIMARY INDICAT	Sur Inui (B7 Spa	face Soil Cracks (B6)	gery	Water-stained Leaves (B9) _ Orainage Patt	erns (B10)	Stunted or Stress Plants (D1)	ition (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water of the control of	PRIMARY INDICAT	Sur Inui (B7 Spa Cor	face Soil Cracks (B6) ndation Visible on Aerial Ima ) ursely Vegetated ncave Surface (B8)	gery	Water-stained Leaves (B9) _ Orainage Patt Oxidized Rhiz Living Roots ( Presence of F	erns (B10)ospheres along C3)	Stunted or Stress Plants (D1) Geomorphic Posi Shallow Aquitard Microtopographic	ition (D2) (D3)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water (A)  High Water Tab  Saturation (A3)  Water Marks (B)	PRIMARY INDICAT	Sur Inui (B7 Spa Cor Mar	face Soil Cracks (B6) ndation Visible on Aerial Ima )_ ursely Vegetated ucave Surface (B8) I Deposits (B15)	gery	Water-stained Leaves (B9) _ Drainage Patt Dxidized Rhiz Living Roots (	erns (B10)ospheres along C3)	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water (A)  High Water Tab  Saturation (A3)  Water Marks (B)	PRIMARY INDICAT	Sur Inui (B7 Spa Cor Mar	face Soil Cracks (B6) ndation Visible on Aerial Ima ) ursely Vegetated ucave Surface (B8) I Deposits (B15)	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4)	erns (B10)ospheres along C3)	Stunted or Stress Plants (D1) Geomorphic Posi Shallow Aquitard Microtopographic	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water and Saturation (A3)  Water Marks (B)	PRIMARY INDICATOR (A1)  Dile (A2)  B1)  sits (B2)	Sur Inui (B7 Spa Cor Mar Hyd Odd	face Soil Cracks (B6)  ndation Visible on Aerial Ima ) ursely Vegetated ncave Surface (B8) I Deposits (B15) urogen Sulfide or (C1) Season	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of Fron (C4)	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water (A)  High Water Tab  Saturation (A3)  Water Marks (B)	PRIMARY INDICATOR (A1)  Dile (A2)  B1)  sits (B2)	Sur Inui (B7 Spa Cor Mar Hyd Odd	face Soil Cracks (B6) ndation Visible on Aerial Ima ) irsely Vegetated icave Surface (B8) I Deposits (B15) irogen Sulfide or (C1)	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of R ron (C4)	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water and Saturation (A3)  Water Marks (B)  Sediment Depo  Drift Deposits (B)	PRIMARY INDICATOR (A1)  Dile (A2)  B1)  sits (B2)	Surrice Surric	face Soil Cracks (B6)  ndation Visible on Aerial Ima ) ursely Vegetated ncave Surface (B8) I Deposits (B15) urogen Sulfide or (C1) Season	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of R ron (C4)	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water of the second of the se	PRIMARY INDICAT  (A1)  ble (A2)  (A1)  sits (B2)  ast (B4)	Surrice Surric	face Soil Cracks (B6)  Indation Visible on Aerial Ima  Insely Vegetated Indate Surface (B8)  I Deposits (B15)  Irogen Sulfide	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of R ron (C4)	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water and Saturation (A3)  Water Marks (B)  Sediment Depo  Drift Deposits (B)	PRIMARY INDICAT  (A1)  ble (A2)  (A1)  sits (B2)  ast (B4)	Surrice Surric	face Soil Cracks (B6)  Indation Visible on Aerial Ima  Insely Vegetated Indate Surface (B8)  I Deposits (B15)  Irogen Sulfide Indeposits (C1)  Season I Deposits (C2)	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of R ron (C4)	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water (A)  High Water Tab  Saturation (A3)  Water Marks (B)  Sediment Depo  Drift Deposits (E)  Algal Mat or Cru  ron Deposits (E)	PRIMARY INDICAT  (A1)  ble (A2)  31)  sits (B2)  33)  Jist (B4)  35)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat Other	face Soil Cracks (B6)	gery I	Water-stained Leaves (B9) _ Drainage Patt Oxidized Rhiz Living Roots ( Presence of R ron (C4)	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water Tab  Saturation (A3)  Water Marks (B  Sediment Depo  Drift Deposits (E  Algal Mat or Cru  ron Deposits (E	PRIMARY INDICAT  (A1)  ble (A2)  (A1)  sits (B2)  (B4)  (B5)  Present (Y/N):	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat Oth)	face Soil Cracks (B6)	gery	Water-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) ospheres along C3) Reduced (C5)	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)  FAC-Neutral Test	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water (A)  High Water Tab  Saturation (A3)  Water Marks (B)  Sediment Depo  Drift Deposits (E)  Algal Mat or Cru  ron Deposits (E)	PRIMARY INDICAT  (A1)  ble (A2)  (A1)  sits (B2)  (B4)  (B5)  Present (Y/N):	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wat Oth)	face Soil Cracks (B6)	gery	Water-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) ospheres along C3) Reduced	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)  FAC-Neutral Test	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water Tab  Saturation (A3)  Water Marks (B  Sediment Depo  Drift Deposits (B  Algal Mat or Cru  ron Deposits (B  Surface Water F  Water Table Pre Saturation Prese	PRIMARY INDICAT  (A1)  (A2)  (A2)  (A3)  (A3)  (B4)  (B5)  Present (Y/N):	Surring Inuit (B7 Space Corring Market Pry Water Oddo Dry Water Other Pry Water Other Pry Water Other Pry Water Other Pry Water Pry Wate	race Soil Cracks (B6)	gery	Water-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) ospheres along C3) Reduced (C5)	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)  FAC-Neutral Test	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water (A)  High Water Tab  Saturation (A3)  Water Marks (B)  Sediment Depo  Drift Deposits (B)  Algal Mat or Cru  ron Deposits (B)  Surface Water F  Vater Table Pre Saturation Press includes capilla	PRIMARY INDICAT  (A1)  (A2)  (A2)  (A3)  (A3)  (B4)  (B5)  Present (Y/N):	Surring Inuit (B7 Space Corring Market Pry Water Oddo Dry Water Other Pry Water Other Pry Water Other Pry Water Other Pry Water Pry Wate	race Soil Cracks (B6)	gery	Water-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) ospheres along C3) Reduced (C5)	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)  FAC-Neutral Test	(D3) (D2)
Hydric Soil Pro Notes:  HYDROLOGY  Surface Water Tab  Saturation (A3)  Water Marks (B  Sediment Depo  Drift Deposits (B  Algal Mat or Cru  ron Deposits (B  Surface Water F  Water Table Presentation Pr	PRIMARY INDICAT  (A1)  (A2)  (A2)  (A3)  (A3)  (B4)  (B5)  Present (Y/N):	Surring Inuit (B7 Space Corring Market Pry Water Oddo Dry Water Other Pry Water Other Pry Water Other Pry Water Other Pry Water Pry Wate	race Soil Cracks (B6)	gery	Water-stained Leaves (B9) Drainage Patt Dxidized Rhiz Living Roots ( Presence of Fron (C4) Salt Deposits Notes:	erns (B10) ospheres along C3) Reduced (C5)	Stunted or Stress Plants (D1)  Geomorphic Posi Shallow Aquitard Microtopographic Relief (D4)  FAC-Neutral Test	(D3) (D2)

VEGETATION VARIABLES		1/0
Forested-Evergreen-Needle-leave Scrub Shrub-Evergreen-Broad-lea Persistent Aquatic Bed	aved Scrub	Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved rub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh Dwarf shrub (<0.5m)	, >6m tall)_205 all herb (≥1m)	Sapling (<5 dbh, <6m tall) 3.5 Tall shrub (2-6m) Short shrub (0.5-2m) 118 Short herb (<1m) 32 Moss-Lichen 50 Floating Submerged
Number of Wetland Types (M):	2 Evennes	s of Wetland Type Distribution (M): EvenHighly UnevenModerately even
80%) Very High Density	/ (80-100%)	
Interspersion of Cover & Open Peripheral Cover >7:	Water (P): 100% Co 5% Scattered or Periph	over or Open Water
Plant Species Diversity (P): Lov	w (< 5 plant species)	Medium (5-25 species) High (>25)
		One or Few Several to Many N/A
	: Laver (P): No Veg.	Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
		surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): High (small groupings, diverse an		concentric rings) Moderate (broken irregular rings)
HGM Class (P): Slope		ine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES		
Soil Factors (P): Soil Lackin Mineral: Gravelly Min	g Histosol:F eral: Sandy	Fibric Histosol:Hemic Histosol: Sapric Histosol: Silty Mineral: Clayey Histosol: Sapric
HYDROLOGIC VARIABLES		
Inlet/Outlet Class (P): No Inlet/Outlet	t/Intermittent Outlet	let/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial
Inlet/Outlet Class (P): No Inlet/Outlet	t/Intermittent Outlet Perennial Inlet/Perennial Drier: Seasonally Floorly Exposed, Semiperm.	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial outlet oded, Temporarily Flooded, Saturated Flooded
Inlet/Outlet Class (P): No Inlet/Outlet	t/Intermittent Outlet Perennial Inlet/Perennial Drier: Seasonally Floorly Exposed, Semiperm.	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Per
Inlet/Outlet Class (P): No Inlet/Outlet	t/Intermittent Outlet_ Perennial Inlet/Perennial Inlet/Pere	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial  oded, Temporarily Flooded, Saturated  Flooded  red Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent! Evidence of Sedimentation (P): Created Microrelief of Wetland Surface Frequency of Overbank Floodie	t/Intermittent Outlet_ Perennial Inlet/Pereni Drier: Seasonally Floo ly Exposed, Semipermi No Evidence Observ (P): AbsentF	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Peren
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent Evidence of Sedimentation (P): Created Microrelief of Wetland Surface	t/Intermittent Outlet_ Perennial Inlet/Pereni Drier: Seasonally Flor ly Exposed, Semiperm. No Evidence Observ (P): AbsentF	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Out
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Intermittent Interval Post Intermittent Interval Post Inter	t/Intermittent Outlet_ Perennial Inlet/Pereni Drier: Seasonally Flor ly Exposed, Semiperm. No Evidence Observ  (P): Absent F  ng (P): No Overbank F  (Circumneut	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Inlet/Intermittent Outlet Intermittent Interval Post Intermittent Interval Post Inter	t/Intermittent Outlet_ Perennial Inlet/Pereni Drier: Seasonally Flor ly Exposed, Semiperm. No Evidence Observ  (P): Absent F  ng (P): No Overbank F  (Circumneut	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perenn
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent! Evidence of Sedimentation (P): Created Microrelief of Wetland Surface Frequency of Overbank Floodi Return Interval >5 yrs Degree of Outlet Restriction (P) Water pH (P): No surface water_ Surficial Glacial Deposit Under	t/Intermittent Outlet Perennial Inlet/Pereni Drier: Seasonally Floo ly Exposed, Semiperm. No Evidence Observ  (P): Absent F  ng (P): No Overbank F  (P): No Outflow Circumneut  T Wetland (P): High Pereni	Intermittent Inlet/Perennial Outlet Perennial Inlet/No
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent Evidence of Sedimentation (P): Created Microrelief of Wetland Surface Frequency of Overbank Floodir Return Interval >5 yrs Degree of Outlet Restriction (P) Water pH (P): No surface water_ Surficial Glacial Deposit Under Glacial Till/Not Permeable Basin Topographic Gradient (N	t/Intermittent Outlet Perennial Inlet/Pereni Drier: Seasonally Floo ly Exposed, Semiperm. No Evidence Observ  (P): Absent F  ng (P): No Overbank F  (P): No Outflow Circumneut  T Wetland (P): High Pereni	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennia
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent Evidence of Sedimentation (P): Created Microrelief of Wetland Surface Frequency of Overbank Floodi Return Interval >5 yrs Degree of Outlet Restriction (P) Water pH (P): No surface water Surficial Glacial Deposit Under Glacial Till/Not Permeable Basin Topographic Gradient (N) Evidence of Seeps and Springs	t/Intermittent Outlet_ Perennial Inlet/Pereni Drier: Seasonally Flor ly Exposed, Semiperm. No Evidence Observ  (P): Absent F  ng (P): No Overbank F  (P): No Outflow Circumneut  r Wetland (P): High Pereni (S): No Seeps or Spr  (etland Isolated	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent Evidence of Sedimentation (P): Created Microrelief of Wetland Surface Frequency of Overbank Floodir Return Interval >5 yrs Degree of Outlet Restriction (P) Water pH (P): No surface water_Surficial Glacial Deposit Under Glacial Till/Not Permeable Basin Topographic Gradient (NEvidence of Seeps and Springs LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Woonly Connected Above	t/Intermittent Outlet_ Perennial Inlet/Perenial Inl	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Per
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Inl	t/Intermittent Outlet_Perennial Inlet/Perennial Inlet/Perennia	Intermittent Inlet/Perennial Outlet Perennial Inlet/No
Inlet/Outlet Class (P): No Inlet/Outlet Intermittent Inlet/Inlet/Intermittent Outlet Intermittent Inlet/Inlet/Intermittent Outlet Wetland Water Regime (P): Wet: Perm. Flooded, Intermittent Evidence of Sedimentation (P): Created Microrelief of Wetland Surface Frequency of Overbank Floodir Return Interval >5 yrs Degree of Outlet Restriction (P): Water pH (P): No surface water_Surficial Glacial Deposit Under Glacial Till/Not Permeable Basin Topographic Gradient (NEvidence of Seeps and Springs LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Woonly Connected Above Wetland Land Use: High Interview Intermittent Inter	t/Intermittent Outlet_Perennial Inlet/Perennial Inlet/Perennia	Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	· ·
	re ID: W61HT002 Field Target: 060 Date: 6/28/14
i Oi aii	l items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for late identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

* Johnster Anderson	January Anderson 6/28/14
Wetland Scientist (print)	Signature / Date

Field Crew Chief (print)

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION					1130
Survey Type: Centerline Acce	ss Road (explain)(	Other (expl	ain)	Field Target: 057	Map #: 31 Map Date: 5 27
Date: 6 28 14	Project Name & No.: A	Maska LNG	26221306	Feature Id	: W61 HT003
Investigators: L Decume	J Andreson	A Fig	his		Team No.: 1, )(a)
State: Alaska	Region: Alaska	11 - 17		542.55	Wel
Latitude: 63° 40' 19.2	7"	Longitude		45' 51.92"	Datum: WGS84
Logbook No.: Wel-2	Logbook Page No.:	5	Picture No.:	D Walleton	- At. Plux: SE; NW
				- VOI HICOS	-MINNESE, NW
Subregion: / nl					
Slope (%): 2				Islope, terrace, hummock	s, etc.): Flat
Pre-mapped Alaska LNG/NWI classifica	tion: 1 th			oncave, convex, none):	Convex
Are climatic/hydrologic conditions on the	COMM	year?		emal Circumstances" pre	
Are Vegetation, Soil, or Hyd		Disturbed?	Yes_/*	No (If no, ex (If yes, explain in Notes	plain in Notes.)
Are Vegetation, Soil, or Hyc			10	(If yes, explain in Notes	
SUMMARY OF FINDINGS				_ ( you, oxplain in reco	··)
Hydrophytic Vegetation Present? Yes_	<i>&gt;</i> №	_ ls t	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	<u></u> №	We	tland Type:	PSS1 4B	
Wetland Hydrology Present? Yes	No	Ala	ska Vegetation	Classification (Viereck):	ICI, IA
Notes and Site Sketch: Please include D	irectional & North Arrow, C				
corridor					
	See la	Spook	Wel-	- 5 bank >	
		for	site sle	-2, pay 5	3

/EGETATION (use scientific names of plants	5)			
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Free Stratum (Plot sizes:	% Cover	Species?	Status	No. of Dominant Species that are OBL, FACW, or FAC
0	10	(Y/N)	Ches	Total Number of Dominant Species Across All Strata: 2 (
Picen glaver	12	-/-	FACU	% Dominant Species that are OBL, FACW, or FAC: 75% (A
. 0				
3,	11			
4.				Prevalence Index worksheet:
Total Cover	12		4.1	Total % Cover of: Multiply by:
50% of total cover	: <u> </u>	% of total cov	er: <u>2.9</u>	OBL species; X1 =
Sapling/Shrub Stratum(24)	Absolute	Dominant	Indicator	FACW species: 30 x 2 = 4()
	% Cover	Species?	Status	FAC species 128 x 3 = 384
		(Y/N)		FACU species 34 x 4 = 136
1. Picca glauca	20	Y	FACU	UPL species X 5 =
2. Betala aladulosa	35	γ	FAC	Column Totals: 82 (A) 560 (B)
3. Rhododandran goverlandicum		Y.	FAC	PI = B/A = 3.08
4. Vaccinium Ulicinosum	20	Y	FAC	EAG
5. Vaccinium vils-idaea	10		FAC	Dasiphera truiticosa 1
6. Salix myrtillifolia	12		Fach	Dasiphora Fruiticosa T FAC Dalix glauca S PAC
	20	Y	FAC	
8. Arctuous rubra	10	/	FAC	
LICIDOUS LONGO	10		11110	
	8		T(1-1)	
9. Salis Oulchra	5		FACW	
9. Saliv pulchra Total Cove	197	0% of total cov	40.00	
9. Salive Oulchra	197	0% of total cov	40.00	
9. Saliv pulchra Total Cove	r: 197 r: 78.5 20	0% of total cov	40.00	
9. Saliv polchra  Total Cover	r: 197 r: 78.5 20	0% of total cov	40.00	Hydrophytic Vegetation Indicators:
9. Saliv pulchra  Total Cover  50% of total cover  VEGETATION (use scientific names of plant	r: 197 r: 785 20	Dominant Species?	ver: 31.4	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
Total Cover 50% of total cover VEGETATION (use scientific names of plant Herb Stratum (	785 20 s) Absolute % Cover	Dominant	Indicator Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0
9. Saliv polchra  Total Cover  50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( )  1. Pelasites Friziduo	r: 197 r: 785 20 s) Absolute	Dominant Species?	Indicator Status	
Total Cover 50% of total cover VEGETATION (use scientific names of plant Herb Stratum (	Absolute % Cover	Dominant Species?	Indicator Status  FACU  FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
9. Saliv polchra  Total Cover  50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( )	785 20 s) Absolute % Cover	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status  FACU  FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9. Saliv polchra  Total Cover  50% of total cove  VEGETATION (use scientific names of plant  Herb Stratum ( )  1. Pelasites frigidus 2. Equiselum scirpoides 3. Colamagnostis cavadensis 4. Unknown hub	Absolute % Cover 3	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
9. Salix polchra Total Cover 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( )  1. Petasites frigidus 2. Equiselum scirpoides 3. Calamagnostis cavadensis 4. Unknown hab 5. Mertensia paniculata	Absolute % Cover	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9. Salix prichra  Total Cover  50% of total cover  VEGETATION (use scientific names of plant  Herb Stratum ( )  1. Petasites frigidus 2. Equiselum scirpoides 3. Calamagnostis cavadensis 4. Unknewn hub 5. Mertensia paniculata 6.	Absolute % Cover 3	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( )  1. Petasites Frisiduo 2. Equiselum scirpoides 3. Calamagostis cavadensis 4. Unknown hub 5. Mertensia paniculata 6. 7.	Absolute % Cover 3	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cover 50% of total cover  VEGETATION (use scientific names of plant Herb Stratum ( )  Pelasites frisiduo  Equiselum scirpoides  Calanagostis cavadensis  Unknewn hub  Mertensia paniculata  6.  7.	Absolute % Cover 3	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( )  1. Petasites Frisiduo 2. Equiselum scirpoides 3. Calamagostis cavadensis 4. Unknown hub 5. Mertensia paniculata 6. 7.	Absolute % Cover 3	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes
Total Cover 50% of total cover  VEGETATION (use scientific names of plant Herb Stratum ( )  Pelasites frisiduo  Equiselum scirpoides  Calanagostis cavadensis  Unknewn hub  Mertensia paniculata  6.  7.	Absolute % Cover 3	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  **Bare Ground**  **Gover of Wetland Bryophytes**  **Total Cover of Bryophytes**  **Cover of Water**
Total Cover 50% of total cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( )  1. Petasites frisiduo 2. Equiselum scirpoides 3. Calamagnostis cavadensis 4. Unknewn hub 5. Mertensia panicukta 6. 7. 8. 9.	Absolute % Cover 3 1 2	Dominant Species?	Indicator Status  FACU FACU FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes

SOIL PROFIL		_	Date 428 14	eature ID	DWI F	TIOCO		Soil Pit Required (Y/N)_
	E DESCRIPTION: (D	escrib		ed to docume	ent the	indicator or	confirm the absence	of indicators,)
Depth	Matrix		Redox Features					
inches)	Color (moist)	%	Color (moist)	% T	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-7"							Fibric	Saturated
7-8"	2.54 4/2		- 01				Silt	
611	10							
8"	FROZEN							
				-				
Type: C=Cor	_I ncentration, D=Depleti	ion RN	M=Reduced Matrix	CS=Covered	or Cor	tod Sand C	raina 21 anation.	Di Barritinia M Matri
	- INDICATORS	1011, 131	W-I reduced Watrix,	C3-C0Vered	01 008	ited Sand G		PL=Pore Lining, M=Matrix.
	stel (A1)		Alaska Gleve	d (A13)				OR PROBLEMATIC HYDRIC SOIL
	on (A2)		Alaska Gleye	α (A 13)				nange (TA4) <sup>4</sup>
	(3)	_						wales (TA5)
		-	Alaska Gleye	d Pores (A15	<u> </u>			rith 2.5Y Hue vithout 5Y Hue or Redder Underlyin
	fide (A4)						Layer_	villiout 51 Hue of Reader Underlyin
	rface (A12)						Other (Explain in	n Notes)
One indicator isturbed or pr	of hydrophytic vegeta	ition, o	ne primary indicator	of wetland h	ydrolog	gy, and an a	ppropriate landscap	pe position must be present unless
Give details of	f color change in Note	s.				/1		
estrictive Lay	ver (if present): Type:		FROZEN	Depth (inche	s):	8		
		17			-	_		
		A						
lydric Soil Pr	resent (Y/N):	7_						
	resent (Y/N):	7						
	resent (Y/N);	7						
	resent (Y/N):	7						
otes:				<i>(f</i> : A)				
otes:	PRIMARY INDICATO		ny one indicator is s	sufficient)			' INDICATORS (2 o	
lotes:		DRS (a	ny one indicator is s		W	ater-stained		Stunted or Stressed
YDROLOGY urface Water	PRIMARY INDICATO	ORS (a	face Soil Cracks (B	3)	- Le	ater-stained aves (B9) _		Stunted or Stressed Plants (D1)
IYDROLOGY Surface Water	PRIMARY INDICATO	Sur Inui (B7	face Soil Cracks (Bindation Visible on A	3)	- Le	ater-stained aves (B9) _		Stunted or Stressed Plants (D1)
IYDROLOGY Surface Water	PRIMARY INDICATO	Sur Inui (B7 Spa	face Soil Cracks (Bindation Visible on A)	6)erial Imagery	- W Le	ater-stained aves (B9) _ rainage Patt kidized Rhiz	erns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
IYDROLOGY Furface Water ligh Water Tal	PRIMARY INDICATO  (A1) ble (A2)	Sur Inui (B7 Spa Cor	face Soil Cracks (Bradation Visible on A )arsely Vegetated acave Surface (B8)	6)erial Imagery	- W Le	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots (	erns (B10) ospheres along C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
IYDROLOGY Surface Water ligh Water Tal	PRIMARY INDICATO	Sur Inui (B7 Spa Cor	face Soil Cracks (Bindation Visible on A)	6)erial Imagery	- W Le ' Dr Ox Liv	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R	erns (B10) ospheres along C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
IYDROLOGY Surface Water ligh Water Table attraction (A3)	PRIMARY INDICATO  (A1)  ble (A2)  31)	Sur Inui (B7 Spa Cor Mar	face Soil Cracks (Bindation Visible on A)  Insely Vegetated Incave Surface (B8)  I Deposits (B15)	6)erial Imagery	- W Le Dr Ox Liv	rater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water ligh Water Table attraction (A3)	PRIMARY INDICATO  (A1) ble (A2)	Sur Inui (B7 Spa Cor Mar Hyd	face Soil Cracks (Bindation Visible on A)  arsely Vegetated oncave Surface (B8)  Deposits (B15)  Irogen Sulfide or (C1)	6)erial Imagery	- W Lee ' Dr On Lin Pr Iro	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
IYDROLOGY Surface Water ligh Water Tate attraction (A3) Vater Marks (E	PRIMARY INDICATO  (A1)  ble (A2)  31)	Sur Inui (B7 Spa Cor Mar Hyd Odd	face Soil Cracks (Bindation Visible on A)  arsely Vegetated facave Surface (B8)  I Deposits (B15)  Irogen Sulfide for (C1)	6)erial Imagery	- W Lee ' Dr On Lin Pr Iro	rater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water ligh Water Tale aturation (A3) Vater Marks (E) ediment Depo	PRIMARY INDICATO  (A1) ble (A2)  31)  psits (B2)  B3)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry- Wat	face Soil Cracks (Bindation Visible on A)  arsely Vegetated facave Surface (B8)  I Deposits (B15)  Irogen Sulfide for (C1)  Season  Ler Table (C2)	6)	- W Lee ' Dr On Lin Pr Iro	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water ligh Water Tale aturation (A3) Vater Marks (E) ediment Depo	PRIMARY INDICATO  (A1)  ble (A2)  31)  posits (B2)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry- Wat	face Soil Cracks (Bindation Visible on A)  arsely Vegetated facave Surface (B8)  I Deposits (B15)  Irogen Sulfide for (C1)	6)	- W Lee ' Dr On Lin Pr Iro	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY  Furface Water  Igh Water Tata  aturation (A3)  Vater Marks (E)  ediment Depo  rift Deposits (I)  Igal Mat or Cri	PRIMARY INDICATO  (A1) ble (A2)  31)  psits (B2)  B3)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry- Wat	face Soil Cracks (Bindation Visible on A)  arsely Vegetated facave Surface (B8)  I Deposits (B15)  Irogen Sulfide for (C1)  Season  Ler Table (C2)	6)	- W Lee ' Dr On Lin Pr Iro	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY Surface Water ligh Water Tale aturation (A3) Vater Marks (E) ediment Depo	PRIMARY INDICATO  (A1) ble (A2)  31)  posits (B2)  B3)  rust (B4)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry- Wat	face Soil Cracks (Bindation Visible on A)  arsely Vegetated facave Surface (B8)  I Deposits (B15)  Irogen Sulfide for (C1)  Season  Ler Table (C2)	6)	- W Lee ' Dr On Lin Pr Iro	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R in (C4)	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY  Furface Water  ligh Water Tata  aturation (A3)  Vater Marks (E  ediment Depo  rift Deposits (I  ligal Mat or Cre  on Deposits (E	PRIMARY INDICATO  (A1) ble (A2)  31)  posits (B2)  B3)  rust (B4)	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry- Wat	face Soil Cracks (Bindation Visible on A)  arsely Vegetated facave Surface (B8)  I Deposits (B15)  Irogen Sulfide for (C1)  Season  Ler Table (C2)	6)	- We Lee	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R on (C4) alt Deposits otes:	erns (B10) ospheres along C3) educed (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
IYDROLOGY  Furface Water  ligh Water Tata  aturation (A3)  Vater Marks (E)  ediment Depo  rift Deposits (I)  ligal Mat or Cru  on Deposits (E)  urface Water I	PRIMARY INDICATO  (A1)  ble (A2)  31)  posits (B2)  B3)  rust (B4)  B5)  Present (Y/N):	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry- Wat	face Soil Cracks (Bindation Visible on A.) Introduce Surface (B8) Introduce Surface (B8) Introduce Surface (B15) Introduce Sulfide Or (C1) Introduce Sulfide Or (C1) Introduce Sulfide Or (C2) Introduce Sulfide Or (C2) Introduce Sulfide Or (C1) Introduce Sulfide Or (C1) Introduce Sulfide Or (C2) Introduce Sulfide Or (C2) Introduce Sulfide Or (Explain in Notes	erial Imagery	- We Lee	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R on (C4) alt Deposits otes:	erns (B10) ospheres along C3) educed	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
IYDROLOGY  Furface Water  Iigh Water Tate  aturation (A3)  Vater Marks (E  ediment Depo  rift Deposits (I  lon Deposits (E  urface Water I  vater Table Presentaturation Prese	PRIMARY INDICATO  (A1)  ble (A2)  31)  posits (B2)  B3)  rust (B4)  Present (Y/N):	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wall	face Soil Cracks (Bindation Visible on A.)  arsely Vegetated incave Surface (B8).  I Deposits (B15)  Irogen Sulfide or (C1)  Season der Table (C2)  er (Explain in Notes  Depth (in):	erial Imagery	- We Lee	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R on (C4) alt Deposits otes:	erns (B10) ospheres along C3) educed (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
IYDROLOGY  Furface Water  ligh Water Tab  aturation (A3)  Vater Marks (E  ediment Depo  rift Deposits (I  lgal Mat or Cru  on Deposits (E  urface Water I  vater Table Pre  vater Table Pre	PRIMARY INDICATO  (A1)  ble (A2)  31)  posits (B2)  B3)  rust (B4)  Present (Y/N):	Sur Inui (B7 Spa Cor Mar Hyd Odd Dry Wall	face Soil Cracks (Bindation Visible on A.) Introduction Visible on A.) Introduction Visible on A.) Introduction (B15) Introduction Sulfide on (C1) Introduction Season Inter Table (C2) Inter Tab	erial Imagery	- We Lee	ater-stained eaves (B9) _ rainage Patt kidized Rhiz ving Roots ( esence of R on (C4) alt Deposits otes:	erns (B10) ospheres along C3) educed (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         1         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)         Short shrub (0.5-2m)         Short shrub (0.5-2m)         Short shrub (0.5-2m)         Noss-Lichen         Floating         Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)       Moderate (broken irregular rings)
HGM Class (P): Slope Flat/ Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Historol: Homis Historol: Sapris
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Pe
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet
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#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: W61 HT 003	Field Target: 057	Date: 6 28/14
For all items not checked, please provid		

#### 1. Site Description

- ⊠ Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ☑ Vegetation names are entered legibly for all strata present?
- All dominant species have been determined and recorded per strata?
- ☑ Indicator status is correct for each species?
- Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Appropriate hydric soil indicators are marked?

#### 4. Hydrology

- Appropriate hydrology indicators are marked?
- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- Each logbook page is initialed and dated?

#### 7. Maps

- Wetland boundaries have been corrected if necessary?
- Maps are initialed and dated?

8.	P	h	O	t	٥	S

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Signature / Date

WETLAND DETERMINATION DATA FORM SITE DESCRIPTION Map Date: 5/27/14 Survey Type: Centerline\_ Access Road (explain)\_ Other (explain) X Field Target: 68 Date: Project Name & No.: Alaska LNG 26221306 W61HT004 Investigators: Anderson Team No .: 100 DEGUTIS A Fisher State: Alaska Region: Alaska Milepost: 542.55 Latitude: 63° 40' 20, 59 Longitude: 148° 45° 47.96 Datum: WGS84 Picture No.: P-W61HT004 Logbook No .: Wol- 2 Logbook Page No.: PF, Plug NE; S SITE PARAMETERS Subregion: Initerior Landform (hillslope, terrace, hummocks, etc.): Slope (%): Local relief (concave, convex, none): Pre-mapped Alaska LNG/NWI classification: Soil Map Unit Name: Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (if no explain in Notes) No (If no, explain in Notes.) \_, or Hydrology\_ Significantly Disturbed? No (If yes, explain in Notes) Are Vegetation\_ \_, Soil , or Hydrology Naturally Problematic? (If yes, explain in Notes.) **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes Is the Sampled Area within a Wetland? Hydric Soil Present? Wetland Type: UDIAND Wetland Hydrology Present? Alaska Vegetation Classification (Viereck): ICI. IAZ Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor. See logood Wel-2, page 6

An site slatch & notes

VEGETATION (use scientific names of plants				D. J Traditional phase
Tree Stratum (Plot sizes: 26	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
1. Picen glanca	15	Y	FACU	% Dominant Species that are OBL, FACW, or FAC: 174%
3.				
4.				Prevalence Index worksheet:
Total Cover:	15			Total % Cover of: Multiply by:
50% of total cover		% of total cov	er: <u>3</u>	OBL species:X 1 =
Sapling/Shrub Stratum( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $\begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array}\\ \end{array}\\ \end{array}\\ \end{array}$ $\begin{array}{c} \begin{array}{c} \begin{array}{c} \end{array}\\ \end{array}$ $\begin{array}{c} \begin{array}{c} \end{array}$ $\begin{array}{c} \end{array}$ $\begin{array}{c$
1. Salix myrtillifolia	10		FACW	UDI sweeter 75-
2. VACCINIUM Uliginosum	20	Y	FAC	Column Totals: 179 (A) 539 (B) 530
3. Arctuous ribra	5		FAC	PI = B/A = 3.10
4. VACCINIUM VITIS-idaea	10		FAC	Salin Oseudomaticala & FAC
5. Prododendron governovicus	30	Y	FAC	Salix pseudomonticola & FAC Empetrum nigrum 3 FAC Rosa acianlaris 2 FAEU
6. Salix glanca	10		FAC	Rosa acialaris 2 FAEU
7. Betula hana	40	Y	FAC	Salix arbusculoides T PACW
8. Alms tenvicolia	8		FAC	
9. Picea stanca	10		FACU	
50% of total cover	JC 9 20	30/ of total on	10r. 70,6	
VEGETATION (use scientific names of plants		or total cov	/ei	
		Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
VEGETATION (use scientific names of plants  Herb Stratum ()	Absolute	Dominant	Indicator Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0
VEGETATION (use scientific names of plants  Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator	Dominance Test is > 50%
VEGETATION (use scientific names of plants  Herb Stratum ( )  1. Colomo astis canades; 5  2. Mectersia DANiculata	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
1. Colomanostis Canadensis 2. Mertensia Daniculata 3. Petasiles fraidus 4. Pou Sp	Absolute % Cover 3	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
VEGETATION (use scientific names of plants  Herb Stratum (	Absolute % Cover	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
VEGETATION (use scientific names of plants  Herb Stratum (	Absolute % Cover 3	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Coloma nostis canadens: 5 2. Mertensia Paniculata 3. Petas tes fraidus 4. Por Sp 5. Unknown herb	Absolute % Cover 3	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground
1- Colomannestis Canadensis 2- Mertensia Paniculata 3. Petasiles fraidus 4. Pou sp 5. Unknown herb 6.	Absolute % Cover 3	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes
1. Coloma nostis canaders: 5 2. Mertensia Panimenta 3. Petas les fraides 4. Por Sp 5. Unknown herb 6.	Absolute % Cover 3	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic  % Bare Ground % Cover of Wetland Bryophytes  Total Cover of Bryophytes
1. Calamarastis canaders: 5 2. Mertensia DANICUlata 3. Petasiles fraidus 4. Pou Sp 5. Unknown herb 6. 7.	Absolute % Cover 3	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes % Cover of Water
1- Calamanastis Canadensis 2- Mertensia Danimata 3. Petasiles fraidus 4. Pou sp 5. Unknown herb 6. 7. 8. 9.	Absolute % Cover 3 7 1 8 7	Dominant Species?	Indicator Status  FAC FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic  % Bare Ground % Cover of Wetland Bryophytes  Total Cover of Bryophytes

			Date 6 28 /					Soil Pit Required (Y/N)
SOIL PROFILE		(Describe	1		nent the	indicator or	confirm the absence	of indicators.)
Depth (inches)	Matrix		Redox Feat		-			
	Color (moist)	%	Color (moist	) %	Type <sup>1</sup>	Loc²	Texture	Notes
0-25"							Fibric	Dry
2.5-5"	0 = 4	-	1. 1.		0	-	Moist Fibric	Moist
5"+16"	2.57 41	70	104R 5/4	30	C	M	S.It	Not distinct on prominent
16"	Colles							
Type: C=Con	centration, D=Depl	etion, RN	M=Reduced Ma	atrix, CS=Covere	ed or Co	ated Sand G	Grains, <sup>2</sup> Location:	PL=Pore Lining, M=Matrix
	INDICATORS							OR PROBLEMATIC HYDRIC SOILS
	el (A1)			Gleyed (A13)			Alaska Color Ch	ange (TA4) <sup>4</sup>
	(A2)		Alaska F	Redox (A14)			Alaska Alpine Sv	vales (TA5)
Black Histic (A3	3)		Alaska (	Gleyed Pores (A	15)			th 2.5Y Hue
lydrogen Sulfic	de (A4)						Alaska Gleyed w Layer	ithout 5Y Hue or Redder Underlying
hick Dark Sur							Other (Explain in	Notes) e position must be present unless
	esent (Y/N):	N						
	pesent (Y/N):	N cutis Fi	y (AII)	or Ak k	Pedox	w/2.5 Y	Hues	
Notes;							Hues Y INDICATORS (20	r more required)
Notes:	ves not s	TORS (a	any one indicat		S		Y INDICATORS (2 or	Stunted or Stressed
HYDROLOGY I	PRIMARY INDICA	TORS (a	iny one indicat face Soil Crac ndation Visible	or is sufficient)	S V	ECONDAR' Vater-stained eaves (B9)	Y INDICATORS (2 or	Stunted or Stressed Plants (D1)
HYDROLOGY I Surface Water (	PRIMARY INDICA	Sur Inu (B7	nny one indicat face Soil Crac ndation Visible ')	or is sufficient) ks (B6) on Aerial Image	V L	ECONDAR' Vater-stained eaves (B9) _ Irainage Pati	Y INDICATORS (2 of deep section of the section of t	Stunted or Stressed Plants (D1)
HYDROLOGY I Surface Water ( digh Water Tab	PRIMARY INDICA	Sur Inu (B7 Spa Cor	nny one indicat face Soil Crac ndation Visible ')	or is sufficient) ks (B6) on Aerial Image ed (B8)	S V L L C C C C C C C C C C C C C C C C C	Vater-stained eaves (B9) _ drainage Patr exidized Rhiz living Roots ( resence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
IYDROLOGY I urface Water ( ligh Water Tab aturation (A3)	PRIMARY INDICA A1)	Sur Inu (B7 Spa Cor Mai	rany one indicate face Soil Crace ndation Visible (1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5)	SS V L L L L L L L L L L L L L L L L L L	Vater-stained eaves (B9) drainage Pate exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY I surface Water (aligh Water Table aturation (A3)	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)	Sur Inu (B7 Spa Cor Mai	riny one indicate face Soil Crace ndation Visible (1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5)	SS V L L C C L L P III	Vater-stained eaves (B9) drainage Pate exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY I surface Water (aligh Water Table aturation (A3) attraction (A3) water Marks (B) ediment Depo	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)	Sur Inu (B7 Spa Cor Mai Hyc	riny one indicate face Soil Crace ndation Visible (1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5)	SS V L L C C L L P III	Vater-stained eaves (B9) _ trainage Pati exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IYDROLOGY I Surface Water ( Igh Water Tab Saturation (A3) Vater Marks (B ediment Depo Irift Deposits (E	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)  ast (B4)	Sur Inu (B7 Spa Cor Mai Hyc	riny one indicate frace Soil Crace ndation Visible (1) arsely Vegetate ncave Surface or I Deposits (B1 drogen Sulfide or (C1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5)	SS V L L C C L L P III	Vater-stained eaves (B9) _ trainage Pati exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY I Surface Water ( digh Water Tab Saturation (A3) Vater Marks (B Sediment Depo- brift Deposits (E Igal Mat or Cru on Deposits (B	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)  st (B4)  15)	Sur Inui (B7 Spa Cori Mai Hyc Odd Dry Wa	rany one indicate face Soil Crace ndation Visible (1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5) Notes):	SS V L L C C L L P III	Vater-stained eaves (B9) _ trainage Pati exidized Rhiz iving Roots ( resence of F on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
IVDROLOGY I urface Water ( ligh Water Tab aturation (A3) /ater Marks (B ediment Depo rift Deposits (E lgal Mat or Cru on Deposits (B	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)  st (B4)  Present (Y/N): N	Sur Inui (B7 Spa Cori Mai Hyc Odd Dry Wa	riny one indicate frace Soil Crace ndation Visible (1) arsely Vegetate ncave Surface or I Deposits (B1 drogen Sulfide or (C1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5)	Print S	Vater-stained eaves (B9) _ drainage Pati exidized Rhiz iving Roots ( resence of F on (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY I Surface Water ( High Water Tab Saturation (A3) Vater Marks (B Sediment Depo Orift Deposits (B Sigal Mat or Cru on Deposits (B Surface Water F Vater Table Pre	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)  st (B4)  Present (Y/N): N  esent (Y/N): N	Sur Inui (B7 Spa Cori Mai Hyc Odd Dry Wa	rany one indicate face Soil Crace ndation Visible (1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5) Notes):	Print S	Vater-stained eaves (B9) _ drainage Pati exidized Rhiz iving Roots ( resence of F on (C4) alt Deposits otes:	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY I  Gurface Water ( High Water Tab  Saturation (A3)  Vater Marks (B  Sediment Depo  Orift Deposits (E  Ligal Mat or Cru  on Deposits (B	PRIMARY INDICA  A1)  le (A2)  1)  sits (B2)  st (B4)  Present (Y/N): N  esent (Y/N): N  ent (Y/N): N	Sur Inuu (B7 Spa Cor Mal	Inny one indicate face Soil Crace ndation Visible (1)	or is sufficient) ks (B6) e on Aerial Image ed (B8) 5) Notes):	Print S	Vater-stained eaves (B9) _ drainage Pati exidized Rhiz iving Roots ( resence of F on (C4) alt Deposits otes:	terns (B10) cospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent       Emergent-Non-persistent
Percent Cover (P)         Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominator         (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)           80%)         Very High Density (80-100%)         Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (\$25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Vig. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol: Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Out
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (B). No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 y
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (\$5.5) pH Reading
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (\$\script{1.5}\$) pH Reading  Surficial Glacial Deposity Inder Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
Zvidance or early and a printing ( ) that a pr
LANDSCALE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown
We hand Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Vatershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check:  GPS Technician QA/QC check:  Page 4 of 4

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: W6/4Tpd4 Field Target: 050 Date: 6/28/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

SITE DESCRIPTION				1130		
Survey Type: Centerline Acce	ss Road (explain) Other	(explain)	Field Target: 059	Map #: 3 Map Date: 5 27 (		
Date: 6 29 14	Project Name & No.: Alaska	LNG 26221306	Feature Id	W6141005		
Investigators: L X60115	J ANDUSON	A Fisher	*	Team No.: W6		
State: Alaska	Region: Alaska		544.85			
Latitude: 63° 38' 29.10'	Long		44' 20.12"	Datum: WGS84		
Logbook No.: WG(-2	Logbook Page No.:	Picture No.:	P. WGIHTOOS_S	PIL: Plus; SE; NE		
SITE PARAMETERS		W	ACCOUNT OF	0, .		
Subregion: (ntuin		Landform (hi	llslope, terrace, hummock	s, etc.): Flate		
Slope (%): 2			concave, convex, none):	Convex		
Pre-mapped Alaska LNG/NWI classifica	tion: Uplam>	Soil Map Unit		CANVER		
Are climatic/hydrologic conditions on the Yes No (if no expl	site typical for this time of year	Are "N	ormal Circumstances" pre			
Are Vegetation, Soil, or Hyd	drology Significantly Distur	bed? No_	(If yes, explain in Notes			
Are Vegetation, Soil, or Hyd	frology Naturally Problema	atic? No	(If yes, explain in Notes	i.)		
SUMMARY OF FINDINGS		-				
Hydrophytic Vegetation Present? Yes_	× No	Is the Sampled A	Area within a Wetland?	Yes NoX		
Hydric Soil Present? Yes_	X No X	Wetland Type:	UPLAND	PEMIR PSS4/13		
Wetland Hydrology Present? Yes_	No	Alaska Vegetation	Classification (Viereck):	IAJ II C/IB		
Notes and Site Sketch: Please include D	rirectional & North Arrow, Center	line. Lenath of featu	re. Distances from Center	line Photo Locations and Survey		
corridor						
	See lo spoo	E 261	Z, page	1		
	See lo spoo	for site	slatch & Note	IAZ, I		
				7 01		
				Thomas b		
				43.		

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)  Total Number of Dominant Species Across All Strata: (B)
1. Picea douca	25	y	FACU	% Dominant Species that are OBL, FACW, or FAC: 75 (A/B)
2.				To bolimate oposios that also obej 171011) of 1710 in the internal operation of the internal operation operation of the internal operation operation of the internal operation ope
3.				
4.				Prevalence Index worksheet:
Total Cover	25			Total % Cover of: Multiply by:
50% of total cover	: 20	% of total cov	er:	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = 354  FAC species X 3 = 354  FACU species 40 X 4 = 60
1. Pias danca	15		FACU	UPL species X 5 =
2. Betita GendulosA	10		FAC	Column Totals: 159 (A) 516 (B)
3. Arctous rubra	25	Y	FAC	PI = B/A =
4. Vaccinium uliainosum	40	У.	FAC	
5. Rhododendson amenlandicum	20	Y	FAC	
6. Vaccinium vitis- daca	5	,	FAC	
7. Empetrum niggum	8		FAC	
8. Salix pseudomyrsinites	a		ASSOCIACN'	
9. Salize alauga	10.		FAC	
Total Cover 50% of total cover		)% of total cov	ver: 27.4	
VEGETATION (use scientific names of plants	s)			
Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Petosites Frisidus			FACW	Morphological Adaptations¹ (Provide supporting data in
2. PA 50.	1		ASSUME	Notes)
3. Mertenzia pavionata	T		FAC	Problematic Hydrophytic Vegetation¹ (Explain)
4. Unknown herb	T		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				
10,	1			Cover of Water
	I R			Hydrophytic Vegetation Present (Y/N):
Total Cove 50% of total cove Herb Skatum addict to S	r: 20	0% of total co um SING		Notes: (If observed, list morphological adaptations below):
			COULS	

SOIL			Date 6 29	eature l	DW616	HT005		Soil Pit Required (Y/N)		
SOIL PROFIL	E DESCRIPTION:	(Describe	to the depth needs	ed to doc	ument the	indicator or o	confirm the absen	ice of indicators.)		
Depth	Matrix		Redox Features							
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes		
Q-3							Prorre	Saturated		
3-7							Hemic	Saturated		
7-13"	1042312	90	104R 5/6	10	C	M	Sway Silt	loan		
13"	Petusal - 1+A	APO PAN					1			
	ncentration, D=Dep	letion, RM	l=Reduced Matrix,	CS=Cov	ered or Co	ated Sand G	1	n: PL=Pore Lining, M=Matrix.  FOR PROBLEMATIC HYDRIC SOILS		
	stel (A1)		Alaska Gleve	d (A13)						
	on (A2)			Alaska Gleyed (A13) Alaska Redox (A14)				Alaska Color Change (TA4) <sup>4</sup> Alaska Alpine Swales (TA5)		
	43)			Alaska Gleyed Pores (A15)				Alaska Redox with 2.5Y Hue		
	fide (A4)				(****)			d without 5Y Hue or Redder Underlying		
	ırface (A12)	_						Other (Explain in Notes)		
disturbed or p Give details of Restrictive La Hydric Soil P	r of hydrophytic veg roblematic. of color change in N yer (if present): Typ			r of wetla		gy, and an a	appropriate landsc	cape position must be present unless		
Notes:		7"028	atrivited ex	77.91 C						

RS (any one indicator is sufficient)	SECONDARY INDICATORS (2 or more required)			
Surface Soil Cracks (B6)	Water-stained Leaves (B9)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)		
Inundation Visible on Aerial Imagery (B7)	Drainage Patterns (B10)			
Sparsely Vegetated Concave Surface (B8)	Oxidized Rhizospheres along Living Roots (C3)			
Marl Deposits (B15)	Presence of Reduced Iron (C4)	Microtopographic Relief (D4)		
Hydrogen Sulfide Odor (C1)	Salt Deposits (C5)	FAC-Neutral Test (D5)		
Dry-Season Water Table (C2)	Notes:	7		
Other (Explain in Notes):				
Depth (in):		V		
Depth (in); /3"	Wetland Hydrology Present (Y/N):			
Saturation Present (Y/N): includes capillary fringe)				
	Surface Soil Cracks (B6)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Marl Deposits (B15)  Hydrogen Sulfide Odor (C1)  Dry-Season Water Table (C2)  Other (Explain in Notes):  Depth (in):	Surface Soil Cracks (B6)		

VEGETATION VARIABLES P= Plot, N	A= Matrix
Forested-Evergreen-Needle-leaved Scub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Dwarf shrab (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Moss-Lichen Floating Submerged
Number of Watland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very Nigh Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover>75% Scattered	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or ed or Peripheral Cover N/A
Plant Species Diversity (P): Low < 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (nane) _	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P) Open Small Scattered Patches_	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
<b>Vegetative Interspersion (P):</b> Low (large High (small groupings, diverse and interspers	e patches, concentric rinos) Moderate (broken irregular rings) sed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	Little of Constant
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol: Fibric Histosol: Hemic Histosol: Sapric Mineral: Silty_ Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial I	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Peren
	Inlet/Perennial Outlet
Wetland Water Regime (P): Orier: Seas Wet: Perm. Flooded, Intermittently Exposed,	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed,  Evidence of Sedimentation (P): No Eviden  Created	sonally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded nce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Wet: Perm. Flooded, Intermittently Exposed,  Evidence of Sedimentation (P): No Eviden  Created  Microrelief of Wetland Surface (P): Absent	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No C	sonally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded nce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No C Return Interval >5 yrs	sonally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded nce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment  t Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overback Flooding (P): No C Return Interval >5 yrs  Degree of Outlet Testriction (P): No Outflooding	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No C Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflood Water pH (P): No surface water	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Striace (P): Absent Frequency of Overbank Flooding (P): No Created Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflood Water pH (P): No surface water Surficial Glacial Deposit Under Wetland (Formula of Company)	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Created Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflood Water pH (P): No surface water  Surficial Gladial Deposit Under Wetland (F) Glacial Till Not Permeable  Basin Topographic Gradient (M): Low	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No C Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outfloo Water pH (P): No surface water C Surficial Gladial Deposit Under Wetland (F Glacial Till/Not Permeable  Basin Tapographic Gradient (M): Low Evidence of Seeps and Springs (P): No Se	Somally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded Ince Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment  I Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs  W Restricted Outflow Unrestricted Outflow  Circumneutral (5.5-7.4) Alkaline (>7.4) Asid (<5.5) pH Reading  P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  O'Gradient (<2%) High Gradient (≥2%)  Deps or Springs Seeps Observed Intermittent Spring Perennial Spring  Perennial Spring Perennial Spring
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No Created Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outfloo Water pH (P): No surface water Created Surficial Gladial Deposit Under Wetland (Find Glacial Till Hot Permeable  Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See  LANDSCAPE VARIABLES (M) Wetland Juxtaposition: Wetland Isolated	sonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Striace (P): Absent Frequency of Overbank Flooding (P): No Created Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflood Water pH (P): No surface water Surficial Gladial Deposit Under Wetland (F) Glacial Till Not Permeable Basin Typographic Gradient (M): Low Evidence of Seeps and Springs (P): No Second Seeps and Springs (P): No Second Seeps	Somally Flooded, Temporarily Flooded, Saturated Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Striace (P): Absent Frequency of Overbank Flooding (P): No Created Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflood Water pH (P): No surface water  Surficial Glatial Deposit Under Wetland (F) Glacial Till/Not Permeable  Basin T pographic Gradient (M): Low Evidence of Seeps and Springs (P): No Second Seeps and Springs (P): No Second Seeps See	Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Evidence of Sedimentation (P): No Evider Created Microrelief of Wetland Striace (P): Absent Frequency of Overback Flooding (P): No Created Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outfloom Water pH (P): No surface water Comparison (P): No Outfloom Water pH (P): No surface water Comparison (P): No Sedimental (P): No Sediment (P): No Se	Semiperm. Flooded

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	re ID: W61 H1005 Field Target: OS9 Date: 6/29/14
For al	l items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?
	<ul><li>Cover calculations are complete and correct?</li><li>All dominant species have been determined and recorded per strata?</li></ul>
	Indicator status is correct for each species?
	Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?

Q	P	h	_	4	n	c
ο.		ш	u	ш	ш	٠.

Ø	Four photos were taken for each Wetland Determination Data Form (2 vegetation,	1
7	soil pit, 1 soil plug)?	

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Welland Scientist (print)

X

Signature / Date

Value / Date

X him Delivers X: White hy 4 (29/14)

Field Crew Chief (print) Signature / Date

SITE DESCRIPTION				130		
Survey Type: Centerline_X Acce	ss Road (explain) Other (explain)	explain)	Field Target: 072	Map #: Map Date: 5 27 (4		
Date: 6/29/14	Project Name & No.: Alaska	LNG 26221306	Feature Id	W61 HT006		
Investigators: K DEC JTS	JANderson	A Fisher		Team No.: WG [		
State: Alaska	Region: Alaska		572	0.41		
Latitude: 43° 20' 57	.98" Longit		14 30.38"	Datum: WGS84		
Logbook No.: WG1-2	Logbook Page No.:			-Pit; Plus; W; E)		
SITE PARAMETERS		A 1000 A				
Subregion: Intaion		Landform (hil	lslope, terrace, hummock	s, etc.): tessaco.		
Slope (%)			concave, convex, none):			
Pre-mapped Alaska LNG/NWI classifica	ation: PEMIF	Soil Map Unit	: Name:			
Are climatic/hydrologic conditions on the Yes No (if no expl	e site typical for this time of year?	Are "N	ormal Circumstances" pre No (If no, ex	esent: plain in Notes.)		
Are Vegetation, Soil, or Hyd	drology Significantly Disturb	ed? No 🎾	_(If yes, explain in Notes	)		
Are Vegetation, Soil, or Hyd	drology Naturally Problemat	ic? No_	_ (If yes, explain in Notes	5.)		
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Yes_	<u></u> №	Is the Sampled A	Area within a Wetland?	Yes No		
Hydric Soil Present? Yes_	ЮNo	Wetland Type: PSSIC				
Wetland Hydrology Present? Yes_	/O No	Alaska Vegetation Classification (Viereck): 11 A3 II B1				
Notes and Site Sketch: Please include D	Directional & North Arrow, Centerli	ne, Length of featu	re, Distances from Center	rline, Photo Locations, and Survey		
corridor.	See losbood	k W61-2	Pace			
	Con r	notes & sit	e sketch			

VEGETATION (use scientific names of plan	ts)			
Tree Stratum (Plot sizes: 200 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  (A)  Tatal Number of Dominant Species Access All Strate:  (B)
1. N/A	_	_	_	Total Number of Dominant Species Across All Strata: (B) % Dominant Species that are OBL, FACW, or FAC:
2.				% Dominant Species that are OBE, 1 ACW, 011 AC.
3.				
4.				Prevalence Index worksheet:
Total Cove	er: NA			Total % Cover of: Multiply by:
50% of total cove	er: 20	% of total cov	er:	OBL species: X 1 =
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 5 + x2 = 144  FAC species 63 x3 = 189  FACU species x4 =
1. Dosiphora fruticosA	40	Y	FAC	UPL species X 5 =
2. Salix polchra	50	Y	FACW	Column Totals: 105 (A) 308 (B)
3. VAccinium ulisinosum	5		FAC	PI = B/A = 3 . 46
4. Andromeda polifolia	2		FACW	
5. Belula dondulosa	2	,	FAC	
6. Salic arbus culvides	5		FACE	
7. Salix pseudonomicola	5		FAC	
8.				
Total Cove	er: 54.5 20	)% of total cov	ver: 31.55	
VEGETATION (use scientific names of plan	-		Ť	
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:
1. Comarum palvetre	3		OBL	Morphological Adaptations¹ (Provide supporting data in
2. Rubus arcticus	1		FAC	Notes)
3. CARRY SO (NOINFLORES.)	10	Y	ABUME FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Equisalum fluventile	1		OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Catha politicis	1		OBL	disturbed or problematic
6.				(100)
7,				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				<del>5</del> % Cover of Water
Total Cove	er: 16			Hydrophytic Vegetation Present (Y/N):
50% of total cov		0% of total cov	ver: 3.7	Notes: (If observed, list morphological adaptations below):

			1 14						
SOIL PROFILE DESCRIPTION: (Describe to the depth needed to docume								Soil Pit Required (Y/N)	
SOIL PROFIL		Describe		d to doc	ument the	indicator or	confirm the absenc	e of indicators.)	
Depth	Matrix		Redox Features			1 .			
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc²	Texture	Notes	
0-14							Fibric	Saturated	
						4			
		1		-					
				-					
		1		-					
<sup>1</sup> Type: C=Co	ncentration, D=Depl	etion, RM	=Reduced Matrix, C	S=Cove	ered or Co	ated Sand G	rains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix	
HYDRIC SOIL	L INDICATORS		1				INDICATORS	FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>	
Histosol or Hi			Alaska Gleyed	(A13) _			Alaska Color C	change (TA4) <sup>4</sup>	
Histic Epipede	on (A2) /		Alaska Redox	(A14) _			Alaska Alpine	Swales (TA5)	
Black Histic (/	43)		Alaska Gleyed	Pores	(A15)			with 2.5Y Hue	
Hydrogen Sul	fide (A4)						Alaska Gleyed Layer	without 5Y Hue or Redder Underlying	
Thick Dark Su	urface (A12)			D.			Other (Explain	in Notes)	
One indicato	r of hydrophytic vege	etation, or	ne primary indicator	of wetla	nd hydrolo	gy, and an a	appropriate landsca	spe position must be present unless	
	of color change in No	otes.	A .						
Restrictive La	yer (if present): Typ	e: <i>U</i>	(A)	Depth (ir	nches):				
		V	1						
	resent (Y/N):								
Notes:	hable to exca	vete .	SOIL Of due	to e	Koessine	pondin	: NO MESTI	ictine layer excountered	
						•	9		
HYDROLOGY	PRIMARY INDICA	TORS (a	ny one indicator is s	ufficient	)   S	ECONDAR	Y INDICATORS (2	or more required)	
Surface Wate	r (A1) <b>/</b>	Surf	face Soil Cracks (B6	3)		Vater-stained eaves (B9)		Stunted or Stressed Plants (D1)	
High Water Ta	able (A2)	Inur (B7)	ndation Visible on A	erial Ima	ngery C	Drainage Patterns (B10)		Geomorphic Position (D2)	
Saturation (A3	3)		rsely Vegetated cave Surface (B8) _			Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)	
Water Marks	(B1)	Mar	l Deposits (B15)		- Ir	Presence of Reduced Micro		Microtopographic Relief (D4)	
Sediment Dep	oosits (B2)		rogen Sulfide or (C1)		S	Salt Deposits (C5) FAC-Neutral Test (D5)			
Drift Deposits	(B3)		-Season er Table (C2)		٨	lotes:		J.	
Algal Mat or C	Crust (B4)	_ Othe	er (Explain in Notes)	)*-					
Iron Deposits	(B5)								
Surface Meter	r Present (Y/N): Y		Donth (in):	011	1				
			Depth (in):	111	Wet	land Hydro	logy Present (Y/N	): Y	
Water Table F	Present (Y/N):		Depth (in):	5					
Saturation Pre (includes capil			Depth (in):	5 11					
Notes:									

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation LackingForested-Deciduous-Needle-leavedForested-Deciduous-Broad-leavedForested-Evergreen-Needle-leavedScrub Shrub-Deciduous-Needle-leavedScrub Shrub-Deciduous-Broad-leavedScrub Shrub-Evergreen-Needle-leavedEmergent-Non-persistentEmergent-PersistentAquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Dwarf shrub (<0.5m) Tall herb (≥1m) Short herb (<1m) Moss-Lichen 15 Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25">&lt;25% Scattered/Peripheral Cover26-75% Scattered or Peripheral Cover N/A</a>
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)_X
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Index Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded   Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment  Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow  Restricted Outflow  Unrestricted Outflow
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs Return Interval Poorly Developed (Outflow Unrestricted Outflow Ph. No Surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Alkaline (>7.4) Ph. Acid (<5.5) Ph. Reading 7.64
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment  Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow  Restricted Outflow  Unrestricted Outflow  Water pH (P): No surface water  Circumneutral (5.5-7.4)  Alkaline (>7.4)  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits  Low Permeability Stratified Deposits
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment  Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow  Restricted Outflow  Unrestricted Outflow  Water pH (P): No surface water  Circumneutral (5.5-7.4)  Alkaline (>7.4)  Alkaline (>7.4)  Phaseding
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Oreated  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 7.4  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Stratified Deposits High Gradient (≥2%)  Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow  Restricted Outflow  Unrestricted Outflow  Water pH (P): No surface water  Circumneutral (5.5-7.4)  Alkaline (>7.4)  Acid (<5.5)  pH Reading  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits  Glacial Till/Not Permeable  University  Basin Topographic Gradient (M): Low Gradient (<2%)  High Gradient (≥2%)  Evidence of Seeps and Springs (P): No Seeps or Springs  Seeps Observed  Intermittent Spring  Perennial Spring  Perennial Spring
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment  Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow  Restricted Outflow  Unrestricted Outflow  Water pH (P): No surface water  Circumneutral (5.5-7.4)  Alkaline (>7.4)  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits  Glacial Till/Not Permeable  Unknow  Basin Topographic Gradient (M):  Low Gradient (<2%)  High Gradient (≥2%)  Ferennial Spring  Perennial Spring  Perennial Spring  Perennial Spring
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 7.64  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Sain Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)  Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring  LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval ≥5 yrs  Degree of Outlet Restriction (P): No Outflow  Restricted Outflow  Unrestricted Outflow  Water pH (P): No surface water  Circumneutral (5.5-7.4)  Alkaline (>7.4)  Acid (<5.5)  pH Reading  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits  Glacial Till/Not Permeable  Un Now  Basin Topographic Gradient (M):  Low Gradient (<2%)  High Gradient (≥2%)  Evidence of Seeps and Springs (P): No Seeps or Springs  Seeps Observed  Intermittent Spring  Perennial Spring  Perennial Spring  Only Connected Below  Only Connected Above  Connected Upstream & Downstream  Unknown  Unknown
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment Observed on Wetland Intermittent Spring  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Return Interval 1-2 yrs  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Return Interval 2-5 yrs  Return Interval 1-2 yrs  Return Interval 2-5 yrs  Return Interval 1-2 yrs  Re

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID: W6141006 Field Target: 072 Date: 6/29/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>☑ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>☑ Vegetation names are entered legibly for all strata present?</li> <li>☑ Cover calculations are complete and correct?</li> <li>☑ All dominant species have been determined and recorded per strata?</li> <li>☑ Indicator status is correct for each species?</li> <li>☑ Dominance Test and Prevalence Index have been completed?</li> </ul>
3.	Soil
	☑ Soil profile is complete? ☑ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul> <li>△ Appropriate hydrology indicators are marked?</li> <li>☑ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

B	Four photos were taken for each Wetland Determination Data Form (2 vegeta	ation, '	1
	soil pit, 1 soil plug)?		

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Field Crow Chief (print)

Field Crew Chief (print)

Signature / Date

				18			
SITE DESCRIPTION			200		1180		
Survey Type: Centerline Acce	ss Road (explain)	Other (exp	lain)	Field Target: 080	Map #: 54 Map Date: 5 27 /4		
Date: 6/29/14	Project Name & No.:	Alaska LNO	G 26221306	Feature Id	1: WEI HTOD 7		
Investigators: L Decuris	J Anderson	A Fisher			Team No.: WG		
State: Alaska	Region: Alaska		Milepost: 590.				
Latitude: 63° 09' 27.3	3"	Longitude	: 149° a	4'38.27"	Datum: WGS84		
Logbook No.: Wel-2	Logbook Page No.:	12			+ Pit; Plus; W: N		
SITE PARAMETERS				10.7			
Subregion Interior			Landform (hil	llslope, terrace, hummock	(s, etc.): Flat		
Slope (%):				concave, convex, none):			
Pre-mapped Alaska LNG/NWI classifica	tion: PEMIF		Soil Map Unit	t Name:			
Are climatic/hydrologic conditions on the Yes No (if no expl	e site typical for this time ain in Notes)	of year?	Are "N	ormal Circumstances" pre			
Are Vegetation, Soil, or Hyd	drology Significant	ly Disturbed?	No yo	(If yes, explain in Notes	3)		
Are Vegetation, Soil, or Hyd	drology Naturally F	Problematic?	No yo	(If yes, explain in Notes	5.)		
SUMMARY OF FINDINGS							
Hydrophytic Vegetation Present? Yes_	<b>&gt;</b> No	ls	Is the Sampled Area within a Wetland? Yes No				
Hydric Soil Present? Yes	<b>ю</b> No	_ w	Wetland Type: PEM IE				
Wetland Hydrology Present? Yes	No	— Al	Alaska Vegetation Classification (Viereck): 111 A 3				
Notes and Site Sketch: Please include D	irectional & North Arrow	, Centerline,	Length of featu	re, Distances from Center	rline, Photo Locations, and Survey		
corridor.				10			
	See logo	ook W	61-2, 1	Dag 12			
	fr	n site	sketch	& notes			

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 26 15)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3 (A)  Total Number of Dominant Species Across All Strata: (B)
1. N A				
2.				% Dominant Species that are OBL, FACW, or FAC: 75% (A/B)
3.				
4.	,			Prevalence Index worksheet:
Total Cove	r: NA			Total % Cover of: Multiply by:
50% of total cove	r: 20	% of total cov	/er:	OBL species: 30 x 1 = 30
Sapling/Shrub Stratum ( 15 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 3 x 2 = 6  FAC species
1. Picea slaves	10	Y	FACU	UPL species X 5 =
2. Betula NANA	2	,	FAC	Column Totals: \\8 (A) 30 (B)
3. Dosiphora fruiticosa	8	Y	FAC	PI = B/A = 2.55
4. Vaccinium DX4COCCUS	1		OBL	
5. Andromeda Difolia			FACW	
6. Comarum palustre	3		OBL	
7. Jaccinium ulizinosum	2		FAC	
9.				
	r: 27 2	4		
50% of total cove	13.6 20	% of total co	ver: 5.4	
VEGETATION (use scientific names of plant	13		4,8	
Herb Stratum (	Absolute	Dominant	Indicator	Hydroxhytic Vegetation Indicators:
TIGIO Ottatum (	% Cover	Species?	Status	Dominance Test is > 50%
1. Pedicularis   Abradorica	1		FACW	Prevalence Index is ≤ 3.0
2. Equisation fluviable	1		OBL	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Plantanthera dilatata	1		FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Drosera robuntifolia	T		OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Viola Januadofit Palustris	T		FACE	disturbed or problematic
6. Beckmannia Syzicachor	25	<b>Y</b>	OBL	A
7. Festuca altaica	60	Y	FAC	% Bare Ground
8. Potentila 50.	3		ASSURE	Cover of Wetland Bryophytes
9 Unknown 50.	T		ASSUMA	Total Cover of Bryophytes  5 % Cover of Water
10. Comarum pallustre	3		OBL	Hydrophytic Vegetation Present (Y/N):
Total Cove		4	100	Notes: (If observed, list morphological adaptations below):
50% of total cove	er: <u>45,5</u> 2	0% of total co	ver: 18.2	Somple plot shape altered to exclude Adjacent
	* *			L. Chimas

<b>SOIL</b> SOIL PROFII	LE DESCRIPTION: (	Describe	to the depth	needed to docume		atol of G			aluis.)
Depth	Matrix		Redox Feat						410101)
inches)	Color (moist)	1 %	Color (mois	t) % Tv	pe <sup>1</sup> L	.oc²	Texture	Notes	
0-10"							Fibric		routed
10-18"							Hemic	Sah	urated
							Hewite	500	or activati
	ncentration, D=Depl	etion, RI	/I=Reduced M	latrix, CS=Covered	or Coated	Sand Gr			e Lining, M=Matrix.
	L INDICATORS								OBLEMATIC HYDRIC SOIL
	stel (A1)			Gleyed (A13)					A4) <sup>4</sup>
	on (A2)			Redox (A14)					A5)
lack Histic (/	A3)		Alaska	Gleyed Pores (A15		_			Hue
ydrogen Sul	fide (A4)						Alaska Gleyed Layer	l without 5	Y Hue or Redder Underlyin
hick Dark Su	urface (A12)						Other (Explain	in Notes)	
One indicato	r of hydrophytic vege	etation, c	ne primary inc	dicator of wetland h	ydrology, a	and an ap			on must be present unless
sturbed or p									
	of color change in No yer (if present): Typ	otes_	HA	Depth (inche	2).	_			
COLITIONIVO LU	yer (ii present). Typ	C	11.	Deptil (illicite	5)				
lydric Soil B	Present (V/N):	J							
	resent (Y/N):	1							
	resent (Y/N):	1							
	Present (Y/N):	1							
	Present (Y/N):	1							
lotes:	Present (Y/N):			itor is sufficient)	SECO	DNDARY	/ INDICATORS (2	? or more i	required)
Notes:	Y PRIMARY INDICA	TORS (a	any one indica		Water	-stained		St	unted or Stressed
lotes:		TORS (a	<b>any one indica</b> rface Soil Cra	cks (B6)	Water Leave	-stained		St	
Notes:  NOTES:	Y PRIMARY INDICA	TORS (a	any one indica rface Soil Crai ndation Visibl		Water Leave	r-stained es (B9) _		St Pla	unted or Stressed
IYDROLOGY urface Wate ligh Water Ta	Y PRIMARY INDICA r (A1) \( \int \mathcal{O} \) able (A2) \( \int \mathcal{O} \)	Su Inu (B7	any one indica rface Soil Cra ndation Visibl () arsely Vegeta	cks (B6)e on Aerial Imagery	Water Leave Drains	r-stained es (B9) _ age Patte	erns (B10)	St Pla Ge	unted or Stressed ants (D1) eomorphic Position (D2)
Notes:  NYDROLOGY Surface Wate	Y PRIMARY INDICA r (A1) \( \int \mathcal{O} \) able (A2) \( \int \mathcal{O} \)	Su Inu (B7	any one indica rface Soil Crai ndation Visibl	cks (B6)e on Aerial Imagery	Water Leave Draina	r-stained es (B9) _ age Patte	erns (B10)	St Pla Ge	unted or Stressed ants (D1)
IYDROLOGY Surface Wate ligh Water Ta	Y PRIMARY INDICA r (A1) D able (A2) D	Su Inu (B7 Sp Co	nny one indica  rface Soil Crac  ndation Visible  /)  arsely Vegeta'  ncave Surface	cks (B6)e on Aerial Imagery	Draina Oxidiz Living Prese	r-stained es (B9) _ age Patte zed Rhize Roots (C	erns (B10) ospheres along C3)	St Pla	eomorphic Position (D2)
IYDROLOGY Surface Water High Water Talesturation (AS	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Sp Co	any one indica rface Soil Crai ndation Visible () arsely Vegeta ncave Surface rl Deposits (B	cks (B6) e on Aerial Imagery ted e (B8) 15)	Water Leave Draina Oxidiz Living	r-stained es (B9) _ age Patte zed Rhize Roots (C	erns (B10) ospheres along C3)	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
AYDROLOGY Surface Water High Water Ta Saturation (AS	Y PRIMARY INDICA r (A1) D able (A2) D	Su Inu (B7 Sp Co Ma	any one indica rface Soil Cran ndation Visible (1) arsely Vegeta ncave Surface rl Deposits (B drogen Sulfide	cks (B6)e on Aerial Imagery ted e (B8)	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhizo Roots (C nce of R	erns (B10) ospheres along C3)	St Pland Ge	eomorphic Position (D2)
HYDROLOGY Surface Water Tage High Water Tage Saturation (AS) Water Marks (AS)	r (A1) D able (A2) D (B1) Dosits (B2)	Su Inu (B7 Co Ma	any one indica rface Soil Crai ndation Visible () arsely Vegeta ncave Surface rl Deposits (B	cks (B6)e on Aerial Imagery ted e (B8)	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhize Roots (C nnce of R C4)	erns (B10) ospheres along C3) Reduced	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
HYDROLOGY Surface Water Tage High Water Tage Saturation (AS) Water Marks (AS)	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Co Ma Hyr Od Dry	rface Soil Cracendation Visible (1) arsely Vegeta (1) ncave Surface (1) Deposits (B) drogen Sulfide (C1)	cks (B6) e on Aerial Imagery ted e (B8) 15)	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhize Roots (C nnce of R C4)	erns (B10) ospheres along C3) Reduced	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
HYDROLOGY Surface Water Ta Saturation (AS Vater Marks of Sediment Dep	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Sp Co Ma Hyr Od Dry Wa	any one indical rface Soil Cran ndation Visible r) arsely Vegetat ncave Surface rl Deposits (B drogen Sulfide or (C1) r-Season ter Table (C2)	cks (B6)e on Aerial Imagery ted e (B8) 15) e	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhize Roots (C nnce of R C4)	erns (B10) ospheres along C3) Reduced	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
HYDROLOGY Surface Water Ta Saturation (AS Vater Marks of Sediment Deporting Deposits Algal Mat or Comment of Comment Deposits	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Sp Co Ma Hyr Od Dry Wa	rface Soil Craindation Visible (1) arsely Vegetal nave Surface rl Deposits (Budrogen Sulfide or (C1)	cks (B6)e on Aerial Imagery ted e (B8) 15) e	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhize Roots (C nnce of R C4)	erns (B10) ospheres along C3) Reduced	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
HYDROLOGY Surface Water Ta Saturation (AS Water Marks of Sediment Deporting Deposits Algal Mat or Comment of Comment Deposits	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Sp Co Ma Hyr Od Dry Wa	any one indical rface Soil Cran ndation Visible r) arsely Vegetat ncave Surface rl Deposits (B drogen Sulfide or (C1) r-Season ter Table (C2)	cks (B6)e on Aerial Imagery ted e (B8) 15) e	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhize Roots (C nnce of R C4)	erns (B10) ospheres along C3) Reduced	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
AYDROLOGY Surface Water Tage High Water Tage Saturation (AS Vater Marks of Sediment Deposits Algal Mat or Company to the property of the posits Algal Mat or Company to the property of the posits Algal Mat or Company to the posits Algal Mat or Company to the posits  The posits of th	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Sp Co Ma Hy) Od Dry Wa	rface Soil Crandation Visible arsely Vegetal neave Surface or (C1)	cks (B6)e on Aerial Imagery ted e (B8) 15)  Notes):	Draina Oxidiz Living Prese Iron (C	r-stained es (B9) _ age Patte zed Rhize Roots (C nnce of R C4)	erns (B10) ospheres along C3) Reduced	St Pland Ge	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
AYDROLOGY Surface Water Tage High Water Tage Saturation (AS Vater Marks of Sediment Deposits Algal Mat or Company to the property of the posits Algal Mat or Company to the property of the posits Algal Mat or Company to the posits Algal Mat or Company to the posits  The posits of th	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Sp Co Ma Hy) Od Dry Wa	any one indical rface Soil Cran ndation Visible r) arsely Vegetat ncave Surface rl Deposits (B drogen Sulfide or (C1) r-Season ter Table (C2)	cks (B6)e on Aerial Imagery ted e (B8)  15)  Notes):	Draina Oxidiz Living Prese Iron (C Salt D Notes	r-stained es (B9) _ age Patte zed Rhizz Roots (C ince of R C4) deposits (	erns (B10) ospheres along C3) Reduced (C5)	St Plane Ge St Mi Re	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (AS Water Marks of Sediment Dep Drift Deposits Algal Mat or Coron Deposits Surface Water	Y PRIMARY INDICA  r (A1)	Su Inu (B7 Co Ma Py Od Dry Wa	rface Soil Crandation Visible arsely Vegetal neave Surface or (C1)	cks (B6)e on Aerial Imagery ted e (B8) 15)  Notes):	Draina Oxidiz Living Prese Iron (C Salt D Notes	r-stained es (B9) _ age Patte zed Rhizz Roots (C ince of R C4) deposits (	erns (B10) ospheres along C3) Reduced	St Plane	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
AYDROLOGY Surface Water High Water Ta Saturation (AS Vater Marks of Sediment Deposits Algal Mat or Coron Deposits Surface Water Vater Table F	Present (Y/N):	Su Inu (B7 Co Ma Py Od Dry Wa	rface Soil Cracendation Visible (1) arsely Vegetaincave Surface or (2) Legeta (1) Legeta (2) (2) Legeta (2) Le	cks (B6)e on Aerial Imagery ted e (B8)  15)  Notes):	Draina Oxidiz Living Prese Iron (C Salt D Notes	r-stained es (B9) _ age Patte zed Rhizz Roots (C ince of R C4) deposits (	erns (B10) ospheres along C3) Reduced (C5)	St Plane	eomorphic Position (D2)  allow Aquitard (D3)  icrotopographic elief (D4)
AYDROLOGY Surface Water High Water Ta Saturation (AS Vater Marks of Sediment Deposits Algal Mat or Coron Deposits Surface Water Vater Table F Saturation Presented	Present (Y/N):	Su Inu (B7 Co Ma Py Od Dry Wa	rface Soil Cracendation Visible (1) arsely Vegetaincave Surface or (2) Legeta (1) Legeta (2) (2) Legeta (2) Le	cks (B6)e on Aerial Imagery ted e (B8)  15)  Notes):	Draina Oxidiz Living Prese Iron (C Salt D Notes	r-stained es (B9) _ age Patte zed Rhizz Roots (C ince of R C4) deposits (	erns (B10) ospheres along C3) Reduced (C5)	St Plane	eomorphic Position (D2)  nallow Aquitard (D3) icrotopographic elief (D4)
AYDROLOGY Surface Water High Water Ta Saturation (AS Vater Marks of Sediment Deposits Algal Mat or Coron Deposits Surface Water	Present (Y/N):	Su Inu (B7 Co Ma Py Od Dry Wa	any one indical rface Soil Cran rdation Visible r) arsely Vegetat rncave Surface rl Deposits (B drogen Sulfide or (C1) r-Season rter Table (C2) rer (Explain in Depth (in):	cks (B6)e on Aerial Imagery ted e (B8)  15)  Notes):	Draina Oxidiz Living Prese Iron (C Salt D Notes	r-stained es (B9) _ age Patte zed Rhizz Roots (C ince of R C4) deposits (	erns (B10) ospheres along C3) Reduced (C5)	St Plane	eomorphic Position (D2)  nallow Aquitard (D3) icrotopographic elief (D4)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved_ Scrub Shrub-Deciduous-Broad-leaved_ Scrub Shrub-Evergreen-Broad-leaved_ Scrub Shrub-Evergreen-Needle-leaved_ Emergent-Non-persistent_ Emerg
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Short shrub (0.5-2m) Short shrub (<0.5m) Submerged Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat_vo Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pe
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Per
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial I
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Per
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/I
Inlet/Outlet Class (P): No Inlet/Outlet
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Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  Intermittent Inlet/Intermittent Inle
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: U61 HT007 Field Target: 080 Date: 6/29/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

### 8. Photos

A	Four photos were taken for each Wetland Determination Data Form (2 vegetation,	1
1	soil pit, 1 soil plug)?	

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X gen la Anderen 6/29/14
Wetland Scientist (print)	Signature / Date

Kim DEGITIS

Field Crew Chief (print)

Signature / Date

		Carpon	
SITE DESCRIPTION		2000 (on flor	1130
Survey Type: Centerline Acce	ss Road (explain) Other		Map #: 5 Map Date: 5 h
Date: 6/29/14	Project Name & No.: Alaska	LNG 26221306 Feature	1d: W61 HT008
Investigators: K Denvis	JAnlesson	A Fisher	Team No.: W6
State: Alaska	Region: Alaska	Milepost: 590.13	
Latitude: 63° 09' 26.62	2" Long	itude: 149° 24′ 39.21″	Datum: WGS84
Logbook No.: W61-2	Logbook Page No.: 12	Picture No.: P_W61HT008	- Pit; Plugi W; N
SITE PARAMETERS			, 0.
Subregion: Interior		Landform (hillslope, terrace, hummo	ocks, etc.): Flat
Slope (%): 2		Local relief (concave, convex, none)	CONVEY
Pre-mapped Alaska LNG/NWI classifica	ation: PENIF	Soil Map Unit Name:	
Are climatic/hydrologic conditions on the Yes No (if no expl			oresent: explain in Notes.)
Are Vegetation, Soil, or Hyd	drology Significantly Distur		
Are Vegetation, Soil, or Hyd	drology Naturally Problema	atic? No <u></u> (If yes, explain in No	tes.)
SUMMARY OF FINDINGS			
Hydrophytic Vegetation Present? Yes_	<u>/</u> No	Is the Sampled Area within a Wetland	? Yes No
Hydric Soil Present? Yes_	<u> </u>	Wetland Type: PEM I F	
Wetland Hydrology Present? Yes	<u>Ю</u> No	Alaska Vegetation Classification (Vierecl	x): <u>I</u> II A 3
Notes and Site Sketch: Please include D corridor.	Directional & North Arrow, Center	line, Length of feature, Distances from Cer	terline, Photo Locations, and Survey
	See logbook	- W61-Z page 12	l E
	_		
		for site statch Exist	

VEGETATION (use scientific names of plan	ts)			
Tree Stratum (Plot sizes: 20 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:
1. N/A	-	-	_	Total Number of Dominant Species Across All Strata:
2.				borninant species that are OBL, FACW, of FAC.
3.				
4_				Prevalence Index worksheet:
Total Cove	er: NA			Total % Cover of: Multiply by:
50% of total cove	er: 20	% of total cov	/er:	OBL species: 79 x 1 = 79
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $4 \times 2 = 8$ FAC species $3 \times 3 = 39$ FACU species $3 \times 4 = 12$
1. Pices deuca	3	/	FACU	UPL species X 5 = 7
2. Dosinhora Eruticosa	5	/	FAC	Column Totals: 99 (A) 1:38 (B)
3. Betula nana	3	Y	FAC	PI = B/A = 1.39
4. Vaccinium oxycecuo			OBL	
5. Andromeda polifolia	2		FACW	
6. Varcinium ulignosum	2		FAC	
7. Inknown Shrub	T		ASS VINE	
8.				
•				
9.	16			
9. Total Cove 50% of total cove	er: <b>\$</b> 20	0% of total cov	ver: 3.2	
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan	er: 20  hts)  Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 7.6 )	er:		·	Dominance Test is > 50%
Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 7.6 )	Absolute % Cover	Dominant Species?	Indicator	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( 7.6 )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( 7.6 )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plant Herb Stratum ( 7.6 )  Drosen a robusticlia  Comarum palutre  3. Viela palutris	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Covers 50% of total covers 50% of total covers vegetation (use scientific names of plant Herb Stratum ( 7.6 )  1. Droser a rotinatifolia 2. Comarum palustre 3. Viola palustris 4. Manyantles trifdiata	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  FACW	Dominance Test is > 50%  Verevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Covers 50% of total covers 50% of total covers of total	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  FACW  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles
Total Cover 50% of total cover 5	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  FACW  OBL  FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles
Total Covers 50% of total covers 50% of total covers of total	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  FACW  OBL  FAC  FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes
Total Covers 50% of total covers of plant Herb Stratum ( 7.6')  1. Droseru rotindifolia 2. Comarum paluare 3. Viola paluatre 3. Viola paluatre 4. Menyantles trifdiata 5. Carex microchaeta 6. Plantantles dilatata 7. Europherum scheuchzesi	Absolute % Cover 1 5 1 5 1 1 1 1	Dominant Species?	Indicator Status  OBL  OBL  FACW  OBL  FACW  OBL  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes
Total Cover 50% of total cover 50%	Absolute % Cover 1 5 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Dominant Species?	Indicator Status  OBL  OBL  FACW  OBL  FACW  OBL  OBL  OBL  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  W Cover of Wetland Bryophytes  Total Cover of Bryophytes  Cover of Water
Total Covers 50% of total	Absolute % Cover    5	Dominant Species?	Indicator Status  OBL  OBL  FACW  OBL  FACW  OBL  OBL  OBL  OBL  OBL	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes

SOIL			Date 6 29 14 Fe					Soil Pit Required (Y/N)
SOIL PROFILI	E DESCRIPTION: (	escribe	to the depth needed	to docu	ment the	indicator or c	confirm the absence	of indicators.)
Depth	Matrix	75	Redox Features			-0-		
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-16							Hemic	SATURATES
<sup>1</sup> Type: C=Con	centration, D=Deple	tion, RN	∕/⊫Reduced Matrix, C	S=Cove	red or Co	ated Sand G	rains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
HYDRIC SOIL					ST.		INDICATORS F	FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
Histosol or His	tel (A1)		Alaska Gleyed	(A13) _		_	Alaska Color Ch	nange (TA4)⁴
Histic Epipedo	n (A2)		Alaska Redox				Alaska Alpine S	wales (TA5)
	3)		Alaska Gleyed				Alaska Redox v	vith 2.5Y Hue
	ide (A4)							without 5Y Hue or Redder Underlying
							Layer	n Nister)
Thick Dark Sur				-£N	al la calana la		Other (Explain i	n Notes) pe position must be present unless
disturbed or pr		ation, c	one primary indicator	or wettar	ia nyarok	ogy, and an a	appropriate landscap	pe position must be present unless
<sup>4</sup> Give details of	f color change in Noter (if present): Type	es.	1.1					
Restrictive Lay	er (if present): Type	_ N	(A	Depth (in	ches):			
		1						
Hydric Soil Pr	resent (Y/N):							
Notes:								
LIVEROL COV	DDIMARY INDICAT	one /	and indicates in a	······································	1	SECONDAD	Y INDICATORS (2	or more required)
		UKS (a	any one indicator is s	umciem)				
Surface Water	(A1)	Su	rface Soil Cracks (B6	i)		Vater-stained _eaves (B9)	d 	Stunted or Stressed Plants (D1)
	10	Inu	indation Visible on A	erial Imag	2004			
High Water Ta	ble (A2)	(B)	0_/_		a, [	Drainage Patterns (B10)		Geomorphic Position (D2)
Saturation (A3)	) V	Sp	arsely Vegetated			Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
ì		- 0	ncave Surface (B8) _					Microtopographic
Water Marks (I	B1)	Ma	ırl Deposits (B15)			Presence of Fron (C4)	Reduced	Relief (D4)
0 1: 10	'i (DO)	Ну	drogen Sulfide				(05)	FAC-Neutral Test (D5)
Sediment Depi	osits (B2)	- Od	or (C1)				(C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)		y-Season		1	Notes:		
- This - openie ,	()	VVa	ater Table (C2)		_			
Algal Mat or Ci	rust (B4)	Oti	ner (Explain in Notes)	Ľ.				
Iron Deposits (B5)								
Iron Deposits (	B5)							
0 6 144 1	D 10/00 V		D # (1)		-			.,
Surface vvater	Present (Y/N): Y		Depth (in):	,	18/0	aland Uvdea	ology Present (Y/N	· *
Water Table P	resent (Y/N):		Depth (in):	1	We	etianu nyuro	nogy Fresent (1714)	· — ·
0-4					-			
Saturation Pre-			Depth (in):					
Notes:	,		· · · · · · · · · · · · · · · · · · ·					

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking     Forested-Deciduous-Needle-leaved     Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved     Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved     Scrub Shrub-Evergreen-Needle-leaved     Emergent-Non-persistent       Persistent     Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Dwarf shrub (<0.5m) Tall herb (≥1m) Short herb (<1m) Moss-Lichen Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)Low Density (20-40%)Medium Density (40-60%)High Density (60-80%)80%)Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)       \( \mathcal{V} \)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sa
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Per
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Y Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 6.03
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 6.03  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits ∠ Low Permeability Stratified Deposits _ Glacial Till/Not Permeable _ High Gradient (≥2%) _ High Gradient (≥2%)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits ∠ Low Permeability Stratified Deposits _ Glacial Till/Not Permeable _ High Gradient (≥2%) _ High Gradient (≥2%)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable High Gradient (≥2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring Perennial Spring Seeps Observed Intermittent Spring Perennial Spring
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable High Gradient (≥2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable Low Gradient (<2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: W61 W7008 Field Target: 081 Date: 6/29/19	
	items not checked, please provide detailed explanation in the notes section of data for	m.
1.	Site Description	
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?	
2.	Vegetation	
	At least 80% of onsite vegetation has been keyed to species, or collected identification?	for later
	All dominant species have been determined and recorded per strata?	
	PK Indicator status is correct for each species?  Dy Dominance Test and Prevalence Index have been completed?	
3.	Soil	
	Soil profile is complete?  Appropriate hydric soil indicators are marked?	
4.	Hydrology	
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?	?
5.	Functions and Values	4
	Vegetation, soil, hydrologic variables, and landscape variables complete i wetland?	f site is a
6.	Field Logbook	
,	Notes have been recorded at each site, including general description, ske accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?	etch, and
7.	Maps	
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?	

8.	P	h	_	4	_	•
ο.		ш	u	ш	u	к

X	Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1
	soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X

Denny for Anderson (a/29/14

Signature / Date

Field Crew Chief (print)

Signature / Date

a label WETLAND DETERMINATION DATA FORM SITE DESCRIPTION Map Date: 52711 Survey Type: Centerline Access Road (explain)\_ Other (explain) Field Target: 572 Date: 6/ Project Name & No.: Alaska LNG 26221306 Feature Id: WUHT009 Investigators: L DEGUTIS J Anderson A Fisher Team No.: Wel State: Alaska Region: Alaska Milepost: Longitude: 149° 24 ' 41 . 09 Latitude: 630 09 26.13 Datum: WGS84 Picture No .: P\_W61HT004\_P.F; Plus; W; E Logbook No.: Logbook Page No.: 17 SITE PARAMETERS Subregion: Interior Landform (hillslope, terrace, hummocks, etc.): Can Vex Slope (%): 2 Local relief (concave, convex, none): Pre-mapped Alaska LNG/NWI classification: PUB Soil Map Unit Name: Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (if no explain in Notes) No\_ (If no, explain in Notes.) Are Vegetation\_ , Soil \_, or Hydrology\_ Significantly Disturbed? (If yes, explain in Notes) Are Vegetation\_\_\_\_, Soil\_ \_, or Hydrology\_\_\_ Naturally Problematic? (If yes, explain in Notes.) **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes Is the Sampled Area within a Wetland? Wetland Type: PUB/ABH Hydric Soil Present? Wetland Hydrology Present? No\_ Alaska Vegetation Classification (Viereck): 4 Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor See logrock Wel-2, page 12 Con she sketch & notes

VEGETATION (use scientific names of plants)				
Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC: 4 (Total Number of Dominant Species Across All Strata: 4 (
1. N/A				% Dominant Species that are OBL, FACW, or FAC: 60 (A
2.				
3.				
4.				Prevalence Index worksheet:
Total Cover:	N/A			Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	er:	OBL species: 37 X 1 = 37 X 1
Sapling/Shrub Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species
1. Disjoina fruticosa	3		Fac	UPL speciesX 5 =
2. Vaccinium Viginisum	2		Fac	Column Totals: 62 (A) 117 (B)
3. Betyla nana	10	Y	Fal	PI = B/A = 1 / 8
4. Andromeda Polifolia	2		Face	
5. Vaccinium Oxycocus	1		061	
6.				
7.				
8.				
9,				
Total Cover: 50% of total cover:		0% of total cov	ver: 3 . 6/	
VEGETATION (use scientific names of plants	)		LELL	
Herb Stratum ( 26'	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Menyanthes trifoliata	2		061	Morphological Adaptations¹ (Provide supporting data in
2 comarum paiustre	5.		obil	Notes)
3. Drosera rotundifolia	2	4	obi	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. elescharis Palustris	107	1. 7	obi	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Beckmyina siziaachne	1510	7	1001	disturbed or problematic
6 carex microchaeda	10	- 4	Fac	
7. Viola Palustris	3		Facily	% Bare Ground
8. carex mogellanica	5:		100	% Cover of Wetland Bryophytes
9.	1		assume	Total Cover of Bryophytes
10.			fac.	% Cover of Water
		1		Hydrophytic Vegetation Present (Y/N):
Total Cover	: 44			Notes: (If observed, list morphological adaptations below):

SOIL			Date 6 29 14	Feature I	D WEITH	009		Soil Pit Required (Y/N) N		
SOIL PROFILE DESCRIPTION: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)										
Depth	Matrix		Redox Features							
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes		
						1				
		1	-	_		1				
						1				
							4			
¹Type: C=Con	<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.									
	INDICATORS		L. Course Historia,					FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>		
	tel (A1)		Alaska Gleye	od (A13)				Change (TA4) <sup>4</sup>		
			Alaska Redo					Swales (TA5)		
	n (A2)									
Black Histic (A	3)		Alaska Gleye	ed Pores	(A15)			with 2.5Y Hue  I without 5Y Hue or Redder Underlying		
Hydrogen Sulfi	ide (A4)						Layer	without 51 Hue of Reader Underlying		
Thick Dark Sur	face (A12)						Other (Explain	in Notes)		
One indicator	of hydrophytic veget	ation, o	ne primary indicato	r of wetla	nd hydrolo	gy, and an a	ppropriate landsc	ape position must be present unless		
disturbed or pro										
Restrictive Lav	f color change in Not er (if present): Type	: N	A	Depth (ii	nches):					
	75 765		(1,	-1 (						
Hydric Soil Pr	resent (Y/N): Y									
					- 0					
Notes. No	pit dug o	rick	to tress	nce	0+ 0	sater	assume	- Al indicator		
						No r	estrictive	layer found		
								-		
HYDROLOGY	PRIMARY INDICAT	ORS (a	ny one indicator is	sufficient	i) S	ECONDARY	INDICATORS (2	2 or more required)		
Surface Meter	(44)	Cur	fono Cail Canalso (F	36)	V	Vater-stained		Stunted or Stressed		
Surface vvaler	(A1)X		face Soil Cracks (E		-	Leaves (B9)		Plants (D1)		
High Water Tal	ble (A2)		ndation Visible on	Aerial Ima	agery	Drainage Patterns (B10)		Geomorphic Position (D2)		
	,		rsely Vegetated			Oxidized Rhizospheres along				
Saturation (A3)	X	Cor	ncave Surface (B8)		[	iving Roots (	Shallow Aquitard (D3)			
Mater Marks (F	31)		I Deposits (B15) _			resence of F	Microtopographic			
vvaler ivialiks (E	o 1)	_			- Ir	Iron (C4) Relief (D4)		Relief (D4)		
Sediment Depo	osits (B2)		Irogen Sulfide		s	Salt Deposits (C5) FAC-Neutral Test (D5)				
		Out	or (C1) -Season			lotes:				
Drift Deposits (	B3)		-Season ter Table (C2)			ioles.				
Algal Mat or Cr	rust (B4)	Oth	er (Explain in Note	s):						
Iron Deposits (I	B5)									
A STATE OF		2010		-	-					
Surface Water	Present (Y/N):		Depth (in): 6	+	T					
	-			).	We	land Hydro	logy Present (Y/I	v):		
Water Table Pr	resent (Y/N):		Depth (in):							
Saturation Pres	sent (Y/N):		. 10							
(includes capilla			Depth (in):							
Notes;	·									

VEGETATION VARIABLES P= Plot, N	/l= Matrix
Forested-Evergreen-Needle-leaved	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) 3 Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) 5  m) Short herb (<1m) 44 Moss-Lichen Floating Submerged
Number of Wetland Types (M): 2	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or ed or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches_>	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
<b>Vegetative Interspersion (P)</b> : Low (large High (small groupings, diverse and interspers	e patches, concentric rings) Moderate (broken irregular rings)ed)X
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	
	Histosol:Fibric Histosol:Hemic_X Histosol: Sapric
Mineral: Gravelly Mineral: Sandy	Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No  Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Wetland Water Regime (P): Drier: Seas Wet: Perm, Flooded, Intermittently Exposed, S	sonally Flooded, Temporarily Flooded, Saturated Semiperm, FloodedX
Evidence of Sedimentation (P): No Eviden Created	ce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
	Poorly Developed (6in.) X Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No O Return Interval >5 yrs	verbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow	Pestricted Outflow Unrestricted Outflow
Water pH (P): No surface water C	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 6.03
Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable	): High Permeability Stratified Deposits Low Permeability Stratified Deposits_X
Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See	Gradient (<2%)_X High Gradient (≥2%)
LANDSCAPE VARIABLES (M)	
Wetland Juxtaposition: Wetland Isolate Only Connected Above Connecte	d Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e.,	ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural	5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medi	um (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check: // / / /	GPS Technician QA/QC check: Quite And USO

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: Wolft Too a	Field Target: 032	Date: 6/29/14
For all items not checked, please provide	de detailed explanation in the r	notes section of data form.

#### 1. Site Description

- Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ☑ Vegetation names are entered legibly for all strata present?
- All dominant species have been determined and recorded per strata?
- ☑ Indicator status is correct for each species?
- ☑ Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Soil profile is complete?
- Appropriate hydric soil indicators are marked?

#### 4. Hydrology

- Appropriate hydrology indicators are marked?
- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

□ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- Each logbook page is initialed and dated?

#### 7. Maps

- Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wattand Education (mint)

Signature / Dake

Field Crow Chief (print)

Signature / Date

SITE DESCRIPTION				AL TOTAL	1130
Survey Type: Centerline 🞾 Acces	ss Road (explain)	Other (expl	ain)	Field Target: 055	Map #: 35 Map Date: 5/27/14
Date: 6/30/14	Project Name & No.:			Feature Id	:W61 HT010
Investigators: K DEGUTIS	Anderson	A Fish	es		Team No.: W6/
State: Alaska	Region: Alaska		Milepost:	528.67	
Latitude: 63° 49' 09.16	11	Longitude	: 1480 5	9' 28.69"	Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:	14	Picture No.:	P_ W61 HTO 10_A	t; Plug; S; W
SITE PARAMETERS					
Subrégion: Interior			Landform (hill	lslope, terrace, hummock	is, etc.): FAL
Slope (%): 3			Local relief (concave, convex, none):		
Pre-mapped Alaska LNG/NWI classifica	tion: PSSI   EMIB		Soil Map Unit	Name:	
Are climatic/hydrologic conditions on the Yes No (if no expl		of year?	Are "No Yes_K	ormal Circumstances" pre	esent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significantly	y Disturbed?		_(If yes, explain in Notes	,
Are Vegetation, Soil, or Hyd	rology Naturally P	roblematic?	No	_ (If yes, explain in Notes	s.)
SUMMARY OF FINDINGS				-	
Hydrophytic Vegetation Present? Yes_	P No	ls	the Sampled A	rea within a Wetland?	Yes <b>b</b> No
Hydric Soil Present? Yes	No	_ w	etland Type:	PSSI /EMI	B
Wetland Hydrology Present? Yes	No	— Ala	aska Vegetation	Classification (Viereck):	ICI, II AZ
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow,	Centerline,	Length of featur	re, Distances from Cente	rline, Photo Locations, and Survey
comao.				page 14 Exotes	,

Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Piceu alaura	21.	, , , ,	Facu	Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC: _/DO_ (A
3.				
4.				Prevalence Index worksheet:
Total Cover:	21.			Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	er:	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute	Dominant	Indicator	FACW species: 35 X 2 = 70
	% Cover	Species?	Status	FAC species 118 X 3 = 354
		(Y/N)		FACU species /5 X 4 = (60
1. Picer glanca	8		FACU	UPL speciesX 5 =
2. Daviplora Philicas	8		FAC	Column Totals: 168 (A) 484 (B)
3. Betula glandulosa	35	7	FAC	PI = B/A = 2. <b>?</b>
4. Salix alexensis	25	Y	FAC	Salix myrtillifolia 21. FacW
5 salix reticulata	25	y	FAC	Salix myrtillifolia 21. FacW Enodo den dron tomentosum 11. Fac
6. Vaccinium vitis-idaea	5		FAC	Salix bardayi I'. Fac
7. S	5		FACU	Sally barclay!
Dryas integritolia	3		1/1001	
8. Alnus tenuifolia	10		FAC	
8. Alnus tenuifolia 9. Yaceinium uliainosum	10			The stratum added to shrubshatha
8. Alnus tenuifolia	10 5 132	% of total cov	FAC	The stratum added to shrubshathan since There was 45% could
8. Alnus tenuifolia 9. Yaccinium uliginosum Total Cover: 50% of total cover:	10 5 132 66 20	% of total cov	FAC	The stratum added to shrubshaitu
·	10 5 132 66 20	Dominant	FAC FAC er: 26.4	Tree Stratum added to Shrub Shaitum Since There was 25% cach  Hydrophytic Vegetation Indicators:
8. Alnus tenuifolia 9. Yaccinium uliginosum Total Cover: 50% of total cover: VEGETATION (use scientific names of plants	10 5 132 66 20	Dominant Species?	FAC FAC er: 26.4	The Stratum added to Shrubstratue  Since Twee was 25% count  Hydrophytic Vegetation Indicators:
8. Alnus tenuifolia 9. Vaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )	10 5 132 66 20 ) Absolute % Cover	Dominant Species? (Y/N)	FAC FAC er: 26.4 Indicator Status	Tree Stratum added to Shrub Shatum Since Twee was 25% cach  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
8. Alnus tenuifolia 9. Yaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous	10 5 132 66 20 ) Absolute % Cover	Dominant Species?	FAC FAC Indicator Status	Tree Stratum added to Shrab Shathar Since Twee was 25% cach.  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
9. Vaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagostis canadensis	10 5 132 66 20 ) Absolute % Cover	Dominant Species? (Y/N)	FAC FAC Indicator Status FACW	The Stratum added to Shrub Shathan Since Twee was 45% county  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
9. Yaccinium wliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagostis canadensis 3. Equisetum arvense	10 5 132 66 20 ) Absolute % Cover 12 2	Dominant Species? (Y/N)	FAC FAC Indicator Status FAC FAC FAC	Tree Stratum added to Shrab Shathar Since Twee was 25% cours  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
8. Alnus tenuifolia 9. Yaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagnstis canadensis 3. Zauisetum arvense 4. Stellaria longipes	10 5 132 66 20 ) Absolute % Cover	Dominant Species? (Y/N)	FAC Indicator Status  FACW FAC FAC	The Stratum added to Shrub Shathan Since Twee was 45% cach.  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
8. Alnus tenuifolia  9. Yaccinium wliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagnstis canadensis 3. Equisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum	10 5 132 66 20 Absolute % Cover	Dominant Species? (Y/N)	FAC FAC Indicator Status FAC FAC	Tree Stratum calded to Shrub Shaither  Since Twee was 25% cash.  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
8. Alnus tenuifolia  9. Yaccinium wliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagnstis canadensis 3. Equisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum 6. Petasites frigides	10 5 132 66 20 Absolute % Cover	Dominant Species? (Y/N)	FAC er: 26.4  Indicator Status  FACW FAC FAC	Tree Stratum added to Shrub Shatus  Since Twee was 25% coch  Hydrophytic Vegetation Indicators:  ∠ Dominance Test is > 50%  ∠ Prevalence Index is ≤ 3.0  _ Morphological Adaptations¹ (Provide supporting data in Notes)  _ Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Practinium uliginosum Total Cover: 50% of total cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26')  1. Rubus chamaemorous 2. Calamagrostis canadensis 3. Equisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum 6. Petasites frigides 7. Agrostis gigantia	10 5 132 66 20 ) Absolute % Cover 12 2 1	Dominant Species? (Y/N)	FAC FAC Indicator Status FAC FAC	Tree Stratum added to Shrab Shathar Since Twee was 25% cours  Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  2 % Bare Ground
8. Alnus tenuifolia  9. Yaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagrostis canadensis 3. Equisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum 6. Petasites frigides 7. Agrostis gigantia 8. Carex membranacea	10 5 132 66 20 ) Absolute % Cover 12 2 1	Dominant Species? (Y/N)	FAC er: 26.4  Indicator Status  FACW FAC FAC	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  2 % Bare Ground  — % Cover of Wetland Bryophytes
9. Yaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagnostis canadensis 3. Zauisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum 6. Petasites frigides 7. Agrostis gigantia	10 5 132 66 20 ) Absolute % Cover 12 2 1	Dominant Species? (Y/N)	FAC Indicator Status  FACW FAC FAC FAC	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  2 % Bare Ground  - % Cover of Wetland Bryophytes  20 Total Cover of Bryophytes
8. Alnus tenuifolia 9. Vaccinium uliginosum Total Cover: 50% of total cover:  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagrostis canadensis 3. Zauisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum 6. Petasites frigides 7. Agrostis gigantia 8. Carex membranacca 9.	10 5 132 66 20 ) Absolute % Cover 12 2 1	Dominant Species? (Y/N)	FAC Indicator Status  FACW FAC FAC FAC	Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  2 % Bare Ground
8. Alnus tenuifolia 9. Vaccinium uliginosum Total Cover; 50% of total cover;  VEGETATION (use scientific names of plants Herb Stratum ( 26 )  1. Rubus chamaemorous 2. Calamagrostis canadensis 3. Equisetum arvense 4. Stellaria longipes 5. Equisetum sylvaticum 6. Petasites frigides 7. Agrostis gigantia 8. Carex membranacea	10 5 132 66 20 ) Absolute % Cover 12 2 1 T	Dominant Species? (Y/N)	FAC Indicator Status  FACW FAC FAC FAC	Tree Stratum added to Shrate Sheather  Since Twee was 25% costs   Hydrophytic Vegetation Indicators:  X Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  2 % Bare Ground  — % Cover of Wetland Bryophytes  20 Total Cover of Bryophytes

SOIL		_	Date 6/30/14 Fea					Soil Pit Required (Y/N) Y
SOIL PROFIL	LE DESCRIPTION: (D	escribe	to the depth needed	to docum	ent the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	% -	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-7"							Fibric	organicleta Saturat
7-11"	10 yr 2/2	90	10 YR 4/4	10			hemic silt	loan Saturated
II.	Frozen							
Tyne: C=Co	ncentration, D=Deplet	ion RN	M=Reduced Matrix CS	=Covere	d or Co	ated Sand G	Prains <sup>2</sup> Location	n: PL=Pore Lining, M=Matrix.
	L INDICATORS	1011, 1410	n-reduced Matrix, Ge	-covere	0 00	ated Sand C	-T	FOR PROBLEMATIC HYDRIC SOILS
Histosol or Hi	istel (A1)		Alaska Gleyed (	A13)			- 1	Change (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A					Swales (TA5)
	A3)		Alaska Gleyed F					with 2,5Y Hue
	Ifide (A4)						Alaska Gleye	d without 5Y Hue or Redder Underlying
	urface (A12)						Layer_	n in Neton
		etion o	ne primary indicator of	f wetland	hydrolo	av and an	Other (Explain	cape position must be present unless
Give details d Restrictive La	of color change in Note yer (if present): Type:	Fro	zen De	pth (inch	es):	16D		
	, o. ( p. o. o). () po.	1.0		ptii (iiioi		14		
Hydric Soil P	Present (V/N)							
	Present (Y/N):		_					
Hydric Soil P	Present (Y/N):							
	Present (Y/N):							
	Present (Y/N):							
Notes:	Present (Y/N):			ficient)	S	ECONDAR	Y INDICATORS (	2 or more required)
Notes:	,	ORS (a			V	ECONDAR Vater-staine eaves (B9)	d	2 or more required) Stunted or Stressed Plants (D1)
Notes:  HYDROLOGY  Surface Wate	Y PRIMARY INDICATO	ORS (a	i <b>ny one indicator is suf</b> face Soil Cracks (B6) ndation Visible on Aeri		- L	Vater-staine eaves (B9)	d	Stunted or Stressed Plants (D1)
Notes:  HYDROLOGY  Surface Wate  High Water Ta	Y PRIMARY INDICATO	Sur Inui (B7	i <b>ny one indicator is suf</b> face Soil Cracks (B6) ndation Visible on Aeri	ial Image	ry C	Vater-staine eaves (B9) trainage Pat exidized Rhi	tterns (B10)	Stunted or Stressed Plants (D1)
Notes:  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3)	Y PRIMARY INDICATO	Sur Inui (B7 Spa Cor	face Soil Cracks (B6) ndation Visible on Aeri	ial Image	TY D	Vater-staine eaves (B9) Prainage Pat exidized Rhiz iving Roots resence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3) Water Marks (	r (A1)able (A2)	Sur Inuu (B7 Spa Cor Mai	face Soil Cracks (B6) Indation Visible on Aeri arsely Vegetated acave Surface (B8)	ial Image	ry D	Vater-staine eaves (B9) Prainage Pat exidized Rhiziving Roots resence of I on (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	r (A1)able (A2) (B1) posits (B2)	Sur Inuu (B7 Spa Cor Mai Hyc	face Soil Cracks (B6) Indation Visible on Aeri Tarsely Vegetated Incave Surface (B8) Indicated (B15) Indicated	ial Image	Y L C L P Ir	Vater-staine eaves (B9) Prainage Pat exidized Rhiziving Roots resence of I on (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  posits (B2)  (B3)	Sur Inuu (B7 Spa Cor Mai Hyc Odd Dry Wat	face Soil Cracks (B6) Indation Visible on Aer Indation	ial Image	Y L C L P Ir	Vater-staine eaves (B9) Prainage Pat Dixidized Rhiziving Roots Presence of I on (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  posits (B2)  (B3)  Crust (B4)	Sur Inuu (B7 Spa Cor Mai Hyc Odd Dry Wat	face Soil Cracks (B6) Indation Visible on Aeri Tarsely Vegetated Incave Surface (B8) Indicated (B15) Indicated	ial Image	Y L C L P Ir	Vater-staine eaves (B9) Prainage Pat Dixidized Rhiziving Roots Presence of I on (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  posits (B2)  (B3)	Sur Inuu (B7 Spa Cor Mai Hyc Odd Dry Wat	face Soil Cracks (B6) Indation Visible on Aer Indation	ial Image	Y L C L P Ir	Vater-staine eaves (B9) Prainage Pat Dixidized Rhiziving Roots Presence of I on (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or Coron Deposits	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  posits (B2)  (B3)  Crust (B4)	Sur Inui (B7 Spa Cor Mai Hyco Odd Dry War Oth	face Soil Cracks (B6) Indation Visible on Aer Indation	ial Image	P Ir	Vater-staine eaves (B9) prainage Pat exidized Rhi exidize	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or Coron Deposits Surface Water	Y PRIMARY INDICATO  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)	Sur Inuu (B7 Spa Cor Mai Hyco Odc Dry War Oth	face Soil Cracks (B6) Indation Visible on Aeri Indation Aeri Indation Visible on Aeri Indation Aeri Indation Visible on Aeri Indation Visible on Aeri Indation Visible on Aeri Indation Aeri	ial Image	P Ir	Vater-staine eaves (B9) prainage Pat exidized Rhi exidize	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits Gurface Water	Present (Y/N): Y	Sur Inuu (B7 Spa Cor Mai Hycodd Dry War Oth	face Soil Cracks (B6) Indation Visible on Aeri arsely Vegetated Incave Surface (B8) Independent (B15)	ial Image	P Ir	Vater-staine eaves (B9) prainage Pat exidized Rhi exidize	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits Surface Water Water Table P Saturation Pre	Present (Y/N): Y	Sur Inuu (B7 Spa Cor Mai Hycodd Dry War Oth	face Soil Cracks (B6) Indation Visible on Aer Indation	ial Image	P Ir	Vater-staine eaves (B9) prainage Pat exidized Rhi exidize	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       8 Tall shrub (2-6m)       O Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">26-75% Scattered or Peripheral Cover</a>
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)_X
HGM Class (P): Slope Flat X Lacustrine Fringe Depressional Riverine Estaurine Fringe
OOU WARIARI FO
SOIL VARIABLES  Soil Footors (R): Soil Locking History Fibrin History Sanric
Soil Factors (P):       Soil Lacking       Histosol:Fibric       Hjstosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       X       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet \( \sqrt{\sq}}}}}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}}} \sqrt{\sqrt{\sqrt{\sq}}}}}}}}} \sqrt{\sqrt{\sqnt{\sq}}}}}}}}} \sqrt{\sqrt{\sqrt{\sqrt{\sq}}}}}}}}}} \sqrt{\sqrt{
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water X Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check: GPS Technician QA/QC check: Avolexe

# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Fea	iture	PID: NOIHTOID Field Target: 055 Date: 6/30/14	_
For	all	items not checked, please provide detailed explanation in the notes section of data for	m.
	1.	Site Description	
		Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?	6.
	2.	Vegetation	
		At I and 000% of analta variation has been knowed to encoing or collected	for later
		At least 80% of onsite vegetation has been keyed to species, or collected identification?	ior iatei
-		Vegetation names are entered legibly for all strata present?	
		Cover calculations are complete and correct?	
		All dominant species have been determined and recorded per strata?	
		Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?	
		Bollimarios Postaria Provancinos illustritudos acompostos.	
	3.	Soil	
		Soil profile is complete?  Appropriate hydric soil indicators are marked?	
	4.	Hydrology	
		Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?	>
	_		
	5.	Functions and Values	
		Vegetation, soil, hydrologic variables, and landscape variables complete i wetland?	f site is a
	6.	Field Logbook	
		Notes have been recorded at each site, including general description, ske	etch, and
		accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?	
	7.	Maps	
		☑ Wetland boundaries have been corrected if necessary?	
		Mans are initialed and dated?	

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennister Anglerson	X Janifs anderson	6/30/14
Wetland Scientist (print)	Signature / Date	7.1

Field Crew Chief (print)

X

Signature / Date

			•		^
SITE DESCRIPTION					1130 1011
Survey Type: Centerline X Acces	ss Road (explain)	Other (expla	ain)	Field Target: <u>054</u>	Map #: <u>5</u> Map Date: <u>5</u> N
Date: 6 30 14	Project Name & No.:	Alaska LNG	26221306	Feature Id	: W61 HT011
Investigators: L DEGUTIS	JANDELSON A	Fisher			Team No.: Wa
State: Alaska	Region: Alaska		Milepost:	528.65	
Latitude: 63° 49'11.34		Longitude	148° 5	9132.29	Datum: WGS84
Logbook No.: W6(-2	Logbook Page No.:	14	Picture No.:	PLUGIHOUL DA;	Plusi SW; SE
SITE PARAMETERS		123	Spirita Sc		
Subregion: Intuin			Landform (hill	slope, terrace, hummock	s, etc.): Flat
Slope (%): <b>U</b>			Local relief (concave, convex, none): None		
Pre-mapped Alaska LNG/NWI classifica	tion: PSSI EMII	3	Soil Map Unit	Name:	
Are climatic/hydrologic conditions on the YesNo(if no expl	site typical fo <sup>‡</sup> this time ( ain in Notes)	of year?	Are "No Yes_	ormal Circumstances" pre No (If no, ex	
Are Vegetation, Soil, or Hyd	rologySignificantly	y Disturbed?	No p	_(If yes, explain in Notes	
Are Vegetation, Soil, or Hyd	rology Naturally P	roblematic?	No_ <b>1</b> 0	_ (If yes, explain in Notes	.)
SUMMARY OF FINDINGS	- 11				
Hydrophytic Vegetation Present? Yes_	No	ls	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	× No	_   We	etland Type:	PSSI # Emi	B
Wetland Hydrology Present? Yes No Alaska Vegetation Classification (Viereck): II C1, III A 2_					
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow,	Wel-a	2, page		line, Photo Locations, and Survey

VEGETATION (use scientific names of plants	)		v	
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 5 (A)  Total Number of Dominant Species Across All Strata: 5 (B)
1. Picen glavea	3		FACU	% Dominant Species that are OBL, FACW, or FAC: 10 (A/B)
2.				76 Dominant Species that are ODE, 1 AOW, OF 1 AO. (100)
3,				
4.				Prevalence Index worksheet:
Total Cover:	3			Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	rer:	OBL species:X 1 =
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $14$ $\times 2 = 2.8$ FAC species $9$ $\times 3 = 7.94$ FACU species $9$ $\times 4 = 36$
1. Pices GANCA	5		FACU	UPL speciesX 5 =
2. Betula Jandulosa	35	4	FAC	Column Totals: 121 (A) 358 (B)
3. Seelix pulchra	5		FACEN	PI = B/A = 2.9
4. Salix alexensis	15	4	FAC	Suliv almostables 2 FAccul
5. Salin pseudomonticolA	2		FAC	Salix arbasaloides 2 FAesu Salix reticulata 5 FAE
6. Vaccinium vitis-idaea	8		FAC	Salix lasiondra 2 FACW
7. Daoi phona Fruiticosa	3		FAL	
8. Alnus tenuitolia	15	4	FAC	
9. Vaccinium uliginosum	5		FAC	Thee skeeting added to show sheeting
Total Cover:	-	% of total cov	ver: 21 -	Since that wes 55% cover
VEGETATION (use scientific names of plants	)	ALTERNATION		
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Chancerian Angestication	1		FACU	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Rubio chamerorus	5	4	FACW	Notes)
3. Equirelym gruense	1		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Stellaria longian	T		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. CAREX 20. (No Almes.)	8	Y	ASSUME	disturbed or problematic.
6. Pedicularis labradaica	T		FACW	
7. Calamagnostis canadensis	1		FAC	% Bare Ground
8. Petasites fricidus	T		FACW	% Cover of Wetland Bryophytes
9,				Total Cover of Bryophytes
10.				Cover of Water
Total Cover:	1\0.			Hydrophytic Vegetation Present (Y/N):
50% of total cover	_	0% of total cov	/er: <u>3.2</u>	Notes: (If observed, list morphological adaptations below):

Depth (inches)  D-3 11  3 -9 11  9 "  Type: C=Conce HYDRIC SOIL II Histosol or Hister Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa Thick Dark Surfa One indicator of disturbed or prof Give details of Restrictive Laye	Matrix Color (moist)  Dentration, D=Depleted in the property of the property o	tation, one	Len Depth (inches)	r Coated Sand G	Texture  Fibric  Alaska Color Cha Alaska Color Cha Alaska Alpine Sw Alaska Redox wii Alaska Gleyed w Layer  Other (Explain in	PL=Pore Lining, M=Matrix.  PR PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5)  th 2.5Y Hue  ithout 5Y Hue or Redder Underlying
iType: C=Conc HYDRIC SOIL I Histosol or Histe Histic Epipedon Black Histic (A3 Hydrogen Sulfid Thick Dark Surfa One indicator o disturbed or prol Give details of a Restrictive Laye	color (moist)  pentration, D=Deple  NDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No or (if present): Type	tation, one	Color (moist) % Type  Reduced Matrix, CS=Covered of Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hyperseconds and the primary indicator of wetland hyperseconds are primary indicator of wetland hyperseconds.	r Coated Sand G	FINIC	PL=Pore Lining, M=Matrix.  PROBLEMATIC HYDRIC SOILS <sup>3</sup> range (TA4) <sup>4</sup> vales (TA5)  th 2.5Y Hue  ithout 5Y Hue or Redder Underlying  Notes)
Type: C=Conce Hydric Soil I Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa One indicator of disturbed or productive details of a Restrictive Layer Hydric Soil Preserved.	entration, D=Deple  NDICATORS  el (A1)  (A2) ) le (A4) ace (A12) of hydrophytic vege blematic. color change in No ar (if present): Type	etion, RM=	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses	r Coated Sand G	FINIC	PL=Pore Lining, M=Matrix.  PROBLEMATIC HYDRIC SOILS <sup>3</sup> range (TA4) <sup>4</sup> vales (TA5)  th 2.5Y Hue  ithout 5Y Hue or Redder Underlying  Notes)
Type: C=Conc HYDRIC SOIL I Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa One indicator o disturbed or prol Give details of a Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	FIBRIC  FIBRIC	PL=Pore Lining, M=Matrix.  PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5)  th 2.5Y Hue  ithout 5Y Hue or Redder Underlying  Notes)
¹Type: C=Conc HYDRIC SOIL I Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa ¹One indicator of disturbed or prol ¹Give details of a Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	FIORIC  FIORIC  Frains. <sup>2</sup> Location: F  INDICATORS FO  Alaska Color Cha  Alaska Alpine Sw  Alaska Redox wit  Alaska Gleyed w  Layer  Other (Explain in	PL=Pore Lining, M=Matrix.  PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5)  th 2.5Y Hue  ithout 5Y Hue or Redder Underlying  Notes)
<sup>1</sup> Type: C=Conc HYDRIC SOIL I Histosol or Histe Histic Epipedon Black Histic (A3 Hydrogen Sulfid Thick Dark Surfa One indicator o disturbed or prol Give details of a Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wii Alaska Gleyed w Layer Other (Explain in	PL=Pore Lining, M=Matrix.  PR PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
HYDRIC SOIL II Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa 3 One indicator o disturbed or prol 4 Give details of Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wit Alaska Gleyed w Layer Other (Explain in	PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
HYDRIC SOIL II Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa 3 One indicator o disturbed or prol 4 Give details of Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wit Alaska Gleyed w Layer Other (Explain in	PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
HYDRIC SOIL II Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa 3 One indicator o disturbed or prol 4 Give details of Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wit Alaska Gleyed w Layer Other (Explain in	PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
HYDRIC SOIL II Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa One indicator o disturbed or prol Give details of Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wit Alaska Gleyed w Layer Other (Explain in	PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
HYDRIC SOIL II Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa 3 One indicator o disturbed or prol 4 Give details of Restrictive Laye Hydric Soil Pre	MDICATORS  el (A1)  (A2)  le (A4)  ace (A12)  of hydrophytic vege blematic. color change in No er (if present): Type	tation, one	Alaska Gleyed (A13)  Alaska Redox (A14)  Alaska Gleyed Pores (A15)  Perimary indicator of wetland hydrogeneses  Depth (inches)	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wit Alaska Gleyed w Layer Other (Explain in	PROBLEMATIC HYDRIC SOILS <sup>3</sup> ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
Histosol or Histe Histic Epipedon Black Histic (A3) Hydrogen Sulfid Thick Dark Surfa One indicator of disturbed or prologive details of a Restrictive Laye Hydric Soil Pre	el (A1)	tation, one	Alaska Redox (A14)  Alaska Gleyed Pores (A15)  primary indicator of wetland hypersection of the control of the	drology, and an a	Alaska Color Cha Alaska Alpine Sw Alaska Redox wii Alaska Gleyed w Layer Other (Explain in appropriate landscape	ange (TA4) <sup>4</sup> vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
Histic Epipedon Black Histic (A3 Hydrogen Sulfid Thick Dark Surfa One indicator o disturbed or prol Give details of Restrictive Laye Hydric Soll Pre	(A2) le (A4) ace (A12) of hydrophytic vege blematic. color change in No or (if present): Type	tation, one	Alaska Redox (A14)  Alaska Gleyed Pores (A15)  primary indicator of wetland hypersection of the control of the	drology, and an a	Alaska Alpine Sw Alaska Redox wit Alaska Gleyed w Layer Other (Explain in appropriate landscape	vales (TA5) th 2.5Y Hue ithout 5Y Hue or Redder Underlying  Notes)
Black Histic (A3 Hydrogen Sulfid Thick Dark Surfa One indicator of disturbed or prol Give details of Restrictive Laye	le (A4) ace (A12) of hydrophytic vege blematic. color change in No or (if present): Type	tation, one tes.	Alaska Gleyed Pores (A15)	drology, and an a	Alaska Redox wii Alaska Gleyed w Layer Other (Explain in	th 2.5Y Hueithout 5Y Hue or Redder Underlying  Notes)
Hydrogen Sulfid Thick Dark Surfa One indicator o disturbed or prol Give details of Restrictive Laye  Hydric Soil Pre	le (A4) ace (A12) of hydrophytic vege blematic. color change in No or (if present): Type	tation, one	e primary indicator of wetland hyder	drology, and an a	Alaska Gleyed w Layer Other (Explain in appropriate landscape	ithout 5Y Hue or Redder Underlying Notes)
Thick Dark Surfa  One indicator of disturbed or proform of the details of the Restrictive Laye  Hydric Soil Pre	ace (A12) of hydrophytic vege blematic. color change in No or (if present): Type	tation, one	Len Depth (inches)		Other (Explain in appropriate landscape	Notes)
³One indicator o disturbed or prol ⁴Give details of o Restrictive Laye Hydric Soil Pre	of hydrophytic vege blematic. color change in No rr (if present): Type	e: Froz	Len Depth (inches)		Other (Explain in appropriate landscape	
³One indicator o disturbed or prol ⁴Give details of o Restrictive Laye Hydric Soil Pre	of hydrophytic vege blematic. color change in No rr (if present): Type	e: Froz	Len Depth (inches)		appropriate landscape	
disturbed or prol Give details of o Restrictive Laye Hydric Soil Pre	blematic. color change in No r (if present): Type	e: Froz	Len Depth (inches)			
Restrictive Laye  Hydric Soil Pre	r (if present): Type	e: Fro7		9"	_	
Hydric Soil Pre						
	sent (Y/N):	/				
Notes.						
HYDROLOGY P	PRIMARY INDICAT	TORS (any	y one indicator is sufficient)	SECONDAR	Y INDICATORS (2 or	more required)
Surface Water (/	A1)	Surfa	ce Soil Cracks (B6)	Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)
High Water Tabl	le (A2)		dation Visible on Aerial Imagery		terns (B10)	
Saturation (A3)	X	Sparsely Vegetated			zospheres along	Shallow Aquitard (D3)
		Conc	ave Surface (B8)	Living Roots		
Water Marks (B	1)		Deposits (B15)	Presence of Reduced Iron (C4)		Microtopographic Relief (D4)
Sediment Depos	sits (B2)		ogen Sulfide (C1)	Salt Deposits (C5) FAC-Neutral Test (D5)		FAC-Neutral Test (D5)
Drift Deposits (B	33)		Dry-Season Water Table (C2)			
Algal Mat or Cru	st (B4)		r (Explain in Notes):	-		
Iron Deposits (B		. Other	(Explain in Notes).			
Dopoono (D						
Surface Water P	Present (Y/N): N	D	epth (in):			×/
Water Table Pre	esent (Y/N):	D	epth (in):	Wetland Hydro	logy Present (Y/N):	
Saturation Prese (includes capillar	ent (Y/N):					
viagos capillal		ט ן	epth (in): 3 <sup>11</sup>			
			epth (in): 3 h			
Notes;			epth (in): 3 h			

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):     Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Non-persistent
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) 5 Tall shrub (2-6m) Short shrub (0.5-2m) Short shrub (0.5-2m) Short shrub (<0.5m) Tall herb (≥1m) Short herb (<1m) 6 Moss-Lichen Solution Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat_X_ Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:FibricX_ Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 y
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) ★  Evidence of Seeps and Springs (P): No Seeps or Springs ★ Seeps Observed Intermittent Spring Perennial Spring
Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use:         0-5% Rural
Size: Small (<10 acres) Madium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check: Andus M. GPS Technician QA/QC check: Jennus Andus M.

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: WOIHTOIL	Field Target: 054	Date: 6/30/14
For all items not checked, please no	ovide detailed explanation in the r	otes section of data form

#### 1. Site Description

- A Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ✗ Vegetation names are entered legibly for all strata present?
- All dominant species have been determined and recorded per strata?
- ☑ Indicator status is correct for each species?
- Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Soil profile is complete?
- Appropriate hydric soil indicators are marked?

#### 4. Hydrology

- Appropriate hydrology indicators are marked?
- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- Each logbook page is initialed and dated?

#### 7. Maps

- ☆ Wetland boundaries have been corrected if necessary?
- A Maps are initialed and dated?

### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X Dennife Anderson 6/30/14
Wetland Scientist (print)	Signature / Date

X Kim DEGUTS

Field Crew Chief (print)

Signature / Date

6/30/14

SITE DESCRIPTION				W IL		
Survey Type: Centerline Acces	ss Road (explain)	Other (exp	olain)	Field Targ	jet: <u>056</u>	Map #: 36 Map Date: 5/27
Date: 6/30/14	Project Name & No.:	Alaska LN	G 26221306		Feature Id:	WEIHTOIZ
Investigators: Deavis	. 3 Ande	50M	A Fish	net		Team No.: WG
State: Alaska	Region: Alaska		Milepost: 🗸	529.	7	
Latitude: (63° 48' 35.43	f <sub>1</sub>	Longitud	le: 148° 5	8'01.	38"	Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:	16	Picture No.:	PWE	HTO	2-PtiBlugiSW; NW
SITE PARAMETERS					1000	The second second
Subregion: Thering			Landform (hill	slope, terrac	e, hummocks	s, etc.): Flat
Slope (%): 3 %			Local relief (c	oncave, con	vex, none): (	Convex
Pre-mapped Alaska LNG/NWI classifica	tion: P551/FN	113	Soil Map Unit		_	
Are climatic/hydrologic conditions on the Yes No (if no expl	site typical for this time ain in Notes)	of year?	Are "No Yes_	rmal Circum	nstances" pre (If no, exp	sent: olain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significant	tly Disturbed	? No_X	_(If yes, exp	lain in Notes)	
Are Vegetation, Soil, or Hyd	rology Naturally F	Problematic?	No_X	_ (If yes, exp	olain in Notes	.)
SUMMARY OF FINDINGS					. 25.3	
Hydrophytic Vegetation Present? Yes_	No	ls	s the Sampled A	rea within a	Wetland?	YesNo
Hydric Soil Present? Yes	No	w	Vetland Type: \$	7451	EMIS	<del>S</del>
Wetland Hydrology Present? Yes	× No	— А	laska Vegetation	Classification	on (Viereck):	IICI, III AZ
Notes and Site Sketch: Please include D	irectional & North Arrow	, Centerline,				
corridor.	5	RR	100/00	solk s	W61- ketch è	2 pag 16

1	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes:	% Cover	Species?	Status	No. of Dominant Species that are OBL, FACW, or FAC:
1. NA		, <u>,</u>		Total Number of Dominant Species Across All Strata:
2.				% Dominant Species that are OBL, FACW, or FAC: 100 (
3,				
4.				Prevalence Index worksheet:
Total Cover				Total % Cover of: Multiply by:
50% of total cover	20	% of total cov	er:	OBL species: X 1 =
Sapling/Shrub Stratum ( 그은 무+ )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $33 \times 2 = 66$ FAC species $84 \times 3 = 252$ FACU species $3 \times 4 = 12$
1. Picea alouca	3		Fail	UPL speciesX 5 =
2. Salix Warsons	12	Y	For	Column Totals: \\( \)\( \)\( (A) \( \) 330 \( (B) \)
3. Betila alundulosa	40	У	Fac	PI = B/A = 7.75
4. Salix Outelive	5		Fach	salix glavea 2 Fac
5. Das nhora fruticosa	3		Fac	Sall 2
6. Vaccinium ulanosum	10		Fac	
7. Balix reticulata	8		Fac	
8. Alnus tenus tolia	5		Fac	
9. Salix bacclay,	1		Fai	
Total Cover				
50% of total cover	. 44 B 20	% of total cov	er 17.5	
	. 11.5 20	7/8 OF TOTAL COV	U. 1. V	
		7% Of total COV	<u>1. 4</u>	
VEGETATION (use scientific names of plant		Dominant	Indicator	Hydrophytic Vegetation Indicators:
VEGETATION (use scientific names of plant	5)	Dominant Species?	·	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
VEGETATION (use scientific names of plant	Absolute	Dominant	Indicator Status	
VEGETATION (use scientific names of plant Herb Stratum ( 36 P+ )	Absolute	Dominant Species?	Indicator	Dominance Test is > 50%
1. Fall is of un willing 2. Tarces from willing 2.	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0  — Morphological Adaptations¹ (Provide supporting data in Notes)
1. Fail Sofum wylenge 2. January 1. Sofum wylenge 3. Petagoleg frigids	Absolute	Dominant Species?	Indicator Status Fac Fac	Dominance Test is > 50%  ———————————————————————————————————
1. Fair Sofum awayenge	Absolute % Cover	Dominant Species?	Indicator Status Fac	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
1. Fair Sotum ( 26 Pt )  1. Fair Sotum ( 26 Pt )  2. January 12 Sotum wylense 2. January 12 Sotum wylense 3. Petasites frigidus	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
1. Fair Sofum wylerse 2. Jacob Fis arganten 3. Petasites Frigids 4. Care Sp. In wylerse	Absolute % Cover	Dominant Species?	Indicator Status  Fac  Fac  Fac  Fac  Manne	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.
1. Fair Sofum averse 2. Jacobs Fis a gantea 3. Petasites Fragiles 4. Carasse, Ino inflormance 5. Calamagnestis canaden	Absolute % Cover	Dominant Species?	Indicator Status  Fac  Fac  Fac  Fac  Fac  Fac  Fac  Fa	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  Market State S
1. Fair Sofum averse 2. Jacob Fis a gantea 3. Petasites fraids 4. Cares p. In inflorecance 5. Calamagnostis canaden 6. Cares Membronace	Absolute % Cover	Dominant Species?	Indicator Status  Fac  Fac  Fac  Fac  Fac  Fac  Fac  Fa	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  Mean Service Serv
1. Fail & etun wilerse 2. Jacos fis aigantea 3. Petasiles frigides 4. Carey Membrance 6. Carey Membrance 7.	Absolute % Cover	Dominant Species?	Indicator Status  Fac  Fac  Fac  Fac  Fac  Fac  Fac  Fa	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  Mean Series Se
1. Fair Sofun averse 2. Jacob Fis a gantea 3. Petasites fractor 4. Cares membranaen 6. Cares membranaen 7. 8. 9.	Absolute % Cover	Dominant Species?	Indicator Status  Fac  Fac  Fac  Fac  Fac  Fac  Fac  Fa	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.   ——————————————————————————————————
1. Fair Sofum averse  2. Jacob for a fragids  4. Cares membrance  6. Cares membrance  7.	Absolute % Cover	Dominant Species?	Indicator Status  Fac  Fac  Fac  Fac  Fac  Fac  Fac  Fa	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  Mean Series Se

Depth inches) Co	atrix olor (moist)	escribe	to the depth needed	to document t	ne mulcator or	United ansets	oo or indicators.)
)-5 1 10							
)-5" 10	olor (moist)	0/		% Type	Loc <sup>2</sup>	Texture	Notes
2-1 W 1D		%	Color (moist)	76 Type	Loc	1.	
1 10		-7	- + Va nt			hemic	esaturated
	17R 4/1	180	7.5 YR 4/6	20	-	BOLOGIA DAG	Frozen
		4					1-107-01
Type: C=Concen	ntration, D=Deple	tion, RI	M=Reduced Matrix, C	S=Covered or	Coated Sand C		n: PL=Pore Lining, M=Matrix.
YDRIC SOIL IND	DICATORS						S FOR PROBLEMATIC HYDRIC SOILS
listosol or Histel (	(A1)		Alaska Gleyed	(A13)			Change (TA4) <sup>4</sup>
Histic Epipedon (A	A2) X		Alaska Redox (	(A14)		Alaska Alpine	e Swales (TA5)
Black Histic (A3) _			Alaska Gleyed	Pores (A15) _		1.14	x with 2.5Y Hue
-lydrogen Sulfide	(Á4)					Alaska Gleye Layer	d without 5Y Hue or Redder Underlying
Thick Dark Surface						Other (Explai	in in Notes)
One indicator of h	hydrophytic veget	—- tation, d	one primary indicator of	of wetland hyd	rology, and an		cape position must be present unless
disturbed or proble	ematic.				7		
Give details of co	olor change in No (if present): Type	tes.	12en D	epth (inches)	711		
			(4)				
-IYDROLOGY PR	RIMARY INDICA	TORS (	any one indicator is si	ufficient)	SECONDAF	RY INDICATORS	(2 or more required)
<b>HYDROLOGY PR</b> Surface Water (A <sup>2</sup>		Sı	urface Soil Cracks (B6	i)	SECONDAR Water-staine Leaves (B9)	ed	(2 or more required)  Stunted or Stressed Plants (D1)
	1)	Sı	urface Soil Cracks (B6 undation Visible on Ae	i)	Water-staine Leaves (B9) Drainage Pa	ed ) atterns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Surface Water (A´	1)	St In (B	urface Soil Cracks (B6 undation Visible on Ae	i)	Water-staine Leaves (B9) Drainage Pa	ed ) atterns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Surface Water (A´	1) (A2) X	Su Ini (B Sp Co	urface Soil Cracks (B6 undation Visible on Ae 7) parsely Vegetated oncave Surface (B8) _ arl Deposits (B15)	erial Imagery	Water-staine Leaves (B9) Drainage Pa	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A' High Water Table Saturation (A3)	1) (A2) <del>/</del> / 	St. Ini (B) St. Co. M.	urface Soil Cracks (B6 undation Visible on Ae 7) parsely Vegetated oncave Surface (B8) _	erial Imagery	Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water (A' High Water Table Saturation (A3) Water Marks (B1)	1) (A2) X ) ts (B2)	Su Inn (B Sp Cu M.	urface Soil Cracks (B6 undation Visible on Ae 7) parsely Vegetated pricave Surface (B8) arl Deposits (B15) urforgen Sulfide	erial Imagery	Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A' High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit	1) (A2)  X  ts (B2)	St. Inn. (B Sp. Co. M. Hy.	urface Soil Cracks (B6 undation Visible on Ae 7) parsely Vegetated pricave Surface (B8) _ arl Deposits (B15) ydrogen Sulfide dor (C1) ry-Season	erial Imagery	Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A' High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3	1) (A2) \( \sqrt{2} \) \( \sqrt{1} \) \( \sqr	St. Inn. (B Sp. Co. M. Hy.	urface Soil Cracks (B6 undation Visible on Ae 7) parsely Vegetated oncave Surface (B8) _ arl Deposits (B15) _ ydrogen Sulfide dor (C1) _ ry-Season fater Table (C2) _	erial Imagery	Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A' High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Algal Mat or Crust	1) (A2)/  X  ts (B2)  st (B4)  i)	St. Ini (B St. Ct. M. M. Oi	urface Soil Cracks (B6 undation Visible on Ae 7) 27 27 28 29 20 20 20 21 21 21 22 22 23 24 25 26 26 27 27 28 28 28 28 28 28 28 28 28 28 28 28 28	erial Imagery	Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)  Salt Deposit	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water (A' High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Algal Mat or Crust Iron Deposits (B5) Surface Water Pressure (A')	1) (A2) \( \beta \) \( \text{X} \) \( \text{S} \) \( \text{S} \) \( \text{B2} \) \( \text{S} \) \( \text{B4} \) \( \text{S} \) \( \text{Persent (Y/N): } \( \text{Persent (Y/N): } \)	St. Ini (B St. Ct. M. M. Oi	urface Soil Cracks (B6 undation Visible on Ae 7) parsely Vegetated phocave Surface (B8) arl Deposits (B15) udrogen Sulfide dor (C1) y-Season ater Table (C2) ther (Explain in Notes)	erial Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	ed ) atterns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  X
Surface Water (A' High Water Table Saturation (A3) Water Marks (B1) Sediment Deposit Drift Deposits (B3 Algal Mat or Crust	1)	St. Ini (B St. Ct. M. M. Oi	urface Soil Cracks (B6 undation Visible on Ae 7) 27 27 28 29 20 20 20 21 21 21 22 22 23 24 25 26 26 27 27 28 28 28 28 28 28 28 28 28 28 28 28 28	erial Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	ed ) atterns (B10) nizospheres along s (C3) f Reduced ts (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)  X

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): _ >_ Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet _
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Clasial Deposit Under Wetter of (B), 1854 B. 1875 B.
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Glacial Till/Not Permeable
Glacial Till/Not Permeable Low Permeability Stratified Deposits _
Glacial Till/Not Permeable
Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below
Glacial Till/Not Permeable   Basin Topographic Gradient (M): Low Gradient (<2%)
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)   Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring   LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Upstream & Downstream Unknown   Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)   Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring   LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown   Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)

Page 4 of 4

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		Field Target: 056 Date: 630 14  s not checked, please provide detailed explanation in the notes section of data form.
1.	Site	e Description
	<b>1 1 1 1 1 1 1 1 1 1</b>	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Veç	getation
	, स्रो	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soi	il
	<b>4</b>	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
	Ø Ø	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	P	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	<b>1</b> 21	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
		Each logbook page is initialed and dated?
7.	Ma	ps
		Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X	X
Jennifer Anderson	Jennifor Omderson (e/130/14
Wetland Scientist (print)	Signature / Date

Field Crew Chief (neint)

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION				
Survey Type: Centerline Acc	ess Road (explain) Other (	(explain)	Field Target:	Map #: 55 Map Date: 5/27
Date: 7/1/14	Project Name & No.: Alaska	LNG 26221306	Feature Id	:W61417013
Investigators: V Deck	otis TANDE	150M.	Afisher	Team No.:
State: Alaska	Region: Alaska	Milepost	5915	
Latitude: 63° 08 32.	36" Longi	itude: [49°	25 17.00	Datum: WGS84
Logbook No.: W6/-2	Logbook Page No.:	Picture No.		-RI, Plus , NU , NE
SITE PARAMETERS				
Subregion: Interio		Landform (h	illslope, terrace, hummock	s, etc.): 500e
Slope (%): 4		Local relief (	(concave, convex, none):	none
Pre-mapped Alaska LNG/NWI classific	cation: O Blanch	Soil Map Un	it Name:	
Are climatic/hydrologic conditions on the Yes No (if no ex	ne site typical for this time of year? plain in Notes)	Are "N	Normal Circumstances" pre	esent: plain in Notes.)
Are Vegetation, Soil, or H	ydrology Significantly Distur	bed? No \	(If yes, explain in Notes	)
Are Vegetation, Soil, or H	ydrology Naturally Problema	atic? No	(If yes, explain in Notes	s.)
SUMMARY OF FINDINGS			E SE ISSUES	
Hydrophytic Vegetation Present? Yes	No	Is the Sampled	Area within a Wetland?	Yes No
Hydric Soil Present? Yes_	No	Wetland Type:	Upland	
Wetland Hydrology Present? Yes	No	Alaska Vegetatio	on Classification (Viereck):	IA2, IB2, ICI
Notes and Site Sketch: Please include	Directional & North Arrow, Center	line, Length of feat	ure, Distances from Cente	rline, Photo Locations, and Survey
corridor.	ee logbood f note	K W61	1-2, page 18	3 for ste sketch
~				
		<b>Y</b>		

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Free Stratum (Plot sizes:)	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
Picea glavia	10	У	Facu	% Dominant Species that are OBL, FACW, or FAC: 67 (
3. ∀				
1.				Prevalence index worksheet:
Total Cover	JU.			Total % Cover of: Multiply by:
50% of total cover	: 20	% of total cove	er:	OBL species:X 1 =
Sapling/Shrub Stratum ()	Absolute % Cover	Dominant Species? i	Indicator Status	FACW species: X 2 = FAC species X 3 = FACU species X 4 = FACU species
1. Picea alauca	5	-6	Face	UPL species X 5 =
Betula alandulasa	25	Y	Fac	Column Totals: 170 (A) 583 (B)
. Varciniumuliainos	-	Y	Fac	PI = B/A =
SDIFACK STEVERIN	20	9	FORU	11/2
1: novem borentis	15		Focu	3
Empetrum nierrum	15	Alec	Fac	
. The state of the	13		FW	
3.				
	0.			
9.	: 1/5	245		
9. Total Cover		% of total cove	ar: 23	
9. Total Cover 50% of total cover	57.5 20	% of total cove	эг <u>. ЭЭ</u>	
Total Cover 50% of total cover  /EGETATION (use scientific names of plants	57.5 20	11112		Hydrophysia Vagasatian Indiagtam:
Total Cover 50% of total cover /EGETATION (use scientific names of plants	57.5 20	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
Total Cover 50% of total cover 50% of total cover // CEGETATION (use scientific names of plants	Absolute % Cover	Dominant	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0
Total Cover 50% of total cover 50% of total cover /EGETATION (use scientific names of plants Herb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plants derb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
Total Cover 50% of total cover 50% of total cover /EGETATION (use scientific names of plants lerb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cover 50% of total cover 50% of total cover VEGETATION (use scientific names of plants lerb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cover 50% of total cover 50% of total cover /EGETATION (use scientific names of plants derb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac Fac Fac	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plants derb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac Fac Fac Fac	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover  /EGETATION (use scientific names of plants Herb Stratum ( )  1. Characteristic names of plants  2. Rubus ( )  3. Characteristic names of plants  4. A characteristic names of plants  6. A characteristic names of plants  7. Characteristic names of plants  7. Characteristic names of plants  6. A characteristic names of plants  6. A characteristic names of plants  7. Characteristic names of plants	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac Fac Fac Fac	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plants derb Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac Fac Fac Fac	Dominance Test is > 50%  —— Prevalence Index is ≤ 3.0  —— Morphological Adaptations¹ (Provide supporting data in Notes)  —— Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  —— % Bare Ground
Total Cover 50% of total cover 50% of total cover vegetation (use scientific names of plants Herb Stratum ( )  1. Characteristic names of plants ( )  2. Rubus ( )  3. County ( )  4. Signature ( )  5. Characteristic names of plants ( )  6. A consideration alasker ( )  7. 8. 9.	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac Fac Fac Fac	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( )  1. Change of the scientific names of plants  2. Rubus ( )  3. County ( )  4. Stratum ( )	Absolute % Cover	Dominant Species?	Indicator Status Fac Fac Fac Fac Fac	Dominance Test is > 50%  —— Prevalence Index is ≤ 3.0  —— Morphological Adaptations¹ (Provide supporting data in Notes)  —— Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  —— % Bare Ground —— % Cover of Wetland Bryophytes —— Total Cover of Bryophytes

SOIL			Date 7 11 14 Featu	_					Pit Required (Y/N)	7
OIL PROFIL		escribe	to the depth needed to	docı	ument the	indicator or c	onfirm the absence	e of indicators.)	7	- 1
epth	Matrix		Redox Features							
nches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc²	Texture	Notes	<i>₽1</i>	
2-11"	1 - 100 - 1	4.6	0 4 10 0 1	7 8 =	-		Fronce	ary	1	
4-9	10 YZ 3/1	60	7 SYD 3/3	70		M	Silt-way	6		
9-18	2.5 4513	70	7.5 YE4/6	30	C	100	tine som	ICI FORM	30% (	2 /O/N
								1 122		rlis
								21 451	Thomas	
Type: C=Co	ncentration, D=Depleti	on, RN	1=Reduced Matrix, CS=0	Cove	ered or C	pated Sand Gr	rains. <sup>2</sup> Location:	PL=Pore Lini	ng, M=Matrix.	
	LINDICATORS	31.5		10				FOR PROBLE	MATIC HYDRIC SC	DILS <sup>3</sup>
istosol or Hi	stel (A1)		Alaska Gleyed (A	13)			Alaska Color C	hange (TA4) <sup>4</sup> _		
	on (A2)		Alaska Redox (A1				Alaska Alpine S			
	A3)		Alaska Gleyed Po				Alaska Redox v			
	fide (A4)								e or Redder Underly	ying
hick Dark Su	urface (A12)	_					Other (Explain	in Notes)		
ydric Soil P	resent (Y/N):	4					-			
IYDROLOGY	Y PRIMARY INDICATO	ORS (a	ny one indicator is suffic	cient	)	SECONDARY	INDICATORS (2	or more requir	ed)	
Surface Wate	r (A1)	Sur	face Soil Cracks (B6) _			Water-stained Leaves (B9) _			or Stressed D1)	
ligh Water T	able (A2)	lnu (B7	ndation Visible on Aeria	l Ima	agery	Drainage Patt	terns (B10) Geomorphic Positio		rphic Position (D2)	_V
aturatión (A	3)	Spa Cor	arsely Vegetated ncave Surface (B8)			Oxidized Rhiz Living Roots (			Aquitard (D3)	_
Vater Marks	(B1)	Ma	rl Deposits (B15)		-	Presence of F Iron (C4)	Reduced	Microto Relief (	pographic D4)	
ediment Der	posits (B2)	Hyd	drogen Sulfide or (C1)			Salt Deposits	t Deposits (C5) FAC-Neutral Test (D5) _			
rift Deposits	(B3)	Dry Wa	r-Season ter Table (C2)			Notes:				
Igal Mat or C	Crust (B4)		ner (Explain in Notes):							
on Deposits	(B5)								49	
	r Present (Y/N):	T	Danib (in)		-					
	r Present (Y/N):		Depth (in):		w	etland Hydro	logy Present (Y/N	n:		
Saturation Preincludes capi	esent (Y/N):	2	Depth (in):							
lotes: Six	mple plan	rc	ut to e of	45	slop	2				

VEGETATION VARIABLES P≈ Plot, M	Λ= Matrix
Perested-Evergreen-Needle-leaved_	ackingForested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall)_ Dwarf shrob (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) m) Short herb (<1m) Moss-Lichen Floating Submerged
Number of Watland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
80%) Very ligh Density (80-100%)	
Interspersion of Cover Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or or Peripheral Cover N/A
Plant Species Diversity (P): Now (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Abset (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patche	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	0-25% of surface) Moderately Abundant (25-00% of surface)
High (small groupings, diverse and interspers	
HGM Class (P): Slope Flat	Lacustrine Fringe Riverine Estaurine Fringe
POIL VADIADI ES	
Soil Factors (P) Soil Lacking	Histosol-Fibric Histosol-Banric Histosol-Sanzic
Mineral: Gravelly Mineral: Sandy	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Siii Mineral: Clayey
	V
LIVEROL COLO MADIA DI EG	A
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	Outlet Perennial Inlet/No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet_ Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Pe
Inlet/Outlet Class (P): No Inlet/Outlet_ Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet_ Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Eviden	OutletIntermittent Inlet/Ferennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet
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Inlet/Outlet Class (P): No Inlet/Outlet_ Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S  Evidence of Sedimentation (P): No Eviden Created  Microrelief of Wetland Surface (P): Absent  Frequency of Overbank Flooding (P): No O Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water C  Surficial Glacial Deposit Under Wetland (P) Glacial Till/Not Permeable	OutletIntermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/No Outlet Pe
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Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Outlet_Inlet/Intermittent Outlet_Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Eviden Created Microrelief of Wetland Surface (P): Absent_Frequency of Overbank Flooding (P): No Sedimentation (P): No Surface of Outlet Restriction (P): No Sufflow Water pH (P): No surface water_Surficial Glacial Deposit Under Wetland (P): Glacial Till/Not Permeable_Basin Topographic Gradient (M): Low Evidence of Seeps and Oprings (P): No Sedimentation (P): No Sedimentat	Outlet
Inlet/Outlet Class (P): No Inlet/Outlet_Outlet_Intermittent Inlet/Intermittent Outlet_Inlet/Intermittent Outlet_Perennial Inlet/Intermittent Outlet Characteristic (P): Description Of Sedimentation (P): No Evident Created Microrelief of Wetland Surface (P): No Evident Outlet O	Outlet
Inlet/Outlet Class (P): No Inlet/Outlet_ Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evident Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Outflow Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water C.  Surficial Glacial Deposit Under Wetland (P): Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See  LANDSCAPE VAFIABLES (M)  Wetland Juxtatosition: Wetland Isolated Only Connected Above Connected	Outlet
Inlet/Outlet Class (P): No Inlet/Outlet_ Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Eviden Created  Microrelief of Wetland Surface (P): Absent_  Frequency of Overbank Flooding (P): No Outline Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outline Water pH (P): No surface water C.  Surficial Glacial Deposit Under Wetland (P). Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low Evidence of Seeps and oprings (P): No See  LANDSCAPE VAFIABLES (M)  Wetland Juxta Josition: Wetland Isolate Only Connected Above Connected	Outlet       Intermittent Inlet/Perennial Outlet       Perennial Inlet/No Outlet       Perennial Inlet/No Outlet       Perennial Inlet/Perennial Inlet/No Outlet       Perennial         Inlet/Perennial Outlet       Inlet/Perennial Outlet       Perennial Inlet/No Outlet       Perennial         Inlet/Perennial Outlet       Inlet/Perennial Outlet       Perennial Inlet/No Outlet       Perennial         Inlet/Perennial Outlet       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment         Inlet/Perennial Outlet       Pronounced (>18in.)       Pronounced (>18in.)         Inlet/Perennial Outlet       Perennial Sediment         Inlet/Perennial Sediment       Perennial Sediment         Inlet/Perennial Sediment       Perennial Sediment         Inlet/Perennial Sediment       Perennial Sediment         Inlet/Perennial Sediment       Perennial Sediment<
Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S Evidence of Sedimentation (P): No Eviden Created Microrelief of Wetland Surface (P): Absent Frequency of Overbank Flooding (P): No O Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water Co Surficial Glacial Deposit Under Wetland (P) Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and oprings (P): No See  LANDSCAPE VARIABLES (M)  Wetland Juxta osition: Wetland Isolate Only Connected Above Connected Wetland Land Use: High Intensity (i.e., a) Water hed Land Use: 0-5% Rural	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: W61 HT013	Field Target:_	083	Date:_	7/1/	14
For all items not checked, please provid	e detailed expl				

#### 1. Site Description

- Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ∀ Vegetation names are entered legibly for all strata present?
- ☑ Cover calculations are complete and correct?
- All dominant species have been determined and recorded per strata?
- Indicator status is correct for each species?
- Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Soil profile is complete?
- Appropriate hydric soil indicators are marked?

#### 4. Hydrology

- Appropriate hydrology indicators are marked?
- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- Each logbook page is initialed and dated?

#### 7. Maps

- Wetland boundaries have been corrected if necessary?
- Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer An derson	X Jennila Coderson 7/1/14
Wetland Scientist (print)	Signature / Date U

Field Crew Chief (print)

signature / Date

SITE DESCRIPTION		34.		1130
Survey Type: Centerline 🞾 Acce	ess Road (explain) Other	(explain)	Field Target:	Map #: 90   Map Date: 5   1
Date: 7 1 1 1	Project Name & No.: Alask	a LNG 26221306	Feature Id	WE HTO IH
Investigators: Lacorn 5	J Anderson	A Foles	20-	Team No.:1.61 - 1
State: Alaska	Region: Alaska		592.6	
Latitude: 63° 07' 58.	On Long	10	26 56.74"	Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:	Picture No.:	P-16141914_	PH; Plu E:SW.
SITE PARAMETERS	MILE STATE OF THE PARTY OF THE	1 4		0
Subregion: Interior / Sauth	Car. D	Landform (hi	ilslope, terrace, hummock	rs, etc.): F/s/-
Slope (%):	Coverso	Grand Transport	concave, convex, попе):	Convex
Pre-mapped Alaska LNG/NWI classifica	ation: Project	Soil Map Uni	it Name:	Grice
Are climatic/hydrologic conditions on the Yes No (if no exp		r? Are "N	lormal Circumstances" pre	esent: (plain in Notes.)
Are Vegetation, Soil, or Hy			(If yes, explain in Notes	
Are Vegetation , Soil , or Hy			yes, explain in Note	
SUMMARY OF FINDINGS		7		
Hydrophytic Vegetation Present? Yes_	No_XO_	Is the Sampled	Area within a Wetland?	Yes No
Hydric Soil Present? Yes_	No. S	Wetland Type:	LPLAND	C ON
Wetland Hydrology Present? Yes_	No_ <i>X</i> O	Alaska Vegetatio	n Classification (Viereck):	IX 2, II B2 II 61
Notes and Site Sketch: Please include I corridor.	moderate, doe See lagook h			mine, Photo Locations, and Survey
77				0.

	i)	-		
ree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
Picen Glauca	35	Y	Forel	% Dominant Species that are OBL, FACW, or FAC:
4.				Prevalence Index worksheet:
Total Cover: 50% of total cover:		)% of total cov	ver:	Total % Cover of: Multiply by:  OBL species: X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 3 X 2 = 5  FAC species
Linnae boreulis	25	7	FACU	UPL species X 5 =
Stephendia CANAdansis	20	1	FACU	Column Totals: (A) 629 (B)
Riber alandulasum	10		FACU	PI = B/A = 3.66
Ribes hudsonianum	15		FAC	
Salv psaudomenticola	5		FAC	
Alms tenvisolia	8		top	
	wales -			
	, j			
Total Cover: 50% of total cover:	41.5 20	% of total cov	/er:\\	,
erb Stratum ( 26 )				
OLO CUGUIII ( # FILE)	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
SIN SUMMIT ( J. J.	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Providence Index is < 3.0
Chamaerian projectionium	% Cover	Species?		Dominance Test is > 50% Prevalence Index is ≤ 3.0
Chamaerian projecticalium	% Cover	Species?	Status FACU FACU	Dominance Test is > 50%
Changerian Angesticalium	% Cover	Species?	Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in
Changesian Angesticalium Connis canvadansis	% Cover	Species?	Status FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Chanceion Angustication Comis canadensis Calamagnostis canadensis Equisalum pratense.	% Cover	Species?	FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes)
Chancelon Angerticalium Connis canadansis Calamagnostis canadansis Egytselvin partense. Lubus arcticus	% Cover	Species?	FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Chanceson Any oticolium Comius canualensis Calamagnostis complensis Equiselum protense Rubus arcticus	% Cover	Species?	FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground
Chancesian Any oticolium Cornis canualensis Calamagnostis constensis Equisalum protensa Rubus arctreus Mentensia anctreus Pyrala aserifolia Camaceaspium Argoteis	% Cover	Species?	FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes
1. Chances Anglotication 2. Comis consudensis 3. Calamagnostis constensis 4. Equisatum protense. 5. Rubus arcticus 3. Mutemia geniculata 7. Pyrala asenifold 8. Camaccalpium Angeleis	% Cover	Species?	FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes
1. Chanceion Anglotication 2. Comis consularsis 3. Calamorpostis constensis 4. Equiselum protense. 5. Rubus arcticus 6. Multimo goriculaita 7. Pyrola aserifolia 8. Campocolpium drypteis 9. Calimo borcale	% Cover	Species?	FACU FACU FACU FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  We have Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes  Cover of Water
1. Chanceion Anglotication 2. Comis consudensis 3. Calamorpostis constensis 4. Equisatum protense. 5. Rubus arcticus 6. Multimo gariculaita 7. Pyralu aserifolia 8. Campocalpium dryptais 9. Calium borcale	% Cover 755 5 20 3	Species?	FACU FACU FACU FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  We have Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes  Cover of Water  Hydrophytic Vegetation Present (Y/N):
1. Chancein Arey d'Colima 2 Cornies canadensis 3 Calamorpostis canadensis 4. Equiselum protense. 5. Lubus arctreus 6. Meternia arctreus 7. Pyrola asenifold 8. Gamaccarpium Argoteis 9. Cachima boreale	% Cover 755 300 3 5 3	Species? (Y/N)	FACU FACU FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  We have Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes  Cover of Water

SOIL		D	ate 7 1114 F	eature l	D Wal	11014		Soil Pit Required (Y/N)
SOIL PROFIL	E DESCRIPTION: (De	scribe t	the depth neede	d to doc	ument the	indicator or o	confirm the absence	of indicators.)
Depth	Matrix		Redox Features		A			
(inchés)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc²	Texture	Notes
Our	1		Al				Filmic	Dru
1-14"	61m 1 25 104	50	104 25/1				Sand lora	Rock cathle good 35
7 16	Ches 1 311	50	1			*	3 20 - 1 -	
	N 3/					4	1	reditato
1.0	1		4					
,					40	0 × *	13:	7
Pag.				1		1	200	-
<sup>1</sup> Type: C=Co	ncentration, D=Depletion	on, RM=	Reduced Matrix,	CS=Cov	ered or Co	atęd Sand G		PL=Pore Lining, M=Matrix.
HYDRIC SOIL	INDICATORS						INDICATORS F	OR PROBLEMATIC HYDRIC SOILS
Histosol or His	stel (A1)	P.	Alaska Gleye	d (A13)			Alaska Color Ch	nange (TA4)⁴
Histic Epipedo	on (A2)		Alaska Redox	x (A14)			Alaska Alpine S	wales (TA5)
Black Histic (A	A3)		Alaska Gleye	d Pores	(A15)			vith 2.5Y Hue
Hydrogen Sul	200	-To	5				Alaska Gleyed v Layer:	without 5Y Hue or Redder Underlying
Thick Dark Su	rface (A12)						Other (Explain i	
disturbed or p			- 0	36	and hydrolo	ogy, and an a	appropriate landscap	pe position must be present unless
	resent (Y/N):				H	- Tr 5	79.125	
Notes: Na	viilly problems	etic.	Corthaturo -	due	to exce	itence m	glacial s	hlls maskig
HYDROLOG	PRIMARY INDICATO	ORS (ar	y one indicator is	sufficier	nt)	SECONDAR	Y INDICATORS (2)	or more required)
		T				Mater etaine	d	Stunted or Stressed

HYDROLOGY PRIMARY INDICATO	RS (any one indicator is sufficient)	SECONDARY INDICATORS (2) or r	more required)
Surface Water (A1)	Surface Soil Cracks (B6)	Water-stained Leaves (B9)	Stunted or Stressed Plants (D1)
High Water Table (A2)	Inundation Visible on Aerial Imagery (B7)	Drainage Patterns (B10)	Geomorphic Position (D2)
Saturation (A3)	Sparsely Vegetated Concave Surface (B8)	Oxidized Rhizospheres along Living Roots (C3)	Shallow Aquitard (D3)
Water Marks (B1)	Marl Deposits (B15)	Presence of Reduced Iron (C4)	Microtopographic Relief (D4)
Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1)	Salt Deposits (C5)	FAC-Neutral Test (D5)
Drift Deposits (B3)	Dry-Season Water Table (C2)	Notes:	
Algal Mat or Crust (B4)	Other (Explain in Notes):	1 3	* 10° 1 =
Iron Deposits (B5)		Yelle	
Surface Water Present (Y/N):	Depth (in):	Miles William Park	1L)
Water Table Present (Y/N):	Depth (in):	Wetland Hydrology Present (Y/N): _	
Saturation Present (Y/N): (includes capillary fringe)	Depth (in):		
Notes:			
		36	

Return Interval >5 yrs	Short shrub (0.5-2m) Submerged Moderately even High Density (60- 26-75% Scattered or  ches; Parts of Site
Forestes Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Emergent-Non-persis Persistent Aquatic Bed Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persis Persistent Aquatic Bed Scrub Shrub-Deciduous Persistent Persistent Persistent Bed Scrub Shrub-Deciduous Persistent Persist	Short shrub (0.5-2m) Submerged Moderately even High Density (60- 26-75% Scattered or  ches; Parts of Site
Number of Wetland Types (M):	Submerged Moderately even )High Density (6026-75% Scattered or ches; Parts of Site staurine Fringe
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even	Moderately even ) High Density (60 26-75% Scattered or ches; Parts of Site staurine Fringe
Interspersion of Cover & Chen Water (P): 100% Cover or Open Water	26-75% Scattered or ches; Parts of Site staurine Fringe
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25) Presence of Islands (M): Absent none) One or Few Several to Many N/A N/A	ches; Parts of Site
Presence of Islands (M): Absent none)  One or Few Several to Many N/A  Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stepns 1 or More Large Pa Open Small Scattered Patches Continuous Cover  Dead Woody Material (P): Low Abundance (0-25% of surface)  Moderately Abundant (25-50% of surface)  Abundant (-50% of surface)  Moderately Abundant (25-50% of surface)  Moderate (broken irregular rings)  High (small groupings, diverse and interspersed)  HGM Class (P): Slope Flat Lacustine Fringe Depressional Riverine Soll Variables  Soil Factors (P): Soil Lacking Histosol: Fibric Histosol: Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Perennial Outlet Perennial Outlet Intermittent Inlet/Intermittent Outlet Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Seminary Seminary Seminary Seminary Seminary Flooded, Saturated Seminary Semina	staurine Fringe
Cover Distribution of Dominant Laye (P): No Veg Solitary, Scattered Stens 1 or More Large Pactopen Small Scattered Patches Continuous Cover Moderately Abundant (25-50% of surface) Patches Moderately Abundant (25-50% of surface) Abundant (>50% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface) Moderate (broken irregular rings) High (small groupings, diverse and interspersed) Moderate (broken irregular rings) High (small groupings, diverse and interspersed) Depressional Riverine ESOIL VARIABLES  SOIL VARIABLES  SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Gilty Histosol: Hemic Histosol: Sapric Mineral: Gravelly Histosol: Politary	staurine Fringe
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface) Moderate (broken irregular rings) High (small groupings, diverse and interspersed) Moderate (broken irregular rings) High (small groupings, diverse and interspersed) Depressional Riverine E	staurine Fringe
Abundant (>50% of surface)  Vegetative Interspersion (P): Low (large patores, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)  HGM Class (P): Slope Flat Lacusthate Fringe Depressional Riverine E  SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Gilty Mineral: Clayey Histosol: No Inlet/Perennial Outlet Depressional Perennial Inlet Intermittent Outlet No Inlet/Perennial Outlet Perennial Inlet Intermittent Outlet Perennial Inlet Intermittent Outlet Perennial Inlet Intermittent Outlet Perennial Inlet Intermittent Outlet Perennial Inlet Perennial Outlet Perennial Inlet Intermittent Outlet Perennial Outlet Perennial Inlet Intermittent Outlet Perennial Outlet Perennial Inlet Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Inlet Intermittent Outlet Perennial Outlet	staurine Fringe
High (small groupings, diverse and interspersed)  HGM Class (P): Slope	staurine Fringe
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Inlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval Syrs	
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Perennia	
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Metland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Watland Substrate Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval Perennial Outlet Per	
Mineral: Gravelly Mineral: Sandy Mineral: Gilty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Intermitte	
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet	
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet Perennial Outlet Perennial Inlet Inlet/Intermittent Inlet Perennial Outlet Perennial Inlet Inlet/Intermittent Inlet/Intermitte	
Wet: Perm. Flooded, Intermittently Exposed Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate  Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval >5 yrs	Intermittent Inlet/No No Outlet Perennial
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Created Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Frequency of Overbank Flooding Return Interval 1-2 yrs Return Interval >5 yrs Return	
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.)   Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval >5 yrs	Fluvaquent Soils Sediment
Return Interval >5 yrs	Pronounced (>18in.)
Doggoo of Outlet Proteintless DV No Outless	l 2-5 yrs
Degree of Outlet Restriction P): No Outflow Restricted Outflow Unrestricted Outflow	
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5)	pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Glacial Till/Not Permeaber	Deposits
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)	
Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring	Perennial Spring
LANDSCAPP VARIABLES (M)	
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Upstream & Downstream Unknown	1
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e.	ed Below
Natershed Land Use:         0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized	
Ze;   Small (<10 acres)	open space
Crew Chief QA/QC check: GPS Technician QA/QC check: Grand Gr	open space

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: Wol HTO 14 Field Target: 084 Date: 7/1/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	PI	h	ot	O:	

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X January	anales Sie	7/1/14
Wetland Scientist (print)	Signature / Date		

X him DEGUTIS

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION		20		130
Survey Type: Centerline Access	ss Road (explain) Other	(explain) V	Field Target	Map #: 5 Map Date: 5 27 14
Date: 9114	Project Name & No.: Alaska	1-	1	: WE HTOIS
70101	TANGUSEN		1 outdie,iu	Team No.: (V6)
P MOOE	Region: Alaska	A fisher	<i>C.</i> 1.1	Touriston Wo, I
State: Alaska		Milepost:	594.1	
Latitude: 63° 06' 51.56		itude: 149°	28 17.67	Datum: WGS84
Logbook No.: W61-2	Lógbook Page No.: 30	Picture No.	- P-W6149015_	PHPLY NEW
SITE PARAMETERS			1	
Subregion: Interior Souther	dad	Landform (h	nillslope, terrace, hummock	s, etc.): FA
Slope (%): 2	((, 00		(concave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	tion: PENIB	Soil Map Ur	nit Name:	
Are climatic/hydrologic conditions on the		? Are "Yes_	Nomal Circumstances" pre No (If no, ex	esent: plain in Notes.)
Are Vegetation, Soil, or Hyd	lrology Significantly Distu	rbed? No 3	(If yes, explain in Notes	()
Are Vegetation, Soil, or Hyd	Irology Naturally Problem	atic? No	(If yes, explain in Notes	s.) <sup>/</sup> \_
SUMMARY OF FINDINGS		A		A CONTRACTOR OF THE PARTY OF TH
Hydrophytic Vegetation Present? Yes_	% No	Is the Sampled	Area within a Wetland?	YesNo
Hydric Soil Present? Yes_	No	Wetland Type:	UPLAND	
Wetland Hydrology Present? Yes_	No <b>P</b>	Alaska Vegetatio	on Classification (Viereck):	II AI
Notes and Site Sketch: Please include Ecorridor.		. 4	ture, Distances from Center  Wel-2, per  sale sket-d  Notes	
			2- 14	

VEGETATION (use scientific names of plants	)	φ	4	
Tree Stratum (Plot'sizes: 240 )  1. N A	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:  (B)  Dominant Species that are OBL, FACW, or FAC:  (A/E)
3.				
4.				Prevalence Index worksheet:
Total Cover:	-			Total % Cover of: Multiply by:
50% of total cover	20	% of total cov	/er:	OBL species: X 1 =
Sapling/Shrub Stratum( 716 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X2 = 306  FAC species X3 = 306  FACU species 52 X4 = 308
1. N/A				UPL speciesX 5 =
2.				Column Totals: 154 (A) 514 (B)
3.			-	PI = B/A = 3,3
4.				
5.				
6.		(4		3.
7.				* * * * * * * * * * * * * * * * * * * *
9.	-			
Total Cover:	-			75 p
50% of total covers		% of total cov	er.	
		70 01 10141 001	·	
VEGETATION (use scientific names of plants	)			
Herb Stratum()	Absolute' % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Colonianos 5 CANCIDENSIS	86	Y	FAC	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Chamación Angustifolium	20	-	FACU	Notes)
3. Martensia Doniousta	12		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Armhun delotionishin	12		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Heracleum Margarem	20		FACU	disturbed or problematic
6. Polemonium acetanum	10		FAC	
7. Athrium Enclosorum	2		FAL	% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water
O			- 11	Hydrophytic Vegetation Present (Y/N):
	MU			
Total Cover:		% of total acr	304	Notes: (If observed, list morphological adaptations below):
		% of total cov	er: 30.6	T.

SOIL		- 0	Date 7///4 Feature	ID%/6/	нто15		Soil Pit Required (Y/N)
	E DESCRIPTION: (E		to the depth needed to do	CONTRACTOR OF THE PARTY OF THE	State seasonactive con-	confirm the absence	
Depth	Matrix	-	Redox Features			0	alter also
(inches)	Color (moist)	%	Color (moist) %	Туре	Loc <sup>2</sup>	Texture	Notes
0-3"	10 YR 3/2	OO			-	Sil+ lam	
3"-18"	2.5 Y 4/3		104R 5/6 5	0	M	Sil-1-loam	60-
		1. 3				V	*
	1.		2				turn
	1		10.			À	6
			1 3		4		
1						- CONTRACTOR	4.5
		tion, RM	=Reduced Matrix, CS=Co	vered or	Coated Sand C		PL=Pore Lining, M=Matrix.
	L INDICATORS .						OR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed (A13)				ange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)				vales (TA5)
	A3)		Alaska Gleyed Pores	s (A15) _		Alaska Redox wit	
Hydrogen Sul	fide (A4)			. 3		Layer	ithout 5Y Hue or Redder Underlying
	ırface (A12)			3		Other (Explain in	
One indicato disturbed or p	r of hydrophytic veget	ation, or	e primary indicator of wet	land hyd	Irology, and an	appropriate landscape	position must be present unless
Give details	of color change in Not		10-				118.
Restrictive La	yer (if present): Type	N	Depth	(inches):			the state of the state of
		11	-			7	AT .
Hydric Soil P	resent (Y/N):	M				1	:04
Notes:			H. y			*	
	1 .				4	¥	5 60
					1		4
HYDROLOGY	PRIMARY INDICAT	ORS (ar	ny one indicator is sufficier	nt)	SECONDAR	Y INDICATORS (2 or	more required)
100	PA				Water-staine		Stunted or Stressed
Surface Water	r (A1)	Surf	ace Soil Cracks (B6)	-	Leaves (B9)		Plants (D1)
High Water Ta	able (A2)	Inun	dation Visible on Aerial Im	nagery	Drainage Pat	terns (B10)	Geomorphic Position (D2)
	4.35	- ' '	rsely Vegetated			zospheres along	1
Saturation (A3	3)		cave Surface (B8)		Living Roots	(C3)	Shallow Aquitard (D3)
Water Marks (	B1)	Mari	Deposits (B15)	1	Presence of		Microtopographic
				1	Iron (C4)	<i>p</i> <sup>1</sup>	Relief (D4)
Sediment Dep	osits (B2)		rogen Sulfide r (C1)		Salt Deposits	(C5)'	FAC-Neutral Test (D5)
Drift Deposite	(B3)	Dry-	Season	141	Notes:		du.
Driit Deposits	(63)	Wat	er Table (C2)	9		1	
Algal Mat or C	rust (B4)	Othe	er (Explain in Notes):			1	B.
Iron Deposits	(DE)		A 1	- 150		CAP I	
non Deposits	(65)		0				
Surface Water	Present (Y/N): N	10	Depth (in):	T		1.7	
Water Table P			Depth (in):	-	Wetland Hydro	ology Present (Y/N):	
Saturation Pre	sent (Y/N):	*	Depth (in):		AL S	3	1 1
(includes capil	lary fringe)	Ye.			10		
Notes:							
							4.3

VEGETATION VARIABLES P= Plot,	M= Matrix
	acking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved
Forested-Evergreen-Needle-leaved	Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Emergent-Non-persistent Emergent-
crub Shrub-Evergreen-Broad-leaved	Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Persistent Aquatic Bed	7 H L L (0.0.)
Pel ent Cover (P): Tree (>5 dbh, >6m tall)	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) Moss-Lichen Floating Submerged
	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately ven
Vegetation Pensity/Dominance (P): Sparse 80%) Very High Density (80-100%)	e (0-20%) Low Density (20-40%) Medium Density (40-60%) Fligh Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scatter	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or ed or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) Mgh (>25)
	One or Few Several to Mapsy N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches_	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance	(0-25% of surface) Moderately Abundant (25-50% of surface)
Abundant (>50% of surface)	
Vegetative Interspersion (P): Low (larg	e patches, concentric rings) Moderate (broken irregular rings)
High (small groupings, diverse and interspen	
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
Trom class (1 ). Clope Trans	
SOIL VARIABLES	
Soil Easters (P): Soil Lacking	Historal Fibria Historal Hamic Historal Sanric
Mineral: Gravelly Mineral: Sandy	Histosol: Pieric Histosol: Hemic Histosol: Sapric Histoso
HYDROLOGIC VARIABLES	
	No Inlet/Intermittent outlet
Inlet/Outlet Class (P): No Inlet/Outlet	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No  at Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
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Inlet/Outlet Class (P): No Inlet/Outlet Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Wetland Water Regime (P): Drier: Sea Wet: Perm. Flooded, Intermittently Exposed Evidence of Sedimentation (P): No Evide Created Microrelief of Wetland Surface (P): Abser Frequency of Overbank Flooding (P): No Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflot Water pH (P): No surface water Surficial Glacial Deposit Under Wetland ( Glacial Till/Not Permeable Basin Topographic Gradient (M): Lov Evidence of Seaps and Springs (P): No Seaps and Spr	Intermittent Inter
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## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	-1.1.1
Feature	e ID: W61 HT 015 Field Target: 085 Date: 085 711/14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present?  ☐ Cover calculations are complete and correct?
	All dominant species have been determined and recorded per strata?
	☑ Indicator status is correct for each species? ☑ Dominance Test and Prevalence Index have been completed?
	Bollinance restains revalence index nave seen completes.
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- $\hfill\Box$  Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer	Anderson	X Jannifer	anderson	7/1/14
Wetland Scientist (print)		Signature / Date		

Field Crew Chief (print)

Signature / Date

De contien SITE DESCRIPTION Field Target: 115 Survey Type: Centerline\_ Access Road (explain) Other (explain) Feature Id: WGIHT 016 Project Name & No.: Alaska LNG 26221306 Date: \* Team No.: W6 Investigators: J Anderson Milepost: 645.35 State: Alaska Datum: WGS84 Latitude: (02° Longitude: 150° Logbook Page No.: Picture No.: Logbook No.: 22 SITE PARAMETERS Subregion: South centra Landform (hillslope, terrace, hummocks, etc.): Local relief (concave, convex, none): Slope (%): Pre-mapped Alaska LNG/NWI classification: Soil Map Unit Name: LIPLAND Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (if no explain in Notes) (If no, explain in Notes.) No\_ (If yes, explain in Notes) Soil Are Vegetation or Hydrology Significantly Disturbed? Are Vegetation Soil or Hydrology Naturally Problematic? (If yes, explain in Notes.) **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes\_ Is the Sampled Area within a Wetland? Wetland Type: Woland Hydric Soil Present? Wetland Hydrology Present? Alaska Vegetation Classification (Viereck): 111 + Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey · Note polygen shape for sample plot altered only to include open grossed Aren's not adjust shrubs /treed ones. See logbook Wol-2, pag 22 for notes & site Steetch

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes: 15 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)
1. NA				Total Number of Dominant Species Across All Strata: (B) % Dominant Species that are OBL, FACW, or FAC: (A/B)
2.				% Dominant Species that are OBL, FACW, or FAC:(A/B)
3.				
4.				Prevalence Index worksheet:
Total Cover:				Total % Cover of: Multiply by:
50% of total cover:	20	% of total cov	/er:	OBL species:X 1 =
Sapling/Shrub Stratum ( 15 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 =
1. NA				UPL speciesX 5 =
2,				Column Totals: 118 (A) 362 (B)
3.				PI = B/A = 3.06
4.				
5.				The state of the s
6,				
7.				
8.				
9,				
Total Cover: 50% of total cover:		% of total cov	/er:	0.4
VEGETATION (use scientific names of plants				
Herb Stratum ( 15 )	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
	% Cover	Species? (Y/N)	Status	Dominance Test is > 50%
1. Calamagnoskis completis	90	Y	FAC	Prevalence Index is ≤ 3.0
2. Chammion anguit Chim	5		FACU	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Enviselum Sylvaticum	10		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Polemonium acutiflorum	10	91-1	FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. GEOGNAL Lindlum	T		FACU	disturbed or problematic.
6. Gumanerajum donotesis	3		FACU	The same of the sa
7				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.		-		Total Cover of Bryophytes
10.				% Cover of Water
Total Cover:	1195			Hydrophytic Vegetation Present (Y/N):
50% of total cover:	• •	% of total cov	ver: <u> <b>23.6</b></u>	Notes: (If observed, list morphological adaptations below):

SOIL			Date 712 14 Featu	4			of indicators \
OIL PROFI		escribe	to the depth needed to	aocument t	ne indicator or	confirm the absence	of indicators.)
Depth	Matrix	_	Redox Features		1 2		
inches)	Color (moist)	%	Color (moist)	% Type	Loc²	Texture	Notes
)+1"						FIDER	Dru
-9"	2.54 4/1		10 YR 5/6	20 C	M	Fine sondy	loan
-184	10 YR 5 6	0.01				Fine Soundy	Inam
	3						
					-		
	t the D. D. ole	tion DN	L De duce al Matrix CC	Cavaradas	Coated Sand (	Proins 21 ocation:	PL=Pore Lining, M=Matrix.
		tion, RIV	I=Reduced Matrix, CS=	Covered or	Coated Sand C		OR PROBLEMATIC HYDRIC SOILS
	IL INDICATORS		1	40)			
	istel (A1)		Alaska Gleyed (A				nange (TA4) <sup>4</sup>
	lon (A2)		Alaska Redox (A				wales (TA5)
3lack Histic (	(A3)		Alaska Gleyed Po	ores (A15) _			vith 2.5Y Huewithout 5Y Hue or Redder Underlying
Hydrogen Su	ılfide (A4)					Layer	without of the of Redder Officerlying
 Thick Dark S	urface (A12)					Other (Explain i	n Notes)
One indicate	or of hydrophytic vege	tation, o	ne primary indicator of	wetland hyd	rology, and an	appropriate landsca	pe position must be present unless
	problematic. of color change in No	too					
Restrictive L	or color change in No	ies.	Der	oth (inches):			
	Present (Y/N):						
Notes:					1		
Notes:			any one indicator is suff	īcient)		RY INDICATORS (2	
Notes:		TORS (£			Water-stains		Stunted or Stressed
Notes:  HYDROLOG  Surface Wat	Y PRIMARY INDICA	Su	iny one indicator is suff rface Soil Cracks (B6) _ ndation Visible on Aeria		Water-staine Leaves (B9)	ed	Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Surface Wat	er (A1)	Su Inu (B7	Iny one indicator is suff Iface Soil Cracks (B6) _ Indation Visible on Aeria Indation Visible on Aeria		Water-staine Leaves (B9) Drainage Pa Oxidized Rh	atterns (B10)izospheres along	Stunted or Stressed Plants (D1)
HYDROLOG Surface Wat High Water	er (A1)  Fable (A2)	Su Inu (B7	nny one indicator is suff face Soil Cracks (B6) _ ndation Visible on Aeria ') _ arsely Vegetated ncave Surface (B8)	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Notes:  HYDROLOG  Surface Wat  High Water T	er (A1)	Su Inu (B7	Iny one indicator is suff Iface Soil Cracks (B6) _ Indation Visible on Aeria Indation Visible on Aeria	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Notes:  HYDROLOG  Surface Wat  High Water T  Saturation (A	er (A1)  Fable (A2)	Su Inu (Bi Sp Co Ma	nny one indicator is suff face Soil Cracks (B6) _ ndation Visible on Aeria ') _ arsely Vegetated ncave Surface (B8)	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A	er (A1)  Fable (A2)  A3)  6 (B1)  eposits (B2)	Su Inu (B) Sp Co Ma  Hy Od	Inny one indicator is suff  Iface Soil Cracks (B6) Indation Visible on Aeria  Iface Soil Cracks (B8) Iface Surface (B8) If Deposits (B15) Iface drogen Sulfide Iface (C1) Iface Surface (B8) Iface Surface (B8) Iface Surface (B15)	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Wat High Water Saturation (A	er (A1)  Fable (A2)  A3)	Su Inu (B) Sp Co Ma  Hy Od	Inny one indicator is suff Iface Soil Cracks (B6) _ Indation Visible on Aeria Indation Visible on A	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A Water Marks Sediment De	er (A1)  Fable (A2)  A3)  6 (B1)  eposits (B2)	Su Inu (B7 Sp Co Ma Hy Od Dn Wa	Inny one indicator is suff  Iface Soil Cracks (B6) Indation Visible on Aeria  Iface Soil Cracks (B8) Iface Surface (B8) If Deposits (B15) Iface drogen Sulfide Iface (C1) Iface Surface (B8) Iface Surface (B8) Iface Surface (B15)	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	er (A1)  Fable (A2)  A3)  5 (B1)  eposits (B2)  s (B3)	Su Inu (B7 Sp Co Ma Hy Od Dn Wa	rface Soil Cracks (B6) _ ndation Visible on Aeria //) arsely Vegetated ncave Surface (B8) rl Deposits (B15) drogen Sulfide or (C1) /-Season atter Table (C2)	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	er (A1)  Fable (A2)  A3)  5 (B1)  eposits (B2)  S (B3)  Crust (B4)  S (B5)	Su Inu (B7 Sp Co Ma Hy Od Dn Wa	Inny one indicator is suff Inface Soil Cracks (B6) Indation Visible on Aeria Inface Sufface (B8) Inface Surface (B8) Inface Sufface (B8) Inface Suffac	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or	er (A1)  Fable (A2)  A3)  5 (B1)  eposits (B2)  S (B3)  Crust (B4)	Su Inu (B7 Sp Co Ma Hy Od Dn Wa	rface Soil Cracks (B6) _ ndation Visible on Aeria //) arsely Vegetated ncave Surface (B8) rl Deposits (B15) drogen Sulfide or (C1) /-Season atter Table (C2)	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10) pizospheres along s (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or Iron Deposit	er (A1)  Fable (A2)  A3)  5 (B1)  eposits (B2)  S (B3)  Crust (B4)  S (B5)	Su Inu (B7 Sp Co Ma Hy Odd Dr Wa	Inny one indicator is suff Inface Soil Cracks (B6) Indation Visible on Aeria Inface Sufface (B8) Inface Surface (B8) Inface Sufface (B8) Inface Suffac	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10)izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Wat High Water Saturation (A Water Marks Sediment De Drift Deposit Algal Mat or Iron Deposit Surface Wat Water Table Saturation P	er (A1)  Fable (A2)  A3)  Exposits (B2)  S (B3)  Crust (B4)  S (B5)  er Present (Y/N):	Su Inu (B7 Sp Co Ma Hy Od Dry Wa	Inny one indicator is suffrace Soil Cracks (B6) Indation Visible on Aeria (1) Indation Visible on Aeria (2) Indation Visible on Aeria (3) Indation Visible on Aeria (2) Indation Visible on Aeria (3) Indation Visible on Aeria (1) Indation Visibl	al Imagery	Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10) pizospheres along s (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix	/
Primary Vegetation Type (P):     Vegetation Lacking     Forested-Deciduous-Needle-leaved     Forested-Evergreen-Needle-leaved     Scrub Shrub-Deciduous-Needle-leaved     Scrub Shrub-Scrub Shrub-Evergreen-Needle-leaved     Scrub Shrub-Evergreen-Needle-leaved     Emergent-Persistent	orested-Deciduous-Broad-leaved Deciduous-Broad-leaved Non-persistent Energent-
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)           Dwarf shrub (<0.5m)	Short shrub (0.5-2m) Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Hig	
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (80-100%) Very High Density (80-100%)	sity (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover N/A	eral cover 26-75% Scattered of
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>26	
Presence of Islands (M): Absent (none) One or Few Several to Many	N/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems1 or Mor	re Large Patches; Parts of Site
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of s Abundant (>50% of surface)	surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular High (small groupings, diverse and interspersed)	rings)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine _	Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol: S	anric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey	арпо <u></u>
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey	арпо
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Claye	Intermittent Inlet/No
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Claye	Intermittent Inlet/No
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Sets on the Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Sets on the Inlet/Intermittent Outlet Perennial Outlet	etIntermittent Inlet/No rennial Inlet/No Outlet Perennia
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Claye	etIntermittent Inlet/No ennial Inlet/No Outlet Perennia e Fluvaquent Soils Sediment
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Per Inlet/Intermittent Inlet/Intermittent Outlet Per Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded Sediment Observed on Wetland Substrate Created Sediment Observed on Wetland Substrate Greated Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 vrs	et Intermittent Inlet/No rennial Inlet/No Outlet Perennia rennial Inlet/No Outlet Perennia
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Per Inlet/Intermittent Inlet/Intermittent Outlet Per Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outle	etIntermittent Inlet/No rennial Inlet/No Outlet Perennia eFluvaquent Soils Sediment n.) Pronounced (>18in.)
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet P	Intermittent Inlet/No ennial Inlet/No Outlet Perennia  Fluvaquent Soils Sediment  n.) Pronounced (>18in.)  eturn Interval 2-5 yrs  pH Reading
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Per Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet	Intermittent Inlet/No ennial Inlet/No Outlet Perennia  Fluvaquent Soils Sediment  n.) Pronounced (>18in.)  eturn Interval 2-5 yrs  pH Reading  ty Stratified Deposits
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Inlet/Perennial Outlet Perennial Outlet Inlet/Perennial Outlet Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Inlet/Per	Intermittent Inlet/No ennial Inlet/No Outlet Perennia  Fluvaquent Soils Sediment  n.) Pronounced (>18in.)  eturn Interval 2-5 yrs  pH Reading  ty Stratified Deposits
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Claye	Intermittent Inlet/No ennial Inlet/No Outlet Perennia  Fluvaquent Soils Sediment  n.) Pronounced (>18in.)  eturn Interval 2-5 yrs  pH Reading  ty Stratified Deposits
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey Mineral: Clayey Mineral: Clayey Mineral: Clayey Mineral: Silty Mineral: Clayey Mineral: Clayey Mineral: Silty Mineral: Clayey Mineral: Clayey Mineral: Silty Mineral: Clayey	Intermittent Inlet/No ennial Inlet/No Outlet Perennia  Fluvaquent Soils Sediment  Pronounced (>18in.)  eturn Interval 2-5 yrs  pH Reading  ty Stratified Deposits  ng Perennial Spring  nly Connected Below
Mineral: Gravelly Mineral: Sandy Mineral: Sitty Mineral: Clayey  HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet	Intermittent Inlet/No Perennia Perennia Inlet/No Outlet Perennia Perennia Pronounced (>18in.) Pronounced (>18in.) Perennia Pronounced Pronou
Mineral: Gravelly Mineral: Sandy Mineral: Sitty Mineral: Clayey  HYDROLOGIC VARIABLES  HYDROLOGIC VARIABLES  Intermittent Class (P): No Inlet/Outlet	Intermittent Inlet/No ennial Inlet/No Outlet Perennia e Fluvaquent Soils Sediment n.) Pronounced (>18in.) eturn Interval 2-5 yrs  pH Reading ty Stratified Deposits  ng Perennial Spring  nly Connected Below

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		Field Target: 115 Date: 7/2/14 s not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	e Description
	NA NA NA	Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
	AND	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	So	il
	A A	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
	A A	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	A	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	<i>A</i> P	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Ma	ips
	<b>3</b>	Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

#### 8. Photos



Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

WETLAND DETERMINATION DATA FORM 2000 Ct conidos SITE DESCRIPTION Map Date: 6 27 | Field Target: 114 Other (explain) Survey Type: Centerline\_ Access Road (explain)\_ Project Name & No.: Alaska LNG 26221306 Feature Id: W61 HTOI Date: Team No.: W6 Investigators: Anderson Milepost: Region: Alaska State: Alaska Longitude: 150° 15'48-13 Datum: WGS84 Latitude: ⓒ 3 ' 3 3 ' 5 7 . 1 6 Picture No.: P\_W61HT017\_Pit; Plus, E, S Logbook Page No.: 23 Logbook No.: SITE PARAMETERS Landform (hillslope, terrace, hummocks, etc.): Southcentral Subregion: Local relief (concave, convex, none): Slope (%): Soil Map Unit Name: Pre-mapped Alaska LNG/NWI classification: Are "Normal Circumstances" present: Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in Notes.) No (if no explain in Notes) Yes\_ (If yes, explain in Notes) Significantly Disturbed? Are Vegetation Soil Naturally Problematic? (If yes, explain in Notes.) or Hydrology Are Vegetation\_ , Soil **SUMMARY OF FINDINGS** Is the Sampled Area within a Wetland? Hydrophytic Vegetation Present? Yes Wetland Type: UPLA M Hydric Soil Present? Wetland Hydrology Present? Alaska Vegetation Classification (Viereck): Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor. # Phot Size altered to capture very community a bottom of local depression See Poglook Wel-2, page 23 for Site stetch & notes

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 20)  1. NA  2.	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2 (A  Total Number of Dominant Species Across All Strata: 3 (B  % Dominant Species that are OBL, FACW, or FAC: 6(A/B)
3. 4. Total Cover 50% of total cover		0% of total co	ver:	Prevalence Index worksheet:  Total % Cover of: Multiply by:  OBL species: X 1 =
Sapling/Shrub Stratum ( 20 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $X2 = $ FAC species $X3 = 234$ FACU species $X4 = 80$
1. Alnus fruticosa 2. Oplopanux horridus 3.	55	У	FACU	UPL species
5. 6. 7,				
8. 9. Total Cover:	66			
50% of total cover:	30	% of total cov	ver: #12	
Herb Stratum ( 20 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Athyrium Cyclosorum 2. Cymrocatpium drypoteris 3. Callander Conference	3 10 20	\(\frac{1}{1}\)	FAC	Prevalence Index is ≤ 3,0  Morphological Adaptations¹ (Provide supporting data in Notes)
4. Equisatum sylvaticum 5. Oplopanux norridus	3	4	FAC FORU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
6. Botrypus Vivainianus 7.	5	8.	Facu	% Bare Ground % Cover of Wetland Bryophytes
9,				Total Cover of Bryophytes  Whater  Whydrophytic Vegetation Present (Y/N):
Total Cover:	16 41 23 20 260	% of total cov	er: 9.7%	Notes: (If observed, list morphological adaptations below):

SOIL		t	Date 12 14 Featu	re ID	GIH	TON		Soil Pit Required (Y/N)
	E DESCRIPTION: (		to the depth needed to				confirm the absence	of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	% Ty	/pe <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-1"							FINAL	Dry
1-9"	10 YR 3/2	35	25 YR 4/6 1	5	C	M	SIH loam	3
9-12"	10 YE 3/6	100						
				_				
1= 0.0-	testion D-Domin	tion DM	=Reduced Matrix, CS=0	Covered	Lor Co	ated Sand G	crains <sup>2</sup> l ocation:	PL=Pore Lining, M=Matrix.
	L INDICATORS	tion, raw	-Reduced Matrix, CS-C	Covered	10100	ated Sand C	D. Committee of the com	FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
			Alaska Gleyed (A	13)				hange (TA4) <sup>4</sup>
	stel (A1)		Alaska Redox (A1					Swales (TA5)
	on (A2) A3)		Alaska Gleyed Po					with 2.5Y Hue
		_	Alaska Gleyea i e	100 (711				without 5Y Hue or Redder Underlying
	lfide (A4)						Layer	
	urface (A12)		to a solid disabase of to	vetlend.	ما معامم ام	and an	Other (Explain	pe position must be present unless
One indicato disturbed or p		tation, or	ne primary indicator of v	vetiand	nyaroic	ogy, and an a	арргорпате тапивса	pe position must be present unless
<sup>4</sup> Give details	of color change in No		<u></u>	4h /inah		_		
Restrictive La	ayer (if present): Type	- 10	1+ Dep	ur (inch	28)			
Hudric Soil F	Present (Y/N):							
	Tesene (Trity:							ž.
Notes:								
HYDROLOG	Y PRIMARY INDICA	TORS (a	ny one indicator is suffi	cient)	8	SECONDAR	Y INDICATORS (2	or more required)
Surface Wate	er (A1)	Sur	face Soil Cracks (B6) _			Vater-staine		Stunted or Stressed Plants (D1)
		2.0	ndation Visible on Aeria		-	_eaves (B9)		
High Water T	able (A2)	(B7		iiiiage	'y [	Drainage Pa	tterns (B10)	Geomorphic Position (D2)
Saturation (A	.3)		arsely Vegetated		(	Oxidized Rhizospheres along		Shallow Aquitard (D3)
- Caranana (		Cor	ncave Surface (B8)			Living Roots (C3)  Presence of Reduced		Microtopographic
Water Marks	(B1)	Mai	rl Deposits (B15)			Iron (C4)		Relief (D4)
Sediment De	posits (B2)	Нус	Irogen Sulfide			Salt Deposits (C5)		FAC-Neutral Test (D5)
Sediment De	posits (D2)	Qui	or (C1)		Notes:			
Drift Deposits	s (B3)		-Season ter Table (C2)		Notes: Win locally concare depies			ly concerne depression
	0 (0)			·				•
Algal Mat or 0	Crust (B4)	_ Oth	er (Explain in Notes):					
Iron Deposits	s (B5)							
		- 1-7			The Control			4-10-01
Surface Water	er Present (Y/N): N		Depth (in):					N
Water Table	Present (Y/N):		Depth (in):		We	etland Hydr	ology Present (Y/N	1):
					-			
Saturation Pr			Depth (in):					
Notes:	mary mage)				1			
, 101001								

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0-5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cove</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Lov (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent Trone) One or Few Several to ManyN/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)       Moderate (broken irregular rings)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Sandy
Mineral: Gravelly Mineral: Sandy Mineral: Mineral: Clayey Mineral: Clayey
HYDROLOGIC VARIABLES
THE TOTAL OF TAKING LEG
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/ntermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pere
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Outlet

Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		we like the control of the control o
1.	Sit	e Description
	<b>4</b>	Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
	A ARREA	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	So	il
	4	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
	7	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	Ø	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	<b>P</b>	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate? Each logbook page is initialed and dated?
7.	Ma	ps
	A A	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

A	Four photos were taken for each Wetland Determination Data Form (2 vegetation,
1	soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X 0 . 0	0.	7/0/11
Jenniter Anderson	1 Donnie	moderson	1/2/14
Wetland Scientist (print)	Signature / Date		, , ,

X him DEGITIS X / Linkly 7/2/14

Field Crew Chief (print) Signature / Date

WETLAND DETERMINATION DATA FORM Zood Condor SITE DESCRIPTION Map #: \_\_\_\_\_\_Map Date:\_\_\_\_\_\_\_ Field Target: 113 Survey Type: Centerline Access Road (explain) Other (explain) Project Name & No.: Alaska LNG 26221306 Feature Id: WGI HTO18 Team No.: Wal Investigators: K DEGUTIS J Anderson Milepost: (045.4 State: Alaska Region: Alaska 53.18" 150° 15' 53.92" Latitude: 670 Longitude: Datum: WGS84 Picture No.: P\_ W61 HTO1B\_Pit; Plug; NE; SB Logbook Page No.: 24 Logbook No.: WG1-2 SITE PARAMETERS Landform (hillslope, terrace, hummocks, etc.): Devess un Subregion: South Contral Local relief (concave, convex, none): Slope (%): Pre-mapped Alaska LNG/NWI classification: Soil Map Unit Name: Are "Normal Circumstances" present: Are climatic/hydrologic conditions on the site typical for this time of year? (If no, explain in Notes.) (if no explain in Notes) Yes 😾 No Significantly Disturbed? ✓ (If yes, explain in Notes) , or Hydrology Are Vegetation\_ Are Vegetation\_\_\_ \_, Soil\_ , or Hydrology\_ Naturally Problematic? No (If yes, explain in Notes.) **SUMMARY OF FINDINGS** Is the Sampled Area within a Wetland? Wetland Type: PEM 15 Hydric Soil Present? Wetland Hydrology Present? Alaska Vegetation Classification (Viereck): ## 1 Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey Somple plot shope modified to only include grassed vegetation type.

Socialogook Wel-2, page 24

For site statch & notes

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 15 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)
1. NA				Total Number of Dominant Species Across All Strata: (B)
2.				% Dominant Species that are OBL, FACW, or FAC: (A/B)
3				and the same of the same of
4.				Prevalence Index worksheet:
Total Cove	r:			Total % Cover of: Multiply by:
50% of total cove	r: 20	1% of total cov	/er:	OBL species:3X 1 =3
Sapling/Shrub Stratum ( 15 <sup>t</sup> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
1. N/A				UPL species X 5 =
2.				Column Totals: (A) 157 (B)
3.				PI = B/A = 2.35
4.				
5.				
6.				
7.				
8.				
9.				
Total Cover				
50% of total cover	r: 20	% of total cov	er:	
VEGETATION (use scientific names of plants	s)			
Herb Stratum ( 15 )	Absolute % Cover	Dominant Species?	Indicator Status	Hydrophytic Vegetation Indicators:  O Dominance Test is > 50%
1. Colo. 1.	100	(Y/N)	FAL	Prevalence Index is ≤ 3.0
1. CAlamacrostis canadersis	3	4		Morphological Adaptations¹ (Provide supporting data in
2 A PHILIPPILES	2		OBL	Notes)
4. Machrocheeta			FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
5.	ļ			Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
				dictal set of problemate.
6.				
7.				% Bare Ground
8.				Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				WCover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover 50% of total cover	_	% of total cov	er:	Notes: (If observed, list morphological adaptations below):  Colanacrostis graving in large hummock hab.

SOIL PROFIL				, ,, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,			
	Matrix	20001100	Redox Features				
Depth inches)	Color (moist)	1 %	Color (moist)	% Typ	e¹ Loc²	Texture	Notes
2-1"	Color (molot)	+	Color (molety			Thatch I pal	4
-61	2.54 3/2	100				5117	catus alea
- (b	25/4/3	90	10 / 8 3/4	10 (	PL	5114	Saturated
Į IB	123.1		12 1 15 2				
						21	Di Di di di Mandali
	ncentration, D=Deple	etion, RN	/I=Reduced Matrix, C	S=Covered o	or Coated Sand		: PL=Pore Lining, M=Matrix.  FOR PROBLEMATIC HYDRIC SOILS
	L INDICATORS			(4.40)			
	stel (A1)		Alaska Gleyed				Change (TA4) <sup>4</sup>
	on (A2)		Alaska Redox				Swales (TA5)
	A3) Ifide (A4)		Alaska Gleyed	Pores (A15)		Alaska Redox Alaska Gleyed Layer	with 2.5Y Hue I without 5Y Hue or Redder Underlying
hick Dark Su	urface (A12)					Other (Explain	in Notes)
	eyer (if present): Type  Present (Y/N):			Depth (inches	):\\a"		
lydric Soil F	Present (Y/N):					ly Adjacent	to somple plot bedroed to parametrost or forces some
Hydric Soil F Notes: And	Present (Y/N):	neom	surface; Exc	n somple	plot; local	ly Adjacent to confirm no	
Hydric Soil F Notes: And	Present (Y/N):	ncomit	surface; Exc	n somple aded mu ufficient)	plot; local ltipe pits SECONDA Water-stain	RY INDICATORS (2	2 or more required) Stunted or Stressed
Hydric Soil F Notes: A pub HYDROLOG Surface Wate	Present (Y/N):	TORS (a	Surface; Exc.  any one indicator is surface Soil Cracks (Beandation Visible on Ae	n sample must ufficient)	SECONDA Water-stain Leaves (B9	ed  atterns (B10)	Stunted or Stressed Plants (D1)
Hydric Soil F Notes: HydroLog Surface Water High Water T	Present (Y/N):  Present (A1)  Present (A2)	TORS (a	Surface; Exc.  any one indicator is s  rface Soil Cracks (Be	n sample must be desired limagery	SECONDA  Water-stain Leaves (B9  Drainage Pour Country of the coun	ed outerns (B10) nizospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Hydric Soil F Notes:  HYDROLOG  Gurface Water  High Water T  Saturation (A	Present (Y/N):  Present (A1)  Present (A2)	TORS (a Su Inu (B7 Sp Co	any one indicator is surface Soil Cracks (Beandation Visible on Activation Visible on Ac	n sample musufficient)  Si)erial Imagery	SECONDA  Water-stain Leaves (B9  Drainage P	ed outerns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG  Gurface Water High Water T  Saturation (A  Water Marks	Present (Y/N):  Present (A1)  Present (A2)  Present (A2)  Present (A3)	Su Inu (B) Co	any one indicator is surface Soil Cracks (Beandation Visible on Aero) arsely Vegetated neave Surface (B8) and Deposits (B15) ard Deposits (B15) ard drogen Sulfide or (C1)	n sample musufficient)  Si)erial Imagery	SECONDA  Water-stain Leaves (B9  Drainage P  Oxidized RI Living Root  Presence o Iron (C4)  Salt Deposi	ed outerns (B10) nizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Present (A1)  Present (A1)  Present (A2)  Present (B1)  Present (B1)	TORS (a Su Inu (B7 Co Ma Hy Od	any one indicator is surface Soil Cracks (Beindation Visible on Aer) arsely Vegetated ncave Surface (B8) ard Deposits (B15) drogen Sulfide	n sample musufficient)  Si)erial Imagery	SECONDA  Water-stain Leaves (B9  Drainage P  Oxidized RI Living Root  Presence o Iron (C4)	ed hatterns (B10) hizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Wate High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Present (A1)  Present (A1)  Present (A1)  Present (B1)  Present (B1)  Present (B2)	Su Inu (B) Sp Co	any one indicator is surface Soil Cracks (Beandation Visible on Aero)  arsely Vegetated nacave Surface (B8)	of sample of the	SECONDA  Water-stain Leaves (B9  Drainage P  Oxidized RI Living Root  Presence o Iron (C4)  Salt Deposi	ed hatterns (B10) hizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG  Surface Water High Water T Saturation (A Water Marks Sediment Deposits  Algal Mat or (	Present (Y/N):  Present (P/N):	Su Inu (B) Sp Co	any one indicator is surface Soil Cracks (Beandation Visible on Aer)  arsely Vegetated ncave Surface (B8)  ard Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)	of sample of the	SECONDA  Water-stain Leaves (B9  Drainage P  Oxidized RI Living Root  Presence o Iron (C4)  Salt Deposi	ed hatterns (B10) hizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment Deposits Algal Mat or (I	Present (Y/N):	Su Inu (B) Co Ma Hy Od Dr. Wa	any one indicator is surface Soil Cracks (Beandation Visible on Aer)  arsely Vegetated ncave Surface (B8)  ard Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)	of sample of the	SECONDA  Water-stain Leaves (B9  Drainage P.  Oxidized RI Living Root  Presence o Iron (C4)  Salt Deposi  Notes:	ed  atterns (B10)  nizospheres along s (C3) f Reduced  ats (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Hydric Soil F Notes:  HYDROLOG  Surface Water High Water T Saturation (A Water Marks Sediment Deposits Algal Mat or (I Iron Deposits Surface Water	Present (Y/N):/ Present (Y/N)	Su Inu (B7 Co Ma	any one indicator is s  rface Soil Cracks (B6  indation Visible on A6  7)  arsely Vegetated ncave Surface (B8)  irl Deposits (B15)  drogen Sulfide for (C1)  y-Season ater Table (C2)  mer (Explain in Notes	of sample of the	SECONDA  Water-stain Leaves (B9  Drainage P.  Oxidized RI Living Root  Presence o Iron (C4)  Salt Deposi  Notes:	ed hatterns (B10) hizospheres along s (C3) f Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):     Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately evenX
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">— &lt; 25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
OOU WARMADI FO
SOIL VARIABLES  Soil Footore (R): Coil Locking Control Fibrical Fi
Soil Factors (P):       Soil Lacking       Histosol:Fibric       Histosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Outlet Intermittent Outlet Perennial Outlet Perennial Outlet Intermittent Inlet/Intermittent Inle
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check: GPS Technician QA/QC check: Cend And

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	Field Target: 113 Date: 7/2/14
	tems not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?
	Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

SITE DESCRIPTION				1		2 130
Survey Type: Centerline Acces	ss Road (explain)	Other (expl	ain)	Field Targ	jet: 117	Мар #: 83 Map Date: 621 М
Date: 73 14	Project Name & No.: A	Alaska LNG	26221306		Feature Id:	W61 147019
Investigators: K DE6 1719	J Anderson					Team No.: Wel
State: Alaska	Region: Alaska		Milepost:	645.94		
Latitude: 62 33' 25.70"		Longitude	: 150° 15'	46.16"		Datum: WGS84
Logbook No.: W61-2	Logbook Page No.: 2	6.	Picture No.;	P-461	HT019_	P.t. Plus: NE; NW
SITE PARAMETERS	- 10/1					
Subregion: Southentral			Landform (hi	llslope, terra	ce, hummocks	s, etc.): Slope
Slope (%): 3			Local relief (	concave, con	vex, none):	Convex
Pre-mapped Alaska LNG/NWI classifica	tion: UDIAND		Soil Map Uni			
Are climatic/hydrologic conditions on the Yes No (if no exp	e site typical for this time o ain in Notes)	of year?	Are "N Yes_	ormal Circur No	nstances" pre (If no, exp	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	drologySignificantly	y Disturbed?	No. K	(If yes, exp	olain in Notes	110
Are Vegetation, Soil, or Hy	drology Naturally Pr	roblematic?	No_ JO	(If yes, ex	plain in Notes	.)
SUMMARY OF FINDINGS					400	7 ~ X
Hydrophytic Vegetation Present? Yes_	No_ <i>D</i> _	ls	the Sampled	Area within	a Wetland?	YesNo
Hydric Soil Present? Yes_	No	_ w	etland Type:	Up	(AND	and the state of t
Wetland Hydrology Present? Yes_	No	— AI	aska Vegetatio	n Classificat	ion (Viereck):	IC3, II-B2, IIA
	Directional & North Arrow,  Show 15h-1	influenc		7		rline, Photo Locations, and Survey

VEGETATION (use scientific names of plant	s)						
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 3			
1. Belula neoglastara	35	Y	FACU	Total Number of Dominant Species Across All Strata: 6			
2. Picca glanca	10	Y	FAW	% Dominant Species that are OBL, FACW, or FAC: 50 (A			
3.							
L.				Prevalence Index worksheet:			
Total Cover			0	Total % Cover of: Multiply by:			
50% of total cover	: <u>\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\</u>	% of total cov	/er:	OBL species:X 1 =			
Sapling/Shrub Stratum( <u>26</u> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = FAC species X 3 = 315  FACU species X 4 = 268			
· Alaws fruiticosa	30	4	FAC	UPL species X 5 =			
Ribeo glandalosum	2	Leg-2	FACU	Column Totals: / 73 (A) 583 (B)			
3.			2	PI = B/A = 3.38			
1							
*II							
).							
Total Cover: 50% of total cover:	: <b>16</b> 20	% of total cov	rer: <u>6.2</u>				
/EGETATION (use scientific names of plants	5)						
Herb Stratum ( 26 )	Absolute	Dominant	Indicator				
	% Cover	Species? (Y/N)	Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%			
			Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0			
- CALAMAGOST. J CANAdonsis		(Y/N)	Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in			
CALAMAGOST J GANADONSIS	30	(Y/N)	Status  FAC FACU:	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)			
1- Calamagost. 3 Canadonsis 2- Crymnocaepium dryppteis 3- Athyrium clyclosorum 4- Equiselum Sylvaticum	30	(Y/N)	Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless			
CALAMAGOST. 3 CANADONSIS Crymnorarpium drypoteris Athquim cholosorum Equiselum Sylvaticum	30 20 35	(Y/N)	FAC FACU:	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)			
1. Calamagost. 3 Ganadonsis 2. Crymnocarpium drypoteris 3. Athyrium cyclososum 4. Equiselum Sylvaticum 5.	30 20 35	(Y/N)	FAC FACU:	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.			
Calamagnost & Canadonsis Crymnocarpium drynoplesis Athyrium cyclososum Equiselum Sylvaticum	30 20 35	(Y/N)	FAC FACU:	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground			
1- Calamagost. 3 Ganadonsis 2- Crymnoraepium dryopteris 3- Athquium clyclososum 4- Equiselum Sylvaticum 5-	30 20 35	(Y/N)	FAC FACU:	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.			
1- Calamagost 3 Ganadonsis 2- Crymnorarpium dryopteris 3- Athyrium clyclosorum 4- Equiselum Sylvaticum 5-	30 20 35	(Y/N)	FAC FAC FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes			
1. Calamagnost & Canadensis 2. Crymnocarpium drypotesis	30 20 35 10	(Y/N)	FAC FAC FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes			

SOIL			Date 7 5 14 Feature ID				Soil Pit Required (Y/N)
SOIL PROFI	LE DESCRIPTION: (D	escribe	to the depth needed to docum-	ent the i	ndicator or	confirm the absence	ce of indicators.)
Depth	Matrix		Redox Features				
(inches)	Color (moist)	%	Color (moist) % T	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
)-En						Fibrit	dru
- 10"	2.54 5/1	100				SUL Joan	may be influenced by as
0-1311	10 YR3/10	50					
0-1811	104 R 5/2	50					
				÷			
		1-1-1		The state of the s			the second
				-10			
		tion, RM	=Reduced Matrix, CS=Covere	d or Coa	ited Sand G		: PL=Pore Lining, M=Matrix.
	IL INDICATORS						FOR PROBLEMATIC HYDRIC SOILS
	istel (A1)		Alaska Gleyed (A13)				Change (TA4) <sup>4</sup>
Histic Epiped	lon (A2)		Alaska Redox (A14)			Alaska Alpine	Swales (TA5)
3lack Histic (	(A3)		Alaska Gleyed Pores (A1	5)			with 2.5Y Hue
Hydrogen Su	ılfide (A4)					Alaska Gleyed	I without 5Y Hue or Redder Underlying
Thick Dark S	urface (A12)			i laik		Other (Explain	in Notes)
		— ation, or	e primary indicator of wetland	hydrolog	gy, and an		ape position must be present unless
disturbed or p							
Give details	of color change in Not	es.	Depth (inch	00):			
(estrictive L	ayer (ii present). Type		Deptil (illen	CS)	-		
Notes:	-10" horizon	indu	les Ash-influenced so.	res; o	bes not	satisfy Alad	kn 254 thre indicator (No Pi
HYDROLOG	Y PRIMARY INDICAT	ORS (a	ny one indicator is sufficient)	S	ECONDAR	Y INDICATORS (2	2 or more required)
Surface Wate	er (A1)	Sur	ace Soil Cracks (B6)		/ater-staine eaves (B9)	Stunted or Stressed Plants (D1)	
High Water T	able (A2)	Inur (B7)	dation Visible on Aerial Image	ry D	rainage Pa	tterns (B10)	Geomorphic Position (D2)
Saturation (A	.3)	Spa Con	rsely Vegetated cave Surface (B8)		xidized Rhi ving Roots	zospheres along (C3)	Shallow Aquitard (D3)
Vater Marks	(B1)	Mar	Deposits (B15)	Р	resence of on (C4)		Microtopographic Relief (D4)
Sediment De	posits (B2)		rogen Sulfide r (C1)		alt Deposits	FAC-Neutral Test (D5)	
Orift Deposits	s (B3)	Dry-	Season er Table (C2)	N	otes:		1
Algal Mat or	Crust (B4)		er (Explain in Notes):				
ron Deposits	s (B5)						
WHY -	NO BEE		The state of				THE PARTY OF THE P
Surface Wate	er Present (Y/N): N		Depth (in):				N
- 1			Depth (in):	Wet	land Hydro	ology Present (Y/I	N):
Nater Table	•						
Water Table Saturation Pr (includes cap	resent (Y/N):		Depth (in)				

VEGETATION VARIABLES P= Plot, N	= Matrix
Forested Evergreen-Needle-leaved	Scrub Shrub-Evergreen-Needle-leaved
Percent Cover (R): Tree (>5 dbh, >6m tall)_ Dwarf shrub (<0.5m) Tall herb (≥1	Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse 80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open W ter (P): Peripheral Cover >75% cattered	100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant	species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Vig Solitary, Scattered Stems or More Large Patches; Parts of Site
Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and interspers	patches, concentric rings) Moderate (broken irregular rings)ed)
HGM Class (P): Slope Flat	Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES	A .
Soil Factors (P): Soil LackingMineral: GravellyMineral: Sandy_	Histosol: Fibric Histosol: Sapric Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, S	onally Flyoded, Temporarily Flooded, Saturated Semiperm. Flooded
Evidence of Sedimentation (P): No Eviden Created	ce Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absent	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Return Interval >5 yrs	verbank Flooding Return Interval 1-2 yrs Peturn Interval 2-5 yrs
	Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water C	ircumneutral (5.5-7.4)
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  High Permeability Stratified Deposits Low Permeability Stratified Deposits
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable Basin Topographic Gradient (M): Low	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  : High Permeability Stratified Deposits Low Permeability Stratified Deposits Scratified Deposits Figure 1.25%  Gradient (<2%) High Gradient (≥2%)
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  : High Permeability Stratified Deposits Low Permeability Stratified Deposits  Gradient (<2%) High Gradient (≥2%)
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See  LANDSCAPE VARIABLES (M) Wetland Juxt position: Wetland Isolate	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading D: High Permeability Stratified Deposits Low Permeability Stratified Deposits  Gradient (<2%) High Gradient (≥2%)  eps or Springs Seeps Observed Intermittent Spring Patennial Spring
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See  LANDSCAPE VARIABLES (M)  Wetland Juxt position: Wetland Isolate Only Connected Above Connected	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading D: High Permeability Stratified Deposits Low Permeability Stratified Deposits  Gradient (<2%) High Gradient (≥2%)  eps or Springs Seeps Observed Intermittent Spring Parennial Spring  ed Wetlands within 400m, Not Connected Only Connected Below
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See  LANDSCAPE VARIABLES (M)  Wetland Juxt position: Wetland Isolate Only Connected Above Connecte  Wetland Land Use: High Intensity (i.e., 2)	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  D: High Permeability Stratified Deposits Low Permeability Stratified Deposits  Gradient (<2%) High Gradient (≥2%)  Eps or Springs Seeps Observed Intermittent Spring Parennial Spring  End Wetlands within 400m, Not Connected Only Connected Below  dd Wetlands within 400m, Not Connected Only Connected Below
Water pH (P): No surface water C Surficial Glacial Deposit Under Wetland (P Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No See  LANDSCAPE VARIABLES (M) Wetland Juxt position: Wetland Isolate Only Connected Above Connecte Wetland Land Use: High Intensity (i.e., a)	ircumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  D: High Permeability Stratified Deposits Low Permeability Stratified Deposits  Gradient (<2%) High Gradient (≥2%)  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Intermittent Spring Parennial Spring  Exps or Springs Seeps Observed Only Connected Only Connected Below  Exps or Springs Seeps Observed Only Connected Only Connected Below  Exps or Springs Seeps Observed

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

			: W() W(6)   Field Target: 117 Date: 1/3/19
F	or a	ll iten	ns not checked, please provide detailed explanation in the notes section of data form.
	1		
	<b>1</b>	. Si	te Description
			Site description, site parameters and summary of findings are complete? A detailed site sketch is included in Jogbook?
	2	. Ve	egetation
		Ø	identification?
		ĮQ.	Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?
		<b>₽</b>	All dominant species have been determined and recorded per strata? Indicator status is correct for each species?
		P	
	3	. So	pil +
			Soil profile is complete? Appropriate hydric soil indicators are marked?
	4	. Ну	ydrology
			Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
	5	. Fu	unctions and Values
		Ø	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6	. Fi	eld Logbook
		Ø	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
		4	Each logbook page is initialed and dated?
	7	. М	aps
			Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X

Signature / Date

X

Signature / Date

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION			2000	of conider		1130	
Survey Type: Centerline Acce	ss Road (explain)	Other (expla		Field Targ	get:_116	Map #: 93   Map Date: 6   27   14	
Date: 7 3 14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	WGIHTOZO	
Investigators: K DEGS15	J Anderson					Team No.: W41	
State: Alaska	Region: Alaska		Milepost: (	645.3			
Latitude: 62° 33' 27.54"		Longitude	150° 15			Datum: WGS84	
Logbook No.: W61-2	Logbook Page No.:	27	Picture No.:	P_ W61 H	TO 20_ P.A	; Pluz; E; W.	
SITE PARAMETERS		Secretary Street					
Subregion: Southcentral			Landform (hil	Islope, terra	ce, hummocks	s, etc.): Flat	
Slope (%): 6			Local relief (d	concave, con	vex, none):	Nore	
Pre-mapped Alaska LNG/NWI classifica	ation: PEM 1/55173		Soil Map Unit	Name:			
Are climatic/hydrologic conditions on the Yes No (if no exp	e site typical for this time	of year?	Are "N Yes_X		nstances" pre (If no, exp	sent: olain in Notes.)	
Are Vegetation, Soil, or Hy	drology Significant	ly Disturbed?	No <b>/</b> O	_(If yes, exp	olain in Notes		
Are Vegetation, Soil, or Hy	drology Naturally F	Problematic?	No_X	_ (If yes, ex	plain in Notes	.)	
SUMMARY OF FINDINGS	No. of the last		11/2	-			
Hydrophytic Vegetation Present? Yes_	<u></u> №	ls	the Sampled A	Area within	a Wetland?	Yes No	
Hydric Soil Present? Yes_	<b>&gt;</b> № No	w	Wetland Type: PEMI /5513				
Wetland Hydrology Present? Yes_	<u>р</u> Nо	AI	Alaska Vegetation Classification (Viereck): 11 A 3, 1 C 2				
Notes and Site Sketch: Please include corridor.	Directional & North Arrow		*			rline, Photo Locations, and Survey	
		to Not	es é site	sket	ch		

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 200 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)  Total Number of Dominant Species Across All Strata: (B)
1. NIA				
2.				% Dominant Species that are OBL, FACW, or FAC:(A/B)
3.				
4.				Prevalence Index worksheet:
Total Cover		1.	l,	Total % Cover of: Multiply by:
50% of total cove	r: 20	% of total cov	/er:	OBL species: 76 X 1 = 76
Sapling/Shrub Stratum ( 24 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 34
1. Betula nana	30	Y	FAC	UPL species X 5 =
2. Phododendron groenlandicum	5		FAC	Column Totals: 135 (A) 229 (B)
"Chamaedanne Chiculota	15.	У	FACE	PI = B/A = 1.69
4. Andromeda política	1		FACW	
5. Picea maria Na	1		FACW	
6. VACCINIUM Oxycoccus	1		OBL	
7.				
8.				
9.				
Total Cover	53			
50% of total cover	:_ <b>36.5</b> 20	% of total cov	er: 10.6	
VEGETATION (use scientific names of plants	s)	-		
Herb Stratum ( 26 )	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
	% Cover	Species? (Y/N)	Status	Dominance Test is > 50%
1. Rubus chamemorous	7		FACW	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
2. Pala las I land as A	T		CALL	wiorphological Adaptations (Provide supporting data in

Herb Stratum( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Rubus chamemorous  2. Pediculais labradorica	7		FACW	Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
3. CAREX 5 Hebensis 4. CAREX VARINARY 5.	15	Y	OBL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
6. 7.				% Bare Ground
<ul><li>8.</li><li>9.</li></ul>				% Cover of Wetland Bryophytes  40 Total Cover of Bryophytes
	ver: <b>31.4</b> 20	% of total cov	er: 15	W Cover of Water  Hydrophytic Vegetation Present (Y/N):  Notes: (If observed, list morphological adaptations below):

SOIL PROFIL	E DESCRIPTION	(Describe	Date 7/3/14 Fea		the indicate	r or confirm the abeer	nce of indicators )
	Matrix	(Describe	Redox Features	to document	the malcate	Tor committee abser	ice of malcators.)
Depth (inches)	-	1 %	Color (moist)	% Typ	e <sup>1</sup> Loc	Texture	Notes
	Color (moist)	70	Color (moist)	76 Typ	e Loc		
0-18"						Fibric	Saturated
		4					
Type: C=Co	oncentration, D=Dep	letion, RI	M=Reduced Matrix, CS	S=Covered o	r Coated Sa	nd Grains. <sup>2</sup> Locatio	n: PL=Pore Lining, M=Matrix.
IYDRIC SOI	L INDICATORS					INDICATOR	S FOR PROBLEMATIC HYDRIC SOILS
listosol or H	istel (A1) 🔑		Alaska Gleyed (	(A13)		Alaska Color	Change (TA4) <sup>4</sup>
listic Epiped	lon (A2)		Alaska Redox (A	A14)		Alaska Alpine	e Swales (TA5)
Black Histiç (	A3)		Alaska Gleyed I	Pores (A15)			x with 2.5Y Hue
	Ifide (A4)	_				Alaska Gleye Layer	ed without 5Y Hue or Redder Underlying
	urface (A12)					Other (Explai	in in Notes)
One indicato	or of hydrophytic veg		one primary indicator o	f wetland hy	drology, and		cape position must be present unless
disturbed or p	of color obsesses in N	otoo					
Restrictive La	of color change in N	oles.	J/A De	anth (inches	):		
COULDIAC FO	ayor (ii prosont). Ty	Je	V/Fi	epui (illones	/·		
lydric Soil F	Present (Y/N):	. /		eptii (iiiciies			,
Hydric Soil F Notes:	Present (Y/N):	Y					(2 or more required)
Hydric Soil F Notes:	Present (Y/N):	Y			SECON	DARY INDICATORS	
Hydric Soil F Notes: HYDROLOG	Present (Y/N):	Y ATORS (		fficient)	SECON Water-s	DARY INDICATORS	Stunted or Stressed
Hydric Soil F Notes: HYDROLOG Surface Wate	Present (Y/N):  Y PRIMARY INDICA	ATORS (	any one indicator is surface Soil Cracks (B6)	fficient)	SECON Water-s Leaves	DARY INDICATORS ained	Stunted or Stressed Plants (D1)
Hydric Soil F Notes: HYDROLOG Surface Water High Water T	Y PRIMARY INDICA	ATORS (i	any one indicator is su rface Soil Cracks (B6) undation Visible on Aei	fficient)	SECON Water-s Leaves Drainag	DARY INDICATORS tained (B9) e Patterns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Hydric Soil F Notes: HYDROLOG Surface Water High Water T	Y PRIMARY INDICA	Su Int	any one indicator is surface Soil Cracks (B6)	fficient)	SECON Water-s Leaves Drainag Oxidize	DARY INDICATORS ained	Stunted or Stressed Plants (D1)
Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A	Y PRIMARY INDICA	Su Int	any one indicator is su rface Soil Cracks (B6) undation Visible on Aei 7) arsely Vegetated	fficient) rial Imagery	SECON Water-s Leaves Drainag Oxidize Living R Presence	DARY INDICATORS  Tained (B9)  Patterns (B10)  Rhizospheres along oots (C3)  e of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)	Su International Su	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Aer  7)  arsely Vegetated uncave Surface (B8)  arl Deposits (B15)	fficient) rial Imagery	SECON Water-s Leaves Drainag Oxidizee Living R Presence Iron (C4	DARY INDICATORS  Tained  B9)  Pe Patterns (B10)  Rhizospheres along  oots (C3)  e of Reduced  )	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A	Y PRIMARY INDICATE  OF (A1)  Table (A2)	ATORS (i	any one indicator is su rface Soil Cracks (B6) undation Visible on Aei 7)_ arsely Vegetated uncave Surface (B8)_	ifficient)	SECON Water-s Leaves Drainag Oxidizer Living R Presenction (C4	DARY INDICATORS  Tained (B9)  Patterns (B10)  Rhizospheres along oots (C3)  e of Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)	Sulling (B) Sp Cc Ma	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Ael  rfacely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide  lor (C1)  y-Season	rial Imagery	SECON Water-s Leaves Drainag Oxidizee Living R Presence Iron (C4	DARY INDICATORS  Tained  B9)  Pe Patterns (B10)  Rhizospheres along  oots (C3)  e of Reduced  )	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  s (B3)	Sulphartors (i	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Aer  rface Soil Cracks (B8)  arsely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide for (C1)  y-Season after Table (C2)	fficient)	SECON Water-s Leaves Drainag Oxidizer Living R Presenction (C4	DARY INDICATORS  Tained  B9)  Pe Patterns (B10)  Rhizospheres along  oots (C3)  e of Reduced  )	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)	Sulphartors (i	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Ael  rfacely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide  lor (C1)  y-Season	fficient)	SECON Water-s Leaves Drainag Oxidizer Living R Presenction (C4	DARY INDICATORS  Tained  B9)  Pe Patterns (B10)  Rhizospheres along  oots (C3)  e of Reduced  )	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  s (B3)	Sulphartors (i	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Aer  rface Soil Cracks (B8)  arsely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide for (C1)  y-Season after Table (C2)	fficient)	SECON Water-s Leaves Drainag Oxidizer Living R Presenction (C4	DARY INDICATORS  Tained  B9)  Pe Patterns (B10)  Rhizospheres along  oots (C3)  e of Reduced  )	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	Present (Y/N):  Y PRIMARY INDICA  er (A1)  fable (A2)  (B1)  posits (B2)  crust (B4)	Sulphartors (i	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Aer  rface Soil Cracks (B8)  arsely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide for (C1)  y-Season after Table (C2)	fficient)	SECON Water-s Leaves Drainag Oxidizer Living R Presenction (C4	DARY INDICATORS  Tained  B9)  Pe Patterns (B10)  Rhizospheres along  oots (C3)  e of Reduced  )	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or (	Present (Y/N):  Y PRIMARY INDICA  er (A1)  Table (A2)  (B1)  posits (B2)  Crust (B4)  6 (B5)	Sulphartors (i	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Aer  rface Soil Cracks (B8)  arsely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide for (C1)  y-Season after Table (C2)	fficient)	SECON Water-s Leaves Drainag Oxidizee Living R Present Iron (C4 Salt De	DARY INDICATORS  ained (B9) e Patterns (B10) d Rhizospheres along oots (C3) e of Reduced ) posits (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or ( ron Deposits	Present (Y/N):  Y PRIMARY INDICA  er (A1)  Table (A2)  (B1)  posits (B2)  Crust (B4)  is (B5)  er Present (Y/N):	Su Su Inu (B Sp Ccc Ma Hy Occ Dr Wi	any one indicator is su  rface Soil Cracks (B6)  undation Visible on Aer  rface Soil Cracks (B6)  arsely Vegetated uncave Surface (B8)  arl Deposits (B15)  drogen Sulfide lor (C1)  y-Season ater Table (C2)  her (Explain in Notes):  Depth (in):	rial Imagery	SECON Water-s Leaves Drainag Oxidizee Living R Present Iron (C4 Salt De	DARY INDICATORS  ained (B9) e Patterns (B10) d Rhizospheres along oots (C3) e of Reduced ) posits (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil F Notes:  HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or (	Present (Y/N):	Su Su Inu (B Sp Ccc Ma Py Occ Dr Wi	any one indicator is surface Soil Cracks (B6) undation Visible on Aeronal Vegetated surface (B8)	rial Imagery	SECON Water-s Leaves Drainag Oxidizee Living R Present Iron (C4 Salt De	DARY INDICATORS  ained (B9) e Patterns (B10) d Rhizospheres along oots (C3) e of Reduced ) posits (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)           80%)         Very High Density (80-100%)         Very High Density (80-100%) <t< td=""></t<>
Interspersion of Cover & Open Water (P): 100% Cover or Open Water
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)       Moderate (broken irregular rings)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/No Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded Yetland Water Regime (P): Drier: Seasonally Flooded Yetland Water
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No O
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenni
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet P
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outle
Inlet/Outlet Class (P): No Inlet/Ottlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  Intermittent Inlet/No Outlet  Intermittent Inlet/Intermittent Inlet/Intermi
Inlet/Outlet Class (P): No Inlet/Ottlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Otflet  No Inlet/Intermittent Outlet  Intermittent Inlet/Intermittent Inlet

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Fe	ature	e ID: <u>WG1 HT070</u> Field Target: <u>UG</u> Date: 7/3/14
		items not checked, please provide detailed explanation in the notes section of data form.
		•
	1.	Site Description
		Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
	2.	Vegetation
		At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
<b>&gt;</b> 0		Vegetation names are entered legibly for all strata present? Cover calculations are complete and correct? All dominant species have been determined and recorded per strata? Indicator status is correct for each species? Dominance Test and Prevalence Index have been completed?
	3.	Soil
		Soil profile is complete? Appropriate hydric soil indicators are marked?
	4.	Hydrology
		Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
	5.	Functions and Values
		Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6.	Field Logbook
		Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
	7.	Maps
		Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Twổ photos were taken for each Observation Point (vegetation/site overview)?

X consider Anderson	X On la Anderon	7/2/14
Wetland Scientist (print)	Signature / Date	

X KIM DEGUTIS

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION						1 21	1
Survey Type: Centerline Acce	ess Road (explain)	Other (expl	ain)	Field Targ	jet: <u>074</u>	Map #: 5011	Map Date: 6 2411
Date: 7/8/14	Project Name & No.:	Alaska LNC	3 26221306	- 1	Feature Id	WOLHTOS	
Investigators: KZE6UTIS	I Anduson	6				Team No.: ພໍ	
State: Alaska	Region: Alaska		Milepost:	576.34	1	- 0	
Latitude: 63° 16' 48.35"		Longitude	: 1490 1	0 56	in it	Datum: WGS8	
Logbook No.: W61-2	Logbook Page No.:	Z <b>8</b>	Picture No.:	P_W61H7	DZ1. P.L.	Plug; W; E	
SITE PARAMETERS	19010				vaga.	July L	
			1 10 000				
Slope (%):			Landform (hil			s, etc.): FA	
N			Local relief (c		vex, none):	NONE	
Pre-mapped Alaska LNG/NWI classification and the climatic/hydrologic conditions on the	1 Parcell		Soil Map Unit				
Yes No (if no exp	lain in Notes)	of year?	1	ormal Circum		sent: plain in Notes.)	
Are Vegetation, Soil, or Hyd	drology Significantl	ly Disturbed?	No_P	_(If yes, exp	lain in Notes)	4.	
Are Vegetation, Soil, or Hyd	drology Naturally P	Problematic?	No_XO	(If yes, exp	lain in Notes	.)	
SUMMARY OF FINDINGS						91.91	1,
Hydrophytic Vegetation Present? Yes_	No	ls 1	the Sampled A	rea within a	Wetland?	Yes	No
Hydric Soil Present? Yes_	<u> </u>	We	etland Type:	PEMI	15510	6.	
Wetland Hydrology Present? Yes	No	- Ala	ska Vegetation	-	1		IIca
Notes and Site Sketch: Please include D	irectional & North Arrow,	Centerline, I	Length of featur	e, Distances	from Center	ine, Photo Locati	ons, and Survey
cornaor.	See logbook						
	for s	she ska	etch fr	inter			
						ii.	
						Der Der G	2 1 1
							74.5
							60 J.T.
			Y				
		- Long				12 X <sub>11</sub> <b>3</b> (24)	
		3					
							- 3

Tree Stratum (Plot sizes: 26	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Vicea glasses			FACU	% Dominant Species that are OBL, FACW, or FAC:
2.				
3.				
4.				Prevalence Index worksheet:
Total Cove				Total % Cover of: Multiply by:
50% of total cove	r: 20	% of total cov	ег:	OBL species: 66 X1 = 66
Sapling/Shrub Stratum(261)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = 14  FAC species 41 X 3 = 126  FACU species 44 X 4 = 64
1. Pieca JAUCA	3		FACU	UPL species X 5 =
2. Davidora FruticosA	5		FAC	Column Totals: 131 (A) 270 (B)
3. Arctous rubra	10	Y	FAC	PI = B/A = 2.06
4. Solix reticulada	3		FAC	
5. Betuka nana	10	Y	FAC	
6. VAccinium oxycoccus	1		OBL	
7. Empetrum nigrum	1		FAC	
8. VAccinium Ulishosum	3		FAC	Tree Stratum added to show 5 Nather
9. Salix autica	10	1	FACU	since There is 25% cours
Total Cove	er: 46 47		ver: 9.4	

Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Pedicularis labradorica 2. Sansuisorba canadensis	5		FACW FACW	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Geranium erianthum	2		FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4 Equisetum Arvense	8		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Tofieldia puzilla	2		FAC	disturbed or problematic.
6. Rubus Chamannorous	1		FACE	1.60
7. unknown herb (unto hid)	1		Petring	% Bare Ground
8. CAREX Aquatilus	55	y	OBL	% Cover of Wetland Bryophytes
9. Eleocharis aciularis	10		OBL	
10.				Hydrophytic Vegetation Present (Y/N):
Total Cover 50% of total cover	84 42 2	0% of total co	ver: 16 . <b>8</b>	Notes: (If observed, list morphological adaptations below):

SOIL PROFIL				eature ID [w	A PINCOL I		Soil Pit Required (Y/N)
	E DESCRIPTION: (	Describe	e to the depth needs	ed to documen	the indicator or	confirm the absence	
Depth Matrix			Redox Features				
(inches)	Color (moist)	%	Color (moist)	% Тур	e <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
0-18"						Fibric	Saturated
1- 00							
		etion, RM	M=Reduced Matrix,	CS=Covered o	r Coated Sand G	1	PL=Pore Lining, M=Matrix.
	INDICATORS			THE REAL PROPERTY.	Clington		FOR PROBLEMATIC HYDRIC SOILS
Histosol or His	stel (A1)			d (A13)			hange (TA4) <sup>4</sup>
	n (A2)		Alaska Redox				Swales (TA5)
	.3)		Alaska Gleye	d Pores (A15)			with 2.5Y Hue
Hydrogen Sulf	ide (A4)					Alaska Gleyed Layer	without 5Y Hue or Redder Underlying
Thick Dark Su	rface (A12)					Other (Explain	in Notes)
One indicator	of hydrophytic vege	etation, o	ne primary indicator	of wetland hy	drology, and an a		pe position must be present unless
disturbed or pr	oblematic. f color change in No		.1.				
Restrictive Lay	er (if present): Typ	e:/\	HA	Depth (inches)			
		,	1				
Hydric Soil Pr	resent (Y/N):	1					
Notes:							
Notes.							
HYDROLOGY	PRIMARY INDICA	TORS (a	any one indicator is s	sufficient)	SECONDAR	Y INDICATORS (2	or more required)
					Water-stained	d t	Stunted or Stressed
	PRIMARY INDICA  (A1)X	Sur	rface Soil Cracks (Bi	6)	Water-stained		Stunted or Stressed
Surface Water		Sur	rface Soil Cracks (Bo	6)	Water-stained Leaves (B9)	d 	Stunted or Stressed Plants (D1)
Surface Water High Water Ta	(A1)X ble (A2)	Sur Inu (B7	rface Soil Cracks (Bondation Visible on A	6)	Water-stained Leaves (B9) _ Drainage Pati	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Surface Water High Water Ta	(A1)X ble (A2)	Sur Inu (B7 Spa	rface Soil Cracks (Bo	6)	Water-stained Leaves (B9) _ Drainage Pati	terns (B10)	Stunted or Stressed Plants (D1)
Surface Water High Water Tal Saturation (A3)	(A1)X ble (A2)X )	Sur Inu (B7 Spa Cor	rface Soil Cracks (Br ndation Visible on A ')arsely Vegetated ncave Surface (B8)	erial Imagery	Water-stained Leaves (B9)	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water High Water Tal Saturation (A3)	(A1)X ble (A2)	Sur Inu (B7 Spa Cor Ma	rface Soil Cracks (Bendation Visible on A ') arsely Vegetated ncave Surface (B8) rl Deposits (B15)	erial Imagery	Water-stained Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots (	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Surface Water High Water Ta Saturation (A3) Water Marks (B	(A1)X ble (A2)X )	Sur Inu (B7 Spa Cor Mar	rface Soil Cracks (Be ndation Visible on A ') arsely Vegetated ncave Surface (B8) rl Deposits (B15)	erial Imagery	Water-stained Leaves (B9)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water High Water Tal Saturation (A3) Water Marks (E	(A1)X	Sur Inu (B7 Spa Cor Mal	rface Soil Cracks (Be ndation Visible on A ') arsely Vegetated ncave Surface (B8) rl Deposits (B15) drogen Sulfide or (C1)	erial Imagery	Water-stained Leaves (B9)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Tal Saturation (A3) Water Marks (B	(A1)X	Sur Inu (B7 Spa Cor Ma Hyd Odd	rface Soil Cracks (Be ndation Visible on A ') arsely Vegetated ncave Surface (B8) rl Deposits (B15)	erial Imagery	Water-stained Leaves (B9) Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo	(A1) \( \omega \) ble (A2) \( \omega \) 31) \( \omega \) osits (B2) \( \omega \)	Sur Inu (B7 Spa Cor Mar Hyd Odd	rface Soil Cracks (Be ndation Visible on A ')	6)	Water-stained Leaves (B9) Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Drift Deposits (	(A1)	Sur Inu (B7 Spa Cor Mar Hyd Odd	rface Soil Cracks (Be ndation Visible on A ')	6)	Water-stained Leaves (B9) Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Drift Deposits (	(A1)	Sur Inu (B7 Spa Cor Mar Hyd Odd	rface Soil Cracks (Be ndation Visible on A ')	6)	Water-stained Leaves (B9) Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Drift Deposits ( Algal Mat or Cr ron Deposits (I	(A1)	Suri Inu (B7 Spa Con Man Hyd Odd Dry Wa	rface Soil Cracks (Bindation Visible on A  ')  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  -Season ter Table (C2)  ner (Explain in Notes	erial Imagery	Water-stained Leaves (B9) Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Drift Deposits ( Algal Mat or Cr ron Deposits (I	(A1)	Suri Inu (B7 Spa Con Man Hyd Odd Dry Wa	rface Soil Cracks (Be ndation Visible on A ')	erial Imagery	Water-stained Leaves (B9) Drainage Patition (Date of Floor (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Surface Water  High Water Tal  Saturation (A3)  Water Marks (B  Sediment Depo  Drift Deposits (  Algal Mat or Cr  ron Deposits (I  Surface Water	(A1)	Suri Inu (B7 Spa Con Man Hyd Odd Dry Wa	rface Soil Cracks (Bindation Visible on A  ')  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  -Season ter Table (C2)  ner (Explain in Notes	erial Imagery	Water-stained Leaves (B9) Drainage Patition (Date of Floor (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Drift Deposits ( Algal Mat or Cr ron Deposits (I Surface Water Water Table Pr Saturation Pres	(A1)	Sur Inu (B7 Spa Cor Ma Hyc Odd Dry Wa Oth	rface Soil Cracks (Be notation Visible on A ()	erial Imagery	Water-stained Leaves (B9) Drainage Patition (Date of Floor (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Surface Water High Water Tal Saturation (A3) Water Marks (E Sediment Depo Drift Deposits ( Algal Mat or Cr ron Deposits (I Surface Water Water Table Pr Saturation Pres Includes capilla	(A1)	Sur Inu (B7 Spa Cor Ma Hyc Odd Dry Wa Oth	rface Soil Cracks (Be notation Visible on A ()	erial Imagery	Water-stained Leaves (B9) Drainage Patition (Date of Floor (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Gurface Water High Water Tal Saturation (A3) Vater Marks (B Sediment Depo Orift Deposits ( NIgal Mat or Cr oron Deposits (I Surface Water Vater Table Pr Saturation Pres Includes capilla	(A1)	Sur Inu (B7 Spa Cor Ma Hyc Odd Dry Wa Oth	rface Soil Cracks (Be notation Visible on A ()	erial Imagery	Water-stained Leaves (B9) Drainage Patition (Date of Floor (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Surface Water  High Water Tal  Saturation (A3)  Water Marks (B  Sediment Depo  Drift Deposits (  Algal Mat or Cr  ron Deposits (I  Surface Water  Water Table Pr  Saturation Pres	(A1)	Sur Inu (B7 Spa Cor Ma Hyc Odd Dry Wa Oth	rface Soil Cracks (Be notation Visible on A ()	erial Imagery	Water-stained Leaves (B9) Drainage Patition (Date of Floor (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) 3 Tall shrub (2-6m) Short shrub (0.5-2m) 18  Dwarf shrub (<0.5m) 2 Short shrub (≥1m) Short herb (<1m) 84 Moss-Lichen 55 Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover_
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric_
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perenni
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Becomiel Society
Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check: GPS Technician QA/QC check: Jemfy Anderson

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		4 :
		W61HT071 Field Target: 074 Date: 7/5/19 s not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	e Description
		Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
		At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	So	il
		Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
		Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fui	nctions and Values
	<b>Æ</b>	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	ld Logbook
		Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate? Each logbook page is initialed and dated?
7	Ma	

#### 7. Maps

- Wetland boundaries have been corrected if necessary?

  Maps are initialed and dated?

8. Photo:	S
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P	Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1
	soil pit, 1 soil plug)?
	Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X Jana la	anders T	1/5/14
Wetland Scientist (print)	Signature / Date		

X Lim DEGUTS X Mills 14/4 7/5/14

Field Crew Chief (print) Signature / Date

SITE DESCRIPTION				- 4	1130 . 110
Survey Type: Centerline Acce	ss Road (explain)(	Other (expla	ain)	Field Target: <u>073</u>	Map #: 50 Map Date: 6 241
Date: 7/5/14	Project Name & No.: A	Alaska LNG	26221306	Feature I	d: W61 HT622
Investigators: K X6013	J Anderson	J			Team No.: W6 /
State: Alaska	Region: Alaska		Milepost:	576.2	Halle
Latitude: 63° 18' 54.04"		Longitude	149° 10'		Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:	28	Picture No.:	P-W61HT022-	PA; Plug N : E
SITE PARAMETERS	IC-				1.10
0.1.			Landform (hil	Islope, terrace, hummoc	ke etc.): CIAI
Slope (%):				oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	ition: Dec . 13		Soil Map Unit		convex
Are climatic/hydrologic conditions on the	1 1 2	f year?			esent:
Yes No (if no expl	ain in Notes)		TF C	ormal Circumstances" pr No (If no, ex	
Are Vegetation, Soil, or Hyd				_(If yes, explain in Note:	*-1-
Are Vegetation, Soil, or Hyd	orology Naturally Pro	oblematic?	No_X	_ (If yes, explain in Note	s.)
	<i>N</i>				
Hydrophytic Vegetation Present? Yes_	NO	_ Is 1	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes	No <i>C</i>	_ We	etland Type:	UPLAND	
Wetland Hydrology Present? Yes_	No	- Ala	ska Vegetation	Classification (Viereck)	PSS 1/43 %
Notes and Site Sketch: Please include D	irectional & North Arrow, 0	Centerline, L	ength of featur	re, Distances from Cente	erline, Photo Locations, and Survey
7.77					
Riz	nt at top ele	84	topo bre	ruk (2-3)	drop)
See 6	schook Wel-	R. Pa	gg 28	for notico	is site sketch
	4,			6	ERECIC:
				/ X VIE	KINC.
			(	I	Ba, ICI)
				CA	

VEGETATION (use scientific names of plants			,	
Tree Stratum (Plot sizes: 200	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC: (A)  Total Number of Dominant Species Across All Strata: (B)
1. Picea cloud	8	Y	FACE	% Dominant Species that are OBL, FACW, or FAC: (A/B)
2.		,		70 Bornmant Operate that are essay, 17 test, est 1 test, est 1 test, est 1 test, est 1 test, est 2 tes
3.				
4.				Prevalence Index worksheet:
Total Cover	8	H	10	Total % Cover of: Multiply by:
50% of total cover	:_4_ 20	% of total cov	rer:_2	OBL species: X1 = X1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 5 X 2 = 10  FAC species 150 71 X 3 = 575 710 8  FACU species 26 X 4 = 104
1. Betvler Glandulo SA	65	7	FAC	UPL species 15 - X 5 = -75
2. VACCINIUM Uliainosum	45	Y	FAC	Column Totals: 202 (A) 627 (B)
3. Empetrum nimum	2		FAC	PI = B/A = 3.10 3.35
4. Salix pulchra	5		FACW	
5. Ahus Eruticosa	15		FAC	
6. Vaccinium vitis-Idaga	2		FAC	
7. Spiraeu stevenil	8		FACU	1 ' as hely a that Direct / Tot - sa
8. Salx seedomyrsinites	715		FACIL	PL - NOT HISTER IN AK 2014 WE HAND PLANT LIST - SO CONSIDERED ON UPL SPECIES
9. Total Cover	•	% of total cov	ver: 31.4	
VEGETATION (use scientific names of plant	s)		les e	
Herb Stratum ( 26 (	Absolute % Cover	Dominant Species?	Indicator	Hydrophytic Vegetation Indicators:   Dominance Test is > 50%
	70 00101	(Y/N)	J	Prevalence Index is ≤ 3.0
1. Calamagnostis canadonsis	25	Y	FAC	Morphological Adaptations¹ (Provide supporting data in
2. Cornus canadans	10	У	FACU	Notes)
3. Daeschampsin CuespitosA	2		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				
7.		/		% Bare Ground
8.				% Cover of Wetland Bryophytes
9.			1.0	Total Cover of Bryophytes
10.				% Cover of Water Hydrophytic Vegetation Present (Y/N):
Total Cove		0% of total co	ver:_ <b>7.4</b> _	Notes: (If observed, list morphological adaptations below):

SOIL PROF	ILL DECOMM HOM. (D	0001100	to the actual need					
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	% Ty	/pe <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
1-511							Fibric	201
5-18"	10 YR 4/4	100					Sandy/loan	dry gravel
								,,,
						1		
Type: C=C	 oncentration, D≂Deplet	ion, RM	=Reduced Matrix	. CS=Covered	or Co	ated Sand 0	Prains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
	IL INDICATORS	BALL						FOR PROBLEMATIC HYDRIC SOIL
listosol or H	listel (A1)		Alaska Gley	ed (A13)			Alaska Color C	hange (TA4) <sup>4</sup>
	don (A2)			ox (A14)				Swales (TA5)
	(A3)			ed Pores (A15				with 2.5Y Hue
	ulfide (A4)						Alaska Gleyed Layer	without 5Y Hue or Redder Underlyin
hick Dark S	Surface (A12)						Other (Explain	in Notes)
		_ N						
	Present (Y/N):							
lotes:		4	y one indicator is	sufficient)	S	SECONDAR	Y INDICATORS (2	or more required)
lotes:	Present (Y/N):	ORS (ar	ny one indicator is		V	Vater-staine		Stunted or Stressed
lotes: IYDROLOG	Present (Y/N):	ORS (ar	ace Soil Cracks (l dation Visible on	B6)	- L	Vater-staine eaves (B9)	d	Stunted or Stressed Plants (D1)
IYDROLOG Surface Water T	Present (Y/N):	ORS (ar	ace Soil Cracks (I	B6) Aerial Imagery	- L	Vater-staine eaves (B9) Orainage Pat Oxidized Rhi	terns (B10)	Stunted or Stressed Plants (D1)
IYDROLOG aurface Water T aturation (A	Present (Y/N):	Surf Inun (B7) Spa Con	ace Soil Cracks (l dation Visible on	B6) Aerial Imagery	- L ' D C L	Vater-staine Leaves (B9) Orainage Pat Oxidized Rhi Living Roots Presence of	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
IYDROLOG Surface Water ligh Water T Saturation (A	Present (Y/N):	ORS (ar Surf Inun (B7) Spa Con Marl	ace Soil Cracks (I dation Visible on rsely Vegetated cave Surface (B8 Deposits (B15) _	B6) Aerial Imagery	- L  / D  C L  P  Ir	Vater-staine eaves (B9) Orainage Pat Oxidized Rhi iving Roots Presence of ron (C4)	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
IYDROLOG Surface Water T Saturation (A Vater Marks	Present (Y/N):  EY PRIMARY INDICATE  er (A1)  Fable (A2)  (B1)	Surf Inun (B7) Spa Con Mari Hyd Odo	ace Soil Cracks (I dation Visible on rsely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1)	B6) Aerial Imagery	- L D C L P Ir	Vater-staine eaves (B9) Orainage Pat Oxidized Rhi iving Roots Presence of ron (C4)	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water T Saturation (A Water Marks Sediment De	Present (Y/N):  BY PRIMARY INDICATOR  Er (A1)  Fable (A2)  (B1)  Eposits (B2)	Surf Inun (B7) Spa Con Marl Hyd Odo Dry- Wate	ace Soil Cracks (I dation Visible on sely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1)	B6)	- L D C L P Ir	Vater-staine Leaves (B9) Prainage Pat Exidized Rhi Living Roots Presence of I Fron (C4) Calt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  NYDROLOG  Surface Water  Saturation (A  Vater Marks  Sediment De  Prift Deposits	Present (Y/N):	Surf Inun (B7) Spa Con Marl Hyd Odo Dry- Wate	ace Soil Cracks (I dation Visible on rsely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1) Season er Table (C2)	B6)	- L D C L P Ir	Vater-staine Leaves (B9) Prainage Pat Exidized Rhi Living Roots Presence of I Fron (C4) Calt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Drift Deposits	Present (Y/N):  EY PRIMARY INDICATE  er (A1)  Fable (A2)  (B1)  posits (B2)  crust (B4)  is (B5)	Surf Inun (B7) Spa Con Marl Hyd Odo Dry- Wate	ace Soil Cracks (I dation Visible on rsely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1) Season er Table (C2)	B6)	- L D C L P Ir	Vater-staine Leaves (B9) Prainage Pat Exidized Rhi Living Roots Presence of I Fron (C4) Calt Deposits	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Drift Deposits Algal Mat or 6	Present (Y/N):  EY PRIMARY INDICATO  EY (A1)  Fable (A2)  (B1)  posits (B2)  Extra (B3)  Crust (B4)	Surf Inun (B7) Spa Con Marl Hydl Odo Dry- Wate	ace Soil Cracks (I dation Visible on rsely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1) Season er Table (C2)	B6)	- L  C L  P Ir  S	Vater-staine Leaves (B9) Prainage Pat Dxidized Rhi Living Roots Presence of Fron (C4) Salt Deposits Hotes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Water High Water T Saturation (A Vater Marks Sediment De Drift Deposits Algal Mat or 6 Ton Deposits	Present (Y/N):  EY PRIMARY INDICATO  EY (A1)  Fable (A2)  (B1)  posits (B2)  Crust (B4)  6 (B5)	ORS (ar Surf Inun (B7) Spa Con Marl Hyd Odo Dry- Wate	ace Soil Cracks (I dation Visible on rsely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1) Season er Table (C2) er (Explain in Note	B6)	- L  C L  P Ir  S	Vater-staine Leaves (B9) Prainage Pat Dxidized Rhi Living Roots Presence of Fron (C4) Salt Deposits Hotes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG  Gurface Water High Water T  Gaturation (A  Water Marks  Gediment De  Drift Deposits  Algal Mat or (  ron Deposits  Gurface Water  Water Table in	Present (Y/N):  EY PRIMARY INDICATE  EY PRIM	Surf Inun (B7) Spa Con Marl Hydi Odo Dry-Wate	ace Soil Cracks (I dation Visible on resely Vegetated cave Surface (B8 Deposits (B15) _ rogen Sulfide r (C1) _ Season er Table (C2) _ er (Explain in Note	B6)	- L  C L  P Ir  S	Vater-staine Leaves (B9) Prainage Pat Dxidized Rhi Living Roots Presence of Fron (C4) Salt Deposits Hotes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (1): Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shab (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (680-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered Peripheral Cover 275% Scattered Peripheral Cover 26-75% Scattered Peripheral Cover 275% Scattered Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Ve Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Ontinuous Cover
Dead Woody Material (P): Low Abundance (0-25% of sun ace) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol: Histosol: Sapric Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenn
Wetland Water Regime (P): Drier: Seas nally Flooded, Temporarily Flooded, Saturated
Created
Created  Microrelief of Wetland Surface (P):   Dosent Poorly Developed (6in.) Well Developed (6.18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Heturn Interval 2-5 yrs
Created  Microrelief of Wetland Surface (P): Obsent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Neturn Interval 2-5 yrs  Return Interval >5 yrs
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Observed Overland O
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Leturn Interval 2-5 yrs  Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface waiter Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Microrelief of Wetland Surface (P):bsent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs I eturn Interval 2-5 yrs  Return Interval >5 yrs Return Interval 1-2 yrs I eturn Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface writer Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  Surficial Glacial Deposit/Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Microrelief of Wetland Surface (P):bsent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs I eturn Interval 2-5 yrs  Return Interval >5 yrs Return Interval 1-2 yrs I eturn Interval 2-5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow  Water pH (P): No surface writer Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  Surficial Glacial Deposit/Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (518in.) Pronounced (>18in.)  Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Neturn Interval 2-5 yrs  Return Interval >5 yrs Neturn Interval 2-5 yrs Neturn Interval 1-2 yrs
Created   Microrelief of Wetland Surface (P): bsent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.)   Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs heturn Interval 2-5 yrs   Return Interval >5 yrs   Degree of Outlet Restriction (P): No Outflow Restricted Outflow   Unrestricted Outflow   Water pH (P): No surface writer Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Created         Microrelief of Wetland Surface (P):bsent
Created         Microrelief of Wetland Surface (P): bsent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.)
Created Microrelief of Wetland Surface (P): / obsent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in.) Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow Water pH (P): No surface writer Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Evidence of Seep/ and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Petennial Spring  LANDSCAPE/VARIABLES (M) Wetland Juktaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Connected Upstream & Downstream Unknown Wetland Justine High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)

Page 4 of 4

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	re ID: W614T022 Field Target: 073 Date: 7/5/19 items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	Ph	oto	9

7	Four photos were taken for each Wetland Determination Data Form (2 vegetation,
′	soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X Jenn fer anderson

X Jenn fer anderson

X Jenn fer anderson

X Jenn fer anderson

Signature / Date

'him DEG

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION						130
Survey Type: Centerline X Acce	ss Road (explain)	Other (e:	kplain)	Field Targ	et: <u>067</u>	Map #: 44 Map Date: 5 21 1
Date: 4/5/14	Project Name & No.:	Alaska L	NG 26221306		Feature Id	WGIHTOZ3
Investigators: L DEGJIS	JA	derso	~			Team No.: \NG(
State: Alaska	Region: Alaska		Milepost: 3	562.6		
Latitude: 64° 44' 57.3	4"	Longitu	de: 148° 50	0 44.7	3"	Datum: WGS84
Logbook No.: WG1-Z	Logbook Page No.:	31	Picture No.:	P. W61	HTOZ	3_P.F. Plus : NW. E
SITE PARAMETERS	-12 - 92					, , , , , ,
Subregion: Interior			Landform (hill	Islope, terrace	e. hummocks	s, etc.): FIA+
Slope (%): 4			Local relief (c			NONE
Pre-mapped Alaska LNG/NWI classifica	ition: PSSIEMI	R	Soil Map Unit			1001012
Are climatic/hydrologic conditions on the	site typical for this time		Are "No	ormal Circum		
Are Vegetation, Soil, or Hyd		tly Disturbe	d? No ×9	(If yes, expl		plain in Notes.)
Are Vegetation, Soil, or Hyd		Problemation	- 1	_(If yes, exp	1-7	the figure of the state
SUMMARY OF FINDINGS	- ratarany i	TODICITIALIC	7	_ (11 yes, exp	iaiii iii Notes	
Hydrophytic Vegetation Present? Yes_	Ψ No	_	ls the Sampled A	rea within∙a	Wetland?	Yes No
Hydric Soil Present? Yes_	P No	_	Wetland Type;	55 1/	EMI	B
Wetland Hydrology Present? Yes_		-	Alaska Vegetation	Classificatio	n (Viereck):	ICI, III AZ.
Notes and Site Sketch: Please include D corridor.						line, Photo Locations, and Survey
	See los		1. skotes	h & mote	<b>'</b> 2	
		107	Site So.			
						7-

Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
		(Y/N)		Total Number of Dominant Species Across All Strata:
1. N/A				% Dominant Species that are OBL, FACW, or FAC:(A
2.				. 80%
3.				
4. j				Prevalence Index worksheet:
Total Cove	r:			Total % Cover of: Multiply by:
50% of total cove	r: 20	% of total cov	rer:	OBL species: X 1 =
Sapling/Shrub Stratum( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 38
1. Betula NANA	20	Y	FAC	UPL species X 5 =
2. Vaccinium uliginosum	15.	Y	FAC	Column Totals: 148 (A) 415 (B)
3. Rhodo dendron groenbroku			FAC	PI = B/A = 2.87
4. Empetrum Nigrum.	2		FAC	
5. Vaccinium vitis-idaen	5		FAC	
	1.4		E44 1	
6. LASSIDDE tetragona"	14		FACU	
6. Cassiope tetrogona *	3		FAC	
7. Salix reticulates.		У	-	ins
8. Saliv anchoca -	3	<b>y</b>	FAC	(N)
8. Salix anctica 9. Salix pulchra Total Cove	3 15 30	Y	FACU FACU	(N)
8. Salix anctica * 9. Salix pulcha	3 15 30	y y 0% of total cov	FACU FACU	[w
8. Salix anchica  9. Salix pulchra  Total Cove  50% of total cove  VEGETATION (use scientific names of plan	3 15 30 r: 104 er: 52 20	y 0% of total cov	FACU FACU	
8. Salix anctica  9. Salix pulctra  Total Cove	3 15 30 r: 104 er: 52 20	Dominant Species?	FACU FACU	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26')	3 15 30 r: 104 er: 52 20 ts) Absolute	Dominant	FACU FACU Ver: 20.8 Indicator Status	Hydrophytic Vegetation Indicators:    → Dominance Test is > 50%  → Prevalence Index is ≤ 3.0
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 20' )	3 15 30 r: 104 er: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU  Indicator Status  FAC	Hydrophytic Vegetation Indicators:  Pominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26 )  1. Bistoria vivipara  2. Peterkes frieidus	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26')  1. Bistoria vivipara  2. Petestes frigidus	3 15 30 r: 104 er: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU  Indicator Status  FAC	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
8. Salix anchica  9. Salix politra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26')  1. Bistoria vivipara 2. Peterkes frieidus 3. Carex bisdouii 4.	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26')  1. Bistoria vivipara 2. Petaskes frizidus 3. Carex bisdonii 4. 5.	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26' )  1. Bistoria vivipara 2. Peterkes frieidus 3. Carex bisdowii 4. 5. 6.	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:   Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26' )  1. Bistoria vivipara 2. Petaskes friziolus 3. Carex bisdonii 4. 5. 6. 7.	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26' )  1. Bistoria vivipara 2. Peterkes friciolus 3. Carex bisglowii 4. 5. 6. 7. 8.	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground % Cover of Wetland Bryophytes
8. Salix anchica  9. Salix pulchra  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26' )  1. Bistoria vivipara 2. Petaskes friziolus 3. Carex bisdonii 4. 5. 6. 7.	3 15 30 104 or: 52 20 ts) Absolute % Cover	Dominant Species?	FACU FACU FACU Indicator Status FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground

SOIL PROF			ate 7/5 14 Fe					Soli Pit Required (Y/N)
	FILE DESCRIPTION: (E			to docum	ent the ir	ndicator or	confirm the absence	e of indicators.)
Depth	Matrix		Redox Features			1	P.	
inches)	Color (moist)	%	Color (moist)	% Т	ype <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
2-4"	1.0						Fibric	oraanics.
1 ~ 8"	104R 3/10	50						Mixed Matrix
1 17 11	a.54 4/2	50		10			Mineralish	MIXED Matrix
8+13"	2.5 4 4/1	20	104R4/10	10	C	PL	MineralSilty	distinct & Prominent
13"	Bedrock							
T 0-0	D. D. J.		D   11441 0				2	
	oncentration, D=Deple	tion, RM=	Reduced Matrix, C	S=Covere	d or Coat	ted Sand G		PL=Pore Lining, M=Matrix.
	OIL INDICATORS	4-1		(1.10)				FOR PROBLEMATIC HYDRIC SOILS
	distel (A1)		Alaska Gleyed	(A13)				hange (TA4) <sup>4</sup>
	don (A2)		Alaska Redox					Swales (TA5)
Black Histic	(A3)		Alaska Gleyed	Pores (A1	5)			vith 2.5Y Hue X
Hydrogen St	ulfide (A4)						Alaska Gleyed	without 5Y Hue or Redder Underlying
Thick Dark S	Surface (A12)						Other (Explain	in Notes)
lotes:								
HYDROLOG	BY PRIMARY INDICAT	ORS (an	y one indicator is su	fficient)	SE	CONDAR	Y INDICATORS (2	or more required)
Surface Wate	er (A1)		ce Soil Cracks (B6)			ater-staine		
ligh Water T	Гаble (A2)	Inund				aves (D3)		Stunted or Stressed Plants (D1)
	,	(B7)	lation Visible on Ae	rial Image	y Dra	ainage Pat	terns (B10)	Plants (D1)
Saturation (A	N3)	(B7) Spars	lation Visible on Ae sely Vegetated ave Surface (B8)		y Dra	ainage Pat	terns (B10)	Plants (D1)
	A3)	Spars Cond	sely Vegetated		Ox Liv Pre	ainage Pat	terns (B10) zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)
Vater Marks		(B7) Spars Cond Marl	sely Vegetated ave Surface (B8) _		Ox Liv Pre- Iro	ainage Pat kidized Rhiz ring Roots esence of F n (C4)	terns (B10) zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Marks Sediment De	s (B1)	(B7) Spars Cond Marl Hydro Odor Dry-S	sely Vegetated ave Surface (B8) Deposits (B15) ogen Sulfide		Ox Liv Pre Iro	ainage Pat kidized Rhiz ring Roots esence of F n (C4)	zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Marks Sediment De Drift Deposits	eposits (B2)	Marl Hydro Odor Dry-S Wate	sely Vegetated ave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  season		Ox Liv Pre Iro	ainage Pat kidized Rhiz ring Roots esence of f n (C4)	zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Marks Sediment De Drift Deposits	eposits (B2)	Marl Hydro Odor Dry-S Wate	sely Vegetated ave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  season r Table (C2)		Ox Liv Pre Iro	ainage Pat idized Rhiz ring Roots esence of f n (C4)	zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Marks Sediment De Drift Deposits Algal Mat or or Tron Deposits	s (B1) eposits (B2) s (B3) Crust (B4) s (B5)	(B7) Spars Conc Marl Hydre Odor Dry-S Wate	sely Vegetated ave Surface (B8) Deposits (B15) ogen Sulfide (C1) season r Table (C2) r (Explain in Notes):		Ox Liv Pre Iro	ainage Pat idized Rhiz ring Roots esence of f n (C4)	zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Vater Marks Sediment De Drift Deposits Algal Mat or or Tron Deposits	s (B1) eposits (B2) s (B3) Crust (B4)	(B7) Spars Conc Marl Hydre Odor Dry-S Wate	sely Vegetated ave Surface (B8)  Deposits (B15)  ogen Sulfide (C1)  season r Table (C2)		Ox. Dr. Ox. Liv. Press Iro	ainage Pat kidized Rhiz ring Roots esence of f n (C4) It Deposits tes:	zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Water Marks Sediment De Drift Deposits Algal Mat or or ron Deposits Surface Water	s (B1) eposits (B2) s (B3) Crust (B4) s (B5)	(B7) Spars Conc Marl Hydre Odor Dry-S Wate	sely Vegetated ave Surface (B8) Deposits (B15) ogen Sulfide (C1) season r Table (C2) r (Explain in Notes):		Ox. Dr. Ox. Liv. Press Iro	ainage Pat kidized Rhiz ring Roots esence of f n (C4) It Deposits tes:	zospheres along (C3) Reduced	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Sediment De Drift Deposits Algal Mat or or ron Deposits Surface Water Water Table Saturation Princludes cap	s (B1) eposits (B2) s (B3) Crust (B4) s (B5)	(B7) Spars Conc Marl Hydre Odor Dry-S Wate Othe	sely Vegetated ave Surface (B8)	ब् द	Ox Liv Pre Iro Sa No	ainage Pat didized Rhiz ring Roots esence of F n (C4) It Deposits tes:	zospheres along (C3) Reduced (C5)	Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) ○ Sapling (<5 dbh, <6m tall) ○ Tall shrub (2-6m) ○ Short shrub (0.5-2m) 75         Dwarf shrub (<0.5m) 2 Tall herb (≥1m) ○ Short herb (<1m) 44 Moss-Lichen ○ Floating ○ Submerged ○
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">— &lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A_
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  No Inlet/Perennial Outlet  Intermittent Inlet/No Outlet  Intermittent Inlet/Intermittent Inlet/Perennial Outlet  Perennial Inlet/Intermittent Outlet  Perennial Inlet/Intermittent Outlet  Perennial Inlet/Perennial Outlet  Perennial Ou
Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  No Inlet/Perennial Outlet  Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inl
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inl
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial
Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermit
Inlet/Outlet Class (P): No Inlet/Outlet

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		1.7			
Featur	e ID	: W61 #1023 Field Target: 067 Date: 7/5/14			
For all	item	s not checked, please provide detailed explanation in the notes section of data form.			
1.	Sit	te Description			
	9	Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?			
2.	Ve	getation			
	Ø	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?			
	يعو	Dominance Test and Prevalence Index have been completed?			
3.	Soil				
		Soil profile is complete? Appropriate hydric soil indicators are marked?			
4.	Hydrology				
	7	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?			
5.	5. Functions and Values				
	<b>F</b>	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?			
6.	Fie	eld Logbook			
	A P	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate? Each logbook page is initialed and dated?			
7.	Ма	Maps			
		Wetland boundaries have been corrected if necessary? Maps are initialed and dated?			

8.	Pł	าด	to	S

	Four photos were taken for each Wetland Determination Data Form (2 vegetation,
/	soil pit, 1 soil plug)?
	Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X Jennih anduson	7/5/14
Wetland Scientist (print)	Signature / Date	. , ,

X Kim DEGUTIS X Mally My 1/5/14

Field Crew Chief (print) Signature / Date

WETLAND DETERMINATION DATA FORM SITE DESCRIPTION Map #: 43 Map Date: 5 27 Survey Type: Centerline Field Target: 066 \_\_ Access Road (explain)\_\_\_\_ Other (explain) Feature Id: Well+Toz4 Project Name & No.: Alaska LNG 26221306 Date: Investigators: K DEGUTS J Anderson Team No.: WG State: Alaska Region: Alaska Milepost: 560.95 Latitude: 63' 26' 15.69 Longitude: 148° 49'37 14 Datum: WGS84 Picture No .: P\_WGIHTOZ4\_P.t; Pluz; N; W Logbook No.: 1261-2 Logbook Page No.: 32 SITE PARAMETERS Subregion: Intuio Landform (hillslope, terrace, hummocks, etc.): FIAT Slope (%): Local relief (concave, convex, none): NONE Pre-mapped Alaska LNG/NWI classification: PEMILSSIB Soil Map Unit Name: Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (if no explain in Notes) No\_ (If no, explain in Notes.) Soil No 10 (If yes, explain in Notes) Are Vegetation , or Hydrology\_ Significantly Disturbed? Are Vegetation\_ \_, Soil\_ , or Hydrology\_ Naturally Problematic? (If yes, explain in Notes.) **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes Is the Sampled Area within a Wetland? Hydric Soil Present? Wetland Type: PSS 1 B Wetland Hydrology Present? Alaska Vegetation Classification (Viereck): \_\_\_\_ C | Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor. See logrook Wel-2, page 32

			1	
Tree Stratum (Plot sizes:	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
1. Pices Sanca	1		FACU	
2.				% Dominant Species that are OBL, FACW, or FAC: _\to\overline{D}(\)
3.				
ł.				Prevalence Index worksheet:
Total Cover:				Total % Cover of: Multiply by:
50% of total cover:	_ <b>-5</b> 20	% of total cov	rer:_0.2_	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species:
Betda nona.	50.	Y	FAC	UPL speciesX 5 =
2. MAceinium Ulisinosum.	40.	Y	FAC	Column Totals: \ \ \ \ \ (A) _ 55 \ (B)
3. VAccinium vitis Polace	15		FAL	PI = B/A =
1. Rhododenshow guerlandicum	25		FAC	
5. Empetrum niquem	5		FAC	
5. Picen JAUCA	10 -		FACU	
VACCINIUM OXYLOCCUS	T		084	to the second
B. Jalix Scouleriana.	10		FAC	The stratum called to shows toother
9.				soul threwas 45% cores
50% of total cover		,	ver:31.,2	
VEGETATION (use scientific names of plants			T	
Herb Stratum ( <b>26</b> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Rubus Chamoemorous	8	Y W	FACW	Prevalence Index is ≤ 3.0
2. CAROX bizdowii	20	4	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3.		1		Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unles
5.				disturbed or problematic.
6.			•	
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10				% Cover of Water
IV.				Hydrophytic Vegetation Present (Y/N):
				Total Cover of Bryoph

Depth			Date 7 5 14 Feature ID 1			Soll Pit Required (Y/N)
		Describe	to the depth needed to docume	ent the indicator or	confirm the absence	ce of indicators.)
	Matrix		Redox Features			
inches)	Color (moist)	%	Color (moist) % T	ype <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
30-3					FIDRIC	dry
- 13"		V-			Fibric	Saturated
(311	Frozen					
	contration DeDoute	diam DA	L De tree d Marie 200 0		2	
		etion, Riv	I=Reduced Matrix, CS=Covered	or Coated Sand C		: PL=Pore Lining, M=Matrix.
	INDICATORS		Alaska Olavad (A40)		the state of the s	FOR PROBLEMATIC HYDRIC SOILS
	tel (A1)		Alaska Gleyed (A13)			Change (TA4) <sup>4</sup>
	n (A2)		Alaska Redox (A14)			Swales (TA5)
	3)		Alaska Gleyed Pores (A1	o)		with 2.5Y Hue
	de (A4)				Layer_	without 5Y Hue or Redder Underlying
	face (A12)				Other (Explain	in Notes)
One indicator of isturbed or pro	of hydrophytic veget	tation, o	ne primary indicator of wetland I	nydrology, and an	appropriate landsca	ape position must be present unless
Sive details of	color change in Not	tes.				
estrictive Laye	er (if present): Type	18	FOREN Depth (inche	es): 13(1		
ydric Soil Pre	esent (Y/N): 💥					
lotes:				*		
YDROLOGY	PRIMARY INDICAT	rors (a	ny one indicator is sufficient)	SECONDAR	Y INDICATORS (2	
urface Water	(A1)				- 111213111 (2	or more required)
		Sur	face Soil Cracks (B6)	Water-staine	d	Stunted or Stressed
	.50			Leaves (B9)	d	Stunted or Stressed Plants (D1)
igh Water Tab	ole (A2)		ndation Visible on Aerial Imager	Leaves (B9)	d	Stunted or Stressed Plants (D1)
		Inur (B7	ndation Visible on Aerial Imagen	Drainage Pat  Oxidized Rhiz	tterns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
		Inur (B7	ndation Visible on Aerial Imager	Drainage Pat Oxidized Rhi Living Roots	tterns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
aturation (A3)		Inur (B7 Spa Cor	ndation Visible on Aerial Imagen	Drainage Pat Oxidized Rhi Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
aturation (A3) /ater Marks (B	31)	Inur (B7 Spa Cor	ridation Visible on Aerial Imager rsely Vegetated cave Surface (B8)	Drainage Pat  Oxidized Rhi Living Roots  Presence of I Iron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3) /ater Marks (B	7	Inur (B7 Spa Cor Mar Hyd	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide or (C1)	Drainage Pat Oxidized Rhit Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3) /ater Marks (B ediment Depo	31)	Inur (B7 Spa Cor Mar Hyd Odd	ridation Visible on Aerial Imager rsely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season	Drainage Pat  Oxidized Rhi Living Roots  Presence of I Iron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3)  /ater Marks (B  ediment Depo  rift Deposits (B	31) ssits (B2)	Inur (B7 Spa Cor Mar Hyd Odd Dry- Wat	rsely Vegetated cave Surface (B8)  rogen Sulfide or (C1) Season er Table (C2)	Drainage Pat Oxidized Rhit Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3)  Jater Marks (B  ediment Depo  rift Deposits (B	31)	Inur (B7 Spa Cor Mar Hyd Odd Dry- Wat	ridation Visible on Aerial Imager rsely Vegetated cave Surface (B8) I Deposits (B15) rogen Sulfide or (C1) Season	Drainage Pat Oxidized Rhit Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
aturation (A3)  /ater Marks (B  ediment Depo  rift Deposits (E	B3)	Inur (B7 Spa Cor Mar Hyd Odd Dry- Wat	rsely Vegetated cave Surface (B8)  rogen Sulfide or (C1) Season er Table (C2)	Drainage Pat Oxidized Rhit Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3)  /ater Marks (B  ediment Depo  rift Deposits (E	31) ssits (B2)	Inur (B7 Spa Cor Mar Hyd Odd Dry- Wat	rsely Vegetated cave Surface (B8)  rogen Sulfide or (C1) Season er Table (C2)	Drainage Pat Oxidized Rhit Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3)  /ater Marks (B ediment Depo rift Deposits (E lgal Mat or Cru on Deposits (E	B3) ust (B4)	Inur (B7 Spa Corr Mar - Odd Dry: Wat	rsely Vegetated cave Surface (B8)  rogen Sulfide or (C1) Season er Table (C2)	Drainage Pat Oxidized Rhit Living Roots Presence of I	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
aturation (A3)  Vater Marks (B ediment Depo rift Deposits (E lgal Mat or Cru on Deposits (E urface Water F	B3) ust (B4)  Present (Y/N): N	Inur (B7 Spa Corr Mar - Odd Dry- Wat Oth	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide or (C1)  Season er Table (C2)  er (Explain in Notes):	Drainage Pat Oxidized Rhis Living Roots Presence of I Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
rift Deposits (E lgal Mat or Cru on Deposits (E urface Water F	B3) ust (B4)	Inur (B7 Spa Corr Mar - Odd Dry- Wat Oth	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):	Drainage Pat Oxidized Rhis Living Roots Presence of I Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Vater Marks (Bediment Depo Prift Deposits (Bediment	B3)	Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):  Depth (in): \  Depth (in): \	Drainage Pat Oxidized Rhis Living Roots Presence of I Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Vater Marks (B dediment Depo drift Deposits (B digal Mat or Cru on Deposits (B durface Water F Vater Table Pre	B3)	Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide or (C1)  Season er Table (C2)  er (Explain in Notes):	Drainage Pat Oxidized Rhis Living Roots Presence of I Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
aturation (A3)  /ater Marks (B ediment Depo rift Deposits (E lgal Mat or Cru on Deposits (E urface Water F /ater Table Pres	B3)	Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):  Depth (in): \  Depth (in): \	Drainage Pat Oxidized Rhis Living Roots Presence of I Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
aturation (A3)  /ater Marks (B  ediment Depo  rift Deposits (E  gal Mat or Cru  on Deposits (E  urface Water F  aturation Preserved	B3)	Inur (B7 Spa Cor Mar Hyd Odc Dry- Wat	rsely Vegetated cave Surface (B8)  I Deposits (B15)  rogen Sulfide r (C1)  Season er Table (C2)  er (Explain in Notes):  Depth (in): \  Depth (in): \	Drainage Pat Oxidized Rhis Living Roots Presence of I Iron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

Primary Vagetation Type (D): \	
Forested-Evergreen-Needle-leav	Vegetation LackingForested-Deciduous-Needle-leavedForested-Deciduous-Broad-leaved vedScrub Shrub-Deciduous-Needle-leavedScrub Shrub-Deciduous-Broad-leaved eavedScrub Shrub-Evergreen-Needle-leavedEmergent-Non-persistentEmergent- id
Percent Cover (P): Tree (>5 db Dwarf shrub (<0.5m) <u>20</u>	oh, >6m tall) Sapling (<5 dbh, <6m tall) \ Tall shrub (2-6m) \ Short shrub (0.5-2m) \ Short shrub (0.5-2m) \ Short herb (<1m) \ Short herb (<1m) \ Short shrub (0.5-2m) \ Short shrub
	Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance 80%) Very High Densi	<b>e (P)</b> : Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-ity (80-100%)
Interspersion of Cover & Open Peripheral Cover >	<b>Water (P)</b> : 100% Cover or Open Water <a href="https://www.example.com/">X</a> <25% Scattered/Peripheral Cover <a href="https://www.example.com/">26-75% Scattered of Peripheral Cover <a href="https://www.example.com/">N/A <a href="https://www.example.com/">25% Scattered/Peripheral Cover <a href="https://www.example.com/">26-75% Scattered of Peripheral Cover </a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a></a>

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: W6 HT024	Field Target: 06 6	Date: 7/5/14
For all items not checked, please provid	le detailed explanation in the note	es section of data form.

### 1. Site Description

- Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ▼ Vegetation names are entered legibly for all strata present?
- **S** Cover calculations are complete and correct?
- All dominant species have been determined and recorded per strata?
- Indicator status is correct for each species?
- Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Soil profile is complete?
- Appropriate hydric soil indicators are marked?

### 4. Hydrology

- Appropriate hydrology indicators are marked?
- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- Each logbook page is initialed and dated?

### 7. Maps

- Maps are initialed and dated?

### 8. Photos

赵	Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1
	soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X

Jennifer Anderson

Signature / Date

7/5/14

him JEGURS

Field Crew Chief (print)

signature / Date

SITE DESCRIPTION	1000	4.000	3000	Cr. Pr		140
Survey Type: Centerline Acce	ss Road (explain)	Other (exp	-	Field Target:_0	64	Map #: 471 Map Date: 5 21
Date: 7 1/1/4	Project Name & No.:					: W61HTOZS
	Anderson					Team No.: W6/
State: Alaska	Region: Alaska		Milepost:	560.05		1000
Latitude: 63° 26 29.67		Longitud	_	18 09.35	. In	Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:					
LOGDOOK NO (VOG) - X	Logbook Page No	54	Picture No.:	P. WEI HTO	25 _	P.t; Plug; N; W
SITE PARAMETERS		at his	1	No.		DIST TO SELECT
Subregion: Intain			Landform (hil	Islope, terrace, hui	mmock	s, etc.): Slope
Slope (%): 20			Local relief (c	concave, convex, n	one):	None
Pre-mapped Alaska LNG/NWI classifica	tion: PSSI EMIS	3	Soil Map Unit	Name;		
Are climatic/hydrologic conditions on the Yes No (if no expl	site typical for this time ain in Notes)	of year?	Are "No	ormal Circumstanc	es" pre no, ex	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	rology Significant	tly Disturbed	? No <u></u>	_(If yes, explain in	Notes	
Are Vegetation, Soil, or Hyd	rology Naturally F	Problematic?	No 10	_(If yes, explain ir	n Notes	s.)
SUMMARY OF FINDINGS	e the sol					
Hydrophytic Vegetation Present? Yes	10No	Is	the Sampled A	Area within a Wetl	and?	Yes No
Hydric Soil Present? Yes	0 No	w	etland Type:	Pss 1B		
Wetland Hydrology Present? Yes	<b>0</b> No	— А	laska Vegetatior	n Classification (Vie	ereck):	II CI
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow le plot locate (Declin					
	logbook W61					

VEGETATION (use scientific names of plant	s)			
Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)  Total Number of Dominant Species Across All Strata: (B)
1. NA				% Dominant Species that are OBL, FACW, or FAC: (A/B)
2.				W Dominant Species that are OBL, FACW, or FAC.
3,				
4.				Prevalence Index worksheet:
Total Cove			.l	Total % Cover of: Multiply by:
50% of total cove	r: 20	% of total cov	/er:	OBL species:X1 =
Sapling/Shrub Stratum( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 13
1. Belda Nava	30	Y	FAC	UPL species X 5 =
2. Vaccinium vitis-idoca	20	У	FAL	Column Totals: 66 (A) 495 (B)
3. Rhododenchow groenlandicum	15		FAC	PI = B/A =
4. Salix pulchra	10		FACW	
5. Empetrum nigrum	5		FAC	
6. Pices davca	10		FACU	
7. Alnus tenuisolia	3		FAC	
8. Vaccinium Ulginosum	35	y	FAC	
9. Dalix scouleriana	10		FAC	
Total Cove 50% of total cove		)% of total cov	ver: <u>27.6</u>	
VEGETATION (use scientific names of plant	s)		17.	
Herb Stratum(_ <b>26</b> )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  O Dominance Test is > 50%  Prevalence Index is ≤ 3.0
1. Rubus chamoenorous	3		FACW	Morphological Adaptations¹ (Provide supporting data in
2. CAREX loigelowii	20	Y	FAC	Notes)
3. Bistorta vivipara	5		FAC	Problematic Hydrophytic Vegetation¹ (Explain)
4.				<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				_36 Total Cover of Bryophytes
10.				% Cover of Water
	1.0			Hydrophytic Vegetation Present (Y/N):
Total Cove		O% of total co	ver: <b>5.6</b>	Notes: (If observed, list morphological adaptations below):

Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  **HYDRIC SOIL INDICATORS**    Indicator of Histel (A1)		F DESCRIPTION: (			Feature ID 126	111100		Soil Pit Required (Y/N)
Color (moist)   % Color (moist)   % Color (moist)   % Type   Loc   Texture   Notes	)enth	1	Describe	1		the indicator or o	confirm the absence	ce of indicators.)
Type: C=Concentration, D=Depletion, RM=Reduced Matrix. CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  **PVORIC SOIL INDICATORS** Historator or Histel (A1)						1 1		
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL INDICATORS    INDICATORS FOR PROBLEMATIC HYDRIC SOIL   Alaska Cleyed (A13)		Color (moist)	%	Color (moist)	% Type	Loc²		
Hydroc Soil Indicators   Alaska Gleyed (A13)	2-10						Fibric	SATURATED
INDICATORS   INDICATORS   INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOIL islisted (A1)   Alaska Color Change (TA4)   Islistic Epipedon (A2)   Alaska Redox (A14)   Alaska Color Change (TA4)   Alaska Chiestic (A3)   Alaska Redox (A14)   Alaska Redox with 2.5Y Hue   Alaska Gleyed without 5Y Hue or Redder Underlying Layer   Alaska Gleyed without 5Y Hue or Redder Underlying Layer   Cher (Explain in Notes)   Cher (Explain in Note		-						
Alaska Color Change (TA4)   Alaska Redox (A14)   Alaska Redox with 2.5 Y Hue   Alaska Gleyed without 5Y Hue or Redder Underlying Layer (Thick Dark Surface (A12)   Other (Explain in Notes)   Other (Exp			1			-		
INDICATORS FOR PROBLEMATIC HYDRIC SOIL   Islate   (A1)   Alaska Color Change (TA4)   Alaska Redox (A14)   Alaska Redox with 2.5 Y Hue   Alaska Gleyed without 5Y Hue or Redder Underlying Layer   Alaska Gleyed without 5Y Hue or Redder Underlying Layer   Other (Explain in Notes)   Othe								
Alaska Color Change (TA4)   Alaska Redox (A14)   Alaska Redox with 2.5 Y Hue   Alaska Gleyed without 5Y Hue or Redder Underlying Layer (Thick Dark Surface (A12)   Other (Explain in Notes)   Other (Exp		1						
INDICATORS FOR PROBLEMATIC HYDRIC SOIL   Islate   (A1)   Alaska Color Change (TA4)   Alaska Redox (A14)   Alaska Redox with 2.5 Y Hue   Alaska Gleyed without 5Y Hue or Redder Underlying Layer   Alaska Gleyed without 5Y Hue or Redder Underlying Layer   Other (Explain in Notes)   Othe								
Alaska Gloyed (A13) Alaska Color Change (TA4)*  Alaska Color Change (TA4)*  Alaska Redox (A14) Alaska Alpine Swales (TA5)  Alaska Redox (A14) Alaska Alpine Swales (TA5)  Alaska Redox (M14) Alaska Alpine Swales (TA5)  Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Investor (A12) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue  Alaska Gleyed Pores (A15) Alaska Crear Present with 5? Hue  Alaska Gleyed Pores (A15) Alaska Crear Present (YN): Alaska Crea	Type: C=Co	ncentration, D=Depl	etion, RN	л=Reduced Matri	x, CS=Covered or	Coated Sand G	rains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
Alaska Redox (A14)	YDRIC SOII	L INDICATORS					INDICATORS	FOR PROBLEMATIC HYDRIC SOILS
Alaska Gleyed Pores (A15)	listosol or His	stel (A1)		Alaska Gle	yed (A13)		Alaska Color (	Change (TA4)⁴
Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  The indicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless sturbed or problematic.  Since details of color change in Notes.  Sestrictive Layer (if present): Type:  Proposed Plants (P/N):  Proposed Plants (P/N):  Surface Soil Cracks (B8)  Inundation Visible on Aerial Imagery  (B7)  Sparsely Vegetated.  Sparsely Vegetated.  Sparsely Vegetated.  Sparsely Vegetated.  Sparsely Vegetated.  Sparsely Sparsely Surface (B8)  Inundation Visible on Aerial Imagery  (B7)  Addition (A3)  Sparsely Vegetated.  Sparsely Vegetated.  Sparsely Vegetated.  Sparsely Sparsely Sparsely Vegetated.  Sparsely Sparsely Sparsely Sparsely Sparsely Vegetated.  Sparsely Sparse				Alaska Red	dox (A14)	_	Alaska Alpine	Swales (TA5)
Layer   Color   Colo	lack Histic (A	43)		Alaska Gle	yed Pores (A15) _			
TYPROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface (A12)  Depth (inches):  Depth (inche	lydrogen Sul	fide (A4)						I without 5Y Hue or Redder Underlying
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isturbed or problematic.  Sive details of color change in Notes.  Water details of color change in Notes.  Property of present (Y/N):  Depth (inches):  Depth (inches)	hick Dark Su	ırface (A12)						in Notes)
Depth (inches):   Depth (inc	One indicator	r of hydrophytic vege	etation, o	ne primary indica	ator of wetland hyd	rology, and an a		
Interest (Y/N):    Secondary Indicators (any one indicator is sufficient)   Secondary Indicators (2 or more required)	isturbed or p Give details o	robiematic. of color change in No	otes.			5 11		
ANDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)	estrictive La	yer (if present): Typ	e: FR	ozen	Depth (inches):	10		
Surface Water (A1)	IVDBOI OGV	/ DDIMA DV INDICA	TODE /	nov one indicator	is sufficient\	SECONDARY	) INDICATORS (2	) or many spanished)
Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Plants (D1)    Injundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2)    Saturation (A3) Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3)    Water Marks (B1) Presence of Reduced Iron (C4) Relief (D4)    Sediment Deposits (B2) Salt Deposits (C5) FAC-Neutral Test (D5)    Orift Deposits (B3) Div-Season Water Table (C2)    Surface Water Present (Y/N): N Depth (in): Pepth (in)	ITDROLOGI	PRIMART INDICA	TURS (8	any one indicator	is sumcient)	SECUNDAR	INDICATORS (2	or more required i
Sparsely Vegetated Concave Surface (B8)	urface Water	r (A1)	I C			Motor stained		
Saturation (A3) Sparsely Vegetated Concave Surface (B8) Diving Roots (C3) Shallow Aquitard (D3) Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Sediment Deposits (B2) Pry-Season Water Table (C2) Other (Explain in Notes):  Surface Water Present (Y/N): N Depth (in): Staturation Present (Y/N): N		. ( /	Sui	rface Soil Cracks	(B6)			Stunted or Stressed
Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Living Roots (C3) Shallow Adultard (D3) // Concave Surface (B8) Shallow Adultard (D3) // Concave Shallo	ligh Water Ta		Inu	ndation Visible o		Leaves (B9)	_	Stunted or Stressed Plants (D1)
Activation Present (Y/N):  Wall Deposits (B1)  Water Table Present (Y/N):  Vater Table Present (Y/N):  Production (C4)  Iron (C4)  Salt Deposits (C5)  FAC-Neutral Test (D5)  Notes:  Notes:  Wetland Hydrology Present (Y/N):  Saturation Present (Y/N):  Popth (in):  Saturation Present (Y/N):		able (A2)	lnu (B7	ndation Visible of	n Aerial Imagery	Drainage Pati	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   Dry-Season Water Table (C2) Notes:  Indigal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N): N Depth (in): Wetland Hydrology Present (Y/N):   Surface Water Table Present (Y/N): N Depth (in):   Depth (in):  Depth (in):   Saturation Present (Y/N): Depth (in):   Depth (in):  Depth (in):   Depth (in):  Depth (in):  Depth (in):   Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):		able (A2)	lnu (B7	ndation Visible of	n Aerial Imagery	Leaves (B9) _ Drainage Pati Oxidized Rhiz Living Roots	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Odor (C1) Salt Deposits (C5) PAC-Neutral Test (D5)   Dry-Season Water Table (C2) Notes:  Other (Explain in Notes)   Surface Water Present (Y/N): N Depth (in):    Vater Table Present (Y/N): N Depth (in):    Salt Deposits (C5) PAC-Neutral Test (D5)   Notes:  Wetland Hydrology Present (Y/N):   Salt Deposits (C5) PAC-Neutral Test (D5)   Notes:  Wetland Hydrology Present (Y/N):   Depth (in):   Salt Deposits (C5) PAC-Neutral Test (D5)   Notes:  Value Table Present (Y/N): N Depth (in):	aturation (A3	able (A2)	- Inu (B7 Spa Co	ndation Visible of 7) arsely Vegetated ncave Surface (B	n Aerial Imagery	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Water Table (C2)	aturation (A3	able (A2)	Inu (B7 Sp: Co Ma	indation Visible or?) arsely Vegetated ncave Surface (Brl Deposits (B15) drogen Sulfide	98)	Drainage Pate Oxidized Rhiz Living Roots Presence of F Iron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Algal Mat or Crust (B4) Other (Explain in Notes):  on Deposits (B5)  Furface Water Present (Y/N): N Depth (in):  Water Table Present (Y/N): N Depth (in):  aturation Present (Y/N): N Depth (in): %  Depth (in): %	aturation (A3	able (A2)	Inu (B7 Sp. Co	indation Visible or 7) arsely Vegetated ncave Surface (B rl Deposits (B15) drogen Sulfide or (C1)	98)	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water Present (Y/N): N Depth (in):  Vater Table Present (Y/N): N Depth (in):  Saturation Present (Y/N): N Depth (in): Wetland Hydrology Present (Y/N): Y Depth	aturation (A3 Vater Marks ( ediment Dep	(B1)	Inu (B7 Spa Co  Ma  Hyd	andation Visible or (7) arsely Vegetated ncave Surface (B rl Deposits (B15) drogen Sulfide or (C1)	n Aerial Imagery	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water Present (Y/N): N Depth (in):  Nater Table Present (Y/N): N Depth (in):  Saturation Present (Y/N): Depth (in): 9 De	aturation (A3 Vater Marks ( ediment Dep Prift Deposits	able (A2)	Inu (B7 Sp. Co Ma Hyy Od Dry Wa	andation Visible or (7) arsely Vegetated ncave Surface (B rl Deposits (B15) drogen Sulfide or (C1) /-Season ater Table (C2)	n Aerial Imagery	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Water Table Present (Y/N): Depth (in):  Saturation Present (Y/N): Depth (in): 8  Depth (in): 8	aturation (A3 Vater Marks ( ediment Dep Prift Deposits	able (A2)	Inu (B7 Sp. Co Ma Hyy Od Dry Wa	andation Visible or (7) arsely Vegetated ncave Surface (B rl Deposits (B15) drogen Sulfide or (C1) /-Season ater Table (C2)	n Aerial Imagery	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	aturation (A3 Vater Marks ( ediment Dep Prift Deposits	able (A2)	Inu (B7 Sp. Co Ma Hyy Od Dry Wa	andation Visible or (7) arsely Vegetated ncave Surface (B rl Deposits (B15) drogen Sulfide or (C1) /-Season ater Table (C2)	n Aerial Imagery	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Depth (in):  Depth (in):  Depth (in):  Depth (in):	vater Marks ( ediment Deporift Deposits lgal Mat or Co	able (A2)	- Inu (B7 Spa Co Ma Hyu Od Dry Wa Oth	andation Visible of (7)  arsely Vegetated ncave Surface (B  rl Deposits (B15)  drogen Sulfide or (C1)  /-Season ter Table (C2)  ner (Explain in No	n Aerial Imagery	Drainage Pati Oxidized Rhiz Living Roots ( Presence of F Iron (C4) Salt Deposits	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
includes capillary fringe)	vater Marks ( ediment Deporift Deposits ligal Mat or Coon Deposits urface Water	able (A2)	Inu (B7 Spa Co Ma Hyw Od Dry Wa Oth	andation Visible of (7)  arsely Vegetated ncave Surface (B  rl Deposits (B15)  drogen Sulfide or (C1)  /-Season ter Table (C2)  ner (Explain in No	n Aerial Imagery	Drainage Pate Oxidized Rhiz Living Roots ( Presence of Flron (C4) Salt Deposits Notes:	cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
	vater Marks ( ediment Deporift Deposits ligal Mat or Coon Deposits urface Water	able (A2)	Inu (B7 Spa Co Ma Hyw Od Dry Wa Oth	andation Visible of (7)  arsely Vegetated ncave Surface (B  rl Deposits (B15)  drogen Sulfide or (C1)  /-Season ter Table (C2)  ner (Explain in No	n Aerial Imagery	Drainage Pate Oxidized Rhiz Living Roots ( Presence of Flron (C4) Salt Deposits Notes:	cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
	vater Marks ( ediment Deporift Deposits ligal Mat or Coon Deposits urface Water vater Table Paturation Prencludes capil	able (A2)	- Inu (B7 Sp. Co Ma Hyd Od Dry Wa Otth	arsely Vegetated ncave Surface (B rl Deposits (B15) drogen Sulfide or (C1)	n Aerial Imagery	Leaves (B9)	cospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) $\nearrow$ High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A_ X
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)_>
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
CON MARIARIES
SOIL VARIABLES  Soil Factors (P): Soil Lacking Historol: Fibric Historol: Hemic Historol: Sanric
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Outlet Perenni
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No
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Outlet
Outlet
Outlet Intermittent Inlet/Intermittent Outlet
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennia
Outlet

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		: W61 HT025 Field Target: 064 Date: 7/6/14
ror all	iterr	ns not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	te Description
		Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Ve	getation
	Ø	At least 80% of onsite vegetation has been keyed to species, or collected for later
		identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?
		All dominant species have been determined and recorded per strata? Indicator status is correct for each species?
		Dominance Test and Prevalence Index have been completed?
3.	So	il
		Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
		Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	Æ	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	<b></b>	Notes have been recorded at each site, including general description, sketch, and
	B	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Ма	ips
		Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

### 8. Photos



Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Field Crew Chief (print)

SITE DESCRIPTION			300	chan	V	
Survey Type: Centerline Acces	s Road (explain)	Other (expl		FT	jet: <u>065</u>	Map #: 421 Map Date: 5 27
Date: 7/4/14	Project Name & No.:			Tield Talg		: W61 HTO 26
14119		Alaska Elec	20221300		reature iu	
State: Alaska	T Andusan		Milonosti			Team No.: We (
	Region. Alaska	Τ		560.1	. 11	
Latitude: 63°26' 29.79"			: 148° 4			Datum: WGS84
Logbook No.: W61-2	Logbook Page No.:	35	Picture No.:	P-W611	47026_P	+, Plus SE, NE
SITE PARAMETERS		del a				120000000000000000000000000000000000000
Subregion: Interior			Landform (hil	islope, terrac	e, hummock	s, etc.): Flat
Slope (%): 2 %			Local relief (c	oncave, con	vex, none):	NONE
Pre-mapped Alaska LNG/NWI classificat	ion: Upland		Soil Map Unit	Name:		
Are climatic/hydrologic conditions on the Yes No (if no expla		of year?	Are "No Yes		stances" pre (If no, ex	sent: plain in Notes.)
Are Vegetation, Soil, or Hydi	rology Significant	ly Disturbed?	No_	_(If yes, exp	lain in Notes	
Are Vegetation, Soil, or Hydi	rology Naturally F	Problematic?	No_ <u>\( \phi\)</u>	_ (If yes, exp	lain in Notes	.)
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Yes	No	ls	the Sampled A	rea within a	Wetland?	Yes NoX
Hydric Soil Present? Yes	No_ 🗸	we	etland Type:	yplan	d	
Wetland Hydrology Present? Yes	No	— Ala	iska Vegetation	Classification	on (Viereck):	IA2,IIC2,IIIAI
Notes and Site Sketch: Please include Dicorridor.	-lock L					

VEGETATION (use scientific names of plant	1			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2  Total Number of Dominant Species Across All Strata: 5
1. Pices churca	45	Y	FACU	% Dominant Species that are OBL, FACW, or FAC: (A
2. 0				76 Bolimiant Opecies that are OBE, 1770W, 01770.
3.				(4) 11 1 - 11 1
4.				Prevalence Index worksheet:
Total Cove	r: 45			Total % Cover of: Multiply by:
50% of total cove	r: <b>22. &lt;</b> 20	% of total cov	er: 9	OBL species:X 1 =
Sapling/Shrub Stratum( <b>26</b>	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: X 2 = FAC species 75 X 3 = 225 FACU species 98 X 4 = 392
1. Ribes slandulosum	10	У	FACU	UPL species X 5 =
2. Alnus Fruticosa	15	У	FAC	Column Totals: 173 (A) 617 (B)
3. Lynnae borealis	10	Y	FACU	PI = B/A = 3.56
4. Rosa acicularis	8		FACU	
5. Picea clauca	2		FAW	
6.				
7.				
7 <i>,</i> 8.				
8.	r. 45			
9.		0% of total cov	ver:	
8. 9. Total Cove 50% of total cove	er: <b>33.5</b> 20	0% of total cov	/er:_ <b>_</b>	
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan	er: <b>33.5</b> 20	0% of total cov	ver: <b>9</b>	Hydrophytic Vegetation Indicators:
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan	er: <b>33.5</b> 20		·	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum (	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	
9.  Total Cove 50% of total cove	ts) Absolute	Dominant Species?	Indicator Status	Dominance Test is > 50%Prevalence Index is ≤ 3.0
Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum (	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum (	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
Total Cove  50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum ( 26 )  1. Equisely protense  2. Chamerin anyutifolium  3. Colomorpostis carvadessis	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status FAC FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Equiselum protense 2. Chamerian angustifolium 3. Colomorostis cavadesis 4. M. L.	Absolute % Cover 45	Dominant Species? (Y/N)	Indicator Status FAC FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan Herb Stratum (	Absolute % Cover 45 5 10	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Equisetum protense 2. Chamaerian Angustifolium 3. Columnes stis canadeasis 4. Mertensia poniculada 5. Corrus canadeasis 6. Pyrda asei. Hara	Absolute % Cover 45 5 10 7 1	Dominant Species? (Y/N)	Indicator Status  FAC  FACU  FACU  FACU  FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cove  50% of total cove  VEGETATION (use scientific names of plan  Herb Stratum (	Absolute % Cover 45 5 10	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
8.  9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan Herb Stratum ( 20 )  1. Equisetum protense 2. Chamerian angustifolium 3. Colaman stis canadasis 4. Mertensia peniculada 5. Cornes canadasis 6. Pyrola asei flya 7. Aconitum delpinii bolium	Absolute % Cover 45 5 10 7 1	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic  Bare Ground
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan Herb Stratum (	Absolute % Cover 45 5 10 7 1	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic. % Bare Ground% Cover of Wetland Bryophytes
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plan Herb Stratum (	Absolute % Cover 45 5 10 7 1 10	Dominant Species? (Y/N)	Indicator Status  FAC FACU FACU FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  **Bare Ground**  **Bare Ground**  **Cover of Wetland Bryophytes*  Total Cover of Bryophytes*

SOIL			Date 7614 Feature ID	161 HT026		Soil Pit Required (Y/N)_Y
SOIL PROFI	LE DESCRIPTION: (D	escribe	to the depth needed to documer		r confirm the absence	
Depth	Matrix		Redox Features			
(inches)	Color (moist)	%	Color (moist) % Ty	pe <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
0-3"					Pibric	dry
3-12"	10 YR 2/2	45	100%		loan	50% gravel 5% peoble
12"	Ketusal due	tohi	sh pebble content			
		-			+	
<sup>1</sup> Type: C=Co	ncentration. D=Deplet	ion RN	//=Reduced Matrix, CS=Covered	or Coated Sand	Grains 2 ocation:	PL=Pore Lining, M=Matrix.
	IL INDICATORS	ion, ran	Troduced Islatin, CO-Covered	or Coated Carlo		FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	istel (A1)		Alaska Gleyed (A13)			hange (TA4) <sup>4</sup>
Histic Epiped	lon (A2)		Alaska Redox (A14)			Swales (TA5)
	A3)		Alaska Gleyed Pores (A15)			with 2.5Y Hue
	Ifide (A4)		, , , , , , , , , , , , , , , , , , , ,			without 5Y Hue or Redder Underlying
		_			Layer	
	urface (A12)	tion o	ne primary indicator of watland by	idealasis and an	Other (Explain	in Notes) pe position must be present unless
disturbed or p	oroblematic.		ne primary indicator of wetland fig	diology, and an	i appropriate landsca	pe position must be present unless
"Give details	of color change in Note	S.	Depth (inches			
T TOOLITOLITO LC	ayer (iii present). Type.	140		9)	<del></del>	
Hydric Soil F	Present (Y/N): N					
Notes:						
NOIGS.						
HYDROLOG	Y PRIMARY INDICATO	ORS (a	ny one indicator is sufficient)	SECONDAI	RY INDICATORS (2	or more required)
Surface Wate	er (A1)		face Soil Cracks (B6)	Water-staine Leaves (B9)	ed )	Stunted or Stressed Plants (D1)
High Water T	able (A2)	Inui (B7	ndation Visible on Aerial Imagery	Drainage Pa	atterns (B10)	Geomorphic Position (D2)
Saturation (A	3)	Spa	arsely Vegetated	Oxidized Rh	nizospheres along	
Saturation (A	3)	Cor	ncave Surface (B8)	Living Roots		Shallow Aquitard (D3)
Water Marks	(B1)		l Deposits (B15)	Presence of Iron (C4)	f Reduced	Microtopographic Relief (D4)
Sediment Dep	oosits (B2)	Odd	rogen Sulfide or (C1)		ts (C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)	Dry Wa	-Season ter Table (C2)	Notes:		
Algal Mat or C	Crust (B4)	Oth	er (Explain in Notes):			
Iron Deposits	(B5)					
Surface Wate	r Present (Y/N):		Depth (in):	100		
		-	Deptil (III).	Wetland Hydr	ology Present (Y/N)	· N
Water Table F	Present (Y/N): N		Depth (in):	World Hy UI	ology i resent (1/14)	
Saturation Pre (includes capi	esent (Y/N): Ilary fringe)		Depth (in):			
Notes:						

Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent	i
Dwarf shrub (<0.5h Tall herb (≥1m) Short herb (<1m) Moss-Lichen Floating Submerged	
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even	en
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (80-100%)	sity (60-
Interspersion of Cover & Open Weter (P): 100% Cover or Open Water <a href="25">25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A	attered or
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25	
Presence of Islands (M): Absent (none) One or Few Several to Many N/A	
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Cover	
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)	
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)	
HGM Class (P): Slope Flat Lacustrine Fringe Den essional Riverine Estaurine Fringe	
X	
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silly Mineral: Clayey	
HYDROLOGIC VARIABLES	955
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet	Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Serviperm. Flooded	
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Se	
Wicrorelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6 18in.) Pronounced (>18in	1.)
Frequency of Overbank Flooding (3): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs	
Degree of Outlet Restriction (1): No Outflow Restricted Outflow Unrestricted Outflow	
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading	}
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits	
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Evidence of See's and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Pyrennial Spring	
ANDSCAPE VARIABLES (M)  Not the state of the	
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Upstream & Downstream Unknown	
Wettlind Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)	

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		121,4702
		:
ror all	nerr	ns not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	te Description
		Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
		At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
		Vegetation names are entered legibly for all strata present? Cover calculations are complete and correct?
	N P	All dominant species have been determined and recorded per strata?
		Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
•	r	
3.	So	II
		Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
		Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
		Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	ld Logbook
	Į.	Notes have been recorded at each site, including general description, sketch, and
		accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Ма	ps
		Wetland boundaries have been corrected if necessary?
	B	Maps are initialed and dated?

### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jenni Fer Anderson X Oak Pr 7/6/14
Wetland Scientist (print) Signature / Date

Field Cuery Chief (mint)

Signature / Date

SITE DESCRIPTION			200	emiden .	1,00 1 114
Survey Type: Centerline Acce	ss Road (explain)	Other (expl		Field Target: 066	Map #: 45 Map Date: 5 M
Date: 7/6/14	Project Name & No.:	Alaska LNC	26221306	Feature Id	: 261 HTO27
Investigators: L MGTIS	5 Anderson			'	Team No.: Wal
State: Alaska	Region: Alaska		Milepost: 5	63.6	
Latitude: 63° 24 108.92		Longitude	:143°51		Datum: WGS84
Logbook No.: 101-2	Logbook Page No.:	36	Picture No.:	P_WG14T027_P,+;	Plus; NW/S
SITE PARAMETERS	The state of the s		No. 1		
Subregion: Intuian			Landform (hil	lslope, terrace, hummock	s, etc.): 5600
Slope (%): 2				concave, convex, none):	NONE
Pre-mapped Alaska LNG/NWI classifica	tion: PSSI EMIB		Soil Map Unit	: Name:	
Are climatic/hydrologic conditions on the Yes No (if no expl	site typical for this time	of year?	Are "No Yes_X	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	drology Significant	tly Disturbed?	No	_(If yes, explain in Notes	)
Are Vegetation, Soil, or Hyd	frology Naturally f	Problematic?	No	_ (If yes, explain in Notes	i.)
SUMMARY OF FINDINGS					
Hydrophytic Vegetation Present? Yes_	No	ls	the Sampled A	rea within a Wetland?	Yes No
Hydric Soil Present? Yes_	X No -	_ w	etland Type: \	PEMI/SSIB	
Wetland Hydrology Present? Yes_	Y No	— Ala	aska Vegetatior	Classification (Viereck):	III AX, II CZ
		Centerline, hish material is	Length of featu avel & pelolo a Soup Com	re, Distances from Center le Content, profil sistency	Z - N' -

VEGETATION (use scientific names of plants	3)		70	
Tree Stratum (Plot sizes: _ 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 5  Total Number of Dominant Species Across All Strata: 5
1. N/A				% Dominant Species that are OBL, FACW, or FAC: 100 (A
3.				
4.	•			Prevalence Index worksheet:
Total Cover	_			Total % Cover of: Multiply by:
50% of total cover		% of total cov	er:	OBL species: 12 X1= 17
Sapling/Shrub Stratum ( 26' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: (63
1. Salix glanes	12.	4	FAC	UPL speciesX 5 =
2. Salix reticulata	15.	4	FAC	Column Totals: 135 (A) 318 (B)
3. Solly mydillifdia	10	Y	FALW	PI = B/A = <u>2.35</u>
4. Vaccinium ulisinos um	5		FAC	
5. Andropada polifolium	1		FACE	
6. Whododendran granenticum	2		FAC	
7. Cosine tetragena	T		FACU	
8. Salix polaris	7	7- 10	FACE	
9. Betula Sondubsa	5	7 10	FACE	
9. Betula Standards A Total Cover 50% of total cover	5 : 57 : 28.5 20		FAL	
9. Betula Standards A  Total Cover  50% of total cover  VEGETATION (use scientific names of plants	5 : 57 : 28.5 20		FAL	Hydrophytic Vegetation Indicators:
9. Betula Standards A  Total Cover  50% of total cover  VEGETATION (use scientific names of plants	5 : 57 : 28.5 20	O% of total cov  Dominant Species?	FAC // // // // // // // // // // // // //	Dominance Test is > 50%
9. Belula Standuls A  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 26)	5 28.5 20 s) Absolute % Cover	% of total cov	rer: 11 . 4  Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0
9. Belula Standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )	5 20 3 5 20 5)  Absolute % Cover	O% of total cov  Dominant Species?	rer: 11 . 4 Indicator Status	Dominance Test is > 50%  ———————————————————————————————————
9. Belula Standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )  1. Eleochasis paludris  2. Eleochasis aciulasis	5 3 4 20 5 20 5s)  Absolute % Cover	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL	Dominance Test is > 50%  ———————————————————————————————————
9. Betula Standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 261 )  1. Eleochasis paludris  2. Eleochasis aciculasis	5 20 3 5 20 5)  Absolute % Cover	O% of total cov  Dominant Species?	rer: 11 . 4 Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )  1. Eleochasis paludris 2. Eleochasis aciulasis 3. Chamerica latifolium 4. Saxifraça rivulasis	5 3 4 20 5 20 5s)  Absolute % Cover	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  ———————————————————————————————————
9. Belvia standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )  1. Eleocharis paludris 2. Eleocharis aciularis 3. Chamerican latifolium 4. Saxifraça rivularis 5. Stellaria langual longian	5 3 4 20 5 20 5s)  Absolute % Cover	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9. Belvia standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 26)  1. Eleochesis paludris 2. Eleochesis aciculasis 3. Chamerican latifolium 4. Saxifraça rivularis 5. Stellaria langual longian 6.	5   20   20	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  OBL  FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9. Belvia standarisa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 261 )  1. Eleochasis paludris 2. Eleochasis aciulasis 3. Chamerica latifolium 4. Saxifraça rivularis 5. Stellaria langual longials 6. Caraca remburacea	5   20   20	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  OBL  FAC	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  — Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  — % Bare Ground — % Cover of Wetland Bryophytes
9. Belvia ziondubsa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )  1. Eleocharis paludris 2. Eleocharis aciularis 3. Chamerica latifolium 4. Saxifraça rivularis 5. Stellaria langual lorgian 6. Carara renburaca 7. Carara renburaca 7. Carara	5   20   20	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  OBL  FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes
9. Belvia standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )  1. Eleochasis paludris 2. Eleochasis aciculasis 3. Chamerron latifolium 4. Saxifraça rivularis 5. Stellaria longipul longipul 6. Capara membranaca 7. Capara 8.	5   20   20	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  OBL  FAC	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  — Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  — % Bare Ground — % Cover of Wetland Bryophytes — Total Cover of Bryophytes — 10% % Cover of Water
9. Belvia standulosa  Total Cover  50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 201 )  1. Eleochasis paludris 2. Eleochasis aciculasis 3. Chamerron latifolium 4. Saxifraça rivularis 5. Stellaria longipul longipul 6. Capara membranaca 7. Capara 8. 9.	5 1 20 5 20 5 5 20 5 5 20 5 5 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7 7	O% of total cov  Dominant Species?	Indicator Status  OBL  OBL  OBL  FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes

SOIL			Date 7 a 14 Feature	ID_W6	1 HTOZ	7	Soil Pit Required (Y/N)
SOIL PROFIL	E DESCRIPTION: (D	escribe	to the depth needed to do	cument t	he indicato	or or confirm the absen	ce of indicators.)
Depth	Matrix		Redox Features				
(inches)	Color (moist)	%	Color (moist) %	Туре	1 Loc	<sup>2</sup> Texture	Notes
0-2"						Fibric	Gaturated Granies
2-18"	10482/2	100					Saturated organies
			38	t their	-		50/gravel 5/periole
							0
					_		
¹Type: C=Co	ncontration D-Daniel	lion DM	I=Reduced Matrix, CS=Co	vered or	Coated Sa	and Grains 21 ocation	n: PL=Pore Lining, M=Matrix.
	- INDICATORS	IIOII, KIV	i-Neduced Watrix, C3-C0	vereu or	Coaled Sa		FOR PROBLEMATIC HYDRIC SOILS
			Alacka Glaved (A13)		-		Change (TA4) <sup>4</sup>
	stel (A1)		Alaska Gleyed (A13) Alaska Redox (A14)				Swales (TA5)
	on (A2)		Alaska Gleyed Pores				with 2.5Y Hue
			Alaska Gleyed Foles	s (X13)_			d without 5Y Hue or Redder Underlying
Hydrogen Sulf	fide (A4)					Layer	
Thick Dark Su		_				Other (Explai	
One indicator disturbed or p		ation, o	ne primary indicator of wet	land hyd	rology, and	d an appropriate lands	cape position must be present unless
4Give details of	of color change in Not	es.					
Restrictive Lay	yer (if present): Type	- N	A Depth	(inches):			
		100	V				
Hydric Soil P	resent (Y/N):	1	У				
Notes: IL.	and content.	hasa	sorturated soils u	ulin 50	Amale Olat	+	
O'Cal land	gard college	Hear	n solvrated soils u content and a high	OH (7	201	•	
SON MALS	(Cos or giring in	etine ii	Achten chilos and	1. /1	. 31)		
HYDROLOGY	PRIMARY INDICAT	ORS (a	ny one indicator is sufficien	nt)	SECON	DARY INDICATORS (	2 or more required\
10		T			Water-st		Stunted or Stressed
Surface Water	r (A1)	Sur	face Soil Cracks (B6)		Leaves		Plants (D1)
High Water Ta	able (A2) <u>×</u>	Inu (B7	ndation Visible on Aerial In	nagery	Drainage	e Patterns (B10)	Geomorphic Position (D2)
Saturation (A3	B)	Spa	arsely Vegetated ncave Surface (B8)			d Rhizospheres along oots (C3)	Shallow Aquitard (D3)
Water Marks (	(B1)	Ma	rl Deposits (B15)			e of Reduced	Microtopographic Relief (D4)
Sediment Dep	posits (B2)		drogen Sulfide or (C1)			posits (C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)	Dry	-Season		Notes:		
	Crust (B4)		ter Table (C2) er (Explain in Notes):				
	(B5)		or (Explain in Notes).				
non Deposits	(50)						
Surface Water	r Present (Y/N):		Depth (in): 1/2 n				
Water Table P	Present (Y/N):		Depth (in): O		Wetland H	lydrology Present (Y/	N):
Saturation Pre	esent (Y/N):		Depth (in):				
Notes:	y milgo)						

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): _2
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25">25% Scattered/Peripheral Cover"&gt;25% Scattered Or Peripheral Cover</a> N/A <a href="25">N/A</a>
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope_X_ Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outle
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet_X Perennial Inlet/No Outlet Perennial
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet
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### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature	e ID: <u>W61 HT037</u> Field Target: <u>D68</u> Date: 7/4/14
	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	➢ Site description, site parameters and summary of findings are complete?   ➢ A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete?  Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

8.	P	h	o	to	9
•			v	·	-

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)	Signature / Date	Children of	
X Jennifer Anderson	X Demails	anderson	7/6/14

Field Cross Chief (mint)

Field Crew Chief (print)

ignature / Date

SITE DESCRIPTION		1			1.10
Survey Type: Centerline Acces	ss Road (explain)	_ Other (exp	lain)	Field Target: 69	Map #: Map Date: 5 21
Date: 7/6/14	Project Name & No.:	: Alaska LN	G 26221306	Feature Id	I: WGIHTUZS
Investigators: K DEGUTIS	J Andreson	)			Team No.: W61
State: Alaska	Region: Alaska		Milepost:	5766.35	
Latitude: 630 22' 47.46"		Longitud	e: 148° 5	566.35	Datum: WGS84
Logbook No.: WE1-2	Logbook Page No.:	31	Picture No.;	P_W611+T028-	P.t. Plus; SW: NW
SITE PARAMETERS		, (18)		N - X	0.
Subregion: Interior			Landform (hill	Islope, terrace, hummock	s, etc.): F/AL
Slope (%): 2_				oncave, convex, none):	NONE
Pre-mapped Alaska LNG/NWI classificat	ion: PSSI EM	173	Soil Map Unit	Name:	
Are climatic/hydrologic conditions on the			Are "No	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	rology Significant	tly Disturbed	? No <b>b</b>	_(If yes, explain in Notes	)
Are Vegetation, Soil, or Hyd	rology Naturally F	⊃roblematic?	No to	(If yes, explain in Notes	s.)
SUMMARY OF FINDINGS					PARTY AND
Hydrophytic Vegetation Present? Yes	<u></u> №	Is	the Sampled A	rea within a Wetland?	Yes_
Hydric Soil Present? Yes	No	_ w	etland Type:	PSSI EMIB	
Wetland Hydrology Present? Yes	<b>№</b> No	— AI	aska Vegetation	Classification (Viereck):	IC1, II A2
Notes and Site Sketch: Please include Dicorridor.  Addlematic Sol		Spook	W61-2 ste skete	e, Distances from Cente	rline, Photo Locations, and Survey

VEGETATION (use scientific names of plan	ts)	,		
261	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 26 )	% Cover	Species?	Status	No. of Dominant Species that are OBL, FACW, or FAC:
1 1		(Y/N)		Total Number of Dominant Species Across All Strata:
1. N/A	4			% Dominant Species that are OBL, FACW, or FAC:(A
2.				(a) %
3.				
4.				Prevalence Index worksheet:
Total Cove	er:			Total % Cover of: Multiply by:
50% of total cove	er: 20	% of total cov	/er:	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 39
1. Rhododerdian greenlandicum	5		FAC	UPL species 30 X 5 = 150
2. Betula rana	15	Y	FAC	Column Totals: (A) 404 (B)
3. Arctous rubra	25	Y	FAC	PI = B/A = 3.18
4. Vaccinium ulizinosum	10		FAC	Soulix scouleriana T FAC
5. Empetrum nigrum	10		FAC	# Salix Stolonifera 15 4 Prace 4
6. Andromeda Dollfolia	T		FACW	Picco slaves 10 FACU Salix pulchra 10 FACU Pryps ajanensis 15 Y N-1-0
7. Salix neticulation	8		FAC	Salix pulchra 10 FACW
	5		FAC	Drugs ajanensis 15 y MI
8. 1/precioium vitis- idaes	3		171-6	1
8. Vaccinium vitis-idaea  9. Vaccinium oxy caccus  Total Covi	1		OBL	K No indicata status listea in 2014 ar horthona Plas
9. Vaccinium Oxy Cacus Total Cove	er: 129 er: <u>04.5</u> 20	0% of total cov	OBL	
9. Vaccinium Oxy Coccuo Total Cove 50% of total cov  VEGETATION (use scientific names of plan	er: 129 er: 44.5 20		08L ver: <u>25.8</u>	* No indicators in the listen in 2014 are written a Plan considered with specify
9. Vaccinium Oxy Coccuo Total Cove 50% of total cov  VEGETATION (use scientific names of plan	er: 129 er: <u>04.5</u> 20	Dominant Species?	OBL	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
9. Vaccinium Oxy Coccuo Total Cove 50% of total cov  VEGETATION (use scientific names of plan  Herb Stratum ( 36 )	er: <u>129</u> er: <u>04.5</u> 20  hts)  Absolute % Cover	Dominant	ver: 25.8  Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50% Prevalence Index is ≤ 3.0
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan  Herb Stratum ( 26 )	er: 129 er: 4.5 20 nts)  Absolute % Cover	Dominant Species?	ver: 25.8  Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Morphological Adaptations¹ (Provide supporting data in
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )	er: <u>129</u> er: <u>04.5</u> 20  hts)  Absolute % Cover	Dominant Species?	obluser: 25.8  Indicator Status  FAC FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Morphological Adaptations¹ (Provide supporting data in Notes)
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Tochieldia pusilla 2. Petusites fricidus 3. Bistorta vivipara	er: 121 er: 04.5 20 nts)  Absolute % Cover	Dominant Species?	Indicator Status  FAC FACW FAC	Hydrophytic Vegetation Indicators:   Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia pusilla 2. Petusites fricidus 3. Bistorta vivi para 4. Capex membranaceo	er: 129 er: 4.5 20 nts)  Absolute % Cover	Dominant Species?	Indicator Status  FAC FACW FACW	Hydrophytic Vegetation Indicators:   Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia fusilla 2. Petasites frisidus 3. Bistorta vivi para 4. Carex membranaces 5. Dodecatheon frisidum	129   129	Dominant Species?	Indicator Status  FAC FACW FACW FACW FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan  Herb Stratum ( 26 )  1. Toefieldia pusilla 2. Petusites fricidus 3. Bistorta vivipara 4. Carex membranaceo 5. Dodecatheon frigidum 6. Stellania longipes	er: 121 er: 04.5 20 nts)  Absolute % Cover	Dominant Species?	Indicator Status  FAC FACW FACW	Hydrophytic Vegetation Indicators:  ———————————————————————————————————
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia posilla 2. Petastes frigidus 3. Bistorta viviacra 4. Carex membranaceo 5. Dodecatheon Crisidum 6. Stellana longipes 7.	129   129	Dominant Species?	Indicator Status  FAC FACW FACW FACW FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia pusilla 2. Petusites flicidus 3. Bistorta vivipara 4. Carex membranacea 5. Dodecatheon frigidum 6. Stellaria longipes 7. 8.	129   129	Dominant Species?	Indicator Status  FAC FACW FACW FACW FACW	Hydrophytic Vegetation Indicators:  ———————————————————————————————————
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia posilla 2. Petasites fizidus 3. Bistorta vivi ara 4. Carex membranaceo 5. Dodecatheon Crizidum 6. Stellana longi pes 7.	129   129	Dominant Species?	Indicator Status  FAC FACW FACW FACW FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes
9. Vaccinium Oxy Coccus Total Cove 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia pusilla 2. Petusites flicidus 3. Bistorta vivipara 4. Carex membranacea 5. Dodecatheon frigidum 6. Stellaria longipes 7. 8.	129   129	Dominant Species?	Indicator Status  FAC FACW FACW FACW FACW	Hydrophytic Vegetation Indicators:
9. Vaccinium Oxy Coccus Total Cov. 50% of total cov  VEGETATION (use scientific names of plan Herb Stratum ( 26 )  1. Toefieldia fisilla 2. Petasites frisidus 3. Bistorta vivi para 4. Carex membranaces 5. Dodecatheon frisidum 6. Stellania longi pes 7. 8. 9.	129   129	Dominant Species?	Indicator Status  FAC FACW FACW FACW FACW	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes

Alaska Gleyed (A13) Alaska Color Change (TA4)* Histic Epipedon (A2) Alaska Redox (A14) Alaska Alpine Swales (TA5) Black Histic (A3) Alaska Redox (A14) Alaska Alpine Swales (TA5) Black Histic (A3) Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue Hydrogen Sulfide (A4) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue or Redder Underlying Layer Thick Dark Surface (A12) One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic. Give details of color change in Notes. Restrictive Layer (if present): Type: Depth (inches):  Hydric Soil Present (Y/N):  Notes:  Problem Soils - high context of problematic pebbles does not alker for discussion of sedox Restrictive Layer (A1).  Water Soil Present (Y/N):  Surface Soil Cracks (B6) SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Prainage Patterns (B10) Geomorphic Position (D2)  Saturation (A3) Sparsely Vegetated Concave Surface (B8) Driving Roots (C3)  Water Marks (B1) Mari Deposits (B15) Presence of Reduced Invitron (C4)  Hydrone Sulfide  Relief (D4)	Matrix   Redox Features   Color (moist)   % Color (moist)   % Type   Loc²   Texture   Notes	Redox Features Color (moist) C	SOIL PROFIL	LE DESCRIPTION: (I	Jescribe	to the depth needed	l to documer	nt the in	ndicator or o	confirm the absence	e of indicators.)	
Color (moist)	Inches) Color (moist) % Color (moist) % Type Loc² Texture Notes CH-16" 2.5 Y x 1 660  CH	Color (moist)   %   Color (moist)   %   Type   Loc   Texture   Notes		4							1	
Content   Cont	Common   C	ype: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Costed Sand Grains. *Location: PL-Pore Lining, M=Matrix.  YORIC SOIL NDICATORS    NDICATORS FOR PROBLEMATIC HYDRIC SOILS**   Stocol or Histel (A1)	•		T 0/				1 2			
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.  **HYDRIC SOIL INDICATORS**  **Indicator of Histel (A1)	Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration, D=Deptetion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration or Called Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration or Called Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration or Called Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  Type: C=Concentration or Called Type: Alaska Gleyed Plants (D1) **  Type: C=Concentration or Called Type: Alaska Gleyed Plants (D1) **  Type: C=Concentration or Called Type: Alaska Gleyed Ribrosphare along Lining Roots (C3) **  Type: C=Concentration or Called Type: Alaska Gleyed Ribrosphare along Lining Roots (C3) **  Type: C=Concentration or Called Type: Alaska Gleyed Ribrosphare along Lining Roots (C3) **  Type: C=Concentration or Called Type: Alaska Gleyed Ribrosphare along Lining Roots (C3) **  Type: C=Concentration or Called Type: Alaska Gleyed Ribrosphare along Lining Roots (C3) **  Type: C=Concentration or Called Type: Alaska Gleyed Alaska Gleyed Ribrosphare along Lining Roots (	ype: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. "Location: PL=Pore Lining, M=Matrix.  YDRIC SOIL NDICATORS  INDICATORS FOR PROBLEMATIC HYDRIC SOILS'  Stocs of Instel (A1)	A / 1 H	Color (moist)	%	Color (moist)	% Typ	pe.	Loc-			
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL INDICATORS    INDICATORS FOR PROBLEMATIC HYDRIC SOILS**   IndicATOR FOR	Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.  YDRIC SOIL NDICATORS  INDICATORS INDI	ype: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  YORIC SOIL NDICATORS    NDICATORS FOR PROBLEMATIC HYDRIC SOILS*  Stosol or Histel (A1)   Alaska Gleyed (A13)   Alaska Color Change (TA4)	0-4	254			-			1-1bn'c	Saturated	
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL INDICATORS    Alaska Gleyed (A13)	Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  YDRIC SOIL NDICATORS    Alaska Gleyed (A13)	ype: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  YDRIC SOIL NOICATORS    INDICATORS FOR PROBLEMATIC HYDRIC SOILs* stocol or Histor (A1)	4-18	4.5 4 211	100		-				45 % gravel	5% pebble
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Hydric Soil Noicators   Noicators   Noicators For Problematic Hydric Soils	INDICATORS FOR PROBLEMATIC HYDRIC SOILS	Alaska Gleyed (A13)									-	
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Hydric Soil Noicators   Noicators   Noicators For Problematic Hydric Soils	INDICATORS FOR PROBLEMATIC HYDRIC SOILS	Alaska Gleyed (A13)					+		-			
Hydric Soil Noicators   Noicators   Noicators For Problematic Hydric Soils	INDICATORS FOR PROBLEMATIC HYDRIC SOILS	Alaska Gleyed (A13)	Type: C=Co	ncentration, D=Deple	tion. RN	I 1=Reduced Matrix. C	S=Covered	or Coat	l ted Sand G	rains <sup>2</sup> l ocation:	PI =Pore Lining	M=Matrix
Alaska Gleyed (A13) Alaska Color Change (TA4)*	Alaska Gleyed (A13) Alaska Color Change (TA4)*  Alaska Redox (A14) Alaska Redox (A14)  Alaska Redox (A14) Alaska Redox (A15)  Alaska Redox (A14) Alaska Redox (A16)  Alaska Redox (A16) Alaska Redox (A16)  Alaska Redox (A16) Alaska Redox (A16)  Alaska Gleyed Wilhout 5Y Hue or Redder Underlying Layer  Wilder (Explain in Notes)  Alaska Gleyed wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Wilhout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Depth (Inches):  Dep	Alaska Gleyed (A13) Alaska Color Change (TA4)* Alaska Redox (A14) Alaska Redox (A15) Alaska Redox (A15) Alaska Redox (A15) Alaska Redox (A15) Alaska Redox (A16) Alas										
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Address Caleyed without SY Hue or Redder Underlying Layer  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless instructed or problematic.  Give details of color change in Notes.  Give details of color change in Notes.  Restrictive Layer (if present): Type:  Application of present (Y/N):  Notes:  Problem Selfs - high Centent of provel pebbles does not allow for dosevation of redox (current).  Hydric Soil Present (Y/N):  Notes:  Problem Selfs - high Centent of provel pebbles does not allow for dosevation of redox (current).  Hydric Soil Present (Y/N):  Surface Water (A1)  Surface Soil Cracks (B6)  Inundation Visible on Aerial Imagery (B7)  Drainage Patterns (B10)  Geomorphic Position (D2)  Saturation (A3)  Sparsely Vegetated Concave Surface (BB)  Valer Marks (B1)  Marl Deposits (B15)  Presence of Reduced Microtopographic Relief (D4)  Sediment Deposits (B2)  Other (Explain in Notes)  Notes:  Notes:  Wetland Hydrology Present (Y/N):  Valer Table Present (Y/N):	Alask Gleyed without SY Hue or Redder Underlying Layer  Other (Explain in Notes)	Alaska Gleyed without 5Y Hue or Redder Underlying Layer Other (Explain in Notes)  Inch Dark Surface (A12)  Inch indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless studied or problematic.  Inch Layer (if present): Type:  Inch Depth (inches):  Phoblem Sents - high content of pebbles does not allow for deservation of redox  Centures. Public year saturated thoughts  Intrace Water (A1)  Surface Soil Cracks (B6)  Intraction (A3)  Sparsely Vegetated  Concave Surface (B8)  Intraction (A3)  Sparsely Vegetated  Concave Surface (B8)  Internation (A3)  Mari Deposits (B15)  Intraction (A4)  Intrace Water (A1)  Mari Deposits (B2)  Other (Explain in Notes)  Water-stained  Leaves (B9)  Secondary Indicators (2 or more required)  Water-stained  Leaves (B9)  Concave Surface (B8)  Concave Surface (B8)  Intraction (A3)  Sparsely Vegetated  Concave Surface (B8)  Intraction (A3)  Sparsely Vegetated  Concave Surface (B8)  Intraction (A4)  Mari Deposits (B15)  Intraction (C4)  Salt Deposits (C5)  FAC-Neutral Test (D5)  Intraction (C4)  Intraction (C4)  Intraction (C4)  Other (Explain in Notes):  Notes:  Wetland Hydrology Present (Y/N):  Valuation Present (										
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Give details of color change in Notes. Restrictive Layer (if present): Type:  Pydric Soil Present (Y/N):  Pydric Soil Present (Y/N):  Pydric Soil Present (Y/N):  Pydrology PRIMARY INDICATORS (any one indicator is sufficient)  Surface Voter (A1)  Surface Soil Cracks (B6)  Leaves (B9)  Inundation Visible on Aerial Imagery (B7)  Sparsely Vegetated Concave Surface (B8)  Vater Table (A2)  Vater Marks (B1)  Marl Deposits (B15)  Rediment Deposits (B2)  Pydrogen Sulfide Odor (C1)  Surface Water (B4)  Other (Explain in Notes):  Vater Table Present (Y/N):  Vater Tab	Depth (inches):    Since details of color change in Notes. estrictive Layer (if present): Type:   Depth (inches):	petitive details of color change in Notes.  particitive Layer (if present): Type:	disturbed or p	r of nydropnytic vege roblematic.	tation, o	ne primary indicator	of wetland hy	/drolog	y, and an a	ppropriate landsca	pe position must t	be present unless
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Surface Water (A1) Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Saturation (A3) Sourface Water	Autration (A3) Sparsely Vegetated Concave Surface (B8) Shallow Aquitard (D3) Shallow Aquitard (D4) Sediment Deposits (B2) Dry-Season Water Table (C2) Other (Explain in Notes):  Autration Present (Y/N): Pepth (in): Depth (in): Autration Present (Y/N): Autration Present (Y	Approximate to the content of the co			Y	content of	gravel,	pebb	les doe	not allow fo	n doservation	n of redux
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Surface Soli Cracks (B6) Leaves (B9) Plants (D1) Addition Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2) Saturation (A3) Noter Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Dry-Season Water Table (C2) Noter (Explain in Notes):  Surface Soli Cracks (B6) Leaves (B9) Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3)	Surface Soli Cracks (B6) Leaves (B9) Plants (D1)	Surface Soli Cracks (Bb) Leaves (B9) Plants (D1) Cemorphic Position (D2) Cemorphic Position (A3) Cemorphic Position (D2) Cemorphic Position (A3) Cemorphic Position (C3) Cemorphic Position (D3) Cemorphic Position (C3) Cemorphic Position (D3) Cemorphic Position (D2)	Notes:	oblem soils -				pebb	les does	s not alka for ghost	n doservation	n of redux
Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2) Saturation (A3) Drainage Patterns (B10) Geomorphic Position (D2) Shallow Aquitard (D3) Shallow Aquitard (D3) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Saturation Present (Y/N): Presence of Reduced Iron (C4) FAC-Neutral Test (D5) Presence of Reduced Iron (C4) FAC-Neutral Test (D5) Presence of Reduced Iron (C4) FAC-Neutral Test (D5) Presence of Reduced Iron (C4) Relief (D4) Presence (D4) Presence (D5) FAC-Neutral Test (D5) Presence (D5) Presenc	Inundation Visible on Aerial Imagery (B7) Drainage Patterns (B10) Geomorphic Position (D2) atturation (A3) \( \) Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) Living Roots (C3) Shallow Aquitard (D3) Presence of Reduced Iron (C4) Relief (D4) Presence of Reduced Iron (C4) Relief (D4) Presence of Reduced Iron (C4) Salt Deposits (B2) Salt Deposits (C5) FAC-Neutral Test (D5) Presence of Reduced Iron (C4) Relief (D4) P	Inundation Visible on Aerial Imagery (B7)	Notes:	oblem soils -								
Saturation (A3) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3) Sediment Deposits (B1) Presence of Reduced Iron (C4) Relief (D4) Sediment Deposits (B2) Other (Explain in Notes):  Other (Explain in Notes):  Other (Explain in Notes):  Other (Table Present (Y/N): Poepth (in): Poepth (i	Comparison (Na)   Description	Sparsely Vegetated Concave Surface (B8)	Notes: Par	oblem soils -	ORS (a	ny one indicator is su	ifficient)	SE	CONDARY	/ INDICATORS (2	or more required)	Stressed
Concave Surface (B8)  Living Roots (C3)  Shallow Aquitard (D3)  Presence of Reduced Iron (C4)  Sediment Deposits (B2)  Dry-Season Water Table (C2)  Surface Water Present (Y/N):  Vater Table Present (Y/N):  Vater Table Present (Y/N):  Saturation (A3)  Concave Surface (B8)  Living Roots (C3)  Presence of Reduced Iron (C4)  Salt Deposits (C5)  FAC-Neutral Test (D5)  Notes:  Vetland Hydrology Present (Y/N):  Vetland Hydrology Present (Y/N):  Saturation Present (Y/N):  Saturation Present (Y/N):  Saturation Present (Y/N):  Depth (in):  De	Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) Agree Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Salt Deposits (B2) Dry-Season Water Table (C2) Other (Explain in Notes):  On Deposits (B5) Depth (in): Dep	Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3) ater Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Salt Deposits (B2) Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Motes:  Dry-Season Water Table (C2) Other (Explain in Notes):  In Deposits (B5) Depth (in): Depth (in): Depth (in): Uturation Present (Y/N): Poepth (in): Ater Table (Y/N): Depth (in): Ater Table (Y/N): Ater Table (Y/N	Notes: PARISTONIA PROLOGY Surface Water	PRIMARY INDICAT	Sur	ny one indicator is su face Soil Cracks (B6	ifficient)	Wa Le	CONDAR) ater-stained aves (B9) _	/ INDICATORS (2	Stunted or Plants (D1)	Stressed
Water Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4) Relief (D4)	Ader Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)	ater Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Microtopographic Relief (D4) Microtopographic Relief (D4) Microtopographic Relief (D4) Salt Deposits (C5) FAC-Neutral Test (D5) Microtopographic Relief (D4) Microtopographic Relief (D5) Microtopographic Relief	Notes: PARISTONIA PROLOGY Surface Water	PRIMARY INDICAT	Sur	ny one indicator is su face Soil Cracks (B6 ndation Visible on Ae	ifficient)	Wa Le	CONDAR) ater-stained aves (B9) _	/ INDICATORS (2	Stunted or Plants (D1)	Stressed
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Prift Deposits (B3) Other (Explain in Notes):  Surface Water Present (Y/N):	rift Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)	Iron (C4) Relief (D4)  rediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  iff Deposits (B3) Other (Explain in Notes):  Iron (C4) Relief (D4)  FAC-Neutral Test (D5)  Notes:  Other (Explain in Notes):  Iron (C4) Relief (D4)  FAC-Neutral Test (D5)  Notes:  Wetland Hydrology Present (Y/N):  deter Table Present (Y/N): Depth (in): Uetland Hydrology Present (Y/N):  Depth (in): Uetland Hydrology Present (Y/N): Depth (in): Uetland Hydrology Present (Y/N):	HYDROLOGY Gurface Water	PRIMARY INDICAT	Sur Inu (B7	ny one indicator is su face Soil Cracks (B6 indation Visible on Ae oursely Vegetated	ifficient)	SE Wa Le Dra	ater-stained aves (B9) _ ainage Patt	r INDICATORS (2	Stunted or Plants (D1)  Geomorphi	Stressed
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Page of the Codor (C1) Notes:    Dry-Season Water Table (C2) Notes:   Sulface Water Present (Y/N): N	Pediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) FAC-Neu	Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)  iff Deposits (B3) Other (Explain in Notes):  In Deposits (B5) Depth (in):  Interest (Y/N): Depth (in): Under Table Present (Y/N): Depth (in): Under Table Present (Y/N): Depth (in): Under Table Present (Y/N): Under Table Pr	HYDROLOGY Surface Water High Water Ta	PRIMARY INDICAT	Sur Inui (B7 Spa Cor	ny one indicator is su face Soil Cracks (B6 ndation Visible on Ae ) ursely Vegetated ncave Surface (B8)	rial Imagery	VVa Lea Dra Ox Liv	ater-stained aves (B9) _ ainage Patt didized Rhiz ring Roots (	r INDICATORS (2	Stunted or Plants (D1) Geomorphi Shallow Aq	Stressed  Comparison (D2)
Orift Deposits (B3) Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  For Deposits (B5) Depth (in): Wetland Hydrology Present (Y/N): Depth (in): Under Table Present (Y/N): Depth (in): Depth (in): Depth (in): Depth (in): Under Table Present (Y/N): Under Table Present (	rift Deposits (B3) Dry-Season Water Table (C2) Notes:  gal Mat or Crust (B4) Other (Explain in Notes);  on Deposits (B5) Depth (in): Vater Table Present (Y/N): Depth (in): Unique Value (Y/N): Depth (in): Value (Y/N): Depth (in): Value (Y/N): Depth (in): Value (Y/N): Depth (in): Value (Y/N):	ift Deposits (B3) Dry-Season Water Table (C2) Day Mater Table (C2) Dry-Season Water Table (C2) Dry-Season Water Table (C2) Depth (in):	HYDROLOGY Surface Water High Water Ta	PRIMARY INDICAT	Sur Inui (B7 Spa Cor	ny one indicator is su face Soil Cracks (B6 ndation Visible on Ae ) ursely Vegetated ncave Surface (B8)	rial Imagery	Dra Ox Liv	ater-stained aves (B9) _ ainage Patt idized Rhiz ring Roots (	r INDICATORS (2	Stunted or Plants (D1) Geomorphi Shallow Aq Microtopog	Stressed  ic Position (D2)  quitard (D3)
Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  From Deposits (B5)  Surface Water Present (Y/N):	gal Mat or Crust (B4) Other (Explain in Notes):  on Deposits (B5)  urface Water Present (Y/N):	water Table (C2) gal Mat or Crust (B4) Other (Explain in Notes):  In Deposits (B5)  Inface Water Present (Y/N):	HYDROLOGY Surface Water High Water Ta Saturation (A3	PRIMARY INDICAT  (A1)  able (A2)  (B1)	Sur Inui (B7 Spa Cor Mai	ny one indicator is sufface Soil Cracks (B6) Indation Visible on Ae Incave Surface (B8) I Deposits (B15)	rial Imagery	SE Wa Le Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt tidized Rhiz ring Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
Algal Mat or Crust (B4) Other (Explain in Notes):  From Deposits (B5)  Surface Water Present (Y/N):	gal Mat or Crust (B4) Other (Explain in Notes); on Deposits (B5)  urface Water Present (Y/N):	Other (Explain in Notes):  In Deposits (B5)  Inface Water Present (Y/N):	HYDROLOGY Surface Water High Water Ta Saturation (A3	PRIMARY INDICAT  (A1)  able (A2)  (B1)	Sur Inu (B7 Spa Cor Man	face Soil Cracks (B6) Indation Visible on Ae Interpretate of the control of the c	rial Imagery	SE Wa Le. Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt idized Rhiz ing Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
Surface Water Present (Y/N): N Depth (in): Depth (in): Y D	urface Water Present (Y/N): N Depth (in): Depth (in): Y De	In Deposits (B5)  Inface Water Present (Y/N): N	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	PRIMARY INDICAT  (A1)  able (A2)  (B1)  posits (B2)	Sur Inui (B7 Spa Cor Main Hyco Odc Dry	ny one indicator is surface Soil Cracks (B6) Indation Visible on Ae Indation Visible on Ae Index Surface (B8) Index Surface (B8) Index Surface (B15) Index Sulfide Index S	rial Imagery	SE Wa Le. Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt idized Rhiz ing Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
Surface Water Present (Y/N): N Depth (in): Depth (in): Wetland Hydrology Present (Y/N): Y Depth (in): Y Depth (in): Y Depth (in): Y Depth (in): Y	urface Water Present (Y/N): N Depth (in): — Wetland Hydrology Present (Y/N): Y Depth (in): Y Depth (in): A''  aturation Present (Y/N): Y Depth (in): A''	riface Water Present (Y/N): N Depth (in): Depth (in): Depth (in): Uturation Present (Y/N): Depth (in):	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	PRIMARY INDICAT  (A1)  able (A2)  (B1)  posits (B2)  (B3)	Sur Inui (B7 Spa Cor Mai Hyc Odd	face Soil Cracks (B6) Indation Visible on Ae	rial Imagery	SE Wa Le. Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt idized Rhiz ing Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
Vater Table Present (Y/N):  Depth (in):	Adder Table Present (Y/N):  Depth (in):	ater Table Present (Y/N):  Depth (in):  Uturation Present (Y/N):  Cludes capillary fringe)  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	PRIMARY INDICAT  (A1)  able (A2)  (B1)  posits (B2)  (B3)	Sur Inui (B7 Spa Cor Mai Hyc Odd	face Soil Cracks (B6) Indation Visible on Ae	rial Imagery	SE Wa Le. Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt idized Rhiz ing Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
Vater Table Present (Y/N):  Depth (in):	Adder Table Present (Y/N):  Depth (in):	ater Table Present (Y/N):  Depth (in):  Uturation Present (Y/N):  Cludes capillary fringe)  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits	PRIMARY INDICAT  (A1)  able (A2)  (B1)  posits (B2)  (B3)  frust (B4)	Sur Inui (B7 Spa Cor Mai Hyc Odd	face Soil Cracks (B6) Indation Visible on Ae	rial Imagery	SE Wa Le. Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt idized Rhiz ing Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
Saturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	aturation Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	turation Present (Y/N): Y Depth (in): 4  turation Present (Y/N): Depth (in): 2"	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	PRIMARY INDICAT  (A1)  able (A2)  (B1)  posits (B2)  (B3)  frust (B4)  (B5)	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa Oth	face Soil Cracks (B6 Indation Visible on Ae I	rial Imagery	SE Wa Le. Dra Ox Liv Pre Iro	ater-stained aves (B9) _ ainage Patt idized Rhiz ing Roots ( esence of F n (C4)	rerns (B10) cospheres along C3)	Stunted or Plants (D1)  Geomorphi Shallow Aq  Microtopog Relief (D4)	Stressed  Comparison (D2)  guitard (D3)  graphic
includes capillary fringe) 7 Depth (In):	ocludes capillary fringe) 7 Depth (in):	cludes capillary fringe) 7 Depth (in):	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C	PRIMARY INDICAT  (A1)  able (A2)  (B1)  posits (B2)  (B3)  frust (B4)  (B5)	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa Oth	face Soil Cracks (B6 Indation Visible on Ae I	rial Imagery	SE Wa Le Dra Ox Liv Pre Iro Sa No	ater-stained aves (B9) _ ainage Patt tidized Rhiz ring Roots ( esence of F n (C4) It Deposits	rerns (B10) cospheres along C3) Reduced (C5)	Stunted or Plants (D1) Geomorphi Shallow Aq Microtopog Relief (D4) FAC-Neutra	Stressed  Comparison (D2)  guitard (D3)  graphic
Thousas supmary imige)	onded dapinary imige)	oludos depinary minge)	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits ( Surface Water	Present (Y/N): N	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa Oth	face Soil Cracks (B6 Indation Visible on Ae I	rial Imagery	SE Wa Le Dra Ox Liv Pre Iro Sa No	ater-stained aves (B9) _ ainage Patt tidized Rhiz ring Roots ( esence of F n (C4) It Deposits	rerns (B10) cospheres along C3) Reduced (C5)	Stunted or Plants (D1) Geomorphi Shallow Aq Microtopog Relief (D4) FAC-Neutra	Stressed  Comparison (D2)  guitard (D3)  graphic
lotes	DIES:	nes:	HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits ( Surface Water Water Table P Saturation Pre	PRIMARY INDICAT  (A1)  able (A2)  (B1)  cosits (B2)  (B3)  frust (B4)  (B5)  Present (Y/N):  resent (Y/N):  sent (Y/N):	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa Oth	face Soil Cracks (B6 Indation Visible on Ae I	rial Imagery	SE Wa Le Dra Ox Liv Pre Iro Sa No	ater-stained aves (B9) _ ainage Patt tidized Rhiz ring Roots ( esence of F n (C4) It Deposits	rerns (B10) cospheres along C3) Reduced (C5)	Stunted or Plants (D1) Geomorphi Shallow Aq Microtopog Relief (D4) FAC-Neutra	Stressed  Comparison (D2)  guitard (D3)  graphic
			HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits ( Surface Water Water Table P Saturation Pre Includes capil	PRIMARY INDICAT  (A1)  able (A2)  (B1)  cosits (B2)  (B3)  frust (B4)  (B5)  Present (Y/N):  resent (Y/N):  sent (Y/N):	Sur Inui (B7 Spa Cor Mai Hyc Odd Dry Wa Oth	face Soil Cracks (B6 Indation Visible on Ae I	rial Imagery	SE Wa Le Dra Ox Liv Pre Iro Sa No	ater-stained aves (B9) _ ainage Patt tidized Rhiz ring Roots ( esence of F n (C4) It Deposits	rerns (B10) cospheres along C3) Reduced (C5)	Stunted or Plants (D1) Geomorphi Shallow Aq Microtopog Relief (D4) FAC-Neutra	Stressed  Comparison (D2)  guitard (D3)  graphic

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)
Number of Wetland Types (M): 2 Evenness of Wetland Type Distribution (M): Even Pighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water Cover Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Out of the latest of the lat
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Index Perennial Outlet Perennial Inlet/Index Perennial Outlet Perennial Inlet/Index Perennial Outlet Perennial Inlet/Index Perennial Outlet Perennial Inlet/Index Perennial Inlet/Index Perennial Outlet Perennial Inlet/Index Pe
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet  Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated  Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Wetland Substrate  Fluvaquent Soils Sediment  Wetland Substrate  Fluvaquent Soils Sediment  Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs  Return Interval 2-5 yrs
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Wetland Water Regime (P):
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded Evidence of Sedimentation (P): No Evidence Observed Created Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated   Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Inlet/Intermittent Outlet       Perennial Inlet/Perennial Outlet         Wetland Water Regime (P):       Drier: Seasonally Flooded, Temporarily Flooded, Saturated         Wetl: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded         Evidence of Sedimentation (P): No Evidence Observed       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment         Created         Microrelief of Wetland Surface (P): Absent       Poorly Developed (6in.)       Well Developed (6-18in.)       Pronounced (>18in.)         Frequency of Overbank Flooding (P): No Overbank Flooding       Return Interval 1-2 yrs       Return Interval 2-5 yrs         Return Interval 2-5 yrs         Degree of Outlet Restriction (P): No Outflow       Restricted Outflow       Unrestricted Outflow         Water pH (P): No surface water       Circumneutral (5.5-7.4)       Alkaline (>7.4)       Acid (<5.5)
Inlet/Intermittent Outlet
Inlet/Intermittent Outlet
Inlet/Intermittent Outlet       Perennial Inlet/Perennial Outlet         Wetland Water Regime (P):       Drier: Seasonally Flooded, Temporarily Flooded, Saturated         Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded         Evidence of Sedimentation (P): No Evidence Observed       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment Created         Microrelief of Wetland Surface (P): Absent       Poorly Developed (6in.)       Well Developed (6-18in.)       Pronounced (>18in.)         Frequency of Overbank Flooding (P): No Overbank Flooding       Return Interval 1-2 yrs       Return Interval 2-5 yrs         Return Interval Pyrs       Return Interval 2-5 yrs         Return Interval 2-5 yrs         Degree of Outlet Restriction (P): No Outflow       Restricted Outflow         Water pH (P): No surface water       Circumneutral (5.5-7.4)       Alkaline (>7.4)       Acid (<5.5)
Inlet/Intermittent Outlet       Perennial Inlet/Perennial Outlet         Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded         Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded         Evidence of Sedimentation (P): No Evidence Observed       Sediment Observed on Wetland Substrate       Fluvaquent Soils Sediment Created         Microrelief of Wetland Surface (P): Absent       Poorly Developed (6in.)       Well Developed (6-18in.)       Pronounced (>18in.)         Frequency of Overbank Flooding (P): No Overbank Flooding       Return Interval 1-2 yrs       Return Interval 2-5 yrs         Return Interval >5 yrs         Degree of Outlet Restriction (P): No Outflow       Restricted Outflow       Unrestricted Outflow         Water pH (P): No surface water       Circumneutral (5.5-7.4)       Alkaline (>7.4)       Acid (<5.5)

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	e ID;	W61 HTO 28 Field Target: 069 Date: 76/14
For all	' item	s not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	re Description
	4	Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
	<b>9</b>	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?
	A CO CO CO	Cover calculations are complete and correct? All dominant species have been determined and recorded per strata? Indicator status is correct for each species? Dominance Test and Prevalence Index have been completed?
3.	So	il
	DE P	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hy	drology
	7	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	P	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	P	Notes have been recorded at each site, including general description, sketch, and
	A	accuracy of pre-mapped wetland boundary as appropriate? Each logbook page is initialed and dated?
7.	Ma	ps
		Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X

Denn In Onderson 7/6/14

Signature / Dalle)

X KIM DEGUTIS

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION			300-6	orrido	1150
Survey Type: Centerline Acce	ss Road (explain)	Other (expl	ain)	Field Target: 071	Map #: Map Date: 12014
Date: 7/6/14	Project Name & No.:	Alaska LNG	26221306	Feature Id	: W61 HT029
Investigators: K DEGVTI3	J Anderson	)			Team No.: W6/
State: Alaska	Region: Alaska		Milepost:	567.6	
Latitude: 63° 22' 26. 400		Longitude	: 148" 56	54.53	Datum: WGS84
Logbook No.: W61- 2	Logbook Page No.:	38	Picture No.:	P_W61HT029_1	P.t. Plux; NE; SE
SITE PARAMETERS	S-0-10 10			C	0
Subregion: Interior South can	tral		Landform (hi	llslope, terrace, hummock	s, etc.): Stream temper
Slope (%): 4	11.12			concave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	ation: PSS I EMIC	_	Soil Map Uni	t Name:	
Are climatic/hydrologic conditions on the Yes No (if no exp		of year?	Are "N Yes	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed?	No_XO	(If yes, explain in Notes	
Are Vegetation, Soil, or Hyd	drology Naturally	Problematic?	No_ <u>\</u>	_ (If yes, explain in Notes	.)
SUMMARY OF FINDINGS		100			- 1400 1131 1
Hydrophytic Vegetation Present? Yes_	✓ No	Is	the Sampled /	Area within a Wetland?	Yes No
Hydric Soil Present? Yes_	<u>₩</u> No	w	etland Type: 1	PSSI/EMIB	22
Wetland Hydrology Present? Yes_	` <i>&gt;</i> Nо	— Ala	aska Vegetatio	n Classification (Viereck):	IC1, ITA2
Notes and Site Sketch: Please include D	Directional & North Arrov	v, Centerline,	Length of featu	re, Distances from Center	line, Photo Locations, and Survey
corridor.	< 111		•	26	
	See lochode	: ω61	-d. p	age SB	η 0
	See lochade	Go	site 5keti	ch & notes	
					5 × 1 × 2 × 0 × 0
					- 4
		1			
					A 12.0
					9.55 or
		*			

VEGETATION (use scientific names of plan	ts)	E				
Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:		
1. NA				Total Number of Dominant Species Across All Strata:		
2.				% Dominant Species that are OBL, PACW, 01 PAC(A		
3.						
				Prevalence Index worksheet:		
Total Cove	or:			Total % Cover of: Multiply by:		
50% of total cove	er: 20	% of total cov	er:	OBL species:X 1 =		
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 35		
Salix neticulatu	15	7	FAC	UPL species X 5 =		
· VACCINIUM Ullyinosum	30	Y	FAC	Column Totals: 133 (A) 376 (B)		
Dooiphora Fruticosa	10		FAC	PI = B/A = 2.82		
Salix bebbiana	7		FAC			
. Salix pulchra	10		FACW			
3. Betula clandulosa	5		FAC			
Solix bareley;	15	Y	FAC			
3. Solix auctica	10		FACU			
	_					
9. Pices slaves	2		FACU			
Total Cove	er: 104					
FICE CALLED	er: 104	)% of total cov				
Total Cove	er: <u>104</u> er: <u>52</u> 20	)% of total cov				
Total Cove	er: <u>104</u> er: <u>52</u> 20	Dominant Species?		Hydrophytic Vegetation Indicators:  O Dominance Test is > 50%		
Total Coverage of the stratum ( 26 )	er: 109 er: 52 20 ets) Absolute % Cover	Dominant	rer: 20.8 Indicator Status	O Dominance Test is > 50%  Prevalence Index is ≤ 3.0		
Total Cover 50% of total cover 5	er: 104 er: 52 20 ts) Absolute	Dominant Species? (Y/N)	rer: 20.8	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in		
Total Cover 50% of total cover 5	er: 109 er: 52 20 ets) Absolute % Cover	Dominant Species? (Y/N)	rer: 20.8 Indicator Status	O Dominance Test is > 50%  Prevalence Index is ≤ 3.0		
Total Cover 50% of total cover 5	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW	Dominance Test is > 50%  ✓ Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)		
Total Covers 50% of total	er: 104 er: 52 20 ts) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)		
Total Cover 50% of total cover 5	er: 104 er: 52 20 ts) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW FACW FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.		
Total Cover 50% of total cover 5	er: 104 er: 52 20 ts) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW FACW FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.		
Total Covers 50% of total covers 50% of total covers of total	er: 104 er: 52 20 ts) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW FACW FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.   Bare Ground  Wetland Bryophytes		
Total Cover 50% of total cover 5	er: 104 er: 52 20 ts) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW FACW FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground  We Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes		
Total Cover 50% of total cover 5	er: 104 er: 52 20 ts) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  FACW FACW FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.   Bare Ground  Cover of Wetland Bryophytes		

Depth	DESCRIPTION: (De	escribe	to the depth needed	to docu	ment the	indicator or		of indicators \
Jehin -			1		mont the	indicator or	confirm the absence	of fidicators.)
inches)			Redox Features	Redox Features				
	Color (moist)	%	% Color (moist) % Typ		Type <sup>1</sup>	Loc²	Texture	Notes
1-2"							FIBRIC	dry
-15"	7.5 YR 2.5/1	95	10 YR 3/8 4	5	C	M	SANON LOAM	Redox dark surface (F
						-		
		-					4	
				+		-		
				1				
Type: C=Conc	centration. D=Depleti	on. RN	I И=Reduced Matrix, C	S=Cover	ed or Co	ated Sand G	irains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix,
HYDRIC SOIL II				ă				OR PROBLEMATIC HYDRIC SOILS
Histosol or Histe	el (A1)		Alaska Gleyed	(A13)				ange (TA4) <sup>4</sup>
	(A2)		Alaska Redox					vales (TA5)
	3)		Alaska Gleyed				Alaska Redox w	
=	de (A4)							vithout 5Y Hue or Redder Underlying
							Layer	N. C.
Thick Dark Surfa		-	no primary indicator	ofallan	d budsala	and and	Other (Explain in	e position must be present unless
Hydric Soil Pre	esent (Y/N):			epth (inc		en I P.	- Liven on C	on up x sur lace - was dry
Notes: 2-15	esent (Y/N): " = Redox da	v K	surface. (Fle	) In 50 and	in al dug I satu			onvex surface-was dry ocally con call surface
Hydric Soil Pre: Notes:	esent (Y/N): " = Redox da	v K		) In 50 and	in al dug I satu		taken on e 55.1 pit on 1 at 6" Y INDICATORS (20	
Hydric Soil Pres Notes: ユーリジン	esent (Y/N): " = Redox da	ORS (E	surface. (Fle	) In	thal dug I satu		Y INDICATORS (2 o	
Hydric Soil Pres Notes: 2-15  HYDROLOGY P  Surface Water (A	esent (Y/N): \frac{1}{2}  " = Redox da  PRIMARY INDICATO	ORS (£	swface (Flance) (Flance) one indicator is surface Soil Cracks (B6) indication Visible on Ae	) In	thal dug I satu	SECONDAR Vater-staine eaves (B9)	Y INDICATORS (2 o	Stunted or Stressed Plants (D1)
Hydric Soil Pres Notes: 2-15  HYDROLOGY P  Surface Water (A	PRIMARY INDICATO	ORS (a	swface (Flance) (Flance) one indicator is surface Soil Cracks (B6) indication Visible on Ae	) In	thal dwg I satured to the satured to	SECONDAR Vater-staine eaves (B9) Orainage Pat	Y INDICATORS (2 o	Stunted or Stressed Plants (D1)
Hydric Soil Pres Notes: ユーロラン HYDROLOGY P Surface Water (A	PRIMARY INDICATO  (A1)  ble (A2)	Sur (B7 Sp. Co	any one indicator is surface Soil Cracks (Beindation Visible on Aero)	) In	thal dwg I satured to the satured to	SECONDAR Vater-staine Leaves (B9) Orainage Pat Oxidized Rhis Living Roots	terns (B10)	r more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Hydric Soil Pres Notes: 2-15  HYDROLOGY P Surface Water (A High Water Table Saturation (A3)	PRIMARY INDICATO  (A1)  ble (A2)	Sun (B7 Sp. Co. Ma	any one indicator is s  rface Soil Cracks (Be indation Visible on Ae 7)  arsely Vegetated ncave Surface (B8)  Irl Deposits (B15)  drogen Sulfide	) In	satural satura satural satural satural satural satural satural satural satural	Vater-stainer Leaves (B9) Drainage Pat Dxidized Rhia Living Roots Presence of I	terns (B10)	r more required)  Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil Pres Notes: 2-15  HYDROLOGY P Surface Water (A High Water Table Saturation (A3)  Water Marks (B1 Sediment Depos	PRIMARY INDICATO  (A1)  ble (A2)  1)	Sun Inu (B7 Cool Ma Hyd Od Dry	any one indicator is s  rface Soil Cracks (Be indation Visible on Ae  r)  arsely Vegetated incave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  y-Season	) In	thal dyay I saturate of the sa	Vater-stainer Leaves (B9) Drainage Pat Dxidized Rhia Living Roots Presence of I	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil Presented	PRIMARY INDICATO  (A1)  (b) (A2)  (c) (B2)  (s) (B2)	Sun (B7 Sp. Co) Ma Hydod Dry Wa	any one indicator is surface Soil Cracks (Beandation Visible on Aero) arsely Vegetated nacave Surface (B8)	) In	thal dyay I saturate of the sa	Vater-stained eaves (B9) Orainage Pate Oxidized Rhicking Roots Presence of I fron (C4)	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil Presented	PRIMARY INDICATO  (A1)  ble (A2)  1)  sits (B2)  JST (B4)	Sun (B7 Sp. Co) Ma Hydod Dry Wa	any one indicator is s  rface Soil Cracks (Be indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) Irl Deposits (B15) drogen Sulfide or (C1)	) In	thal dyay I saturate of the sa	Vater-stained eaves (B9) Orainage Pate Oxidized Rhicking Roots Presence of I fron (C4)	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil Preservoires: 2-15 \ HYDROLOGY Properties (A) High Water Table (A) Water Marks (B1) Gediment Deposits (B) Algal Mat or Cruston Deposits (B)	PRIMARY INDICATO  (A1)  (b) (A2)  (b) (B2)  (b) (B4)  (b) (B4)	Sun (B7 Sp. Co) Ma Hydod Dry Wa	any one indicator is s  rface Soil Cracks (Beandation Visible on Aero)  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  y-Season atter Table (C2)  ner (Explain in Notes)	) In	thal dyay I saturate of the sa	Vater-stained eaves (B9) Orainage Pate Oxidized Rhicking Roots Presence of I fron (C4)	terns (B10) zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil Preservoires: 2-15 \ HYDROLOGY Properties (A) High Water Table (A) Water Marks (B1) Gediment Deposits (B) Algal Mat or Cruston Deposits (B)	PRIMARY INDICATO  (A1)  ble (A2)  1)  sits (B2)  JST (B4)	Sun (B7 Sp. Co) Ma Hydod Dry Wa	any one indicator is s  rface Soil Cracks (Be indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) Irl Deposits (B15) drogen Sulfide or (C1)	) In	satural satura satural satural satural satural satural satural satural satural	Vater-stained Leaves (B9) Orainage Pate Dividized Rhis.iving Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Hydric Soil Pres Notes: 2-15  HYDROLOGY P  Surface Water (A  High Water Table  Saturation (A3)  Water Marks (B1  Sediment Depos  Drift Deposits (B  Algal Mat or Crui  ron Deposits (B)  Surface Water P	PRIMARY INDICATO  (A1)  (b) (A2)  (b) (B2)  (b) (B4)  (b) (B4)	Sun (B7 Sp. Co) Ma Hydod Dry Wa	any one indicator is s  rface Soil Cracks (Beandation Visible on Aero)  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  y-Season atter Table (C2)  ner (Explain in Notes)	) In	satural satura satural satural satural satural satural satural satural satural	Vater-stained Leaves (B9) Orainage Pate Dividized Rhis.iving Roots Presence of I fron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         O         Sapling (<5 dbh, <6m tall)         A         Tall shrub (2-6m)         O         Short shrub (0.5-2m)         N           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) X One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed) X
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine X Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric_
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated <a href="Mailto:Wet:Perm. Flooded">Wet: Perm. Flooded</a> , Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded  Evidence of Sedimentation (P): No Evidence Observed  Sediment Observed on Wetland Substrate  Fluvaquent Soils Sediment Created  Microrelief of Wetland Surface (P): Absent  Poorly Developed (6in.)  Well Developed (6-18in.)  Pronounced (>18in.)  Pronounced (>18in

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	e ID: W61 HT029 Field Target: 71 Date: 7/6/14  items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer	Anderson	X gennelo	Anderson	7/6/14
Wetland Scientist (print)		Signature / Date		

X him Delov T15

Field Crew Chief (print)

Signature / Date

300 Ct conido SITE DESCRIPTION Map #: 41 Map Date: 5/27/14 Field Target: 70 Other (explain) X Survey Type: Centerline Access Road (explain) Project Name & No.: Alaska LNG 26221306 Feature Id: W61 HT 030 Date: 7/6/14 Investigators: K DEGVIS Team No.: Wa / J ANDUSON State: Alaska Region: Alaska Milepost: 567.55 56' 49.88" Longitude: 148° 22' 27.20" Latitude: 63<sup>6</sup> Datum: WGS84 Logbook Page No.: 39 Picture No.: P\_W61HT030 Logbook No.: Pit: Plug: E; South SITE PARAMETERS Landform (hillslope, terrace, hummocks, etc.): River terrace Subregion: Interior Local relief (concave, convex, none): Slope (%): Pre-mapped Alaska LNG/NWI classification: Soil Map Unit Name: EMIC Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (If no, explain in Notes.) Yes\_*y* (if no explain in Notes) No\_ (If yes, explain in Notes) Are Vegetation\_ , Soil Significantly Disturbed? or Hydrology Are Vegetation\_ , Soil or Hydrology Naturally Problematic? (If yes, explain in Notes.) **SUMMARY OF FINDINGS** Is the Sampled Area within a Wetland? Hydrophytic Vegetation Present? Yes No P551C Hydric Soil Present? Wetland Type: No Wetland Hydrology Present? No Yes Alaska Vegetation Classification (Viereck): ## 81, ## 62 Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey See laspook Wel-2, page 39 for site sletch's notes. corridor.

VEGETATION (use scientific names of plants	3)			
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:
1. NA			~	Total Number of Dominant Species Across All Strata: 4 (
2.				% Dominant Species that are OBL, FACW, or FAC:(A/
3.				
4.				Prevalence Index worksheet:
Total Cover	:			Total % Cover of: Multiply by:
50% of total cover		% of total cov	er:	OBL species:/5X 1 =/5
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 15
1. Alnus Friticosa	10		FAC	UPL species X 5 =
2. Salix bardani	30	Y	FAC	Column Totals: 135 (A) 360 (B)
3. Rubus aucticus	20		FAC	PI = B/A = 2.67
2. Salix bandayi 3. Rubus aucticus 4. Salix pulchra 5. Salix glauca	15		FACW	
5. Salix glauca	35	У	FAC	
6. V		,		
7.				
8,				
9.				
Total Cover				
50% of total cover	: <u>55</u> 20	% of total cov	rer: 22	
VEGETATION (use scientific names of plants	3)	77 - 6-		1071
Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Commun palnotre	10	У	OBL	Prevalence Index is ≤ 3.0
2. Calamagnostis Conadensis	10	Y	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3. Gazer aquatilus	5		OBL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Viola Palustris	T		FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.			1,11000	disturbed or problematic.

	% Cover	Species? (Y/N)	Status	Dominance Test is > 50%
1. Comarum palnotre	10	У	OBL	Prevalence Index is ≤ 3.0  Marphological Adoptations 1/Dravide supporting data in
2. Calamagnostis Conadensis	10	X	FAC	△ Morphological Adaptations¹ (Provide supporting data in Notes)
1. Comarum palnotre 2. Calamagnostis Conadensis 3. Caser aquatilus	5		OBL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Viola palustris	T		FACW	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5.				disturbed or problematic.
6.				
7.				% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				/o % Cover of Water
Total Cover		I 0% of total cov	ver:	Notes: (If observed, list morphological adaptations below):  multiple timeing observed in most Solin. Specime

			Date 7/6/14	1 14 1				£ ! !! 4 \
SOIL PROFIL	E DESCRIPTION: (De	escribe			it the indic	ator or c	confirm the absen	ce of indicators.)
Depth	Matrix	1	Redox Features		1 1.	2	-	N.
nches)	Color (moist)	%	Color (moist)	% Тур	be. L	oc²	Texture	Notes
0-2"					-		Fibric	SalvateD
2 10"	7.5 42	-					Fibric	includes spandy logana
2-6"	7.5 4R 3/1	100	1.	1			Fibric /St	who las in
6-18"	7.5 YR 2.5/1	85	10 YR 3/4	15 0	2	4	Fine sauby 4	an Redox distinct promoent includes 15% openes, 5%
								(ncludes 13 /ognivers, sp
Type: C=Co	ncentration, D=Deplet	ion, RM	/ //=Reduced Matrix	c, CS=Covered	or Coated	Sand G	rains. <sup>2</sup> Location	: PL=Pore Lining, M=Matrix.
YDRIC SOII	LINDICATORS		I all			d.	INDICATORS	FOR PROBLEMATIC HYDRIC SOIL
istosol or His	stel (A1)		Alaska Gley	yed (A13)			Alaska Color	Change (TA4) <sup>4</sup>
	on (A2)			lox (A14)			Alaska Alpine	Swales (TA5)
	A3)			yed Pores (A15)			Alaska Redox	with 2.5Y Hue
	fide (A4)						Alaska Gleye Layer	d without 5Y Hue or Redder Underlying
	ırface (A12)						Other (Explai	n in Notes) 🗶 cape position must be present unless
	Present (Y/N):	,						
Hydric Soil P	Present (Y/N):	1		clox danks	surface	3		
Hydric Soil P Notes:		1 ind	icaton = Rec		_		Y INDICATORS (	2 or more required)
Hydric Soil P Notes:	Alisties (FG)	) indi	icaton = Rec	is sufficient)	SEC0 Wate	ONDAR'		2 or more required)  Stunted or Stressed Plants (D1)
Hydric Soil P Notes:	PRIMARY INDICAT	) indi	any one indicator i	is sufficient)	SECC Wate Leave	ONDAR' r-stained es (B9)	d	Stunted or Stressed Plants (D1)
Hydric Soil P Notes:  HYDROLOG  Surface Water Ta	Y PRIMARY INDICAT  If (A1)  able (A2)	ORS (E	any one indicator i	is sufficient) (B6)  Aerial Imagery	SECC Wate Leave Drain	ONDAR' r-stained es (B9) age Pat zed Rhiz	d	Stunted or Stressed Plants (D1)
Hydric Soil P Notes:  HYDROLOG  Surface Wate High Water T: Saturation (A:	Y PRIMARY INDICAT  If (A1)  able (A2)	ORS (a	any one indicator inface Soil Cracks industrian Visible or 7)	is sufficient) (B6) n Aerial Imagery	SECC Wate Leave Drain Oxidi: Living Prese	ondar r-stained es (B9) age Pat zed Rhiz l Roots	terns (B10) 🔀	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Hydric Soil P Notes:  HYDROLOGY  Surface Water High Water To Saturation (A: Water Marks	PRIMARY INDICAT  IT (A1)  able (A2) \( \sum_{\text{B}} \)	ORS (a	any one indicator in reface Soil Cracks undation Visible or 7) arsely Vegetated incave Surface (Bi	is sufficient) (B6) n Aerial Imagery	SECC  Wate Leave  Drain Oxidia Living Prese Iron ( Salt D	DNDAR' r-stained es (B9) age Pat zed Rhiz I Roots ince of I C4)	terns (B10) 💢	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Hydric Soil P Notes: HYDROLOG Surface Wate High Water Table Saturation (A: Water Marks Sediment Dep	PRIMARY INDICAT  (A1)  able (A2)  (B1)	ORS (in Su Inu (B' Sp Co	any one indicator in rface Soil Cracks indation Visible or 7) arsely Vegetated incave Surface (Bit and Deposits (B15)) ardrogen Sulfide	is sufficient) (B6) n Aerial Imagery	SECO Wate Leave Drain Oxidit Living Prese Iron (	DNDAR' r-stained es (B9) age Pat zed Rhiz I Roots ince of I C4)	terns (B10) X zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG  Gurface Wate High Water Ta  Saturation (A:  Water Marks  Sediment Deposits	Y PRIMARY INDICAT  IT (A1)  able (A2) \( \sum_{\text{B}} \)  (B1)  posits (B2) \( \text{Q} \)	ORS (a Su Inu (B) Sp Co Ma Hy Oc Dr Wa	any one indicator in rface Soil Cracks undation Visible or 7) arsely Vegetated incave Surface (Bit of Carl Deposits (B15) drogen Sulfide lor (C1)	is sufficient) (B6) n Aerial Imagery	SECC  Wate Leave  Drain Oxidia Living Prese Iron ( Salt D	DNDAR' r-stained es (B9) age Pat zed Rhiz I Roots ince of I C4)	terns (B10) X zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG  Surface Wate High Water Ta Saturation (A: Water Marks Sediment Dep Drift Deposits  Algal Mat or (	Y PRIMARY INDICAT  IT (A1)  able (A2) \( \sum_{\text{B}} \)  (B1)  cosits (B2) \( \overline{\text{Q}} \)	ORS (a Su Inu (B) Sp Co Ma Hy Oc Dr Wa	any one indicator in trace Soil Cracks and ation Visible or arrely Vegetated ancave Surface (Bit of Carl Deposits (B15) adrogen Sulfide for (C1)	is sufficient) (B6) n Aerial Imagery	SECC  Wate Leave  Drain Oxidia Living Prese Iron ( Salt D	DNDAR' r-stained es (B9) age Pat zed Rhiz I Roots ince of I C4)	terns (B10) X zospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOG  Gurface Water High Water T  Saturation (A: Water Marks  Sediment Deposits  Algal Mat or C  ron Deposits	Y PRIMARY INDICAT  (A1)  able (A2) \( \sum_{\text{B}} \)  (B1)  cosits (B2) \( \sum_{\text{C}} \)  (B3)  Crust (B4)	ORS (i Su Inu (B Sp Co Ma Hy Oc Ot	any one indicator in rface Soil Cracks undation Visible or 77) arsely Vegetated uncave Surface (Bit of Carl Deposits (B15) drogen Sulfide lor (C1) y-Season after Table (C2) her (Explain in No	is sufficient) (B6) n Aerial Imagery	SECC Wate Leave Drain Oxidia Living Prese Iron ( Salt D	DNDAR' r-stained es (B9) _ age Pat zed Rhiz I Roots ince of I C4) Deposits	terns (B10) 🔀	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Co Iron Deposits Surface Water	PRIMARY INDICAT  (A1)  able (A2) \( \sum_{\text{B}} \)  (B1)  cosits (B2) \( \sum_{\text{C}} \)  (B3)  Crust (B4)  (B5)	ORS (i Su Inu (B Sp Co Ma Hy Oc Ot	any one indicator in rface Soil Cracks indation Visible or 7)  arsely Vegetated incave Surface (Bit of C1)  drogen Sulfide for (C1)  y-Season ater Table (C2)  her (Explain in No Depth (in):	is sufficient)  (B6)  Aerial Imagery  8)  ites):	SECC Wate Leave Drain Oxidia Living Prese Iron ( Salt D	DNDAR' r-stained es (B9) _ age Pat zed Rhiz I Roots ince of I C4) Deposits	terns (B10) 🔀	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Hydric Soil P Notes:  HYDROLOGY  Gurface Water High Water To Saturation (A: Water Marks  Sediment Deposits  Algal Mat or C  ron Deposits  Surface Water	Present (Y/N):	ORS (i Su Inu (B Sp Co Ma Hy Oc Ot	any one indicator in rface Soil Cracks indation Visible or 7)  arsely Vegetated incave Surface (Bit of C1)  drogen Sulfide for (C1)  y-Season ater Table (C2)  her (Explain in No Depth (in):	is sufficient)  (B6)  Aerial Imagery  8)  ttes):	SECC Wate Leave Drain Oxidia Living Prese Iron ( Salt D	DNDAR' r-stained es (B9) _ age Pat zed Rhiz I Roots ince of I C4) Deposits	terns (B10) 🔀	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):     Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved     Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Broad-leaved     Emergent-Non-persistent Emergent-Non-persistent
Percent Cover (P): Tree (>5 dbh, >6m tall)     Sapling (<5 dbh, <6m tall)     Tall shrub (2-6m)     75     Short shrub (0.5-2m)       Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)       \( \sum_{} \)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Fringe
SOIL VARIABLES  Seil Featers (D): Seil Leaking Litteraturis Litteratur
Soil Factors (P): Soil Lacking Histosol: Fibric Histosol: Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
LIVERED COLO VARIABLES
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval >5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4)
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) High Gradient (≥2%)
Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
LANDSCAPE VARIABLES (M)
LANDSCAPE VARIABLES (M)       Wetland Juxtaposition:     Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below       Only Connected Above Connected Upstream & Downstream Unknown
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Only Connected Above Unknown
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown         Wetland Land Use:       High Intensity (i.e., ag.)       Moderate Intensity (i.e., forestry)       Low Intensity (i.e. open space)

Page 4 of 4

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID:	W61HT030 Field Target: 70 Date: 7/6/14
		s not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	e Description
		Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
	/ Ø	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	So	il
		Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
	Ø Ø	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	粒	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	<b>4</b>	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7		
7.		
	- 1	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Junifer	Anderson	X Jank	Andr	7/6/04
Wetland Scientist (print)		Signature / Date		

X Kim DEGUTIS X Pulls With 7/6/14

Field Crew Chief (print) Signature / Date

SITE DESCRIPTION	Company of the last		2000	er Ja	
Survey Type: Centerline Acce	ess Road (explain)	Other (exp		Field Target: 075	Map #: 51/13 Map Date: 5 27/14
Date: 7 7 14	Project Name & No.:	Alaska LNC	3 26221306	Featur	e ld: W61 HT03 1
Investigators: L DEGUTIS	J Anderson				Team No.: W6
State: Alaska	Region: Alaska		Milepost:	581. 15	1001
Latitude: 63°15 '20.05		Longitude	: 149° 15		Datum: WGS84
Logbook No.: WGI-2	Logbook Page No.:	40			_Pit; Plus; NE, S
SITE PARAMETERS					0'
Subregion: Southcare	1_ 0	-	Landform (hi	illslope, terrace, humm	nocks, etc.): hummocks
Slope (%):				concave, convex, non	
Pre-mapped Alaska LNG/NWI classific	ation: PEM IF		Soil Map Un		
Are climatic/hydrologic conditions on th	• • • • • • • • • • • • • • • • • • • •	e of year?	Are "N	lormal Circumstances	" present: o, explain in Notes.)
Are Vegetation, Soil, or Hy	drologySignifican	tly Disturbed	No_X	(If yes, explain in N	otes)
Are Vegetation, Soil, or Hy	drology Naturally	Problematic?	No 🗲	(If yes, explain in N	otes.)
SUMMARY OF FINDINGS		10	All		A STATE OF THE STA
Hydrophytic Vegetation Present? Yes_		Is	the Sampled	Area within a Wetlan	d? Yes No
Hydric Soil Present? Yes_	♥ No	w	etland Type:	PEMI/SS	IXF
Wetland Hydrology Present? Yes_	√ No	AI	aska Vegetatio	on Classification (Viere	ck): III A 3, II CI
Notes and Site Sketch: Please include corridor.	be plot wlin	area a	f patter	red appared A	
		5000		•	and the state of
			47		110
					90, 4
			-	3	e nate
					gin ± 124
					1
		-1			11.00
				~	
				34	

VEGETATION (use scientific names of plan	ts)			
Tree Stratum (Plot sizes:	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:  (B
1.				Total Number of Dominant Species Across All Strata: (B)  M Dominant Species that are OBL, FACW, or FAC: (A/E)
2.				(AL
3.				
4.				Prevalence Index worksheet:
Total Cove	er: 0			Total % Cover of: Multiply by:
50% of total cove	er: 20	% of total cov	/er:	OBL species: 49 X 1 = 49
Sapling/Shrub Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 23
1. Betila nana -	20	4	FAC	UPL species X 5 =
2. Vaccinium Ulizinosum -	75:12	Y	FAC	Column Totals: 134 (A) 286 (B)
3. Rhododendron spenlandicum			FAC	PI = B/A = 2.13
4. Andromeda polifolia.	1		FACW	
5. Picco danca	2		FACU	
6. Empetrum ni soum	7		FAC	
7. Spirea stevenii -	3		FACU	
8. JACEINIUM OXUCOCCUS.	1		OBL	
9.				The state of the s
Total Cove	r: 56			
50% of total cove	r: <u>28</u> 20	% of total cov	ver: 11 . 2	

Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  ———————————————————————————————————
1. Congrum Palustre	3		OBL	1
2. Viola palustris			FACW	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3. Eleochoris acicularis	30	Y	100	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Calamagnostis caradensis	15.8		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Pedicularis lubractories	1		FACU	disturbed or problematic.
6. Carex Vaginata	15		100	
7. Carex capillaris	20	Y	Fach	% Bare Ground
8. Pubus chamacamerous	T		FACW	5 % Cover of Wetland Bryophytes
9.				45 Total Cover of Bryophytes
10.				% Cover of Water
	ver: <u>42.5</u> 20		15.6 rer: <del>17</del>	Notes: (If observed, list morphological adaptations below):

OIL PROFIL	E DESCRIPTION:	Describe	Date 7 7 1 Feature ID	ment the	indicator or	confirm the absen	ce of indicators.)	
	Matrix	Describe	Redox Features					
Depth inches)	Color (moist)	1 %	Color (moist) %	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
	Color (molet)	1	Color (moley)	.,,,,		Histol	FUNCTO	
D-18,						1112111		
		1/1-						
						W.	1 ,	
		etion, RI	M=Reduced Matrix, CS=Cove	red or Co	ated Sand C		n: PL=Pore Lining, M=Matrix.	
	LINDICATORS						FOR PROBLEMATIC HYDR	ic soils
	stel (A1)		Alaska Gleyed (A13) _				Change (TA4) <sup>4</sup>	
	on (A2)						Swales (TA5)	
3lack Histic (/	A3)		Alaska Gleyed Pores (	A15)			with 2.5Y Hue	ndoslui-s
Hydrogen Sul	lfide (A4)					Alaska Gleye	d without 5Y Hue or Redder U	naenying
Thick Dark Su	urface (A12)					Other (Explai	n in Notes)	
One indicato	r of hydrophytic veg	etation, o	one primary indicator of wetlan	nd hydrol	ogy, and an	appropriate lands	cape position must be present	unless
disturbed or p	A DESCRIPTION OF THE PROPERTY OF THE PARTY O	otes						
Restrictive La	eyer (if present): Type Present (Y/N):	e:_ N	Depth (in	ches):			*	
Restrictive La	Present (Y/N):	pe: N					2 or more required)	
Restrictive La	Present (Y/N):	pe: N			SECONDAR	Y INDICATORS	2 or more required)	17-2-
Restrictive La Hydric Soil F Notes: HYDROLOG	Present (Y/N):	ATORS (			SECONDAR Water-staine	<b>EY INDICATORS</b> (	Stunted or Stressed	15-5
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate	Present (Y/N):	ATORS (	any one indicator is sufficient	)	<b>SECONDAR</b> Water-staine Leaves (B9)	Y INDICATORS	Stunted or Stressed Plants (D1)	(D2)
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Water High Water T	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  or (A1)	ATORS ( St.  Interpolation (B	any one indicator is sufficient rface Soil Cracks (B6) undation Visible on Aerial Ima	gery	<b>SECONDAR</b> Water-staine Leaves (B9) Drainage Pa	ey INDICATORS ( ad tterns (B10) izospheres along	Stunted or Stressed Plants (D1)	
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate High Water T Saturation (A	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  or (A1)	St.  St.  St.  Co.	any one indicator is sufficient irface Soil Cracks (B6) undation Visible on Aerial Ima 7) parsely Vegetated	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh	ey INDICATORS of the desired states along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position	
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate High Water T Saturation (A	Present (Y/N):  Present (Y/N):	ATORS ( St. Inn. (B Sp. Cc M:	any one indicator is sufficient, inface Soil Cracks (B6) undation Visible on Aerial Ima 7) harsely Vegetated incave Surface (B8)	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	ey INDICATORS of the desired states along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position  Shallow Aquitard (D3)  Microtopographic	)
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Present (Y/N):	St. Inn. (B Sp. Cc. M:	any one indicator is sufficient;  urface Soil Cracks (B6)  undation Visible on Aerial Ima  7)  varsely Vegetated uncave Surface (B8)  arl Deposits (B15)  urdrogen Sulfide	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	et indicators (ed	Stunted or Stressed Plants (D1)  Geomorphic Position  Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate High Water T Saturation (A Water Marks Sediment De	Present (Y/N):  Present (Y/N):	ATORS ( St. Inn.  (B Sp. Cc  M:  Dr.  W.	any one indicator is sufficient;  Inface Soil Cracks (B6)  Indation Visible on Aerial Ima  7)  Parsely Vegetated oncave Surface (B8)  and Deposits (B15)  Indrogen Sulfide on (C1)  Ty-Season	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	et indicators (ed	Stunted or Stressed Plants (D1)  Geomorphic Position  Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits	Y PRIMARY INDICA  or (A1)  able (A2)  (B1)  posits (B2)  s (B3)	ATORS ( St. Inn.  (B Sp. Cc  M:  Dr.  W.	any one indicator is sufficient;  Inface Soil Cracks (B6)  Indation Visible on Aerial Ima  7)  Parsely Vegetated oncave Surface (B8)  arl Deposits (B15)  Idrogen Sulfide dor (C1)  y-Season ater Table (C2)	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	et indicators (ed	Stunted or Stressed Plants (D1)  Geomorphic Position  Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
Restrictive La Hydric Soil F Notes: HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or (I	Present (Y/N):  Present (Y/N):	ATORS ( St. Inn.  (B Sp. Cc  M:  Dr.  W.	any one indicator is sufficient, or acceptance of the control of t	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	et indicators (ed tterns (B10) izospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position  Shallow Aquitard (D3)  Microtopographic Relief (D4)	)
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Restrictive La Hydric Soil F Notes: HYDROLOG Surface Wate High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or ( Iron Deposits Surface Wate Water Table Saturation Pr	Present (Y/N):	ATORS ( St. Inn.  (B Sp. Cc  M:  Dr.  W.	any one indicator is sufficient, or acceptance of the control of t	gery	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	ey INDICATORS (ad	Stunted or Stressed Plants (D1)  Geomorphic Position  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Persistent         Aquatic Bed           Percent Cover (P): Tree (>5 dbh, >6m tall)         ○         Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): _2 Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) — One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
COIL VADIADI ES
SOIL VARIABLES  Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES   Inlet/Outlet Class (P): No Inlet/Outlet \( \sum_{\text{outlet}} \) No Inlet/Intermittent Outlet \( \text{No Inlet/Perennial Outlet} \) Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet \( \text{Perennial Inlet/No Outlet} \) Perennial Inlet/Intermittent Outlet \( \text{Perennial Outlet} \) Perennial Inlet/Perennial Outlet \( \text{Perennial Outlet} \)
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Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  No Inlet/Perennial Outlet  Intermittent Inlet/No Outlet  Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet  Perennial Inlet/Intermittent Outlet  Perennial Inlet/Perennial Outlet  Perennial Inlet/Perennial Outlet  Perennial Inlet/Perennial Outlet  Perennial Inlet/Perennial Outlet  Perennial Outlet  Perennial Inlet/Perennial Outlet  Perennial Outlet  Perennial Inlet/Perennial Outlet  Pe
Inlet/Outlet Class (P): No Inlet/Outlet \( \subseteq \) No Inlet/Intermittent Outlet \( \subseteq \) No Inlet/Perennial Outlet \( \subseteq \) Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet \( \subseteq \) Perennial Inlet/Intermittent Outlet \( \subseteq \) Perennial Inlet/Perennial Outlet \( \subseteq \subseteq \subseteq \subseteq \) Perennial Inlet/Perennial Outlet \( \subseteq
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Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  Intermittent Inlet/No Outlet  Intermittent Inlet/Intermittent Inlet/Intermi
Inlet/Outlet Class (P): No Inlet/Outlet

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: WGIHTO31	Field Target: 075	Date: 7/7/14
For all items not checked, please	provide detailed explanation in the	notes section of data form.

#### 1. Site Description

- ☑ Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ☑ Vegetation names are entered legibly for all strata present?
- All dominant species have been determined and recorded per strata?
- ☑ Indicator status is correct for each species?
- ➡ Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Soil profile is complete?
- Appropriate hydric soil indicators are marked?

#### 4. Hydrology

- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- 包 Each logbook page is initialed and dated?

#### 7. Maps

- ✓ Wetland boundaries have been corrected if necessary?
- Maps are initialed and dated?

### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson	X Oom for Angless	7/7/14
Wetland Scientist (print)	Signature / Date	11/11

X Kim DEGUTIS

X Mull La H 7/1/19

Field Crew Chief (print)

Signature / Date

\_ Access Road (explain)\_

J Anduson

Region: Alaska

Logbook Page No.:

SITE DESCRIPTION

Investigators:

State: Alaska

Logbook No.:

Latitude:

Survey Type: Centerline\_

TA FORM	Corrido		
2000		Are	1,20 11
Other (explain) X	Field Targ	et: <u>16</u>	Map #: 5 1   Map Date: 5   27   און
Alaska LNG 26221306		Feature Id	: WGIHTO32
			Team No.: いんり
Milepost: 5	581.2		
Longitude: 149° 15'	51.15"		Datum: WGS84

Picture No.: P\_WGIHT032\_P.H: Plug: S: NE

	. 0'
SITE PARAMETERS	
Subregion: South central	Landform (hillslope, terrace, hummocks, etc.): Flut
Slope (%):	Local relief (concave, convex, none):
Pre-mapped Alaska LNG/NWI classification: PEM   F	Soil Map Unit Name:
Are climatic/hydrologic conditions on the site typical for this time of year?  Yes No (if no explain in Notes)	Are "Normal Circumstances" present: Yes No (If no, explain in Notes.)
Are Vegetation, Soil, or Hydrology Significantly Disturb	ed? No (If yes, explain in Notes)
Are Vegetation, Soil, or Hydrology Naturally Problemat	ic? No (If yes, explain in Notes.)
SUMMARY OF FINDINGS	and the same
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area within a Wetland? Yes_ Yes_ No:
Hydric Soil Present? Yes	Wetland Type: PSS 1 / EM 1 B
Wetland Hydrology Present? Yes No	Alaska Vegetation Classification (Viereck): TT C 1, TTT A 5

Other (expla

41

Project Name & No.: Alaska LNG

Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor.

See logook Wel-2, page 41 for site sletchy notes

VEGETATION (use scientific names of plant	s)	C 3	-	
Tree Stratum (Plot sizes: 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. N/A	_	_	_	Total Number of Dominant Species Across All Strata: 5 (B)
2.				% Dominant Species that are OBL, FACW, or FAC: <u>VØ Ö</u> (A/B)
3.				
4.				Prevalence Index worksheet:
Total Cove	<del>-</del>			Total % Cover of: Multiply by:
50% of total cove	r: 20	)% of total cov	/er:	OBL species: X 1 = 8
Sapling/Shrub Stratum ( 24 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 2\
1. Betula mana-	45	Y	FAC	UPL species X 5 =
2. Vaccinium uliginesum-	35	. 7	FAC	Column Totals: 151 (A) 416 (B)
3. Rhododendron greenlandicum			FAC	PI = B/A = 2.75
4. Vaccinium oxycoccus	1		OBL	
5. Empetrum nigrum	15		FAC	
6. Andromeda polifolica.	2		FACE	
7.				
8.				
9.				
Total Cove 50% of total cove	•	0% of total cov	ver: <u>22.6</u>	
VEGETATION (use scientific names of plant	s)			35 A 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Herb Stratum ()	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Rubus Chamsemorens	8	Y	FACW	Prevalence Index is ≤ 3.0
2. CAREX VAGINATA	7	Y	OBL	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Calamamostis Canadensis	5		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Pedicularis Informadorica	3		FACW	Indicators of hydric soil and wetland hydrology must be present unless
5. CAREX biggionii	7	4	FAC	disturbed or problematic.
6. Sanguisorba Canadensis	3		FACW	
7. Eughorum angusti folium	T		OBL	% Bare Ground
8. Carex membranacea	5		FACW	% Cover of Wetland Bryophytes
9.				Total Cover of Bryophytes
10.				% Cover of Water
Total Cover	- 32			Hydrophytic Vegetation Present (Y/N):
50% of total cover		% of total cov	rer: <u>7.6</u>	Notes: (If observed, list morphological adaptations below):

OIL PROF	LL DLOGICII IION.		to the depth hoods.					
Depth	Matrix		Redox Features					
(inches)	Color (moist)	1 %	Color (moist)	T I		e <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
18"					- 7/-			Saturated
10				1 (1)			Filoric	Salmara
-								
						1		
								111
Type: C=C	oncentration, D=Depl	etion, RI	√l=Reduced Matrix, €	CS=Cove	ered or Co	ated Sand C	Frains. <sup>2</sup> Location	n: PL=Pore Lining, M=Matrix,
YDRIC SO	IL INDICATORS	FEE	ST. 57	1000	boa-		INDICATORS	FOR PROBLEMATIC HYDRIC SOIL
fistosol or H	istel (A1)		Alaska Gleyed	d (A13) _			Alaska Color	Change (TA4) <sup>4</sup>
	lon (A2)		Alaska Redox				_	Swales (TA5)
	(A3)		Alaska Gleyed					with 2.5Y Hue
	ılfide (A4)				`	ries .		d without 5Y Hue or Redder Underlying
							Layer	_
	urface (A12)						Other (Explain	
One indicati	or of nydropnytic vego problematic.	etation, c	ne primary indicator	of wetla	na nyarok	ogy, and an	appropriate landso	cape position must be present unless
Give details	of color change in No							
Restrictive L	ayer (if present): Typ	e:_Nc		Depth (in	nches):			
Hydric Soil	Present (Y/N):	1						
	Present (Y/N):	1						
	Present (Y/N):	4						
	Present (Y/N):	4						
	Present (Y/N):	<del>/</del>						
lotes:	Present (Y/N):			ufficient	)   §	BECONDAR	Y INDICATORS (	2 or more required)
Notes:	Y PRIMARY INDICA	TORS (a	any one indicator is s		V	Vater-staine	d	Stunted or Stressed
Notes:		Su	any one indicator is s	6)	V		d	
Notes: HYDROLOG Surface Wat	er (A1)	Su	any one indicator is s rface Soil Cracks (Be undation Visible on A	6)	V L	Vater-staine eaves (B9)	d	Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Gurface Water 1	er (A1) Paller (A2)	Su Inu	any one indicator is s rface Soil Cracks (Be undation Visible on A	6)	Lagery [	Vater-staine eaves (B9) Orainage Pa	tterns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Notes:  HYDROLOG  Surface Water 1	er (A1)	Su Su Inu (B)	any one indicator is s rface Soil Cracks (Be undation Visible on A	6)	agery [	Vater-staine eaves (B9) Orainage Pa Oxidized Rhi	d	Stunted or Stressed Plants (D1)
HYDROLOG Surface Water 1 High Water 1	er (A1) Pable (A2) Pable (A2)	Su Inu - (B Sp Co	any one indicator is surface Soil Cracks (Be undation Visible on A 7) arsely Vegetated uncave Surface (B8)	6)	agery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water 1 High Water 1	er (A1) Paller (A2)	Su Inu (B) Sp Co	any one indicator is surface Soil Cracks (Beaundation Visible on Arry) arsely Vegetated ancave Surface (B8)	6)	agery C	Vater-staine .eaves (B9) Drainage Pa Dxidized Rhi .iving Roots	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water 1 High Water 1 Saturation (A	er (A1) Pable (A2) Pable (A2)	Su Int. (B) Sp Co	any one indicator is surface Soil Cracks (Beaudation Visible on Arron Arrows Vegetated ancave Surface (B8)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water T Saturation (A Water Marks Sediment De	er (A1) Pable (A2) Pable (A2) Pable (B1) Paposits (B2) Paposits (B2)	Su Inu (B) Sp Co	any one indicator is surface Soil Cracks (Be undation Visible on Ar 7) arsely Vegetated uncave Surface (B8) arl Deposits (B15) drogen Sulfide lor (C1)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water T Saturation (A Water Marks	er (A1)  Fable (A2)  (B1)	Su Inu (B' Sp Co Ma	any one indicator is surface Soil Cracks (Be undation Visible on Arr) arsely Vegetated uncave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4)	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water T Saturation (A Water Marks Sediment De	er (A1)  Fable (A2)  (B1)  sposits (B2)  s (B3)	Su Interest (B) Sp Co Maa Hy Odd Dry Wa	any one indicator is surface Soil Cracks (Be undation Visible on Arroy) arsely Vegetated oncave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	er (A1) Pable (A2) Pable (A2) Pable (B1) Paposits (B2) Paposits (B2)	Su Interest (B) Sp Co Maa Hy Odd Dry Wa	any one indicator is surface Soil Cracks (Be undation Visible on Arr) arsely Vegetated uncave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposite	er (A1)  Fable (A2)  (B1)  sposits (B2)  s (B3)	Su Interest (B) Sp Co Maa Hy Odd Dry Wa	any one indicator is surface Soil Cracks (Be undation Visible on Arroy) arsely Vegetated oncave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposite	er (A1) Fable (A2) (B1)  eposits (B2)  crust (B4)	Su Interest (B) Sp Co Maa Hy Odd Dry Wa	any one indicator is surface Soil Cracks (Be undation Visible on Arroy) arsely Vegetated oncave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2)	6)	ugery C	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposite Algal Mat or	er (A1) Fable (A2) (B1)  eposits (B2)  crust (B4)	Su Inu (B) Sp Co Ma Hy Od Dr Wa	any one indicator is s  rface Soil Cracks (Be undation Visible on Ar  r)  arsely Vegetated encave Surface (B8)  arl Deposits (B15)  drogen Sulfide elor (C1)  y-Season eater Table (C2)  ther (Explain in Notes	6)	agery [	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits	er (A1) ————————————————————————————————————	Su Inu (B) Sp Co Ma Hy Od Dr Wa	any one indicator is a rface Soil Cracks (Be undation Visible on Ar7) arsely Vegetated incave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2) her (Explain in Notes	6)	agery [	Vater-staine Leaves (B9) Drainage Par Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits Surface Water Water Table	er (A1) ————————————————————————————————————	Su Inu (B) Sp Co Ma Hy Od Dr Wa	any one indicator is surface Soil Cracks (Beaudation Visible on Arroy) arsely Vegetated encave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2) ther (Explain in Notes	6)	agery [	Vater-staine Leaves (B9) Drainage Path Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or ron Deposits Surface Water Water Table Saturation P	er (A1) Prable (A2) Prosits (B2) Present (Y/N): Present (Y/N):	Su Inu (B) Sp Co Ma Hy Od Dr Wa	any one indicator is surface Soil Cracks (Be undation Visible on Ar7)  arsely Vegetated incave Surface (B8)  arl Deposits (B15)  drogen Sulfide for (C1)  y-Season ater Table (C2)  her (Explain in Notes)  Depth (in): 8	6)	agery [	Vater-staine Leaves (B9) Drainage Path Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or ron Deposits Surface Water Water Table Saturation P	er (A1) ————————————————————————————————————	Su Inu (B) Sp Co Ma Hy Od Dr Wa	any one indicator is a rface Soil Cracks (Be undation Visible on Ar7) arsely Vegetated incave Surface (B8) arl Deposits (B15) drogen Sulfide for (C1) y-Season ater Table (C2) her (Explain in Notes	6)	agery [	Vater-staine Leaves (B9) Drainage Path Dxidized Rhi Living Roots Presence of ron (C4) Salt Deposits Notes:	tterns (B10) zospheres along (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)X

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Forested-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved
Percent Cover (P): Tree (>5 dbh, >6m tall)         ○         Sapling (<5 dbh, <6m tall)         ○         Tall shrub (2-6m)         ○         Short shrub (0.5-2m)         9.5           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches_X_ Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed) X
HGM Class (P): Slope FlatX   Lacustrine Fringe   Depressional   Riverine   Estaurine Fringe
COIL MADIADI ES
SOIL VARIABLES  Soil Footore (P): Soil Locking Historial Fibria V Historial House
Soil Factors (P):       Soil Lacking       Histosol:Fibric       Histosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perenn
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding
Degree of Outlet Restriction (P): No Outflow Kestricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading 5.23
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%)       X       High Gradient (≥2%)         Evidence of Seeps and Springs (P):       No Seeps or Springs       X       Seeps Observed       Intermittent Spring       Perennial Spring
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition:       Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below         Only Connected Above Connected Upstream & Downstream Unknown
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)
Watershed Land Use: 0-5% Rural 5-25% Urbanized 25-50% Urbanized >50% Urbanized
Size: Small (<10 acres) Medium (10-100 acres) Large (>100 acres)
Crew Chief QA/QC check: Of A GPS Technician QA/QC check Jemba Ardenor

#### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Feature ID: W6LHT032 Field Target: FT:076 Date: 7/7/14

For all items not checked, please provide detailed explanation in the notes section of data form.

#### 1. Site Description

- Site description, site parameters and summary of findings are complete?
- A detailed site sketch is included in logbook?

#### 2. Vegetation

- At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
- ☑ Vegetation names are entered legibly for all strata present?
- □ Cover calculations are complete and correct?
- All dominant species have been determined and recorded per strata?
- ☑ Indicator status is correct for each species?
- Dominance Test and Prevalence Index have been completed?

#### 3. Soil

- Soil profile is complete?
- ☒ Appropriate hydric soil indicators are marked?

#### 4. Hydrology

- Appropriate hydrology indicators are marked?
- Surface water, water table, and saturation depths are recorded if present?

#### 5. Functions and Values

□ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?

#### 6. Field Logbook

- Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
- Each logbook page is initialed and dated?

#### 7. Maps

- ▶ Wetland boundaries have been corrected if necessary?
- Maps are initialed and dated?

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			to	

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)	Signature / Date	nderson 1/1/14
X	X n · 1 n	7/7/11

X C vm DECOVIS X Mully KM 7/1/14

Field Crew Chief (print) Signature / Date

Ct Covider

SITE DESCRIPTION	2000
	er (explain) X Field Target: 77 Map #: 51/3 Map Date: 5 27
Date: 7714 Project Name & No.: Alas	
Investigators: K DEGITIS J ANGUSON	Team No.: W61
State: Alaska Region: Alaska	Milepost: 581.25
Latitude: 63° 15' 12-65" Lo	ngitude: 149° 15' 52.92'' Datum: WGS84
Logbook No.: W61-2 Logbook Page No.: 48	Picture No.: P_We1HTO 33_ P.F. Plus; SW; NE
SITE PARAMETERS	
Subregion: Southantral	Landform (hillslope, terrace, hummocks, etc.): F/A+
Slope (%):	Local relief (concave, convex, none): NONE
Pre-mapped Alaska LNG/NWI classification: PS-13	Soil Map Unit Name:
Are climatic/hydrologic conditions on the site typical for this time of ye Yes No (if no explain in Notes)	Are "Normal Circumstances" present: Yes No (If no, explain in Notes.)
Are Vegetation, Soil, or Hydrology Significantly Dis	sturbed? No(If yes, explain in Notes)
Are Vegetation, Soil, or Hydrology Naturally Proble	ematic? No (If yes, explain in Notes.)
SUMMARY OF FINDINGS	
Hydrophytic Vegetation Present? Yes No	Is the Sampled Area within a Wetland? Yes No
Hydric Soil Present? Yes Yes No	Wetland Type: $\rho$ 55 $1\overline{B}$
Wetland Hydrology Present? Yes No	Alaska Vegetation Classification (Viereck): II B I, III A 2
	nterline, Length of feature, Distances from Centerline, Photo Locations, and Survey
corridor.	1
See log	Con rotes & site sketch
	Con notes & site sketch
Salix. dom. wetland	The state of the s
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	The state of the s
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VEGETATION (use scientific names of plan	its)			
26	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 200 )	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC: 2
1. N A	_	-	-	Total Number of Dominant Species Across All Strata: 2
2.				% Dominant Species that are OBL, FACW, or FAC: _/oo_ (
3.				50
4.	-			
				Prevalence Index worksheet:
Total Cove				Total % Cover of: Multiply by:
50% of total cove		0% of total cov	1	OBL species: X1= X2= 8
Sapling/Shrub Stratum( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 4 X 2 = 8  FAC species: 48 X 3 = 339 179  FACU species: 12 X 4 = 48
1. Spiren Stevenii	10		FACU	UPL species <u>V5 - X5 = -335</u>
2. Salix pseudomyrstnites	65	M	FACU ASSOME FACULT	-Column Totals: 129 (A) 395 505 (B)
3. Rubus auticus	8	<b>'</b>	FAC	PI = B/A = 3.06 4.07
4.				
5.				
6.				
7.				* Not rested in 2019 AT we though Prant 1187
8.				-so considered upl species
9.				
Total Cove 50% of total cove  VEGETATION (use scientific names of plan	er: <u>41.5</u> 20	0% of total cov	ver: 16.6	
Herb Stratum ( 26 )		Dominant	Indicator	Hudrophytic Vocatation Indicators
Heib Stratum ( ACC )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Calamucrostis Canadensis	35	Y	FAC	Prevalence Index is ≤ 3.0
2. Sanguisorba Canadensis	3	'	FACW	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Favisitum arvense	5		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4 ().	2		FACU	Indicators of hydric soil and wetland hydrology must be present unles
5. 1/. 1. AugudiColium	1		FACW	disturbed or problematic.
6. Viola palnotris			1 new	
7.				% Bare Ground
8.	+	-		% Cover of Wetland Bryophytes
9.		-	1	Total Cover of Bryophytes
·				© % Cover of Water
10.				Hydrophytic Vegetation Present (Y/N):
Total Cove		0% of total cov	ver: <u>9.2</u>	Notes: (If observed, list morphological adaptations below):  Salie exhibits sufficient rooting & multiple  Trinking throughout plots will adjacent areas

SOIL	= DECODIDEION (		Date 7714 Fea	=			confirm the absonce	Soll Pit Required (Y/N)
SOIL PROFIL		Jescribe	to the depth needed	to docur	Herit the	maicator or	committe absence	or mulcators.)
Depth	Matrix	1	Redox Features	1	_ 1	1 , 2		N
inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-2"							Fibric	Saturated
2:5"	1					-	Hemic	Sahmted
5-7"	104R 2/2	100	T.			0.4	Silt longer	Saturated
7-12"	2.544/3	70		30	<u>C</u>	PL	S.H. GAM	5% gravel throughout Sat
12 - 18"	2.545/3	85	7.5 YR 5/6	15	C	PL	Silt loam	5th gravel throughout, Sats
Type: C=Cor	ncentration, D=Deple	etion, RN	/I=Reduced Matrix, C	S=Cover	ed or Co	ated Sand (		PL=Pore Lining, M=Matrix.
IYDRIC SOIL	INDICATORS				7.15			OR PROBLEMATIC HYDRIC SOILS
listosol or His	stel (A1)		Alaska Gleyed	(A13)				ange (TA4) <sup>4</sup>
Histic Epipedo	on (A2)		Alaska Redox (	(A14)				wales (TA5)
3lack Histic (A	A3)		Alaska Gleyed	Pores (A	\15)			ith 2.5Y Hue
-lydrogen Sulf	fide (A4)						Layer	vithout 5Y Hue or Redder Underlying
	ırface (A12)						Other (Explain in	n Notes) e position must be present unless
	yer (if present): Type	e: <u> V </u>	<u>A</u> D				***************************************	
Restrictive La	yer (if present): Type resent (Y/N):	,						
Restrictive Lag	resent (Y/N):	/					RY INDICATORS (2 o	or more required)
Restrictive Lay Hydric Soil P Notes:	resent (Y/N):	TORS (a	any one indicator is su	ufficient)	1		RY INDICATORS (2 c	or more required)  Stunted or Stressed Plants (D1)
Restrictive Lay Hydric Soil P Notes: HYDROLOGY Surface Wate	resent (Y/N):	TORS (a	any one indicator is surface Soil Cracks (B6	ufficient)	\\	<b>SECONDAF</b> Water-staine Leaves (B9)	RY INDICATORS (2 c	Stunted or Stressed Plants (D1)
Restrictive Lay Hydric Soil P Notes: HYDROLOGY Surface Water Ta	PRIMARY INDICA  (A1)	TORS (a	any one indicator is surface Soil Cracks (B6	ufficient) ) erial Imag	gery [	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots	ed atterns (B10) izospheres along is (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Restrictive Lay Hydric Soil P Notes: HYDROLOGY Surface Water High Water Tay Saturation (AS	PRIMARY INDICA  (A1)	TORS (a	any one indicator is surface Soil Cracks (B6 indation Visible on Ae 7) arsely Vegetated ncave Surface (B8)	ufficient) )erial Imag	gery [	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of	ed atterns (B10) izospheres along is (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Restrictive Lay Hydric Soil P Notes: HYDROLOGY Surface Water High Water Ta Saturation (A3	Y PRIMARY INDICA  r (A1)  able (A2)	Sullinu (B) Spp Co	any one indicator is surface Soil Cracks (B6 indation Visible on Ae 7) arsely Vegetated incave Surface (B8) trl Deposits (B15) drogen Sulfide lor (C1)	ufficient) )erial Imag	gery [	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	editterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Restrictive Lay Hydric Soil P Notes: HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	resent (Y/N):	Su Inu (B) Sp Co	rface Soil Cracks (B6 indation Visible on Ae 7) arsely Vegetated ncave Surface (B8) irl Deposits (B15)	ufficient) )erial Imag	gery [	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	ed atterns (B10) izospheres along s (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Restrictive Lay Hydric Soil P Notes: HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep	Present (Y/N):	Su Inu (B) Sp Co	rface Soil Cracks (B6 indation Visible on Ae 7) arsely Vegetated ncave Surface (B8)	ufficient) )	gery [	SECONDAR Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4)	ed atterns (B10) izospheres along s (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
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Hydric Soil P Notes:  HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C Iron Deposits Surface Water	Present (Y/N):	Su Inu (B) Sp Co Ma	any one indicator is surface Soil Cracks (B6 indation Visible on Ae 7) arsely Vegetated incave Surface (B8) arl Deposits (B15) drogen Sulfide lor (C1) y-Season ater Table (C2) ther (Explain in Notes)  Depth (in):  Depth (in):	ufficient) )erial Imag	gery [	SECONDAF Water-staine Leaves (B9) Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	ed interns (B10) izospheres along is (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Forested-Evergreen-Needle-leaved_ Scrub Shrub-Deciduous-Broad-leaved_ Scrub Shrub-Evergreen-Broad-leaved_ Scrub Shrub-Evergreen-Needle-leaved_ Emergent-Non-persistent_ Emergent-Persistent_ Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall) Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) 5 Short shrub (0.5-2m) Warf shrub (<0.5m) 5 Tall herb (≥1m) Short herb (<1m) 46 Moss-Lichen Floating Submerged
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       Q       Very High Density (80-100%)       High Density (60-90%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
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HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
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Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pere
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment Created
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding  Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs O Seeps Observed Intermittent Spring Perennial Spring
Evidence of Seeps and Springs (P): No Seeps or Springs O Seeps Observed Intermittent Spring Perennial Spring
I ANDSCADE VADIADI ES (MI)
LANDSCAPE VARIABLES (M)
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Connected Upstream & Downstream Unknown
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below_
Wetland Juxtaposition: Wetland Isolated Wetlands within 400m, Not Connected Only Connected Below Connected Upstream & Downstream Unknown
Wetland Juxtaposition:       Wetland Isolated       Wetlands within 400m, Not Connected       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown    Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space)

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

			Not checked, please provide detailed explanation in the notes section of data form.
	1.	Site	Description
			Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
	2.	Veg	etation
		i	At least 80% of onsite vegetation has been keyed to species, or collected for later dentification?
			Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
		<b>7</b>	Dominance Test and Prevalence Index have been completed?
	3.	Soil	
			Soil profile is complete? Appropriate hydric soil indicators are marked?
	4.	Hyd	rology
			Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
-	5.	Fun	ctions and Values
			Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
	6.	Field	d Logbook
			Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?
		9	Each logbook page is initialed and dated?
	7.	Мар	os estados esta
		~7	Wetland boundaries have been corrected if necessary? Maps are initialed and dated?

### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer 1	Anderson	X Dama les	Anderson
Wetland Scientist (print)		Signature / Date	73

X Kim DEGUTIS

X While DeGUTIS

Field Crew Chief (print)

X While Date

SITE DESCRIPTION		1 -7				130 114
Survey Type: Centerline Acces	ss Road (explain)	Other (expl	ain) 🗶 conclus	Field Targ	jet: <u>79</u>	Map #: 63   Map Date: 6   201
Date: 7/8/14	Project Name & No.:	: Alaska LNC	3 26221306		Feature Id	W61 HT 034
Investigators: K DEGUTS	J Anous	or				Team No.: WG1
State: Alaska	Region: Alaska		Milepost: No	MPGNMI	APGPS	
Latitude: 63° 14' 11.8560	11	Longitude	: 1490 1	6 29. 3	39"	Datum: WGS84
Logbook No.: Wel-Z	Logbook Page No.:	43	Picture No.:	P_W6(1+7	1034_	Pit; Pluz; S; N
SITE PARAMETERS						
Subregion: Southcenter			Landform (hill	slope, terrac	ce, hummock	s, etc.): terrace
Slope (%):			Local relief (co	oncave, con	vex, none):	None
Pre-mapped Alaska LNG/NWI classifica	tion: PFO1 4 SS1	13	Soil Map Unit	Name:		
Are climatic/hydrologic conditions on the Yes No (if no expl		e of year?	Are "No Yes_	mal Circum	nstances" pre (If no, ex	sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	drology Significan	tly Disturbed	No X	_(If yes, exp	lain in Notes	
Are Vegetation, Soil_ <del>//</del> , or Hyd	drology Naturally	Problematic?	No	_ (If yes, exp	olain in Notes	i.)
SUMMARY OF FINDINGS				- 1	S. Jee	
Hydrophytic Vegetation Present? Yes_	No	Is	the Sampled A	rea within a	Wetland?	YesNo
Hydric Soil Present? Yes_	No	w	etland Type	PF01/4/	SSIB	PISA OF OR
Wetland Hydrology Present? Yes_	X No	AI	aska Vegetation	Classification	on (Viereck):	IC3, IIBL, IIAZ
Notes and Site Sketch: Please include Ecorridor.  SAMP Plot loc  Very PL 3.45  Whin  water table 6  Confirm	however multip	tenace sle trinki PHOLOGO despest oughort	SOILS PI S & butter WT OF	appration	e throw of treas	observed

Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Populus bakanifera	15	Y	FACU	Total Number of Dominant Species Across All Strata: 5  % Dominant Species that are OBL, FACW, or FAC: 40
2. Saix Laves	3		FACU	76 Dominant Species that are Obl., PACW, or PAC: 40
3. Betula neoplaskana	2		FACU	iii .
4.				Prevalence Index worksheet:
Total Cove	r: 26			Total % Cover of: Multiply by:
50% of total cove	er: <u>10</u> 20	% of total cov	ver:_ <u>4</u>	OBL species:X 1 =
Sapling/Shrub Stratum(26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 3
1. Stephendia Canadensis	10		FACU	UPL species X 5 =
2. Salix pseudomyrsinites	55	4	NI	Column Totals: 142 (A) 491 (B)
3. Rosa acialans	5		FACU	PI = B/A = 3.48
4. Salix pseudo monticola	5		FAC	
5. VAccinium ulighosum	25	4	FAC	
6. Ribus hudsoni Standulosum	2		FACU	
7. Populus balsamifera	5		FACU	
8.				
9.				
Total Cove 50% of total cove		% of total cov	er: 21.4	

Herb Stratum ( 26 )	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
	% Cover	Species? (Y/N)	Status	Dominance Test is > 50%
1. Calamagnostis annalonsis	12	\$.KD	FAC	Prevalence Index is ≤ 3.0
2. Equiselyum arvense	20	Y	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting data in Notes)
3. Cornus CANADINGIS	15	Ý	FACU	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Chamaeilon AngustiFdium	10		FACU	Indicators of hydric soil and wetland hydrology must be present unless
5. Aconitum delphinistolium	2		FAC	disturbed or problematic.
6. Salium boreak	1		FACU	ASSESSED TO THE RESIDENCE OF THE PARTY OF TH
7. Rubus acticus	7		FAC	
8. Sanguisorba Canadansis	3		FACW	% Cover of Wetland Bryophytes
9. Lupinus arcticus	T		FACU	Total Cover of Bryophytes
10.				Cover of Water
Total Cover	: 70		1	Hydrophytic Vegetation Present (Y/N):
50% of total cove		% of total cov	ver:_ <u> 4</u>	Notes: (If observed, list morphological adaptations below):  Some multiple trunking observed in Salix =p. F  populus balsam (tree) o butthessing of trees observ  come surficial rooting

SOLL PROFILE DESCRIPTION (Describe to the depth needed to document the indicator or confirm the absence of indicators.)  Depth (inches)  Color (moist)  Alanka (nohes)  Color (moist)  Col	SOIL			- College	781		200		此034		Soil Pit Required (Y/N)_
Color (molst)	SOIL PROF		escribe	to the	depth	needed to	docu	ment the	indicator or o	confirm the absen	ce of indicators.)
Type: C-Concentration, D-Depletion, RM-Reduced Matrix, CS-Covered or Coated Sand Grains. *Location: PL-Pore Uning, M-Matrix. 11 12 " In Y R 2 / I 10 0	•	Matrix		Redo	x Feat	ures					
1 - 1		Color (moist)	%	Color	r (moist	t)	%	Type <sup>1</sup>	Loc²	Texture	Notes
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains.											
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRIG SOIL INDICATORS  INDICATORS FOR PROBLEMATIC HYDRIC SOILS*  IIII Alaska Cloir Change (TA4)*  Alaska Color Change (TA4)*  Alaska Redox (A14)  Alaska Redox (A14)  Alaska Redox (A15)  Alaska Redox (M1 2.2 Y Hue  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Layer (Tother (Explain in Notes)  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue or Redder Underlying Layer  Alaska Cieyed without 5Y Hue  Alaska Cieyed without 5Y			80	10 7	R 3/	10	20	C	M	Fine Sendy	
Type: C Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. "Location: PL=Pore Lining, M=Matrix. HYDRIC SOIL. NDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Alaska Color Change (TA4)   Alaska Chonge (TA4)	7-18"	10 YR 2/1	100							Time Sandy	15%- cobna, 50%. gravel
Type: C Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. "Location: PL=Pore Lining, M=Matrix. HYDRIC SOIL. NDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Alaska Color Change (TA4)   Alaska Chonge (TA4)											
Type: C Concentration. D-Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. "Location: PL=Pore Lining, M=Matrix. HYDRIC SOIL. NDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS'   Alaska Color Change (TA4)   Alaska Chonge (TA4)											
INDICATORS FOR PROBLEMATIC HYDRIC SOILS	-45		1								
INDICATORS FOR PROBLEMATIC HYDRIC SOILS	Type: C=C	oncentration D=Deplet	ion RN	/I=Redi	iced M	latrix CS=	Cove	red or Co	ated Sand G	rains <sup>2</sup> l ocation	PI =Pore Lining M=Matrix
Alaska Gleyed (A13) Alaska Color Change (TA4)*    Alaska Redox (A14)				i rtout	400 G 181	idana, oo	0010	100 01 00	atou oanu o	7	
Alaska Redox (A14)				1	Alaska (	Gleved (A	.13)		_	and the second	
Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Other (Explain in Notes)  Other (Explain in Notes)  Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Other (Explain in Notes)  Alaska Gleyed without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Other (Explain in Notes)  Alaska Gleyed Pores (A15)  Alaska Gleyed Without 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Pores (A15)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Other (Explain in Notes)  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Alaska Gleyed Whout 5Y Hue or Redder Underlying Layer  Alaska Gleval And an appropriate Layer  Alaska Gleval And an appropriate Layer  Alaska Gleval And an appropriate Layer  Alaska Care And											
Alaska Gleyed without SY Hue or Redder Underlying Layer.  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless isterubed or problematic.  Give details of color change in Notes.  Give details of color change in Notes.  Restrictive Layer (if present): Type: No Depth (inches):											
Thick Dark Surface (A12)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present). Type: 10 Depth (inches):  Hydric Soil Present (Y/N):  Hydric Soil Present (Y/N):  Hydric Soil Present (Y/N):  Water-stained  Leaves (B9)  Plants (D1)  Praining Patterns (B10)  Geomorphic Position (D2)  Saturation (A3)  Water Table (A2)  Water Marks (B1)  Marl Deposits (B15)  Dry-Season  Water Table (C2)  Water Table (C2)  Other (Explain in Notes)  Wetland Hydrology Present (Y/N):  Y  Wetland Hydrology Present (Y/N):  Y  Wetland Hydrology Present (Y/N):  Y  Depth (in): 3   Wetland Hydrology Present (Y/N):  Y  Wetland Hydrology Present (Y/N):  Y  Depth (in): 3   Wetland Hydrology Present (Y/N):						,	(1	,			
One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: No Depth (inches): —  Hydric Soil Present (Y/N): Y  Notes: problem soils on Flood plain Hydrology (Vaterial Suths Hydrology PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)											11
disturbed or problematic. Give details of color change in Notes. Restrictive Layer (if present): Type: No Depth (inches):				no prim	anni ina	diantar of v	wattar	d budsala	au and an a		
NOTES   Problem Soils on Flood Plain Hydrology or Hear of Soth 15 feed.							41 41	oboo):	_		
Second   South   Sou	Restrictive L	anyor (ii prodonty. Typo	100			Dep	th (in				
Surface Water (A1) X Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Stunted or Stressed Plants (D1) Surface Water Table (A2) X Sparsely Vegetated Concave Surface (B8) Sparsely Vegetated Concave Surface (B8) Surface (B8) Surface (B8) Stunted or Stressed Plants (D1) Sediment (D2) Surface (B8) Sparsely Vegetated Concave Surface (B10) Sparsely Vegetated Concave (B10) Sparsely Vegetated Co	Hydric Soil	Present (Y/N):									d.
Surface Soil Cracks (B6) Leaves (B9) Plants (D1)   High Water Table (A2) X	Hydric Soil Notes: Pro	Present (Y/N): Y blem soils or is high (73), a	nd so	flood il ye	plai 18 lok	n; Hy	dro	lozy mailm	criteria UnitaT	satisfie	
Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3) Shallo	Hydric Soil Notes: Pro	Present (Y/N): Y blem soils or is high (73), a	nd so	flood il ye	plai 18 lok	n; Hy	dro	nalin i	eriteria ankat BECONDAR	satisfie	? or more required)
Concave Surface (B8) Living Roots (C3) Shallow Adultate (D3)  Nater Marks (B1) Marl Deposits (B15) Presence of Reduced Iron (C4) Relief (D4)  Sediment Deposits (B2) Salt Deposits (C5) FAC-Neutral Test (D5)  Orift Deposits (B3) Dry-Season Water Table (C2) Notes:  Other (Explain in Notes):  Surface Water Present (Y/N): Y Depth (in): Y"  Nater Table Present (Y/N): Y Depth (in): G"  Saturation Present (Y/N): Y Depth (in): Q"	Hydric Soil Notes: Pro	Present (Y/N): Y  blem soils or is high (73) or	ORS (a	locd	plai 1 linu 1 indica	or by Hy	cient)	naim i	SECONDAR'	satisfic	? or more required)  Stunted or Stressed
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) Prift Deposits (B3) Other (Explain in Notes):  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N): Y Depth (in): 4"  Water Table Present (Y/N): Y Depth (in): 6"  Saturation Present (Y/N): Y Depth (in): 2"  Depth (in): 3"	Hydric Soil Notes: Pro	Present (Y/N): Y  blem soils or is high (73) or is high (73) or is present (XI) X	ORS (a	any one	Plai Mindical oil Crac	tor is sufficed the control of the c	cient)	logy mailer i	SECONDAR' Vater-stained	satisfie	Stunted or Stressed Plants (D1)
Odor (C1)  Dry-Season Water Table (C2)  Algal Mat or Crust (B4)  Other (Explain in Notes):  FAC-Neutral Test (B5)  Notes:  Water Table (C2)  FAC-Neutral Test (B5)  Notes:  Water Table (C2)  PAC-Neutral Test (B5)  Notes:  Water Table Present (Y/N): Y  Depth (in): 4"  Wetland Hydrology Present (Y/N):  Saturation Present (Y/N): Y  Depth (in): 2"  Depth (in): 2"  Depth (in): 2"	Hydric Soil Notes: Pro HYDROLOG Surface Wat	Present (Y/N): Y  blem soils or is high (73) o	ORS (a Sur Inu (B7 Spa	any one rface Sondation	plai	tor is sufficed to the control of th	cient)	logy mailin i	BECONDAR' Vater-stained Leaves (B9) Drainage Pate	Y INDICATORS (2) terns (B10) b	Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Algal Mat or Crust (B4) Other (Explain in Notes):  For Deposits (B5) Depth (in): '4''  Water Table Present (Y/N): Y Depth (in): '6''  Saturation Present (Y/N): Y Depth (in): 2''  Depth (in): 3''  Depth (in): 3''  Depth (in): 3''	Hydric Soil Notes: Pro HYDROLOG Surface Wat High Water T	Present (Y/N): Y  blem soils or  shigh (73) at  BY PRIMARY INDICAT  er (A1) X  Table (A2) X	ORS (a Sui Inu (B7 Spa Coi	any one rface So indation r) arsely \ ncave S	plai indical oil Crac oil Visible Vegetat Surface	ttor is sufficed by the control of t	cient)	logy mailin i	BECONDAR' Vater-stained Leaves (B9) Drainage Patroxidized Rhiz Living Roots (Presence of F	Y INDICATORS (2) terns (B10) \(\sigma\) cospheres along (C3) \(\sigma\) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) \( \sum_{\text{c}} \) Shallow Aquitard (D3)  Microtopographic
Surface Water Present (Y/N): Y Depth (in): '4"  Nater Table Present (Y/N): Y Depth (in): 6"  Saturation Present (Y/N): Y Depth (in): 2"  Depth (in): 2"	Hydric Soil Notes: Pro HYDROLOG Surface Water High Water The Saturation (A	Present (Y/N): Y  blem soils or  shigh (73) at  BY PRIMARY INDICAT  er (A1) X  Table (A2) X  A3) X  G (B1)	Sur Inu (B7 Spa Cor Ma	any one rface Sondation ()	plai indica oil Crac Visible Vegetat Surface	tor is sufficed ted to (B8)	cient)	V L Gery C	BECONDAR'  Water-stained Leaves (B9)  Orainage Pati  Dividized Rhiz  Living Roots  Presence of Fron (C4)  Salt Deposits	Y INDICATORS (2) terns (B10)	Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Surface Water Present (Y/N): Y Depth (in): 4"  Water Table Present (Y/N): Y Depth (in): 6"  Saturation Present (Y/N): Y Depth (in): 2"  Depth (in): 2"	Hydric Soil Notes: Pro HYDROLOG Surface Water High Water T Saturation (A	Present (Y/N): Y  Dolem Soils or  Shigh (73) (4)  EY PRIMARY INDICAT  er (A1) X  Table (A2) X  A3) X  Eposits (B2)	Sur Inu (B7 Spa Cor Ma Hyc Odd	any one rface So Indation () So Incave So Inca	plai indication Visible Vegetat Surface	ttor is suffice cks (B6)e on Aeria ted e (B8)	ccient)	y constant of the second of th	BECONDAR'  Water-stained Leaves (B9)  Orainage Pati  Dividized Rhiz  Living Roots  Presence of Fron (C4)  Salt Deposits	Y INDICATORS (2) terns (B10)	Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Water Table Present (Y/N):  Depth (in):	Hydric Soil Notes: Pro- HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N): Y  blem soils or  Shigh (73) of  BY PRIMARY INDICAT  er (A1) X  Table (A2) X  (B1)  eposits (B2)  s (B3)	ORS (a Sui Inu (B7 Spa Coi Ma Hyd Odd Dry Wa	any one rface So rdation r) arsely \ ncave S rl Depo drogen or (C1) r-Seasc	plai indical oil Crace Vegetat Surface osits (B' Sulfide	ttor is suffice cks (B6) e on Aeria ted e (B8)	ccient)	y constant of the second of th	BECONDAR'  Water-stained Leaves (B9)  Orainage Pati  Dividized Rhiz  Living Roots  Presence of Fron (C4)  Salt Deposits	Y INDICATORS (2) terns (B10)	Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Water Table Present (Y/N):  Depth (in):  Dep	Hydric Soil Notes: Pro HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposit	Present (Y/N): Y  blem soils or  Shigh (73) (4  BY PRIMARY INDICAT  er (A1) X  Table (A2) X  (B1)  eposits (B2)  s (B3)  Crust (B4)	ORS (a Sui Inu (B7 Spa Coi Ma Hyd Odd Dry Wa	any one rface So rdation r) arsely \ ncave S rl Depo drogen or (C1) r-Seasc	plai indical oil Crace Vegetat Surface osits (B' Sulfide	ttor is suffice cks (B6) e on Aeria ted e (B8)	ccient)	y constant of the second of th	BECONDAR'  Water-stained Leaves (B9)  Orainage Pati  Dividized Rhiz  Living Roots  Presence of Fron (C4)  Salt Deposits	Y INDICATORS (2) terns (B10)	Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4)
Saturation Present (Y/N): includes capillary fringe)  Depth (in): 2"	Hydric Soil Notes: Pro- HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposite Algal Mat or ron Deposits	Present (Y/N): Y  DIEM SOILS OF STANDING TO THE SOILS OF SOILS OF SOILS OF STANDING TO THE SOILS	ORS (a Sur Inu (B7 Spa Cor Ma Hyc Odd Dry Wa Oth	any one  rface So  Indation  rocave So  Induction  Indu	plain indical plain in plain in	tor is sufficed by (B8)	ccient)	ogy C	BECONDAR' Vater-stained Leaves (B9) Drainage Patr Dxidized Rhiz Living Roots (Presence of Fron (C4) Calt Deposits Notes:	terns (B10) / become along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
includes capillary innige)	Hydric Soil  Notes: Property Surface Water Marks  Sediment Description (Algal Mat or ron Deposits  Surface Water Surface Water Marks  Surface Water Marks	Present (Y/N): Y  Dlem soils or Shigh (734) (41)  BY PRIMARY INDICAT  er (A1) X  Table (A2) X  A3) X  By PRIMARY INDICAT  er (B1) X  Crust (B2) X  Crust (B4) X  Er Present (Y/N): Y	ORS (a Sui Inu (B7 Spa Coi Ma Hyc Odd	any one  rface Soundation  rfa	plain indical plain in indical plain indicad plain ind	ttor is sufficed by the control of t	ccient)	ogy C	BECONDAR' Vater-stained Leaves (B9) Drainage Patr Dxidized Rhiz Living Roots (Presence of Fron (C4) Calt Deposits Notes:	terns (B10) / become along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
	Hydric Soil  Notes: Property Surface Water Marks  Sediment Description Deposits  Iron Deposits  Surface Water Marks	Present (Y/N): Y  Dlem soils or Shigh (734) (41)  BY PRIMARY INDICAT  er (A1) X  Table (A2) X  A3) X  By PRIMARY INDICAT  er (B1) X  Crust (B2) X  Crust (B4) X  Er Present (Y/N): Y	ORS (a Sui Inu (B7 Spa Coi Ma Hyc Odd	any one  rface Soundation  rfa	plain indical plain in indical plain indicad plain ind	ttor is sufficed by the control of t	ccient)	ogy C	BECONDAR' Vater-stained Leaves (B9) Drainage Patr Dxidized Rhiz Living Roots (Presence of Fron (C4) Calt Deposits Notes:	terns (B10) / become along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved_ Forested-Deciduous-Broad-leaved_ Forested-Evergreen-Needle-leaved_ Scrub Shrub-Deciduous-Needle-leaved_ Scrub Shrub-Deciduous-Broad-leaved_ Scrub Shrub-Evergreen-Needle-leaved_ Emergent-Non-persistent_ Emergent-Persistent_ Aquatic Bed_
Percent Cover (P): Tree (>5 dbh, >6m tall)       30       Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Highly Uneven Moderately even _
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="tel:458">&lt;25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) X One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open_X Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)X
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine X Estaurine Fringe
SOIL VARIABLES
Soil Factors (P):       Soil Lacking       Histosol:Fibric       Histosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenn
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Inlet/Outlet Class (P): No Inlet/Outlet

Page 4 of 4

## Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

	ID: U61 HT034 tems not checked, please	Field Target: provide detailed expla		Date: 7/4/14	form.
For all ite		provide detailed expla	nation in the	notes section of data	form.
1. 3	Site Description				
J		e parameters and su ch is included in logb		ndings are complete	?
2.	Vegetation				
	identification?	site vegetation has be	•		ed for later
) 1 1	D Cover calculations All dominant specie Indicator status is c	are entered legibly to are complete and co es have been determ correct for each spec ad Prevalence Index	rrect? ined and red ies?	corded per strata?	
3.	Soil				
	Soil profile is compl Appropriate hydric		arked?		
4.	Hydrology				
	Appropriate hydrolo G Surface water, water			re recorded if prese	nt?
5.	Functions and Values	5			
į	D Vegetation, soil, hywetland?	drologic variables, a	nd landscap	e variables complet	e if site is a
<b>6</b> . I	Field Logbook				
		ecorded at each site, pped wetland bound is initialed and date	lary as appro	-	sketch, and
7. I	/ Maps				
_		s have been correcte and dated?	ed if necessa	ary?	

### 8. Photos

B	Four photos were taken for each Wetland Determination Data Form (2 vegetation,	1
/	soil pit, 1 soil plug)?	

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X Jange Ane 7/8/14

Signature / Date

1 Lim VEGUTIS

Field Crew Chief (print)

Signature / Date

		2-6	Conider	
SITE DESCRIPTION	1	700	Cor	(2)14
Survey Type: Centerline Access Road (explain)_			Field Target: 78	Map #: 521 Map Date: 6 20 119
Date: 7/8/14 Project Name &	No.: Alaska LN	IG 26221306	Feature Id	: W611+T035
Investigators: K DEGUNS JANDUSON				Team No.: ₩6 ( द
State: Alaska Region: Alaska			No MP OWMAP \$ 6PS	
Latitude: 63° 14' 38.74"	Longitue	de: 149° 16	20.73"	Datum: WGS84
Logbook No.: W61-2 Logbook Page	No.: 44	Picture No.:	P_W61HT035_	Pt; Plus; NE; SE
SITE PARAMETERS	1000	5 15 3 3 d	100	USSEL MALLANDI
Subregion: Southantrul		Landform (hi	illslope, terrace, hummock	s, etc.): Flat
Slope (%): ]		Local relief (	concave, convex, none):	NONE
Pre-mapped Alaska LNG/NWI classification:		Soil Map Uni	it Name:	
Are climatic/hydrologic conditions on the site typical for this Yes No (if no explain in Notes)	s time of year?	Are "N Yes_	lormal Circumstances" pre No (If no, ex	esent: plain in Notes.)
Are Vegetation, Soil, or Hydrology Sign	ificantly Disturbe	d? No <u></u>	(If yes, explain in Notes	)
Are Vegetation, Soil, or Hydrology Natu	rally Problematio	? No	(If yes, explain in Notes	s.)
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes No		s the Sampled	Area within a Wetland?	Yes No
Hydric Soil Present? Yes No	<u>e</u>	Wetland Type:	Upland	
Wetland Hydrology Present? Yes X No No		Alaska Vegetatio	on Classification (Viereck):	Icz, II AZ
Notes and Site Sketch: Please include Directional & North corridor.  See logbook of for 9  · Hydrology by 2° indicator of some some some some some some some some	w61-2, hite sketch	page 44	ure, Distances from Cente	rline, Photo Locations, and Survey

VEGETATION (use scientific names of plan	its)		-	
	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes: 26)	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC: (A)
1. NA		-	-	Total Number of Dominant Species Across All Strata: (B)
2.				% Dominant Species that are OBL, FACW, or FAC: <b>160</b> (A/B)
3.				
4.				Prevalence Index worksheet:
Total Cove	er:		No.	Total % Cover of: Multiply by:
50% of total cove	er: 20	% of total co	/er:	OBL species: X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 15
1. Betula Jandulosa	30	Y	FAC	UPL species X 5 =
2. Vaccinium Ulicinosum	8		FAC	Column Totals: 123 (A) 354 (B)
1. Betula Jandulosa 2. Vaccinium Uliciansum 3. Salux bebbiana	10		FAC	PI = B/A = 2.87
4. Jalix polonis	7		FACW	
5.				
6.				
7.				
8.				
9.				
Total Cove		% of total cov	/er: <u>                                      </u>	
VEGETATION (use scientific names of plan	ts)	- 4415	520 0	
Herb Stratum ( 240 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  ———————————————————————————————————
1. Calamacantis canadensis	45	Y	FAC	Prevalence Index is ≤ 3.0
2. Desdampsia Caespitosa	5		FAC	Morphological Adaptations¹ (Provide supporting data in Notes)
3. Rubus chamemons	5		FACW	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Polemonium Acutiflorum	3		FAC	Indicators of hydric soil and wetland hydrology must be present unless
5. CARLEY PORMARDA	5		FAC	disturbed or problematic.
6. CARERO LO LIACEA	2		FAC	
7. CARRO SAXATILIS	3		FACW	% Bare Ground
8.				% Cover of Wetland Bryophytes
9.				
10.				% Cover of Water
Total Cove	r. 69			Hydrophytic Vegetation Present (Y/N):
50% of total cove		% of total cov	rer: 13.6	Notes: (If observed, list morphological adaptations below):

SOIL				ature ID		_		Soil Plt Required (Y/N	)
SOIL PROFIL	E DESCRIPTION: (	Describe	to the depth needed	to documer	nt the i	ndicator or	confirm the absence	e of indicators.)	
Depth	Matrix		Redox Features			,	- 1		
(inches)	Color (moist)	%	Color (moist)	% Тур	pe <sup>1</sup>	Loc²	Texture	Notes	
,-0.5"							Fibric	dry	
0.5=18"	2.54 4/3	100	104R 3/3	5 (	<u></u>	PL	sijt loam	5% gravel; 21. cont	de
								0	
				-					
T 0-0		Aire DA	A-D-dudata-ti-	2 0		1.10.10	21 (	DI D. III AAAAA	
		etion, Ki	n=Reduced Matrix, C	S=Covered	or Coa	ited Sand G		: PL=Pore Lining, M=Matrix.	011.0
	INDICATORS		A	(4.40)	MI.			FOR PROBLEMATIC HYDRIC S	OILS
	stel (A1)		Alaska Gleyed					Change (TA4) <sup>4</sup>	
	on (A2)		Alaska Redox					Swales (TA5)	
	N3)		Alaska Gleyed	Pores (A15)				with 2.5Y Hue	
Hydrogen Sulf	fide (A4)						Layer	without 5Y Hue or Redder Under	ying
Thick Dark Su	ırface (A12)						Other (Explain	in Notes)	
One indicator	of hydrophytic vege	tation, o	ne primary indicator o	of wetland h	ydrolog	gy, and an a	appropriate landsca	ape position must be present unle	SS
listurbed or pr	of color change in No	toe							
Restrictive Lay	yer (if present): Type	9:	NA	epth (inches	s):				
Restrictive Lay	yer (if present): Type	9:	Hue molitation (cul						
Restrictive Lay	resent (Y/N): N	e:	Hue adicates (cul	la, % ,f	nedox	throughert)			
Restrictive Lay	resent (Y/N): N	e:		la, % ,f	nedox	Montput)	Y INDICATORS (2	or more required)	
Restrictive Lay Hydric Soil Pi Notes: かん 4	resent (Y/N): N	2.5 Y	Hue adicates (cul	ufficient)	nedox SI	Showfurt)  ECONDAR	Y INDICATORS (2	Stunted or Stressed	
Hydric Soil Provides: Down of the Hydrology  Surface Water	resent (Y/N): N  Aut Satisty Alcohol  PRIMARY INDICA  (A1)	7.54 TORS (8	Hue <i>indicator</i> (col	ufficient)	Nedox SI - Le	ECONDAR /ater-stainee aaves (B9)	Y INDICATORS (2	Stunted or Stressed Plants (D1)	
Hydric Soil Provides: Down of the Hydrology  Surface Water	yer (if present): Type resent (Y/N): N  Aut Satisty Alwala  PRIMARY INDICA	TORS (a	Hue indicator is surface Soil Cracks (B6)	ufficient)	SI W Le	ECONDAR dater-stained eaves (B9) rainage Pat	Y INDICATORS (2	Stunted or Stressed Plants (D1)	k
Hydric Soil Provides: Down of the Hydrology Surface Water High Water Ta	resent (Y/N): N  resent (Y/N): N  Alway  PRIMARY INDICA  (A1)  able (A2)	TORS (a	Hue indicator is surface Soil Cracks (B6 indation Visible on Ae	ufficient)	SI W Le	ECONDAR  /ater-stainedeaves (B9)  rainage Pat  xidized Rhiz	Y INDICATORS (2	Stunted or Stressed Plants (D1)	k
Hydric Soil Power of the Hydrology  Hydrology  Hydrology  Surface Water  High Water Ta	yer (if present): Type resent (Y/N):  Alcohol PRIMARY INDICA  (A1)  able (A2)	TORS (a Sui Inu (B7 Spa	Hue indicator is surface Soil Cracks (B6 indation Visible on Ae incave Surface (B8)	ufficient)	SI W Le	ECONDAR Vater-stainer eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	k
Hydric Soil Power of the Hydrology  Hydrology  Hydrology  Surface Water  High Water Ta	resent (Y/N): N  resent (Y/N): N  Alway  PRIMARY INDICA  (A1)  able (A2)	TORS (a Sui Inu (B7 Spa	Hue Indicator is surface Soil Cracks (B6 andation Visible on Ae arsely Vegetated acave Surface (B8)	ufficient)	SI W Le	ECONDAR Vater-stainer eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I	Y INDICATORS (2	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	k
Hydric Soil Position  Notes: Doco de Hydrology  Surface Water High Water Ta  Saturation (A3)  Water Marks (	yer (if present): Type resent (Y/N):  Alcohol PRIMARY INDICA  (A1)  able (A2)	TORS (a Sui Inu (B7 Spa Coi Ma	Hue mblicator is surface Soil Cracks (B6 and ation Visible on Ae arsely Vegetated acave Surface (B8)	ufficient)	SI W Le Di C:	ECONDAR  /ater-stainedeaves (B9)  rainage Pat  xidized Rhiz  ving Roots  resence of I	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic	
Hydric Soil Ponts  Hydric Soil Ponts  HydroLogy  Surface Water  High Water Ta  Saturation (A3)  Water Marks (  Sediment Dep	resent (Y/N): Normal Satisfy Alcohology  PRIMARY INDICA  (A1)  able (A2)  B1)  posits (B2)	TORS (a Sun Inu (B7 Con Ma Hyo	Hue Indicator is surface Soil Cracks (B6 andation Visible on Aero)  arsely Vegetated acave Surface (B8)  If Deposits (B15)  drogen Sulfide or (C1)	ufficient)	SI W Lee	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
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Hydric Soil Proposits	yer (if present): Type  resent (Y/N): N  PRIMARY INDICA  (A1)  able (A2)  B1)  cosits (B2)  (B3)	TORS (a Sun Inu (B7 Spa Con Ma Hyo Od Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Ae incave Surface (B8)	ufficient)	SI W Lee	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
Hydric Soil Provides: Decorate Marks ( Sediment Deporift Deposits  Algal Mat or C	resent (Y/N): Normal Property (if present): Type  resent (Y/N): Normal Property (Y/N): Norm	TORS (a Sun Inu (B7 Spa Con Ma Hyo Od Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Aero)  arsely Vegetated incave Surface (B8)  If Deposits (B15)  drogen Sulfide or (C1)	ufficient)	SI W Lee	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
Hydric Soil Proposits  Algal Mat or C	yer (if present): Type  resent (Y/N): N  PRIMARY INDICA  (A1)  able (A2)  B1)  cosits (B2)  (B3)	TORS (a Sun Inu (B7 Spa Con Ma Hyo Od Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Ae incave Surface (B8)	ufficient)	SI W Lee	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
Hydric Soil Proposits  Hydric Soil Proposits  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep  Drift Deposits  Algal Mat or C	yer (if present): Type resent (Y/N): N  PRIMARY INDICA  (A1)  B1)  B1)  Oosits (B2)  (B3)  (B5)  (B5)	TORS (a Sun Inu (B7 Spa Con Ma Hyd Od Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Aero)  arsely Vegetated incave Surface (B8)  If Deposits (B15)  If orgen Sulfide or (C1)  Season ter Table (C2)  Inter (Explain in Notes)	ufficient)	SI W Lee	ECONDAR Vater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of I on (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
Hydric Soil Proposits  Hydric Soil Proposits  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep  Drift Deposits  Algal Mat or C	resent (Y/N): Normal Property (if present): Type  resent (Y/N): Normal Property (Y/N): Norm	TORS (a Sun Inu (B7 Spa Con Ma Hyd Od Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Ae incave Surface (B8)	ufficient)	SI W Le	ECONDAR' /ater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of fon (C4) alt Deposits otes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
Hydric Soil Proposits  Hydric Soil Proposits  HYDROLOGY  Surface Water  High Water Ta  Saturation (A3)  Water Marks (  Sediment Dep  Drift Deposits  Algal Mat or C  Iron Deposits (  Surface Water	yer (if present): Type resent (Y/N): N  PRIMARY INDICA  (A1)  B1)  B1)  Cosits (B2)  (B3)  Fresent (Y/N): N	TORS (a Sui Inu (B7 Spa Cool Ma Hyd Odd Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Aero)  arsely Vegetated incave Surface (B8)  If Deposits (B15)  If orgen Sulfide or (C1)  Season ter Table (C2)  Inter (Explain in Notes)	ufficient)	SI W Le	ECONDAR' /ater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of fon (C4) alt Deposits otes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)	
Hydric Soil Proposits Hydroc Soil Proposits Hydroc Soil Proposits Hydroc Water Table Proposits High Water Table Proposits (1)	resent (Y/N): New Yer (if present): Type  resent (Y/N): New Yer Satisfy Always  PRIMARY INDICA  (A1)  able (A2)  B1)  B1)  (B3)  Frust (B4)  (B5)  Present (Y/N): New Yeresent (Y/N): N	TORS (a Sui Inu (B7 Spa Cool Ma Hyd Odd Dry Wa	If we indicator is surface Soil Cracks (B6 indation Visible on Aero)  arsely Vegetated incave Surface (B8)  If Deposits (B15)  If Deposits (B15)	ufficient)	SI W Le	ECONDAR' /ater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of fon (C4) alt Deposits otes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	
Hydric Soil Provides: Deco A HYDROLOGY Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits ( Surface Water	resent (Y/N): New Yer (if present): Type  resent (Y/N): New Yer (if present): Type  resent (Y/N): New Yer (Y/N): New Yer (if present): Type  resent (Y/N): N	TORS (a Suii Inu (B7 Spa Coi Ma Hyo Od Dryw a	If we indicator is surface Soil Cracks (B6 indation Visible on Aero)  arsely Vegetated incave Surface (B8)  If Deposits (B15)  If Deposits (B15)	ufficient)	SI W Le	ECONDAR' /ater-stained eaves (B9) rainage Pat xidized Rhiz ving Roots resence of fon (C4) alt Deposits otes:	terns (B10) zospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)	

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved
Forestet Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved
Scrub Shribe Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Persistent Aquatic Bed
Percent Cover (14: Tree (>5 dbh >6m tall) Sanling (<5 dbh <6m tall) Tall shrub (2.6m) Short-brub (0.5-2m)
Percent Cover (Pt: Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)         Tall shrub (2-6m)         Short shrub (0.5-2m)           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UneyenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
80%) Very High Density (80-100%)
Very High Density (do-10076)
Interspersion of Cover & Open Vater (P): 100% Cover or Open Water <25% Scattered/Deripheral Cover 26-75% Scattered or
Peripheral Cover >75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site
Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)
Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings)
High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fib.ic Histosol:Hemic Histosol: Sapric
Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
William Staveny William Stay William Stay Stay
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perenni
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Page 4 of 4

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: <u>W6   H7035</u> Field Target: <u>78</u> Date: <u>7   8   14</u>
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>D Soil profile is complete?</li><li>Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>Appropriate hydrology indicators are marked?</li> <li>✓ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- $\hfill\Box$  Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Anderson X genter Arrow 7/8/14
Wetland Scientist (print) Significance / Date

Min DEGUTS

Field Crew Chief (print)

Signature / Date

7/8/14

Date: 7 8 14   Project Name & No.: Alaska LNG 26221306     Investigators:		1,20
Investigators: Websta Jawasa Region: Alaska Milepost: 55  Latitude: 63° 27' 55.57" Longitude: 148° 48' Logbook No.: 16 2 Logbook Page No.: 9 Picture No.: P_L  SITE PARAMETERS  Subregion: South cardred Local relief (concav. Soli Map Unit Name Are climatic/hydrologic conditions on the site typical for this time of year? Yes No. (if no explain in Notes)  Are Vegetation. Soil. or Hydrology. Significantly Disturbed? No. (if yet Summary Of Findings  Hydrophytic Vegetation Present? Yes No. Is the Sampled Area wether the Sampled Area wether Sampled	Target: <u>63</u>	Map #: 41 Map Date: 5/27 14
State: Alaska  Region: Alaska  Milepost: 55  Latitude: 3° 27' 55.57"  Logbook No.: 148° 48'  Logbook No.: 148° 48'  Logbook No.: 148° 48'  Picture No.: P_L  SITE PARAMETERS  Subregion: South cantral  Solope (%): 2  Pre-mapped Alaska LNG/NWI classification: 150 Local relief (concaved for this time of year)  Are climatic/hydrologic conditions on the site typical for this time of year?  Yes	Feature Id	: W61 HT036
Latitude: 63° 27 55.57"  Logbook No.: 46 Picture No.: P_L  SITE PARAMETERS  Subregion: South control  Slope (%): 3  Pre-mapped Alaska LNG/NWI classification: UPLAN  Are climatic/hydrologic conditions on the site typical for this time of year? Yes No_ (if no explain in Notes)  Are Vegetation_, Soil_, or Hydrology_ Significantly Disturbed? No_ (if ye SUMMARY OF FINDINGS  Hydrophytic Vegetation Present? Yes No_ Is the Sampled Area w  Hydric Soil Present? Yes No_ Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.  **Control of the Control of the State of the Sampled Area w  **Control of the Control of Samples Arrow Centerline, Length of feature, Discorridor.  **Control of Samples Arrow Centerline, Length of feature, Discorridor.		Team No.: We
Logbook No.:   Well   Dependence   Logbook Page No.:   Picture No.:   P. L.	1.95	
SITE PARAMETERS  Subregion: South control  Slope (%): 3  Pre-mapped Alaska LNG/NWI classification: Up Land  Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in Notes)  Are Vegetation Soil or Hydrology Significantly Disturbed? No (If yes Summary OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area we Hydric Soil Present? Yes No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.  No Basak Hydro Research Substitute Proposition of the sture of the substitute Proposition of the subst	2.33"	Datum: WGS84
SITE PARAMETERS  Subregion: South control  Slope (%): 3  Pre-mapped Alaska LNG/NWI classification: Up Land  Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in Notes)  Are Vegetation Soil or Hydrology Significantly Disturbed? No (If yes Summary OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area we Hydric Soil Present? Yes No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.  No Basak Hydro Research Substitute Proposition of the sture of the substitute Proposition of the subst	01 HTO 36_F	it; Plusis; E.
Slope (%): 3  Pre-mapped Alaska LNG/NWI classification: UPLAD  Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in Notes)  Are Vegetation Soil or Hydrology Significantly Disturbed? No (if yes SUMMARY OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area well Hydrology Present? Yes No Alaska Vegetation Class Wetland Hydrology Present? Yes No Alaska Vegetation Class Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.		0
Slope (%): 3  Pre-mapped Alaska LNG/NWI classification: UPLAD  Are climatic/hydrologic conditions on the site typical for this time of year? Yes No (if no explain in Notes)  Are Vegetation Soil or Hydrology Significantly Disturbed? No (if yes SUMMARY OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area well Hydrology Present? Yes No Alaska Vegetation Class Wetland Hydrology Present? Yes No Alaska Vegetation Class Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.	errace, hummock	s, etc.): FIA+
Are climatic/hydrologic conditions on the site typical for this time of year?  Are "Nomal of Yes No (if no explain in Notes)  Are Vegetation , Soil , or Hydrology Significantly Disturbed?  Are Vegetation , Soil , or Hydrology Naturally Problematic?  No (If yes Summary OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area well Hydric Soil Present?  Yes No Wetland Type: \$\rho_{55}\$  Wetland Hydrology Present? Yes \( \times \) No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.  **North Arrow Centerline**  **North	convex, none):	NONE
Are Vegetation, Soil, or Hydrology Significantly Disturbed? No (If ye Are Vegetation, Soil, or Hydrology Naturally Problematic? No (If ye SUMMARY OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area w Hydric Soil Present? Yes O No Wetland Type: \$\rangle\$ Soil Present? Yes O No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.  **Note Sand Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.**  **Note Sand Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.**  **Note Sand Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.**  **Note Sand Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.**  **Note Sand Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.**  **Note Sand Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.**		
Are Vegetation, Soil, or Hydrology Significantly Disturbed? No (If ye Are Vegetation, Soil, or Hydrology Naturally Problematic? No (If ye SUMMARY OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area we Hydric Soil Present? Yes No Wetland Type: \$\rho_{55}\$  Wetland Hydrology Present? Yes \times_ No No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.  **MOUNTAIN**  **PRESENTAL**  **TOPO BREAK**  **TOPO BREAK	rcumstances" pre	esent:
Are Vegetation, Soil, or Hydrology Naturally Problematic? No (If yets SUMMARY OF FINDINGS  Hydrophytic Vegetation Present? Yes No Is the Sampled Area wethen Hydric Soil Present? Yes No Wetland Type: \$\rho_{55}\$ Wetland Hydrology Present? Yes  No No Alaska Vegetation Class Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.  No Replace	explain in Notes	
Hydric Soil Present? Yes No Wetland Type: P55  Wetland Hydrology Present? Yes No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.  MOUNTAIN  ROBBERK HITTORO BREAK HITTORO	, explain in Notes	
Hydric Soil Present?  Yes  No  Wetland Type: P55  Wetland Hydrology Present?  Yes  No  Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow Centerline, Length of feature, Discorridor.  **MOUNTAIN**  **Wetland Type: P55  Alaska Vegetation Class  **MOUNTAIN**  **Wetland Type: P55  **Alaska Vegetation Class  **Alaska Vegetation Class  **Alaska Vegetation Class  **MOUNTAIN**  **Wetland Type: P55  **Alaska Vegetation Class  **A		
Wetland Hydrology Present? Yes Q No Alaska Vegetation Class  Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.  MOUNTAIN  PORD BARAK	nin a Wetland?	Yes No
Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Discorridor.  MOUNTAIN  PROBLEAK 11-14  WEITHTO36	EMIB .	
GHHH TOPO BREAK HILLY  "WEITHTO36"	cation (Viereck):	IIAZ, IICI, IIIAZ
		rline, Photo Locations, and Survey  page 45 &  page 45 &  tes \$ 5. te 5 ketch

VEGETATION (use scientific names of plants	3)			
Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)  Total Number of Dominant Species Across All Strata: (B)
1. Pices claves	7	Y	FACU	% Dominant Species that are OBL, FACW, or FAC: 57% (A/B)
2.				We be that are OBL, FACW, or FAC3 7 10 (AVB)
3.				Paramolaria in the state
4.				Prevalence Index worksheet:
Total Cover:	7			Total % Cover of: Multiply by:
50% of total cover	3.5 20	% of total cov	er:	OBL species;X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 25 x 2 = 50  FAC species 36 x 3 = 700 396  FACU species 36 x 4 = 108
1. Vaccinium uliginosum	40	Y	FAC	UPL speciesX 5 =
2. Vaccinium vits-idaea	10		FAC	Column Totals: 193 (A) 554 (B)
3. BeULA NANA	15	Y	FAC	PI = B/A = 2.87
4. Splix PASIANDIA	10		FACW	() ID FAC
5. Salix pulchra	10		FACW	Salix afunça 10 FAC Salix arbusachoides & FACW
6. Lhado dendran goenlandicum	5		FAC	Jan 2 Da bus exterior
7. Picea apresa	15	Y	FACU	
8. Spiren steveni:	15	Y	FACU	
9. Emperum niquem	5		FAC	
Total Cover			4.0	
50% of total cover	: <u>70</u> 20	% of total cov	er: 26	
VEGETATION (use scientific names of plants	3)			
Herb Stratum ( 26 )	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:
	% Cover	Species?	Status	
1.6	0.	(Y/N)	F	Prevalence Index is ≤ 3.0
1. Equiselous sylvaticum	30	1	FAC	Morphological Adaptations <sup>1</sup> (Provide supporting data in
- CALAMANDSTIS CANADOSSIS	15	4	FAC	Notes)
3. Egyitelum arvonse	10		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
Lubus Chamalmorous	5		FACW	Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
5. Pyrola gradiflora	2		FAC	distribed of problematic.
6. Rimex Orisons	7		FAC	
7.				% Bare Ground
8.				Cover of Wetland Bryophytes
9.				
10.				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover	<u>_62</u>		10.11	Notes: (If observed, list morphological adaptations below):

50% of total cover: 31 20% of total cover: 12.4

Depth inches)			to the depth needed to docume	ent the indicator of	confirm the absence	e of indicators.)
•	Matrix	7	Redox Features			
71	Color (moist)	%	Color (moist) % T	ype <sup>1</sup> Loc <sup>2</sup>	Texture	Notes
0-60		4 1			Fibric	Saturated
0-18"	104R3/2	100			sander loam	60% edsble
					1	
					2	Di Di di di di di di
		letion, RM	1=Reduced Matrix, CS=Covered	or Coated Sand C		PL=Pore Lining, M=Matrix.
	INDICATORS		Alaska Olavad (A42)			FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed (A13)			nange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)			wales (TA5)
	A3)		Alaska Gleyed Pores (A1	5)		vith 2.5Y Hue without 5Y Hue or Redder Underlying
lydrogen Sulf	fide (A4) <u></u>	-			Layer	—
	ırface (A12)				Other (Explain i	
One indicator	r of hydrophytic veg	etation, o	ne primary indicator of wetland	hydrology, and an	appropriate landscap	pe position must be present unless
isturbed or pr	roblematic. of color change in N	otos				
lestrictive La	yer (if present): Typ	otes.	A Depth (inch	es): —		
lvdric Soil P	resent (Y/N):	Y				
Notes:						
IYDROLOGY	PRIMARY INDICA	ATORS (a	nny one indicator is sufficient)	SECONDAR	RY INDICATORS (2	or more required)
				Water-staine	ed	Stunted or Stressed
	PRIMARY INDICA	Su	rface Soil Cracks (B6)	Water-staine Leaves (B9)		Stunted or Stressed Plants (D1)
Surface Water		Sul	rface Soil Cracks (B6)	Water-staine Leaves (B9)	ed	Stunted or Stressed Plants (D1)
Surface Water High Water Ta	r (A1) able (A2)	Sui Inu - (B7	rface Soil Cracks (B6)	Water-staine Leaves (B9)  Drainage Pa  Oxidized Rh	ed atterns (B10)izospheres along	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)
Surface Water	r (A1) able (A2)	Sui Inu - (B7	rface Soil Cracks (B6) ndation Visible on Aerial Image ')	Water-staine Leaves (B9)  Drainage Pa	ed atterns (B10)izospheres along	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
Surface Water High Water Ta Saturation (A3	r (A1) <u>(A</u> able (A2) <u>(A</u> B) <u>(A</u>	Sul Inu (B7 Sp. Co	rface Soil Cracks (B6) ndation Visible on Aerial Image ') arsely Vegetated ncave Surface (B8)	Water-staine Leaves (B9)  Ty Drainage Pa  Oxidized Rh Living Roots  Presence of	atterns (B10) izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water High Water Ta Saturation (A3 Vater Marks (	r (A1)	Sui Inu (B7 Spa Co	rface Soil Cracks (B6) ndation Visible on Aerial Image () arsely Vegetated ncave Surface (B8) rl Deposits (B15)	Water-staine Leaves (B9)  Ty Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Ta Saturation (A3 Vater Marks (	r (A1) <u>(A</u> able (A2) <u>(A</u> B) <u>(A</u>	Sui Inu (B7 Sp: Co Ma	rface Soil Cracks (B6) ndation Visible on Aerial Image () arsely Vegetated ncave Surface (B8) rl Deposits (B15)	Water-staine Leaves (B9)  Ty Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)	atterns (B10) izospheres along s (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep	r (A1)	Sullinu (B7 Sp. Co Ma Hyr Od	rface Soil Cracks (B6)  ndation Visible on Aerial Image (1) arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)	Water-staine Leaves (B9)  Ty Drainage Pa  Oxidized Rh Living Roots  Presence of Iron (C4)	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water  High Water Ta  Saturation (A3  Water Marks (  Sediment Dep	r (A1)	Sullinu (B7 Sp. Co Ma Hyr Od	rface Soil Cracks (B6)  ndation Visible on Aerial Image  (1)  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)	Water-staine Leaves (B9)  Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits	r (A1)	Sullinu (B7 Sp. Co Ma Hyd Od Dry Wa	rface Soil Cracks (B6)  ndation Visible on Aerial Image (1) arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)	Water-staine Leaves (B9)  Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits	r (A1)	Sullinu (B7 Sp. Co Ma Hyd Od Dry Wa	rface Soil Cracks (B6)  ndation Visible on Aerial Image () arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  r-Season tter Table (C2)	Water-staine Leaves (B9)  Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits	r (A1)	Sullinu (B7 Sp. Co Ma Hyd Od Dry Wa	rface Soil Cracks (B6)  ndation Visible on Aerial Image () arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  r-Season tter Table (C2)	Water-staine Leaves (B9)  Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Gurface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits	r (A1)	Sullinu (B7 Sp. Co Ma Hyd Od Dry Wa	rface Soil Cracks (B6)  ndation Visible on Aerial Image  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  r-Season ater Table (C2)  ner (Explain in Notes):	Water-staine Leaves (B9)  Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Gurface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits	r (A1)	Sui Inu (B7 Sp: Co Ma Hy/ Od Dry Wa	rface Soil Cracks (B6)	Water-staine Leaves (B9)  Ty Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10) aizospheres along s (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Gurface Water High Water Ta Saturation (A3 Water Marks ( Gediment Dep Drift Deposits Algal Mat or C ron Deposits Gurface Water	r (A1)	Sui Inu (B7 Sp: Co Ma Hy/ Od Dry Wa	rface Soil Cracks (B6)  ndation Visible on Aerial Image  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  r-Season ater Table (C2)  ner (Explain in Notes):	Water-staine Leaves (B9)  Ty Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Gurface Water High Water Ta Saturation (A3 Water Marks ( Sediment Dep Drift Deposits Algal Mat or C ron Deposits Gurface Water Water Table F	r (A1)	Sui Inu (B7 Sp: Co Ma Hy/ Od Dry Wa	rface Soil Cracks (B6)	Water-staine Leaves (B9)  Ty Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10) aizospheres along s (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Gurface Water High Water Ta Saturation (A3 Water Marks ( Gediment Dep Drift Deposits Algal Mat or C ron Deposits Gurface Water	r (A1)	Sui Inu (B7 Sp: Co Ma Hy/ Od Dry Wa	rface Soil Cracks (B6)  ndation Visible on Aerial Image  r)  arsely Vegetated ncave Surface (B8)  rl Deposits (B15)  drogen Sulfide or (C1)  /-Season tter Table (C2)  ner (Explain in Notes):	Water-staine Leaves (B9)  Ty Drainage Pa Oxidized Rh Living Roots Presence of Iron (C4) Salt Deposit Notes:	atterns (B10) aizospheres along s (C3) Reduced s (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)     Sapling (<5 dbh, <6m tall)     Tall shrub (2-6m)     Short shrub (0.5-2m)     \$\frac{7}{2}\text{20}\$       Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="25">25% Scattered/Peripheral Cover_25% Scattered or Peripheral Cove</a>
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat_ / Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet P
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding P Return Interval 1-2 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading %.25
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits  Glacial Till/Not Permeable
Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring
I ANDSCADE VADIADI ES (18)
Wetland Juxtaposition: Only Connected Above Only Connected Upstream & Downstream Downstream Unknown
West-add and the state of the s
Winderste intensity (i.e., au.) Winderste intensity (i.e. and
thousand moderate monoticy (n.e., forestry) Low intensity (n.e. open space)

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		<b>3</b> .	
Feature	e ID: <u>W6I HT036</u> Field T	arget: 63	Date: 7/8/14
	items not checked, please provide detail		
1.	Site Description		
	Site description, site parameters  A detailed site sketch is included		indings are complete?
2.	Vegetation		
	At least 80% of onsite vegetation identification?	n has been keyed t	to species, or collected for later
	☑ Vegetation names are entered le		present?
	<ul> <li>Cover calculations are complete</li> <li>All dominant species have been</li> <li>Indicator status is correct for each</li> </ul>	determined and re	corded per strata?
	Indicator status is correct for each Dominance Test and Prevalence		completed?
3.	Soil		
	Soil profile is complete?  Appropriate hydric soil indicators	s are marked?	
4.	Hydrology		
	Appropriate hydrology indicators  Surface water, water table, and		are recorded if present?
5.	Functions and Values		
	Vegetation, soil, hydrologic varia wetland?	ables, and landscap	oe variables complete if site is a
6.	Field Logbook		
	Notes have been recorded at ea		
	accuracy of pre-mapped wetland Each logbook page is initialed a		ropriate?
7.	Maps		
	☑ Wetland boundaries have been ☑ Maps are initialed and dated?	corrected if necess	eary?

8.	Р	h	O	to	9

卤	Four photos were taken for each Wetland Determination Data Form (2 vegetation,	1
	soil pit, 1 soil plug)?	
_		

☐ Two photos were taken for each Observation Point (vegetation/site overview)?

X Jennifer Andurin	X genfo and	n 7/8/14
Wetland Scientist (print)	Signature / Date	1

X Kim DEGUTIS

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION							30
Survey Type: Centerline X Acce	ss Road (explain)	Other (expl	ain)	Field Targe	et: <u>62</u>	Map #: <u>40</u>	Map Date: 5 27 1
Date: 7/8/14	Project Name & No.:	Alaska LNG	26221306		Feature lo	1: W61 1+703	7
Investigators: L VIGUTIS	FANDUSON					Team No.:	061
State: Alaska	Region: Alaska		Milepost:	553.85			1
Latitude: 63° 31' 14.16'	,	Longitude	: 148°	48' 02	. 06"	Datum: WGS	884
Logbook No.: WG1-2	Logbook Page No.:	46	Picture No.:	: P_W611	11037_	.P.F; Plus	5; ω
SITE PARAMETERS		= -9	51 =	W = 3		Mary May	
Subregion: Southentral			Landform (hi	illslope, terrac	e, hummocl	(s, etc.): F/A	+
Slope (%):			Local relief (	concave, conv	ex, none):	NONE	
Pre-mapped Alaska LNG/NWI classifica	ation: PS\$4/1B		Soil Map Uni	it Name:			
Are climatic/hydrologic conditions on the Yes No (if no exp		e of year?	Are "N Yes	lormal Circum No		esent: (plain in Notes.)	
Are Vegetation, Soil, or Hy	drology Significan	tly Disturbed?	No	(If yes, expl	ain in Notes	s)	
Are Vegetation, Soil, or Hy	drology Naturally	Problematic?	NoX	(If yes, exp	lain in Note	s.)	
SUMMARY OF FINDINGS					-		
Hydrophytic Vegetation Present? Yes_	Ж No	Is	the Sampled	Area within a	Wetland?	Yes	No
Hydric Soil Present? Yes_	No	w	etland Type:	(	JPLAM	D	
Wetland Hydrology Present? Yes_	No <del>/</del> 2	AI	aska Vegetatio	on Classificatio	n (Viereck)	主 A2,	耳(川瓜
Notes and Site Sketch: Please include	Directional & North Arrov	w, Centerline,	Length of feat	ure, Distances	from Cente	erline, Photo Loc	ations, and Survey
corridor,	See loc	book (	W61-2,	page	46		
			for site	sketch	à note	0	

VEGETATION (use scientific names of plan	nts)			
Tree Stratum (Plot sizes: 26)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:
1. Picea slavca	7	Y	FACU	Total Number of Dominant Species Across All Strata:
2.			1,111	% Dominant Species that are OBL, FACW, or FAC:(A
3.				
4.				Prevalence Index worksheet:
Total Cove	er: Y			Total % Cover of: Multiply by:
50% of total cove		0% of total co	ver:	OBL species: X1 =
Sapling/Shrub Stratum( 26 )	Absolute % Cover	Dominant Species? (Y/N)	7	FACW species: 8
1. Betula Sandulosa	55	Y	FAC	UPL species
2. Unodo dendron appenlandicum	30	V	FAC	9 9
3. Vaccinium vitis Idaea	35 7		FAC	Column Totals: 1/5 (A) 545 (B) PI = B/A = 3.11
Plosa Acicularis	3		FACU	
5. Vaccinium Ulisinosum	35	У	FAC	
Picea Sauca	7	-	FACU	
, 0			1 110	
3.				
9.				
50% of total cove		<b>7</b> % of total cov	ver: 26 21.	
/COUTATION! /	e)			
	<b>0</b> )		-	
lerb Stratum( 26 1 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
lerb Stratum( 26 1 )	Absolute		Status	Dominance Test is > 50% Prevalence Index is ≤ 3.0
PetAsites forejolus	Absolute % Cover	Species?	1	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in
Petasites friejdus  Calamagnestis Canadensis	Absolute % Cover	Species?	Status FACW FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
1. Petasites friejdus 2. Calamagnestis Canadensis 3. Cornus canadensis	Absolute % Cover 5	Species?	Status FACW FAC FACV	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
1. Petasites friejdus 2. Calamagnestis Canadensis 3. Cornus canadangis 4. Rubus Chamaemorous 5.	Absolute % Cover  5 10 710 3	Species?	FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
1. Petasites friejdus 2. Colamasportis Canadensis 3. Cornus canadensis 4. Rubus Chamaemorous 5. Equisalum arvense	Absolute % Cover 5	Species?	Status FACW FACV FACW FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unless
1- Petasites friejdus 2- Calamagnestis Canadensis 3- Cornus Canadensis 4- Rubus Chamaemorous 5- Equiselum arvense 6- Chamaerian Anguelifolium	Absolute % Cover  5 10 710 3	Species?	FACU FACU FACU	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Petasites friejdus 2. Colamospostis Canadensis 3. Cornus canadensis 4. Rubus Chamoemorous 5. Equisalum arvense 6. Chamoerian Angualifolium	Absolute % Cover  5 10 710 3	Species?	Status FACW FACV FACW FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Petasites friejdus 2. Calamagostis Canadensis 3. Cornus Canadensis 4. Rubus Chamaemorous 5. Equisalum arvense 6. Chamaerian Angualifolium 7.	Absolute % Cover  5 10 710 3	Species?	Status FACW FACV FACW FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes
3. Cornus canadangis 4. Rubus Chamaemorous 5. Equisatum arvense 6. Chamaerian Angualifolium 7.	Absolute % Cover  5 10 710 3	Species?	Status FACW FACV FACW FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.   Bare Ground  Cover of Wetland Bryophytes  Total Cover of Bryophytes
1. Petasites friejdus 2. Calamagostis Canadensis 3. Cornus Canadensis 4. Rubus Chamaemorous 5. Equisalum arvense 6. Chamaerian Angualifolium 7.	Absolute % Cover  5 10 7/0 3	Species?	Status FACW FACV FACW FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes

			1 11 1 11			-11 4		
SOIL PROFI		Describe	to the depth needed t	o documer	nt the inc	dicator or	confirm the absence	or indicators.)
Depth	Matrix		Redox Features		. 1	1 2		1
inches)	Color (moist)	%	Color (moist)	% Ty <sub>l</sub>	pe'	Loc <sup>2</sup>	Texture	Notes
J-8"							Fibric	£ 26 3
3-11011	2.5 Y 3/12	-63	10783/10		_	M	silt loam	1,0
D-12"	254411	89	7.5 YR'3/4	P		M	5ilt loan	
Tuno: C=Co	properties D-Denk	ation Pl	//=Reduced Matrix, CS	=Covered	or Coate	ed Sand O	Praine <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
	L INDICATORS	stion, Ki	VI-Reduced Watrix, Co	-covered	OI COAL	eu Ganu C		FOR PROBLEMATIC HYDRIC SO
	istel (A1)		Alaska Gleyed (	Δ13)				hange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A					Swales (TA5)
			Alaska Gleyed F					with 2.5Y Hue
	A3) Ifide (A4)		Alaska Gleyeu F	Foles (A15			Alaska Gleyed	without 5Y Hue or Redder Underly
			-				Other (Explain	in Notes)
	urface (A12)	tation o	ne primary indicator of	f wetland h	vdrology	v. and an		pe position must be present unless
listurbed or	problematic.				,	<b>,</b> ,		ria na amazari
	of color change in No		D <sub>0</sub>	epth (inche	٠)٠			
restrictive La								
	ayer (if present): Typ	e: N1		eptin (iniche	J)			
Hydric Soil I	Present (Y/N):			eptii (iiiche:	J)			
				sptn (mone			•	
				sptn (inche				
				spin (inche	-7:-			
				эри (шспе	-7:-			
Notes:	Present (Y/N):\	O	any one indicator is sui			CONDAR	Y INDICATORS (2	or more required)
Notes:	Present (Y/N):\	TORS (		fficient)	SE Wa	ater-staine	ed	Stunted or Stressed
Notes:  HYDROLOG  Surface Wate	Present (Y/N):	TORS (	any one indicator is suf rface Soil Cracks (B6) indation Visible on Aer	fficient)	SE Wa	ater-staine aves (B9)		Stunted or Stressed Plants (D1)
Notes:  HYDROLOG  Surface Water T	Present (Y/N):	TORS ( Su Interpretation (B) Sp	any one indicator is suf rface Soil Cracks (B6) Indation Visible on Aer 7)arsely Vegetated	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa	tterns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _
Notes:  HYDROLOG  Surface Water 1	Present (Y/N):	TORS ( Su Int (B	any one indicator is suf rface Soil Cracks (B6) Indation Visible on Aer 7)	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots	tterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)
Notes:  HYDROLOG  Surface Water T  High Water T	Present (Y/N):	TORS ( Su Inu (B Sp Cc	any one indicator is suf rface Soil Cracks (B6) indation Visible on Aer 7) arsely Vegetated ncave Surface (B8) arl Deposits (B15)	fficient) ial Imagery	SE Wa Lea Ox Liv	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of	tterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _
HYDROLOG Surface Water High Water T Saturation (A	Present (Y/N):  P	TORS ( Su - (B Sp Co Ma	any one indicator is suf rface Soil Cracks (B6) indation Visible on Aer 7)arsely Vegetated incave Surface (B8) arl Deposits (B15) drogen Sulfide	fficient) ial Imagery	SE - Wa Lea - Ox Liv Pre Irol	ater-staine aves (B9) ainage Pa kidized Rh ring Roots esence of n (C4)	tterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water High Water T Saturation (A Water Marks	Present (Y/N):  Present (A1)  Present (A1)  Present (A1)  Present (B1)  Present (B2)	TORS ( Su Inu (B Sp Cc Ma Hy Oc	any one indicator is sufurface Soil Cracks (B6) indation Visible on Aer 7) arsely Vegetated incave Surface (B8) induction Deposits (B15) drogen Sulfide lor (C1)	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ring Roots esence of n (C4)	itterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De	Present (Y/N): Present (B1) Present (B2) Present (B3)	TORS ( Su Int. (B Sp Co Ma Hy Oc Dr W	any one indicator is suffrace Soil Cracks (B6) indation Visible on Aer 7)arsely Vegetated incave Surface (B8)trl Deposits (B15)drogen Sulfide lor (C1)y-Season ater Table (C2)	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of n (C4)	itterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits	Present (Y/N): Present (B1) Present (B2) Present (B3) Present (B4)	TORS ( Su Int. (B Sp Co Ma Hy Oc Dr W	any one indicator is sufurface Soil Cracks (B6) indation Visible on Aer 7) arsely Vegetated incave Surface (B8) induction Deposits (B15) drogen Sulfide lor (C1)	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of n (C4)	itterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOG  Surface Water  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposits  Algal Mat or	Present (Y/N): Present (B1) Present (B2) Present (B3)	TORS ( Su Int. (B Sp Co Ma Hy Oc Dr W	any one indicator is suffrace Soil Cracks (B6) indation Visible on Aer 7)arsely Vegetated incave Surface (B8)trl Deposits (B15)drogen Sulfide lor (C1)y-Season ater Table (C2)	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of n (C4)	itterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Notes:  HYDROLOG  Surface Water  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposits  Algal Mat or	Present (Y/N): Present (B1) Present (B2) Present (B3) Present (B4)	TORS ( Su Int. (B Sp Co Ma Hy Oc Dr W	any one indicator is suffrace Soil Cracks (B6) indation Visible on Aer 7)arsely Vegetated incave Surface (B8)trl Deposits (B15)drogen Sulfide lor (C1)y-Season ater Table (C2)	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of n (C4)	tterns (B10) izospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
Notes:  HYDROLOG  Surface Water  High Water T  Saturation (A  Water Marks  Sediment De  Drift Deposite  Algal Mat or  Iron Deposits	Present (Y/N): Present (B1) Present (B1) Present (B2) Present (B3) Present (B4) Present (B5) Present (B5)	TORS ( Su Int (B Sp Co Ma — Ot	any one indicator is sufface Soil Cracks (B6) Indation Visible on Aer 7) arsely Vegetated Incave Surface (B8) Ind Deposits (B15) Indrogen Sulfide Ior (C1) Ior (C1) Ior (C2) Inter (Explain in Notes):	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of n (C4)	itterns (B10)izospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment De Drift Deposits Algal Mat or Iron Deposits	Present (Y/N): Present (Y/N): Present (Y/N): Present (Y/N): Present (Y/N): Present (Y/N):	TORS ( Su Int (B Sp Co Ma — Ot	any one indicator is suf- rface Soil Cracks (B6) Indation Visible on Aer 7) arsely Vegetated Incave Surface (B8) Ind Deposits (B15) Indrogen Sulfide Ior (C1) Incy-Season Inter Table (C2) Inher (Explain in Notes):  Depth (in):	fficient) ial Imagery	SE Wa Lea	ater-staine aves (B9) ainage Pa kidized Rh ving Roots esence of n (C4)	tterns (B10) izospheres along (C3) Reduced	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Print ary Vegetation Type (P):     Vegetation Lacking     Forested-Deciduous-Needle-leaved     Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved     Scrub Shrub-Deciduous-Needle-leaved     Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved     Scrub Shrub-Evergreen-Needle-leaved     Emergent-Non-persistent     Emergent-Non-persistent
Percent Cover (P):         Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)
Number of Wetland Type (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)
Interspersion of Cover & Open Vater (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover
Plant Species Diversity (P): Low (< 5 ant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to ManyN/A
Cover Distribution of Dominant Layer (P): No Veg. Solitary, Scattered Stems or More Large Patches; Parts of Site Open Small Scattered Patches
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Mederate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES
Soil Feeters (D): Cail Lacking 15 to 15 to 15 to 15
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet _
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Inlet/Perennia
Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Pe
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Outet

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### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

e ID: <u>W6  H7037</u> Field Target: <u>62</u> Date: <u>7/8/14</u>
items not checked, please provide detailed explanation in the notes section of data form.
Site Description
Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
Vegetation
At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
☑ Vegetation names are entered legibly for all strata present?
Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?
Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
Soil
Soil profile is complete?  Appropriate hydric soil indicators are marked?
Hydrology
Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
Functions and Values
✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
Field Logbook
Notes have been recorded at each site, including general description, sketch, and
accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
Maps

Wetland boundaries have been corrected if necessary?

Maps are initialed and dated?

### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X

Signature / Bate

Field From Chief (mit)

Field Crew Chief (print)

Signature / Date

2000 A Conido WETLAND DETERMINATION DATA FORM SITE DESCRIPTION Map #: 40 Map Date: 5/27/14 Other (explain)\_ X Survey Type: Centerline Access Road (explain)\_\_\_ Field Target: 61 Project Name & No.: Alaska LNG 26221306 Feature Id: WGIHT038 Investigators: K DEGUTIS J ANDERSON Team No.: WG / Milepost: 553.65 State: Alaska Region: Alaska Longitude: 148° 48' 06.96" Latitude: (03° 31 24.36 Datum: WGS84 Picture No.: P\_W61 HT038\_P.+; Plugi W: E Logbook No .: Wel-2 Logbook Page No.: リフ SITE PARAMETERS Subregion: Southcentral Landform (hillslope, terrace, hummocks, etc.): FA+ Slope (%): Local relief (concave, convex, none): NoNE Pre-mapped Alaska LNG/NWI classification: Soil Map Unit Name: UDIAND Are climatic/hydrologic conditions on the site typical for this time of year? Are "Normal Circumstances" present: (if no explain in Notes) No\_ (If no, explain in Notes.) No\_\( \sum\_(\text{lf yes, explain in Notes} \) Are Vegetation , Soil , or Hydrology\_ Significantly Disturbed? No\_\_\_\_\_ (If yes, explain in Notes.) Are Vegetation\_ , Soil , or Hydrology Naturally Problematic? **SUMMARY OF FINDINGS** Hydrophytic Vegetation Present? Yes Is the Sampled Area within a Wetland? Hydric Soil Present? Wetland Type: UPLANC Wetland Hydrology Present? Yes Alaska Vegetation Classification (Viereck):  $\Box$  A2 ,  $\Box$   $\Box$  C2Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor. Tee logbook We1-2, page 47 for site sketch & notes

	its)			
Tree Stratum (Plot sizes: 🔏 💆 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: 2  Total Number of Dominant Species Across All Strata: 6
1. Picea Spuca	40	4	FACU	% Dominant Species that are OBL, FACW, or FAC: 33% (6)
2.				% Dominant Species that are OBL, FACW, or FAC:(F
3.				
4.				Prevalence Index worksheet:
Total Cove	er: 40			Total % Cover of: Multiply by:
50% of total cove		% of total cov	er: <b>%</b>	OBL species:X 1 =
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $\frac{2}{3}$ $\times 2 = \frac{4}{5}$ FAC species $\frac{51}{3}$ $\times 3 = \frac{153}{236}$ FACU species $\frac{59}{3}$ $\times 4 = \frac{236}{3}$
1. Rosa acicularis	10	Y	FACU	UPL species X 5 =
2. VARCINIUM vitis -idoea	7		FAC	Column Totals: 112 (A) 393 (B)
3. Empetrum nigum	5		FAC	PI = B/A = 3.51
4. Linnae borealis	2		FACU	
5. VAccinium ulizinosum	25	Y	FAC	
6. Salixo backani	7	1	FAC	
7.				
8.				
9.				
Total Cove	er: <u>56</u>			
50% of total cov	er: <u>28</u> 20	% of total cov	rer: 11.2	
VEGETATION (use scientific names of plan	nts)		HE IN	Laborate and the second
AEGE IN LOIS (USE SCIENTIFIC HATTIES OF PIAC			-	
	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators: Dominance Test is > 50%
Herb Stratum ( 26')		Species?		Dominance Test is > 50%Prevalence Index is ≤ 3.0
Herb Stratum ( 26')  1. Equisetum arvense		Species? (Y/N)	Status	Dominance Test is > 50%
Herb Stratum ( 26')  1. Equisetum arvense	% Cover 5	Species? (Y/N)	Status	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
1. Equisetum arvense 2. Pelasites frigidus 3. Colamagostis Canadensis	% Cover 5 2 2	Species? (Y/N)	Status  FAC  FACW	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
1. Equisetum arvense 2. Pelasites Prisidus 3. Calamagostis Canalensis 4. Mestensia paniculata 5. 11	% Cover 5 2 2 3	Species? (Y/N)	Status  FAC  FACW  FAC	Dominance Test is > 50%  Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
1. Equisetum arvense 2. Pelasites frisidus 3. Calamagostis Canadensis 4. Mestensia paniculata 5. Helysarum alpinum	% Cover 5 2 2	Species? (Y/N)	FAC FACW FAC FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
1. Equisetum arvense 2. Petasites frigidus 3. Calamagostis Canadensis 4. Mertensia paniculata 5. Hedysarum alpinum	% Cover 5 2 2 3	Species? (Y/N)	Status  FAC  FACW  FAC  FACU  FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
1. Equisetum arvense 2. Petasites frisidus 3. Calamagostis Canadensis 4. Mestensia paniculata 5. Helysarum alpinum 6. Chamaerian argusticolium	% Cover 5 2 2 3	Species? (Y/N)	FAC FACW FAC FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Equisetum arvense 2. Petasites frigidus 3. Calamagostis Canadensis 4. Mestensia paniculata 5. Hedysarum alpinum 6. Chamaerran argusticolium 7. Rumes Cispus	% Cover 5 2 2 3	Species? (Y/N)	FAC FACW FAC FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
1. Equisetum arvense 2. Petasites frisidus 3. Calamagnestis Canadensis 4. Mestensia paniculata 5. Hedysarum alpinum 6. Chamaeron argusticolium 7. Rumer Caispus 8. 9.	% Cover 5 2 2 3	Species? (Y/N)	FAC FACW FAC FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic. % Bare Ground% Cover of Wetland Bryophytes% Cover of Bryophytes% Cover of Water
1. Equisetum arvense 2. Petasites Prisidus 3. Calamagnestis Canadensis 4. Mestensia paniculata 5. Hedysarum alpinum 6. Chamaerian argusticolium 7. Rumex Caispus 8.	% Cover 5 2 2 3 3 1 1	Species? (Y/N)	FAC FACW FAC FACU FACU FACU	Dominance Test is > 50% Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in Notes) Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic. % Bare Ground % Cover of Wetland Bryophytes Total Cover of Bryophytes

SOIL			Date 7/8/14 Feature ID_	146	HT038		Soil Pit Required (Y/N)
SOIL PROFIL	E DESCRIPTION: (I	Describe	to the depth needed to docum	ent the	e indicator or o	confirm the absence	
Depth	Matrix		Redox Features				
(inches)	Color (moist)	%	Color (moist) %	Type <sup>1</sup>	Loc²	Texture	Notes
0-7"						Fibric	organie.
7-1211	2.5 Y 3/1	95	10YR 3/6 5	0	M	Sond/IDam	0
£3.4	Brozer						
		-					
		-			_		
¹Type: C=Co	ncentration D=Denie	tion RM:	=Reduced Matrix, CS=Covere	ad or C	nated Sand G	trains <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.
	L INDICATORS	tion, raw	Treduced Wattrix, 00-00vere	,a oi o	oated band o	_	OR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
-	stel (A1)		Alaska Gleyed (A13)				nange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)				wales (TA5)
	A3)		Alaska Gleyed Pores (A				vith 2.5Y Hue
	fide (A4)						vithout 5Y Hue or Redder Underlying
Thick Dark Su	ırface (A12)	_				Other (Explain is	n Notes)
<sup>3</sup> One indicator disturbed or p	r of hydrophytic vege roblematic.	tation, on	e primary indicator of wetland	l hydro	logy, and an a	appropriate landscap	pe position must be present unless
<sup>4</sup> Give details of	of color change in No				Var. II		
Restrictive La	yer (if present): Type	EVO	Depth (inch	nes):	17 11		
Hydric Soil P	resent (Y/N):						
Notes:							
HYDBOI OCY	PRIMARY INDICAT	FODO /	over a familiant of the control of t		OF COMPANY	/ INDIGATORS (S	
HIDROLOGI	PRIMART INDICA	OKS (an	y one indicator is sufficient)			Y INDICATORS (2 d	
Surface Water	r (A1)		ace Soil Cracks (B6)	-	Water-stained Leaves (B9) _	) 	Stunted or Stressed Plants (D1)
High Water Ta	able (A2)	(B7)	dation Visible on Aerial Image	ery	Drainage Patterns (B10)		Geomorphic Position (D2)
Saturation (A3	3)		sely Vegetated cave Surface (B8)		Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)X
Water Marks (	B1)	Marl	Deposits (B15)		Presence of F Iron (C4)	Reduced	Microtopographic Relief (D4)
Sediment Dep	osits (B2)		rogen Sulfide r (C1)		Salt Deposits	(C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)	Dry-	Season er Table (C2)		Notes:		
Algal Mat or C	rust (B4)		er (Explain in Notes):				
Iron Deposits	(B5)						
				46			I le la
Surface Water	Present (Y/N): N		Depth (in):				XI.
Water Table P	resent (Y/N):	C	Depth (in):	W	etland Hydro	logy Present (Y/N):	:_N
Saturation Pre		С	Depth (in):				
Notes:							

VEGETATION VARIABLES P= Plot, M=	= Matrix
Primary Vegetation Type (P): Vegetation Lac Forested-Evergreen-Needle-leaved Scrub Sarub-Evergreen-Broad-leaved Persisten Aquatic Bed	kingForested-Deciduous-Needle-leavedForested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leavedScrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leavedEmergent-Non-persistentEmergent-
Percent Cov r (P): Tree (>5 dbh, >6m tall) Dwarf shrub (<1,5m) Tall herb (≥1m	Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M):	Evenness of Wetland Type Distribution (M): EvenHighly UpevenModerately even
Vegetation Density/Deminance (P): Sparse (080%) Very High Density (80-100%)_	0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover75% Scattered	100% Cover or Open Water <25% Scattered Peripheral Cover 26-75% Scattered or or Peripheral Cover N/A
Plant Species Diversity (P): Low < 5 plant sp	pecies) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)	One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P) Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Abundant (>50% of surface)	Noderately Abundant (25-50% of surface)
<b>Vegetative Interspersion (P)</b> : Low (large p High (small groupings, diverse and interspersed	patches, concentric rings) Moderate (broken irregular rings)
HGM Class (P): Slope Flat	Lacustrine Tings Depressional Riverine Estaurine Fringe
1	
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Mineral: Clayey
HYDROLOGIC VARIABLES	
Inlet/Outlet Class (P): No Inlet/Outlet Outlet	No Inlet/Intermittent OutletNo inlet/Perennial OutletIntermittent Inlet/No OutletPerennial Inlet/Perennial OutletPerennial Inlet/No OutletPerennial outletPerennial OutletPerennial OutletPerennial
Wetland Water Regime (P). Drier: Season Wet: Perm. Flooded, Internittently Exposed, Se	nally Flooded, Temporarily Flooded, Saturated emiperm. Flooded
Evidence of Sedimentation (P): No Evidence Created	Observed Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment
Microreller of Wetland Surface (P): Absent_	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
	Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Pronounced (>18in
Frequency of Overbank Flooding (P): No Over Return Interval > 5 yrs  Degree of Jutlet Restriction (P): No Outflow_	erbank Flooding Return Interval 1-2 yrs Return Interval 2-5 yrs  Restricted Outflow Unrestricted Outflow
Frequency of Overbank Flooding (P): No Over Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow  Water pt (P): No surface water Circle	Restricted Outflow
Prequency of Overbank Flooding (P): No Over Return Interval > 5 yrs  Degree of Jutlet Restriction (P): No Outflow_ Water pt (P): No surface water Circle Surficial Glacial Deposit Under Wetland (P): Glacial Till/Not Permeable	Restricted Outflow Unrestricted Outflow Cumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) PH Reading High Permeability Stratified Deposits Low Permeability Stratified Deposits
Frequency of Overbank Flooding (P): No Over Return Interval > 5 yrs  Degree of Outlet Restriction (P): No Outflow  Water pt (P): No surface water Circles Surficial Glacial Deposit Under Wetland (P):	Restricted Outflow Unrestricted Outflow  Cumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) PH Reading  High Permeability Stratified Deposits Low Permeability Stratified Deposits  radient (<2%) High Gradient (≥2%)
Prequency of Overbank Flooding (P): No Over Return Interval > 5 yrs	Restricted Outflow
Frequency of Overbank Flooding (P): No Over Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow_ Water pt (P): No surface water Circles Surficial Glacial Deposit Under Wetland (P): Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low G Evidence of Seeps and Springs (P): No Seep  LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated	Restricted Outflow Unrestricted Outflow  Cumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading  High Permeability Stratified Deposits Low Permeability Stratified Deposits  radient (<2%) High Gradient (≥2%) s or Springs Seeps Observed Intermittent Spring Perennial Spring
Frequency of Overbank Flooding (P): No Over Return Interval > 5 yrs	Restricted Outflow Unrestricted Outflow Reading High Permeability Stratified Deposits Low Permeability Stratified Deposits radient (<2%) High Gradient (≥2%) s or Springs Seeps Observed Intermittent Spring Perennial Spring Wetlands within 400m, Not Connected Only Connected Below
Frequency of Overbank Flooding (P): No Over Return Interval > 5 yrs	Restricted Outflow
Frequency of Overbank Flooding (P): No Over Return Interval > 5 yrs  Degree of Jutlet Restriction (P): No Outflow_ Water pt (P): No surface water Circ Surficial Glacial Deposit Under Wetland (P): Glacial Till/Not Permeable Basin Topographic Gradient (M): Low G Evidence of Seeps and Springs (P): No Seep  LANDSCAPE VARIABLES (M)  Wetland Juxtaposition: Wetland Isolated Only Connected Above Connected  Wetland Land Use: High Intensity (i.e., ag	Restricted Outflow

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

		3 1
Feature	e ID:	W61 HT038 Field Target: 61 Date: 7 8 14
For all	item	s not checked, please provide detailed explanation in the notes section of data form.
1.	Sit	e Description
	网络	Site description, site parameters and summary of findings are complete? A detailed site sketch is included in logbook?
2.	Ve	getation
	4	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
		Vegetation names are entered legibly for all strata present?
	7	Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?
	4993	Indicator status is correct for each species?
	Ø	Dominance Test and Prevalence Index have been completed?
3.	So	il
	<b>A</b>	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Ну	drology
	夕	Appropriate hydrology indicators are marked? Surface water, water table, and saturation depths are recorded if present?
5.	Fu	nctions and Values
	炣	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Fie	eld Logbook
	<b>(</b>	Notes have been recorded at each site, including general description, sketch, and
	<i>y</i>	accuracy of pre-mapped wetland boundary as appropriate? Each logbook page is initialed and dated?
7.	Ma	ps
		Wotland houndaries have been corrected if necessary?
		Wetland boundaries have been corrected if necessary?  Mans are initialed and dated?

### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☐ Two photos were taken for each Observation Point (vegetation/site overview)?

Wetland Scientist (print)

X

Jenn'i Fer Analyso

Signature / Bate

X

Jenn'i Fer Analyso

Signature / Bate

Field Crew Chief (print)

Signature / Date

SITE DESCRIPTION					
Survey Type: Centerline_X_ Acce	ss Road (explain)	Other (expl	ain)	Field Target: 193	Map #: 126 Map Date: 5/27/14
Date: 06-01-2014	Project Name & No.:	Alaska LNG	26221306	Feature Id	: WOOTIOOI
nvestigators: Valerie Watl	cins, Zoe N	leade	>		Team No.: W60
State: Alaska	Region: Alaska		Milepost:	701.9	
atitude: 61.48.28.66"		Longitude	:-150°18'	'40.96'	Datum: WGS84
_ogbook No.: \	Logbook Page No.:		Picture No.:	P_WGOTIOOI.	-E-W-Pit-Plug
SITE PARAMETERS					
Subregion: Interior			Landform (hil	Islope, terrace, hummock	s, etc.): hunimock
Slope (%): 0 - 3				oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classifica	tion: PSSIJEMIB		Soil Map Unit	Name:	
Are climatic/hydrologic conditions on the /esX No (if no expl		of year?	Are "No Yes	ormal Circumstances" pre	
Are Vegetation, Soil, or Hyd	lrology Significantl	y Disturbed?	No_X	_(If yes, explain in Notes	)
Are Vegetation, Soil, or Hyd	lrology Naturally P	roblematic?	No_X	_ (If yes, explain in Notes	5.)
SUMMARY OF FINDINGS		U			
Hydrophytic Vegetation Present? Yes_	√ No	Is	the Sampled A	Area within a Wetland?	YesX No
Hydric Soil Present? Yes_	✓ No	_ w	etland Type:	PSSIB	
Vetland Hydrology Present? Yes	No	— Ala	aska Vegetatior	Classification (Viereck):	26¥ 261 II 6
lotes and Site Sketch: Please include Dorridor.	Sprua breh	forest	surroundn	ng wotland	rline, Photo Locations, and Survey

<u>Tree Stratum</u> (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:  Total Number of Dominant Species Across All Strata:
1.				% Dominant Species that are OBL, FACW, or FAC: 100
2.				W Bollman openies that are OBE, 171011, 4111101.
3.				
4.				Prevalence Index worksheet:
Total Cover	0			Total % Cover of: Multiply by:
50% of total cover	:_ 0 _ 20	% of total cov	rer:O	OBL species: 3 X 1 = 3
Sapling/Shrub Stratum ( 26 1 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 26
1. Betula neoalaskana	4, 75		FACU	
2. Betyla nana	25	У	FAC	UPL species
3. Picea mariana	1		FACW	PI = B/A = 2.8
4. Salex fuscesens	5	p. C. makery	FACW	4 7 7
5. Vaccinium Uliginosum	60	7	FAC	
6.				
7.				
8.				
9.				
TOMECOVER				
The second secon	: <u>48</u> 20	% of total cov		Hydrophytic Vegetation Indicators:
50% of total cover	:48 20	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:
50% of total cover	: <u>48</u> 20	Dominant Species?	Indicator	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
VEGETATION (use scientific names of plants Herb Stratum ( 201 )	Absolute % Cover 2 0	Dominant Species?	Indicator Status	Dominance Test is > 50%
VEGETATION (use scientific names of plants Herb Stratum ( 261	20 Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (201)  1-Andromeda polifolia  2-Comarum palustre	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
VEGETATION (use scientific names of plants Herb Stratum (201)  1 Andromeda polifolia 2. Comarum palustre 3. Calamagrostis Canadensis	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (201)  1 Andromeda polifolia  2. Comarum palustre  3. Calamagrostis Canadensis  4.	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (201)  1-Andromeda polifolia  2-Comarum palustre 3-Calamagrostis Canadensis 4. 5.	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (201)  1 Andromeda polifolia 2. Comarum palustre 3. Calamagrostis Canadensis 4. 5. 6.	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (201)  1-Andromeda polifolia 2-Comarum palustre 3-Calamagrostis Canadensis 4. 5. 6. 7.	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  O % Bare Ground  Y O % Cover of Wetland Bryophytes  Total Cover of Bryophytes
50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum (201)  1. Andromeda polifolia 2. Camarum palustre 3. Calamagrostis Canadensis 4. 5. 6. 7. 8.	Absolute % Cover 2 0	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  O % Bare Ground  O % Cover of Wetland Bryophytes  O Total Cover of Bryophytes  O Cover of Water
1-Andromeda polifolia 2-Camarum palustre 3. Calamagrostis Canadensis 4. 5. 6. 7. 8. 9.	Absolute % Cover 2 0 3 2 5	Dominant Species?	Indicator Status FACW	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unles disturbed or problematic.  O % Bare Ground  Y O % Cover of Wetland Bryophytes  Total Cover of Bryophytes

SOIL	de		Date 06-01-14 Fea	ture I	DWGO	T1001		Soil Pit Required (Y/N)	
SOIL PROF	ILE DESCRIPTION: (	Describe	to the depth needed	to doc	ument th	e indicator or	confirm the absence	of indicators.)	
Depth Matrix Redox Features									
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
0-6		1 - 1		-			-	Organic; fibric only	
0-22	7.5 YR 4/4	60	7.5 YR 2.5/3	15	C	M	SandyLoan	January Control of the Control of th	
	10 YR 2/1	2.5							
							7		
	1								
	oncentration, D=Deple	tion, RM	=Reduced Matrix, CS	=Cove	ered or C	oated Sand (	Grains. <sup>2</sup> Location:	PL=Pore Lining, M=Matrix.	
	IL INDICATORS		100				INDICATORS F	OR PROBLEMATIC HYDRIC SOILS	
listosol or H	istel (A1)		Alaska Gleyed (	A13)_			Alaska Color Change (TA4) <sup>4</sup>		
listic Epiped	lon (A2)		Alaska Redox (A	14)_			Alaska Alpine Swales (TA5)		
Black Histic (A3) Alaska Gleyed Pores (A15)				(A15)		Alaska Redox with 2.5Y Hue			
Hydrogen Su	Ilfide (A4)						Alaska Gleyed without 5Y Hue or Redder Underlyin Layer		
	urface (A12)	_					Other (Explain in Notes)		
Give details	of color change in Not	es.						e position must be present unless	
Restrictive La	ayer (if present): Type		De	pth (ir	nches):				
	Present (Y/N):	Υ							
10 Y	YR 2.5/3 R 2   1 YR 4/1						4-		
YDROLOG	Y PRIMARY INDICAT	ORS (ar	ny one indicator is suff	ficient		SECONDAR	Y INDICATORS (2 or	more required)	
	er (A1)		ace Soil Cracks (B6)			Water-staine Leaves (B9)	d	Stunted or Stressed Plants (D1)	
ligh Water Table (A2)X				gery	Drainage Pat	terns (B10)			

HYDROLOGY PRIMARY INDICAT	ORS (any one indicator is sufficient)	SECONDARY INDICATORS (2 o	SECONDARY INDICATORS (2 or more required)		
Surface Water (A1)	Surface Soil Cracks (B6)	Water-stained Leaves (B9)	Stunted or Stressed Plants (D1)		
High Water Table (A2)	Inundation Visible on Aerial Imagery (B7)	Drainage Patterns (B10)			
Saturation (A3) X	Sparsely Vegetated Concave Surface (B8)	Oxidized Rhizospheres along Living Roots (C3)	Shallow Aquitard (D3)		
Water Marks (B1)	Marl Deposits (B15)	Presence of Reduced Iron (C4)	Microtopographic Relief (D4)  FAC-Neutral Test (D5)		
Sediment Deposits (B2)	Hydrogen Sulfide Odor (C1)	Salt Deposits (C5)			
Drift Deposits (B3)	Dry-Season Water Table (C2)	Notes: Saturated to Sur			
Algal Mat or Crust (B4)			70CE		
Iron Deposits (B5)					
Surface Water Present (Y/N): N	Depth (in):		\/		
Water Table Present (Y/N):	Depth (in): 3	Wetland Hydrology Present (Y/N):			
Saturation Present (Y/N): (includes capillary fringe)  Depth (in):					
Notes: parts of plot	have Standing surfac	e water			

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P):         Tree (>5 dbh, >6m tall)         Sapling (<5 dbh, <6m tall)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water < 25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe DepressionalX Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial O
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, SaturatedX
Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Created  Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding X Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No OutflowX Restricted Outflow Unrestricted Outflow
Water pH (P): No surface water         Circumneutral (5.5-7.4)         Alkaline (>7.4)         Acid (<5.5)         X         pH Reading
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%)
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Gradient (<2%) High Gradient (≥2%) Evidence of Seeps and Springs (P): No Seeps or Springs Seeps Observed Intermittent Spring Perennial Spring Pe
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5)
Water pH (P): No surface water Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID: <u>WG0TI 00  </u> Field Target: 193 Date: <u>06 -0 1 - 14</u>
For all	l items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	✓ Vegetation names are entered legibly for all strata present? ✓ Cover calculations are complete and correct?
	☐ All dominant species have been determined and recorded per strata?☐ Indicator status is correct for each species?☐ Dominance Test and Prevalence Index have been completed?
3.	Soil
	☑ Soil profile is complete? ☑ Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	✓ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	Wetland boundaries have been corrected if necessary?  Maps are initialed and dated?

### 8. Photos

点	Four photos were taken for each Wetland Determination Data Form (2 vegetation	, ′
	soil pit, 1 soil plug)?	

	Two photos were taken for each Observation Point (vegetation/site overview)?
N	λ

Wetland	d Scientist	t (print)	Signature	/ Date	
X	Zoe	Meade	XA	puncals	00-01-14

X Valent waters X Valent Earths

Field Crew Chief (print) Signature / Date

NEE

# Vegetation Classification Data Form

Site Description		The Hotel College	
Date:	Project Name & #		Field Target:
6/1/14	Alaska LNG 2622	21306	192
Investigators:	, ZM		Feature ID: WCDT1002
Latitude 610 481	30.09"	Longitude: 38,19"	Datum: WGS84
Logbook #:	,100	Logbook Page #:	P-W60T1001-Veg(W)(N
Location Description			
NEW	FT 193	2 7h	
Common Species Ob	served (Scientific	Name)	
Picta maria			
Betwanea	laskara		
Valcinium	Hs-Idae	1	
Rhododenda			,
Percent Cover of Dom	inant Structure Lev	rel:	
Habitat Description:		Harris Merchant	
spruce / &	oren forts	7 Upland	
Alaska Vegetation Cl	assification: Leve	el I, Level II, Level III	
	CQ		
Notes:		1 1 1 1 1 1 1 1	

Field Crew Chief: Mullatus Field Scientist/Technician Field Scientist/Technician

QAQC DEE

# Vegetation Classification Data Form

Level I	Level II	Level III
l Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland
II Scrub	A. Owerf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C_Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub
III Herbaceous	A Graminoid herbeceous	(1) Dry graminoid herbaceous (2) Mesic graminoid herbaceous (3) Wet graminoid herbaceous (emergent)
	B. Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C. Bryoid herbaceous	(1) Mosses (2) Lichens
	D Aquatic (nonemergent) herbaceous	Freshwater aquatic herbaceous     Brackish water aquatic herbaceou     Manne aquatic herbaceous

-	criptions of levels I, II, III, and IV folio	11. The management to the second
la.	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more	I Forest 2
16	Trees over 3 meters (10 ft) tall are absent or nearly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters [10 ft] tall may be present and abundant	
l, Fo	orest	
2a	Over 75 percent of tree cover contributed by needlelger (conifer) species	I A Needleleaf forest
2b.	Less than 75 percent of tree cover contributed by needleleaf (conifer) species	al lugare or in the literature
3a	Tree canopy of 60-100 percent cover	I.A.1 Closed needleleaf forest
3b	Tree canopy of 25-59 percent cover	I A 2 Open needleleaf fores
3с	Tree canopy of 10-24 percent cover .	I.A.3 Needleleef woodland
4a	Over 75 percent of tree cover contributed by broadleaf species	IB Broadleaf forest
4b	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover	وه در استان
5a	Tree canopy of 60-100 percent cove	or
5b.	Tree canopy of 25-59 percent cover	. IB 2 Open broadleaf forest
5c.	Tree canopy of 10-24 percent cover	I.B.3 Broadleaf woodland
6a	Tree canopy of 60-100 percent cover	er I.C 1 Closed mixed fores
вb.	Tree canopy of 25-59 percent cover	rI.C.2 Open mixed fores
вc.	Tree canopy of 10-24 percent cover	LC 3 Mixed woodland
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 ti] tall)	
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover)	15

II. Sc	rub
8a	Vegetation with at least 10 percent cover of dwarf trees
8b.	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees
9a	Dwarf tree canopy of 60-100 percent cover
9b.	Dwarf tree canopy of 25-59 percent cover
9c	Dwarf tree canopy of 10-24 percent cover
10a	Shrubs more than 1.5 meters (5 ft) tall
10b	Shrubs less than 15 meters (5ft) tall
	Shrub canopy cover greater than 75 percent II 8 1 Closed tall scrub
11 b	Shrub canopy cover of 25-74 percent II B 2 Open tall scrub
12a.	Shrubs 20 centimeters to 1.5 meters tall II C Low scrub 13
12b	Shrubs under 20 centimeters in height
13a	Shrub canopy cover greater than 75 percent II C I Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present
14a	Dryas species dominant in the dwarf shrub layer
14b.	Ericaceous species dominant in the dwarf shrub layer
14c.	Willow species dominant in the dwarf scrub layer
III. F	lerbaceous
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water

16a	Grasses, sedges, or rushes (graminoid) plants dominant. III A Graminoid herbaceous 17
16b	Forbs or bryophytes dominant18
17a	Grasslands of well-drained dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by E/mus spp., Festica spp , and Deschampsia spp
17b	On moist sites, but usually not with standing water. Usually dominated by Calamagrostis spp.  Carer spp. or Enophorum spp., tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra, bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails) III.8 Forb herbaceous 19
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b.	On moist sites but without standing water, mostly within forested areas III.B.2 Mesic forb herbaceous
19c	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses
20b	Vegetation cover dominated by lichens III C 2 Bryoid lichen
218	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water
210	Vegetation submerged or floating in salt water

# Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Fe	eature ID: WOOTIOU2 Field Target: 192 Date: 06-01-	14
Fo	or all items not checked, please provide detailed explanation in the notes section of	data form.
		. 7
1.	General Information	
	√ Location data recorded?	6
	₽ Photo taken and photo number recorded?	
2.	Location Description	i
	☑ Location of site recorded with enough detail to help relocate?	
3.	Common Species	
	Scientific name of common species recorded?	
	Percent cover of dominant structure level noted?	
4.	Habitat Description	
	Habitat described?	
5.	Classification	
	☑ All three levels of classification recorded?	
6.	Field Log Book	
	Field form entries consistent with log book?	
	✓ Logbook clearly identifies the Field Target ID and Feature ID?	
)	X Zor meade X Simmerale	
Fie	ield Technician (print) Signature	4
>	X Valence untress X 1/4/2 12 cottes	
Fie	ield Crew Chief (print) Signature	

PAGE DEL

SITE DESCRIPTION				
Survey Type: Centerline X Acc	ess Road (explain) Other	er (explain)	Field Target: 191	Map #: 18 Map Date: 587
Date: 06-01-2014	Project Name & No.: Alasi	ka LNG 26221306	Feature I	d: W6 0T1003
Investigators: VAIEVIE Watk	ins, zoe Meade			Team No.: W60
State: Alaska	Region: Alaska	Milepost:	700	
Latitude: (10 49 52.50	Lon	ngitude: -   50.16	54.30"	Datum: WGS84
Logbook No.:	Logbook Page No.: 2	Picture No.:	P_W6071	003-N-S-pit-plus
SITE PARAMETERS		S- who is		
Subregion: Interior		Landform (hil	Islope, terrace, hummod	ks, etc.): Sm, humin Ocks
Slope (%): 0 - 3			oncave, convex, none):	
Pre-mapped Alaska LNG/NWI classific	cation: PSSIA	Soil Map Unit		
Are climatic/hydrologic conditions on the YesX No (if no expected the second seco	ne site typical for this time of yea plain in Notes)	Are "No	ormal Circumstances" pr No (If no, e	resent:
Are Vegetation, Soil, or H			(If yes, explain in Note	
Are Vegetation, Soil, or Hy			_ (If yes, explain in Note	
SUMMARY OF FINDINGS				
Hydrophytic Vegetation Present? Yes	X No	Is the Sampled A	rea within a Wetland?	YesXNo
Hydric Soil Present? Yes_	X No	Wetland Type:	PEM12B7	MEE
Wetland Hydrology Present? Yes_	X No			: 3A3 Ⅲ A3
Notes and Site Sketch: Please include corridor.	Directional & North Arrow, Center	-		
compon.	-1(	0	2000	
			PSS4B	-
		P55'	1 R	
				· ·
	11		-1.4	1.11
	///	DEM 17	o bull	0
,		DEW 1X	B	
/	1 1			
	1 ophoto	T.L		
	1 / 2	X Plot	1	
		///		
\	Swied			
•	11 6100	1/		
•				

	Absolute	Dominant	Indicator	Dominance Test worksheet:
Tree Stratum (Plot sizes:)	% Cover	Species? (Y/N)	Status	No. of Dominant Species that are OBL, FACW, or FAC:
1,		-		Total Number of Dominant Species Across All Strata:  % Dominant Species that are OBL, FACW, or FAC: 100 (A
2.				% Dominant Species that are OBL, FACW, 01 FAC. 100 (A
3.				
4.				Prevalence Index worksheet:
Total Cover	: 0			Total % Cover of: Multiply by:
50% of total cover	:0209	% of total cov	er:0	OBL species: $25 \times 1 = 25$
Sapling/Shrub Stratum ( 201 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 25
1. Betula nana	3	Y	FAC	UPL species
2. Vaccinium OXUCOCCUS	10	Y	OBL	Column Totals: 56 (A) 95 (B)
3.				PI = B/A =
4.				
5.				
6.				
7.				
8.			-	
9.				
9. Total Cove			2 6	
9.		% of total cov	ver: 2 , 6	
9. Total Cove	r: <u>6.5</u> 20	% of total cov	ver: 2 , 6	
9. Total Cove 50% of total cove	r: <u>6.5</u> 20	% of total cov	ver: 2 . 6	Hydrophytic Vegetation Indicators:
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plant	r: <u>(0.5</u> 20	Dominant Species?		Hydrophytic Vegetation Indicators: Dominance Test is > 50%
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plant  Herb Stratum ( 201	Absolute % Cover	Dominant	Indicator Status	Dominance Test is > 50%  ———————————————————————————————————
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plant  Herb Stratum ( 201 )  1. Comarum palustre	20 (s) Absolute	Dominant Species?	Indicator Status	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vaccinium oxycoccus	7: 6.5 20  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vaccinium oxycoccus 3. Andromeda polifolia	r: 6.5 20  S)  Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
9.  Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vaccinium oxycoccus 3. Andromeda polifolia 4. Calamagrostis Canadens	r: 6.5 20  S)  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  PAC W	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum (20)  1. Comarum palustre 2. Vaccinium oxycoccus 3. Andromeda polifolia 4. Calamagrostis Canadens 5. Carex aquatilis	r: 6.5 20 s) Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  PACW  FAC	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vaccinium oxycoccus 3. Andromeda polifolia 4. Calamagrostis Canadens	7: <u>6.5</u> 20  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  OBL  FACW  GBL	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cove 50% of total cove  50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vaccinium oxycoccus 3. Andromeda polifolia 4. Calamagrostis Canadens 5. Carex aquatilis 6. Carex saxatilis	7: <u>6.5</u> 20  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  OBL  FACW  GBL	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  B O % Bare Ground  Cover of Wetland Bryophytes
Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vacanium oxycoccus 3. Androme da polifolia 4. Calamarustis Canadens 5. Carex aquatilis 6. Carex saxatilis 7.	7: <u>6.5</u> 20  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  OBL  FACW  GBL	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  ———————————————————————————————————
Total Cove 50% of total cove  VEGETATION (use scientific names of plant Herb Stratum ( 201 )  1. Comarum palustre 2. Vacanium oxycoccus 3. Andromeda polifolia 4. Calamagrostis Canadens 5. Carex aquatilis 6. Carex saxatilis 7. 8. 9.	7: <u>6.5</u> 20  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  OBL  FACW  GBL	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  **BO**  **O**  **O
1. Comarum palustre 2. Vacantum oxycoccus 3. Andromeda polifolia 4. Calamagrostis Canadens 5. Carex aquatilis 6. Carex saxatilis 7. 8.	7: 6.5 20  S)  Absolute % Cover	Dominant Species? (Y/N)	Indicator Status  OBL  OBL  FACW  GBL	Dominance Test is > 50%  Y Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Market State

			Date 00-01-14 Fe					Soil Pit Required (Y/N)
SOIL PROFII	LE DESCRIPTION: (D	escribe	to the depth needed	to doc	ument the	indicator or	confirm the absen	ce of indicators.)
Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0 - II				-	_		Floric	Organics
1 32 16		-		-		-	Saprichen	Organics
16-18	10YR 3/6	-		-	_	-	hemic	Statestore organic
18-21	2.5YR 4/4	50	10 YR 3/6	5	C	PL	SL	SL- silt loam
	10YR 3/2	45					SL	
21-23	10 YR 2/2	100					SL	
7								
	ncentration, D=Deplet	ion, RN	I=Reduced Matrix, C	S=Cove	ered or Co	ated Sand G		: PL=Pore Lining, M=Matrix.
	L INDICATORS	-						FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed				Alaska Color	Change (TA4) <sup>4</sup>
	on (A2)	620					Alaska Alpine	Swales (TA5)
Black Histic (	A3)		Alaska Gleyed	Pores (	(A15)			with 2.5Y Hue
Hydrogen Sul	lfide (A4)							without 5Y Hue or Redder Underlying
	urface (A12)						Other (Explain	in Notes)
		ation, o	ne primary indicator o	of wetla	nd hydrolo	gy, and an a		ape position must be present unless
disturbed or p	problematic.				•	0,7		
Restrictive La	of color change in Note yer (if present): Type:	es.	TA D	epth (ir	nches):t	IIA		
	, , ,		4		/			
Hydric Soil F	Present (Y/N):	/						
	Present (Y/N):							
				O Fac	mio	lauers		
	Present (Y/N):			orga	inte	layers		
				0+gr	into	layers		
Notes: 10		S	aturated					2 or more required)
Notes: 10	YR 2/2	S ORS (a	aturated	ufficient	) S	SECONDAR Vater-staine	Y INDICATORS (	Stunted or Stressed
HYDROLOG Surface Wate	YR 2/2 Y PRIMARY INDICATE	ORS (a	iny one indicator is surface Soil Cracks (B6)	ufficient	) S	SECONDAR Vater-staine eaves (B9)	Y INDICATORS (	Stunted or Stressed Plants (D1)
HYDROLOG Surface Water	Y PRIMARY INDICATOR OF (A1)_X able (A2)_X	ORS (a Sur Inu (B7	ny one indicator is surface Soil Cracks (B6)	ufficient	y L	SECONDAR  Vater-stainer Leaves (B9)  Orainage Pat  Oxidized Rhiz	terns (B10)	Stunted or Stressed Plants (D1)
HYDROLOG  Surface Water  High Water T.  Saturation (A:	Y PRIMARY INDICATOR OF (A1)_X able (A2)_X	Sur Inu (B7 Spa Cor	iny one indicator is surface Soil Cracks (B6)	ufficient )	y L L C L L F	Vater-stainer Leaves (B9) Drainage Pat Dividized Rhiz Living Roots	Y INDICATORS (: d terns (B10) cospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic
HYDROLOG Surface Water High Water To Saturation (A: Water Marks	Y PRIMARY INDICATOR  or (A1)X  able (A2)X  3)X	ORS (a Sur Inu (B7 Spa Cor Ma	iny one indicator is surface Soil Cracks (B6) Indation Visible on Ae The property of the control	ufficient )	y L L C L L F I I I I I I I I I I I I I I I I I	Vater-stainer eaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)
HYDROLOGY Surface Water High Water To Saturation (A: Water Marks Sediment Dep	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)  posits (B2)	Sur Inu (B7 Spa Cool	riny one indicator is surface Soil Cracks (B6) Indation Visible on Ae Indation Visible on A	ufficient )	y L L S C L L S S S S S S S S S S S S S S	Vater-stainer eaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I	Y INDICATORS (: d terns (B10) cospheres along (C3)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water To Saturation (A: Water Marks Sediment Dep	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)	Sur Inu (B7 Spa Cor Ma Hyc Odd	iny one indicator is surface Soil Cracks (B6) Indation Visible on Ae The property of the control	ufficient )	y L L S C L L S S S S S S S S S S S S S S	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG' Surface Water High Water To Saturation (A: Water Marks Sediment Deposits	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)  posits (B2)	Sur Inu (B7 Spa Cor	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae ) arsely Vegetated incave Surface (B8) If Deposits (B15) drogen Sulfide or (C1) -Season	ufficient )rial Ima	y L L S C L L S S S S S S S S S S S S S S	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or C	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)  possits (B2)  (B3)	Sur Inu (B7 Spa Cor	iny one indicator is surface Soil Cracks (B6) Indation Visible on Ae	ufficient )rial Ima	y L L S C L L S S S S S S S S S S S S S S	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG Surface Water High Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Co Iron Deposits	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)	Sur Inu (B7 Spa Cor	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae	ufficient )rial Ima	y L L S C L L S S S S S S S S S S S S S S	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOG' Surface Water High Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Co Iron Deposits	Y PRIMARY INDICATOR (A1) able (A2) (B1)  coosits (B2) (B3)  Crust (B4)	Sur Inu (B7 Spa Cor Ma Hyc Odd Dry Wa Oth	iny one indicator is surface Soil Cracks (B6) Indation Visible on Ae	ufficient )rial Ima	y L L S S N N	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10) zospheres along (C3) (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water T. Saturation (A: Water Marks Sediment Deposits Algal Mat or C Iron Deposits Surface Water	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)	Sur Inu (B7 Spa Cor Ma Hyco Odd Dry Wa Oth	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae	ufficient )rial Ima	y L L S S N N	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10) zospheres along (C3) (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)
HYDROLOGY Surface Water High Water To Saturation (A: Water Marks Sediment Deposits Algal Mat or Co Iron Deposits Surface Water	Y PRIMARY INDICATOR (A1) able (A2) (B1)  posits (B2)  (B3)  Crust (B4)  (B5)  If Present (Y/N):	ORS (a Sur Inu (B7 Spa Cor Ma Hyo Odd Dry Wa Oth	any one indicator is surface Soil Cracks (B6) Indation Visible on Ae	ufficient )rial Ima	y L L S S N N	Vater-stainer Leaves (B9) Orainage Pat Oxidized Rhiz Living Roots Presence of I ron (C4)	terns (B10) zospheres along (C3) (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
HYDROLOGY Surface Water High Water To Saturation (A: Water Marks Sediment Dep Drift Deposits Algal Mat or Co Iron Deposits Surface Water Water Table F Saturation Pro (includes capi	Y PRIMARY INDICATOR  or (A1)  able (A2)  (B1)  cosits (B2)  (B3)  Crust (B4)  (B5)  or Present (Y/N):  Present (Y/N):  esent (Y/N):  illary fringe)	Sur Inu (B7 Spa Con Ma Hyco Odd	iny one indicator is surface Soil Cracks (B6) indation Visible on Ae ) arsely Vegetated incave Surface (B8) indicave Surface (B8) indicave Surface (B15) indicave (B15) indicave Surface (B15) indicave (B15) indica	rial Ima	y Lagery C	Vater-stainer Leaves (B9) Drainage Pat Dxidized Rhiz Living Roots Presence of I ron (C4) Salt Deposits Notes:	terns (B10) zospheres along (C3) Reduced (C5)	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P):       Vegetation Lacking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-Persistent Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)       Tall shrub (2-6m)       Short shrub (0.5-2m)         Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-80%) Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="#">25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover_X
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P):       Soil Lacking       Histosol:Fibric       Histosol:Hemic       Histosol: Sapric         Mineral: Gravelly       Mineral: Sandy       Mineral: Silty       Mineral: Clayey
HYDROLOGIC VARIABLES
HYDROLOGIC VARIABLES  Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Peren
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Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Peren
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet  No Inlet/Intermittent Outlet  Intermittent Inlet/Intermittent Inlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Inlet/Intermitt

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# Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: 1003 Field Target: 191 Date: 06 - 01 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?
	All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?
	Dominance Test and Prevalence Index have been completed?
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul> <li>Appropriate hydrology indicators are marked?</li> <li>Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul> <li>✓ Wetland boundaries have been corrected if necessary?</li> <li>✓ Maps are initialed and dated?</li> </ul>

### 8. Photos

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

SITE DESCRIPTION								
Survey Type: Centerline Acces	ss Road (explain)	Other (expl	ain) <u>corrido</u> r Field Targ	et:_/90	Map #: 124 Map Date: 0527			
Date: 06 -02 -14	Project Name & No.:	Alaska LNG	3 26221306	Feature Id:	W60T1004			
Investigators: Valerie Wat	Kins, Zoe Med	ade			Team No.: W60			
State: Alaska	Region: Alaska		Milepost: 699,8					
Latitude: 61° 50' 02.87"		Longitude	:-150°16'49.4	3"	Datum: WGS84			
Logbook No.:	Logbook Page No.:	4	Picture No.: Pw60	T1004_	N-5-pit-p149			
SITE PARAMETERS		ly a		-30-				
Subregion: interior			Landform (hillslope, terrac	e, hummocks	s, etc.): Small hummacks			
Slope (%): 0 - 3			Local relief (concave, conv	/ex, none): <	lightly concave			
Pre-mapped Alaska LNG/NWI classifica	tion: PEMIB		Soil Map Unit Name:	_	and the state of			
Are climatic/hydrologic conditions on the YesX No (if no expla	site typical for this time ain in Notes)	of year?	Are "Normal Circum YesXNo	stances" pres	sent:			
Are Vegetation, Soil, or Hyd		ly Disturbed?						
Are Vegetation, Soil, or Hyd	rology Naturally P	roblematic?		lain in Notes.				
SUMMARY OF FINDINGS					See Super Civil Intelligence			
Hydrophytic Vegetation Present? Yes_	X No	ls 1	the Sampled Area within a	Wetland?	Yes No			
Hydric Soil Present? Yes	X No	We	etland Type: PEMI	SSIB	У,			
Wetland Hydrology Present? Yes	X No	— Ala	aska Vegetation Classificatio	n (Viereck):	IIIA Q, II CQ			
Notes and Site Sketch: Please include D	irectional & North Arrow							
Notes and Site Sketch: Please include Directional & North Arrow, Centerline, Length of feature, Distances from Centerline, Photo Locations, and Survey corridor.  PEMI/SSIB  PEMI/SSIB  PSSIB								
					X			

chieckin survey et.

VEGETATION (use scientific names of plants	)							
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:				
1.				% Dominant Species that are OBL, FACW, or FAC:				
2.				% Dominant Species that are OBE, 1 AOW, OF 1 AO.				
3.				The same of the sa				
4.	Prevalence Index worksheet:							
Total Cover:	0			Total % Cover of: Multiply by:				
50% of total cover:	O 20	% of total cov	er: <u>    O                                </u>	OBL species: 19 X 1 = 19				
Sapling/Shrub Stratum ( 26 ' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 0				
1. Betula neoglaskana	5	N	FACU	UPL species Q X 5 = 0				
2. Rnodadendrun groenlandicum	5	N	FAC	Column Totals: 99 (A) 284 (B)				
3. Vaccinium Oxycoccus	4	N	OBL	PI = B/A = 2.87				
4. Vaccinium ulia inosum	15	γ	FAC					
5. Spiraea Stevenii	20	Y	FACU					
6.								
7,								
8.								
9,								
Total Cover: 49								
50% of total cover								
VEGETATION (use scientific names of plants	5)	EL IN						
Herb Stratum ( 26')	Absolute	Dominant	Indicator	Hydrophytic Vegetation Indicators:				
	% Cover	Species?	Status	X Dominance Test is > 50%				

VEGETATION (use scientific names of plants)							
Herb Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  _X			
1. Ca lamagrostis canadensi. 2. Carex Phiri Flora 3. 4.	35 25	Y	FAC OBL				
6. 7. 8.							
9. 10. Total Cover:	60			15 Total Cover of Bryophytes 3 % Cover of Water  Hydrophytic Vegetation Present (Y/N):			
50% of total cover:		Notes: (If observed, list morphological adaptations below):					

SOIL			Date 06/02	Feature I	D WG	0 T1 004		Soil Pit Required (Y/N)	
SOIL PROFIL	E DESCRIPTION: (D	escribe					confirm the absence		
Depth Matrix			Redox Features						
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes	
0-10		-		-	_	_	Fibric	organics	
10-13		-					Sapric / Hemic	organics	
13-22	2.5 Y 5/3	65	7,5 YR 3/4	15	C	M	Silt loam		
			2.5 YR 3/6	5	C	PL-			
22-25	10 YR 2/2	100		_	_		sandy loun	n	
¹Type: C=Cor	ncentration, D=Depleti	ion PA	1-Poducod Matrix	, CS=Cov	orod or (	Coated Sand C	Spains 21 apption	PL=Pore Lining, M=Matrix.	
	INDICATORS	IOII, KI	-Reduced Matrix	t, CS=C0V	erea or v	Coated Sand G		FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>	
			Alaska Gley	(ed (A13)	- 1				
Histic Eninedo	on (A2)		Alaska Red						
	A3)		Alaska Gley					with 2.5Y Hue	
	fide (A4) X		7 Hadita City	704 1 0103	(/110)			without 5Y Hue or Redder Underlying	
							Layer		
Thick Dark Su			no primani indicat	or of water	and bude	ology, and an	Other (Explain	in Notes) spe position must be present unless	
disturbed or p	roblematic. of color change in Note		ne primary murcar	tor or wella	and nydi	ology, and an a	appropriate landsca	spe position must be present unless	
Restrictive Lay	yer (if present): Type:		N/A	Depth (i	nches):_	NIA			
_		,							
Hydric Soil P	resent (Y/N):	γ	-						
Notes: Fai	nt hydrogen	sul	fide color	at 10	90				
	1.19-								
HYDROLOGY	PRIMARY INDICATO	ORS (a	ny one indicator is	s sufficient	t)	SECONDAR	Y INDICATORS (2	or more required)	
			-			Water-stained		Stunted or Stressed	
	r (A1)							Plants (D1)	
High Water Table (A2) Inundat (B7)				tion Visible on Aerial Imagery  Drainage			terns (B10)	Geomorphic Position (D2)	
Saturation (A3	3)	1 ~	arsely Vegetated	ly Vegetated Oxidized Rhizer Surface (B8) Living Roots			zospheres along	Shallow Aquitard (D3)	
	B1)			posits (B15) Presence of				Microtopographic	
vvalei iviaiks (	B1)			lron (C4)			15	Relief (D4)	
			Irogen Sulfide or (C1) <u>X</u>	_		Salt Deposits	(C5)	FAC-Neutral Test (D5)	
Drift Deposits	Drift Deposite (B2) Dry-Season					Notes:	. A 55		
	Drift Deposits (B3) Water Table (C2) Conductivity = 58								
Algal Mat or Crust (B4) Other (Explain in Notes):									
Iron Deposits	(B5)								
						The same			
Surface Water	Present (Y/N): /		Depth (in): —					14	
Water Table P	resent (Y/N):	Depth (in):	Inches	v	Vetland Hydro	logy Present (Y/N	):		
Saturation Pre (includes capil			Depth (in):	inches	5				
Notes:	all pockets o	f SH	andina 1.	ater	Cnt	wated t	2 Sufferio		
9	· Facilities		in the same	1161	JAN	and the s	4// 1004		

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       Aquatic Bed
Percent Cover (P): Tree (>5 dbh, >6m tall)         ○         Sapling (<5 dbh, <6m tall)         5         Tall shrub (2-6m)         ○         Short shrub (0.5-2m)         2-○           Dwarf shrub (<0.5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): EvenHighly UnevenModerately even
Vegetation Density/Dominance (P): Sparse (0-20%)       Low Density (20-40%)       Medium Density (40-60%)       High Density (60-80%)         80%)       X       Very High Density (80-100%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water <a href="tel:45%">&lt;25% Scattered/Peripheral Cover</a> 26-75% Scattered or Peripheral Cover N/A 25% Scattered/Peripheral Cover
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none)X One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site OpenX Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)       X         High (small groupings, diverse and interspersed)
HGM Class (P): Slope Flat Lacustrine Fringe Depressional Riverine Estaurine Fringe
SOIL VARIABLES  Soil Footors (P): Soil Looking History: Fibria Market Homes History: Sonris
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Out
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/Inte
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/No Outlet Perennial Inlet/Intermittent Inlet/In
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Inlet/No
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Intermittent Inlet/No Outlet Intermittent Inlet/No Outlet Intermittent Inlet/No Outlet Intermittent Inlet/No Outlet Inlet/No Outlet Inlet/No Outlet Intermittent Inlet/No Outlet Inlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Intermittent Inlet/No Outlet Inlet/N
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Inlet/Intermit
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet
Inlet/Outlet Class (P): No Inlet/Outlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inle
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet
Inlet/Outlet Class (P): No Inlet/Outlet X No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet
Inlet/Outlet Class (P): No Inlet/Outlet

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	e ID: <u>W60TT 004</u> Field Target: <u>190</u> Date: <u>06-02-14</u>
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	Soil profile is complete? Appropriate hydric soil indicators are marked?
4.	Hydrology
	Appropriate hydrology indicators are marked?  Surface water, water table, and saturation depths are recorded if present?
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	<ul> <li>✓ Wetland boundaries have been corrected if necessary?</li> <li>✓ Maps are initialed and dated?</li> </ul>

8.	PI	าด	to	
ο.	П	IU	w	

Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?

Two photos were taken for each Observation Point (vegetation/site overview)?

Site Description	Trible V	The Second Secon		
Date:	Project Name &	#: 221306	Field Target: 190	
Investigators:	Alaska LIVO 202	22 1300		
VV	ZM	Feature ID: W60T1 005		
(e) 50' 02.4		Longitude: "150"   16" 51,25"	Datum: WGS84	
Logbook #:		Logbook Page #: 4	Picture #:	
Location Description	:	Thin -		
WIST	9 W60T	1004		
Common Species Ob	served (Scientif	ic Name)		
Picea maria	ng			
Betula nevala	Silana			
Sally sp.				
Vallingum Viti	s-idaea	well.		
reicelli Cover of Dolli	mant Structure Le	svei:		
Habitat Description:			in some final state of	
sprice/	Dirch Forze	<del>-</del>		
Alaska Vegetation Cla	assification: Lev	vel I, Level II, Level III		
ICFI				
Notes:		u au li		
-				

ICI

Field Crew Chief: \_\_\_\_\_\_\_ Field Scientist/Technician\_\_\_\_\_\_\_

Level I	Level II	Level III			
l Forest	A Needleleaf (conifer) forest	Closed needleleaf (conifer) forest     Open needleleaf (conifer) forest     Needleleaf (conifer) woodland			
	B Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland			
	C Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland			
II Scrub	A. Dwarf tree scrub	(1) Closed dwarf tree scrub (2) Open dwarf tree scrub (3) Dwarf tree scrub woodland			
	B Tall scrub	(1) Closed tall scrub (2) Open tall scrub			
	C. Low scrub	(1) Closed low scrub (2) Open low scrub			
	D Dwarf scrub	Dryas dwarf scrub     Ericaceous dwarf scrub     Willow dwarf scrub			
III Herbaceous	A Graminoid herbaceous	(1) Dry graminoid herbaceous (2) Mesic graminoid herbaceous (3) Wet graminoid herbaceous (emergent)			
	B Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergen)			
	C. Bryoid herbaceous	(1) Mosses (2) Lichens			
	D. Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marine aquatic herbaceous			

Desi	criptions of levels I, II, III, and IV follow the classification table
la	Treas over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more
1 b	Trees over 3 meters (10 ft) tall are absent or neerly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters [10 ft) tall may be present and abundant
i Fo	rest
20	Over 75 percent of tree cover contributed by needleleaf (conifer) species
2b.	Less than 75 percent of tree cover contributed by needleleaf (confler) species
За.	Tree canopy of 60-100 percent cover
3b.	Tree canopy of 25-59 percent cover I.A.2 Open needleleaf fores
Зс,	Tree canopy of 10-24 percent cover I A 3 Needleleaf woodland
4a_	Over 75 percent of tree cover contributed by broadleaf species
4b	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover
5a	Tree canopy of 60-100 percent cover
5b.	Tree canopy of 25-59 percent cover
5c	Tree canopy of 10-24 percent cover I.B.3 Broadleaf woodland
6a	Tree canopy of 60-100 percent cover
6b.	Tree canopy of 25-59 percent cover
6с	Tree canopy of 10-24 percent cover LC.3 Mixed woodland
7a,	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 t] tall.
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover) 15

II. So	crub	
82	Vegetation with at least 10 percent cover of dwarf trees	II A Dwarf tree scrub 9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	10
9a	Dwarf tree canopy of 60-100 percent cover	II.A.1 Closed dwarf tree scrub
9b.	Dwarf tree canopy of 25-59 percent cover	II.A.2 Open dwarf tree scrub
9c	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall	II B Tall scrub 11
10b	Shrubs less than 1.5 meters (5ft)tall	12
	Shrub canopy cover greater than 75 percent	
11 b	Shrub canopy cover of 25-74 percent	II B 2 Open tali scrub
12a	Shrubs 20 centimeters to 1.5 meters tall	II.C Low scrub 13
12b	Shrubs under 20 centimeters in height	II,D Dwarf scrub 14
13a	Shrub canopy cover greater than 75 percent	II C I Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	
14a	Dryas species dominant in the dwarf shrub layer	II D.1 Dryas dwarf scrub
14b	Ericaceous species dominant in the dwarf shrub layer	II D 2 Encaceous dwarf scrub
14c	Willow species dominant in the dwarf scrub layer	II D 2 Willow dwarf scrub
III. I	Herbaceous	
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	16
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	III D Aquatic herbaceous 21

16a	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant :
17a	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes. Typically (but not always) dominated by Elymus spp., Festuce spp., and Deschampsie spp
17b.	On moist sites, but usually not with standing water. Usually dominated by Calamagnastia spp.  Cerex spp. or Enophorum spp tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet fundra, bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b	On moist sites but without standing water, mostly within forested areas
19c	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses
20b	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water aquatic herbaceous
21c	Vegetation submerged or floating in salt water III D 3 Marine aquatic herbaceous

### Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

Fea	eature ID: <u>W60TI</u> 00 5 Field Targe	t: <u>11900</u> Date: 06-02-14						
Foi	or all items not checked, please provide	detailed explanation in the notes section of data form.						
1.	General Information							
	☑ Location data recorded?							
	Photo taken and photo number re	corded?						
2.	Location Description							
		ugh detail to help relocate?						
3.	Common Species							
	Scientific name of common specie	es recorded?						
	Percent cover of dominant structu	re level noted?						
4.	Habitat Description							
	☐ Habitat described?							
5.	Classification							
	All three levels of classification red	corded?						
	Field Log Book							
	Field form entries consistent with	og book?						
	Logbook clearly identifies the Field							
	- ,							
_	_							
X	10e meade	X 1 m 1110-1						
Fie	- U	ignature						
		•						
V		V 1						
_^	Valient water	1 Ven alt						
Fie	Field Crew Chief (print) Signature							



SITE DESCRIPTION									
Survey Type: Centerline X Acce	ss Road (explain)	ain)	Field Target: 188	Map #: 123 Map Date: 5/27/14					
Date: 06 - 02 - 14	Project Name & No.:	Alaska LNG	26221306	Feature Id	:W60TI006				
Investigators: Valerie Wa	tkins, Zoe	Meade			Team No.: W60				
State: Alaska	Region: Alaska		Milepost: 692.8						
Latitude: 61° 55' 31.6"		Longitude	itude: -150.12 ' 06.39 ' Datum: WGS84						
Logbook No.:	Logbook Page No.:	4	Picture No.:	P_W6071006.	E-W-pA-plug				
SITE PARAMETERS		011							
Subregion: Interior			Landform (hill	slope, terrace, hummock	s, etc.): sm. hummocks				
Slope (%): 3 – 5					concave: slight				
Pre-mapped Alaska LNG/NWI classifica	tion: PEM1/58	51B	Soil Map Unit		3				
Are climatic/hydrologic conditions on the YesX No (if no expl		of year?		ormal Circumstances" pre					
Are Vegetation, Soil, or Hyd	lrology Significant	ly Disturbed?	No_X	_(If yes, explain in Notes					
Are Vegetation, Soil, or Hyd	Irology Naturally F	Problematic?	No_X	_ (If yes, explain in Notes	.)				
SUMMARY OF FINDINGS	-Allha				SOCIETY OF THE				
Hydrophytic Vegetation Present? Yes_	No	ls	the Sampled A	rea within a Wetland?	YesX No				
Hydric Soil Present? Yes	X No	We	etland Type:	PEM1   551	В				
Wetland Hydrology Present? Yes	X No	— Ala	aska Vegetation	Classification (Viereck):	Ш А2, ЛС2				
Notes and Site Sketch: Please include D corridor.	irectional & North Arrow	, Centerline, I	Length of featur	e, Distances from Center	line, Photo Locations, and Survey				
Burn area surrounding Wetland Stretch  Burn  Burn  Burn  Burn  Burn  Burn  Burn  Survey marker									
	• pit								
No u	rned a	rea	4	1					

VEGETATION (use scientific names of plants			1	
<u>Tree Stratum</u> (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:(A)  Total Number of Dominant Species Across All Strata:(B)
1.				% Dominant Species that are OBL, FACW, or FAC: 6/17 (A/B)
2.				% Dominant Species that are ODE, 1 NOW, 01 NO (VID)
3.				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover:	O 20% of total cover: O			OBL species:X 1 =
Sapling/Shrub Stratum ( 2 6 1	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 10
1. Betula nana	5	У	FAC	UPL species
2. Spiraea Stevenii	5	У	FACU	Column Totals: 85 (A) 245 (B)
3. Betula neoalaskana	5	У	FACU	PI = B/A = 2.89
4. Salex pulchra	10	γ	FACW	
5.				
6,				
7.				
8.				
9.				
Total Cover: 50% of total cover:		% of total cov	ver:_5	
VEGETATION (use scientific names of plants	)	11-2-1		
Herb Stratum ( 2.6' )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:
1. Calamagrostis Canadensis	50	Y	FAC	Morphological Adaptations¹ (Provide supporting data in
2. Trientalis arctica	T	FNU	FACU	Notes)
3. Carex aquatilis	20	Y	OBL	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Equisetum sylvaticum	T	N	FAC	Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
0.				
6.				\5 % Bare Ground
7,				% Bale Glound  Compared to the state of the
8.				
9.				O % Cover of Water
10.				Hydrophytic Vegetation Present (Y/N):
Total Cover 50% of total cover		0% of total cov	ver:_14	Notes: (If observed, list morphological adaptations below):

SOIL Date 0602 1 Feature IDW 60TI 006 Soil Pit Required (Y/N) Y									
SOIL PROFILE DESCRIPTION: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)									
Depth Matrix		Redox Features							
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc²	Texture	Notes	
0-2		-		-			Fibric	Organics	
	7.5YR 3/4	100		-			Silty loam	WI fine roots	
8-22	2.5 4 3/2	85	7.5 YR 2.5/2	15	C	M	Sandy lam	•	
								100	
					1				
<sup>1</sup> Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup> Location: PL=Pore Lining, M=Matrix.									
HYDRIC SOIL INDICATORS INDICATORS FOR PROBLEMATIC HYDRIC SOILS <sup>3</sup>									
	el (A1)		Alaska Gleyed	(A13) _			Alaska Color Ch	ange (TA4) <sup>4</sup>	
Histic Epipedor	n (A2)		Alaska Redox (	A14) _			Alaska Alpine Sv	vales (TA5)	
Black Histic (A3	3)		Alaska Gleyed	Pores (	(A15)		Alaska Redox w	ith 2.5Y Hue	
Hydrogen Sulfic	de (A4)X							rithout 5Y Hue or Redder Underlying	
Thick Dark Sur							Other (Explain in	Notes)	
<sup>3</sup> One indicator of	of hydrophytic vegeta	ation, o	l ne primary indicator o	f wetla	nd hydrolog	y, and an ap		e position must be present unless	
disturbed or pro	oblematic. I color change in Note	25							
	er (if present): Type:		VIA De	epth (ir	nches):_N	A			
Hydric Soil Pre	esent (Y/N):								
Notes: \\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\	eas table :		ient at II"					,	
				ı					
taini	nyarayan su	TTICK	e octor at 11'						
HYDROLOGY	PRIMARY INDICATO	ORS (a	ny one indicator is su	fficient	) SE	CONDARY	INDICATORS (2 o	r more required)	
Surface Water	(A1)			ee Soil Cracks (B6)		Water-stained Leaves (B9)		Stunted or Stressed Plants (D1)	
High Water Tab	ole (A2)X	Inur (B7		ation Visible on Aerial Imagery		Drainage Patterns (B10)		Geomorphic Position (D2)X	
Saturation (A3)	_X		rsely Vegetated cave Surface (B8)		(O)	Oxidized Rhizospheres a Living Roots (C3)		Shallow Aquitard (D3)	
Water Marks (B	1)	Mar	1 Deposits (B15)		- Pr	esence of Re on (C4)	educed	Microtopographic Relief (D4)	
Sediment Depo	sits (B2)		rogen Sulfide or (C1)X			Salt Deposits (C5) FAC-Neutral Test (D5)			
Drift Deposits (E	33)		-Season er Table (C2)		No	Notes:			
Algal Mat or Cru	ust (B4)	Oth	er (Explain in Notes):						
Iron Deposits (E	35)								
Surface Water I	Present (Y/N): N		Depth (in):	P.					
			. 11		Wetl	and Hvdrolo	oav Present (Y/N):	<u> </u>	
Water Table Present (Y/N): y Dep			Depth (in):						
Saturation Pres (includes capilla			Depth (in):						
Notes:									
saturation present at 911									
					7				

VEGETATION VARIABLES P= Plot, M= Matrix
Primary Vegetation Type (P): Vegetation Lacking       Forested-Deciduous-Needle-leaved       Forested-Deciduous-Broad-leaved         Forested-Evergreen-Needle-leaved       Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Deciduous-Broad-leaved         Scrub Shrub-Evergreen-Broad-leaved       Scrub Shrub-Evergreen-Needle-leaved       Emergent-Non-persistent         Persistent       X       Aquatic Bed
Percent Cover (P):         Tree (>5 dbh, >6m tall)         O         Sapling (<5 dbh, <6m tall)         5         Tall shrub (2-6m)         O         Short shrub (0.5-2m)         2.0           Dwarf shrub (<0,5m)
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even
Vegetation Density/Dominance (P): Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         X         High Density (60-80%)
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)
Presence of Islands (M): Absent (none) X One or Few Several to Many N/A
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site OpenX Small Scattered Patches Continuous Cover
Dead Woody Material (P): Low Abundance (0-25% of surface) X Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P):       Low (large patches, concentric rings)       Moderate (broken irregular rings)         High (small groupings, diverse and interspersed)       X
HGM Class (P): Slope Flat Lacustrine Fringe Depressional X Riverine Estaurine Fringe
SOIL VARIABLES
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy X Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES   Inlet/Outlet
Wetland Water Regime (P): Drier: Seasonally Flooded, Temporarily Flooded, Saturated X Wet: Perm. Flooded, Intermittently Exposed, Semiperm. Flooded
Evidence of Sedimentation (P): No Evidence Observed X Sediment Observed on Wetland Substrate Fluvaquent Soils Sediment  Created Sediment Observed (6.18in) S
Microrelief of Wetland Surface (P): Absent Poorly Developed (6in.) Well Developed (6-18in.) Pronounced (>18in.) Pronounced (>18in.)
Frequency of Overbank Flooding (P): No Overbank Flooding X Return Interval 1-2 yrs Return Interval 2-5 yrs Return Interval 2-5 yrs
Degree of Outlet Restriction (P): No Outflow_X Restricted Outflow Unrestricted Outflow
Water pH (P): No surface waterX         Circumneutral (5.5-7.4) Alkaline (>7.4) Acid (<5.5) pH Reading
Surficial Glacial Deposit Under Wetland (P): High Permeability Stratified Deposits Low Permeability Stratified Deposits Glacial Till/Not Permeable
Basin Topographic Gradient (M):       Low Gradient (<2%) X
LANDSCAPE VARIABLES (M)  Westland Justine Politics: Westland Justine Annual Connected Relaw
Wetland Juxtaposition:       Wetland Isolated X       Wetlands within 400m, Not Connected Only Connected Below       Only Connected Below         Only Connected Above       Connected Upstream & Downstream       Unknown
v.
Wetland Land Use: High Intensity (i.e., ag.) Moderate Intensity (i.e., forestry) Low Intensity (i.e. open space) X
Wetland Land Use:       High Intensity (i.e., ag.)       Moderate Intensity (i.e., forestry)       Low Intensity (i.e. open space)         Watershed Land Use:       0-5% Rural       X       5-25% Urbanized       25-50% Urbanized       >50% Urbanized

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: W 6 0 T 1 0 0 6 Field Target: 188 Date: 0 6 - 0 2 - 14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	Site description, site parameters and summary of findings are complete?  A detailed site sketch is included in logbook?
2.	Vegetation
	<ul> <li>✓ At least 80% of onsite vegetation has been keyed to species, or collected for later identification?</li> <li>✓ Vegetation names are entered legibly for all strata present?</li> <li>✓ Cover calculations are complete and correct?</li> <li>✓ All dominant species have been determined and recorded per strata?</li> <li>✓ Indicator status is correct for each species?</li> </ul>
	☑ Dominance Test and Prevalence Index have been completed?
3.	Soil
	☐ Soil profile is complete? ☐ Appropriate hydric soil indicators are marked?
4.	Hydrology
	<ul><li>✓ Appropriate hydrology indicators are marked?</li><li>✓ Surface water, water table, and saturation depths are recorded if present?</li></ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  ☑ Each logbook page is initialed and dated?
7.	Maps
	<ul><li>✓ Wetland boundaries have been corrected if necessary?</li><li>✓ Maps are initialed and dated?</li></ul>

8	P	าด	tos
u.		10	LUC

ď	Four photos were taken for each Wetland Determination Data Form (2 vegetation,	1
	, soil pit, 1 soil plug)?	

Two photos were taken for each Observation Point (vegetation/site overview)?

X Zoe Meade

Wetland Scientist (print)

Signature / 10

Field Crew Chief (nrint)

Signature / Date

AER

Site Description	45		
Date: Project Name & #		Field Target: 189	
Investigators:			Feature ID: W60T1007
Latitude: 61° 55 ' 25 . 39 "	Longitude: 150° 12' 16 - 25"		Datum: WGS84
Logbook #:	Logbook Page #: 5	-6	Picture #: 001-002 P_W60T1007_E-W
Location Description:	the state of		
SW of WGOTI	006		
Common Species Observed (Scientific	Name)		
Salex pulchra	(Figure	Cr	namerion angustofolium
Betvia neoalaskana			,
Rosa ascicularis			
Calamagrostis Canade			
Percent Cover of Dominant Structure Lev	el: 30		
Habitat Description:			
Burned area			
Alaska Vegetation Classification: Leve	I I, Level II, Level III		
II B Z	. C 2		III A 2
Notes:			
Field Crew Chief:	Field Scient	ist/Te	echnician Jumeau



Level I	Level II	Level #I
l Forest	A. Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B Broadleaf forest	(1) Closed broadleaf forest (2) Open broadleaf forest (3) Broadleaf woodlend
	C Mixed forest	Closed mixed forest     Open mixed forest     Mixed woodland
II Scrub	A Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland
	B Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C. Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	(1) Dryas dwarf scrub (2) Ericaceous dwarf scrub (3) Willow dwarf scrub
III Herbaceous	A Graminoid herbaceous	(1) Dry graminoid herbaceous (2) Mesic graminoid herbaceous (3) Wet graminoid herbaceous (emergent)
	B. Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb herbaceous (emergent)
	C Bryoid herbaceous	(1) Mosses (2) Lichens
	D Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marine aquatic herbaceous

	criptions of levels I, II, III, and IV follow the classification table
la_	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more
1 b	Trees over 3 meters (10 ft) tail are absent or nearly so, Less than 10 percent cover (Dwarf trees, less than 3 meters [10 ft) tail may be present and abundant
l. Fo	rest
2n	Over 75 percent of tree cover contributed by needleleaf (conifer) species I.A Needleleaf forest
2b	Less than 75 percent of tree cover contributed by needleleaf (conifer) species
3в.	Tree canopy of 60-100 percent cover
3b	Tree canopy of 25-59 percent cover I.A.2 Open needleleaf fores
3с	Tree canopy of 10-24 percent cover I A 3 Needleleef woodland
4a	Over 75 percent of tree cover contributed by broadlesf species
4b	Broadleef or needleteaf species contribute 25 to 75 percent of the tree cover
5a.	Tree canopy of 60-100 percent cover I.B.1 Closed broadleaf fores
5b	Tree canopy of 25-59 percent cover LB.2 Open broadlesf forest
5c	Tree canopy of 10-24 percent cover
8a.	Tree canopy of 60-100 percent cover. I.C.1 Closed mixed fores
6b.	Tree canopy of 25-59 percent cover. I.C.2 Open mixed forest
8c.	Tree canopy of 10-24 percent cover
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 fi] tall).
7b	Vegetation herbaceous (may have up to 25 percent shrub cover)

II Sc	crub	
8a	Vegetation with at least 10 percent cover of dwarf trees	II A Dwarf tree scrub 9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	
9а	Dwarf tree canopy of 60-100 percent cover	.II.A.1 Closed dwarf tree scrub
9Ь	Dwarf tree canopy of 25-59 percent cover	II.A.2 Open dwarf tree scrub
9c	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1.5 meters (5 ft) tall	
10b	Shrubs less than 15 meters (5ft)tall	12
11 a	Shrub canopy cover greater than 75 percent	II 8 1 Closed tall scrub
11 b	Shrub canopy cover of 25-74 percent	II B 2 Open tall scrub
12a	Shrubs 20 centimeters to 1.5 meters tall .	
12b	Shrubs under 20 centimeters in height .	
13a	Shrub canopy cover greater than 75 percent	li C   Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	
14a	Dryas species dominant in the dwarf shrub layer	II D 1 Dryas dwarf scrub
14b	Ericaceous species dominant in the dwarf shrub layer	II D 2 Ericaceous dwarf scrub
14c.	Willow species dominant in the dwarf scrub layer	II D 2 Willow dwarf scrub
JII. E	Herbaceous	
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	16
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	III D Aquatic herbaceous 21

16a	Grasses, sedges, or rushes (graminoid) plants dominant	III A Graminoid herbaceous 17
16b	Forbs or bryophytes dominant	18
17a	Grasslands of well-drained dry sites, such as south-facing bluffs, old beaches, and sand dunes. Typically (but not always) dominated by Elymus spp., Festuca spp., and Deschampsia spp.	III A.I Dry graminoid herbaceous
17b	On moist sites, but usually not with standing water. Usually dominated by Calemagrostis spp. Carex spp. or Eriophorum spp: tussocks often present.	III A 2 Mesic graminoid herbaceous
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet tundra bogs, marshes, and fens	
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)	. III.8 Forb herbaceous 19
18b	Vegetation dominated by mosses or lichens .	III C Bryoid herbaceous 20
19a	On dry sites, usually rocky and well drained; mostly tundra sites	
19b	On moist sites but without standing water, mostly within forested areas .	III B.2 Mesic forb herbaceous
19c	On wet sites, usually with standing water for part of the year .	III B 3 Wet forb herbaceous
20a	Vegetation cover dominated by	
205	Vegetation cover dominated by lichens	
21a	Vegetation submerged or floating in fresh water.	III D.1 Freshwater aquatic herbaceous
21 b	Vegetation submerged or floating in brackish water III (	2 Brackish water aquatic herbaceous
210.	Vegetation submerged or floating in salt water	III D 3 Marine aquatic herbaceous

### **Vegetation Classification Data Form QA/QC Checklist**

This form is to be completed before leaving the field site.

Fe	eature ID: WGOTI007 Field Target: 189 Date: 06-02-14
	or all items not checked, please provide detailed explanation in the notes section of data
1.	General Information
	✓ Location data recorded?
	☑ Photo taken and photo number recorded?
2.	Location Description
	✓ Location of site recorded with enough detail to help relocate?
3.	Common Species
	Scientific name of common species recorded?
	☑ Percent cover of dominant structure level noted?
4.	Habitat Description
	☐ Habitat described?
5.	Classification
	☑ All three levels of classification recorded?
6.	Field Log Book
	Field form entries consistent with log book?
	☐ Logbook clearly identifies the Field Target ID and Feature ID?
>	X Zoe meade X Bameall
Fi	eld Technician (print) Signature
>	X Alahamata X
_	Valent wathing / Tale wather

Signature

Field Crew Chief (print)

form.

SITE DESCRIPTION						
Survey Type: Centerline_X_ Acce	ss Road (explain)	Other (expl	ain)	Field Targe	et: 187	Map #: 100 Map Date: 5/27/1
Date: 06 - 03 - 14	Project Name & No.:	Alaska LNG	26221306		Feature Id:	W60TI008
Investigators: VW, ZM						Team No.: ₩60
State: Alaska	Region: Alaska		Milepost:	(0913		
Latitude: 61° 56' 45, 33"		Longitude	:-150011		J1	Datum: WGS84
Logbook No.:	Logbook Page No.:	7	Picture No.:	P_Wel	571008	~ N_S-pH-pluy
SITE PARAMETERS			100		372	
Subregion: interior			Landform (hil	Islope, terrace	e, hummocks	s, etc.): hummocics
Slope (%): 0-3			Local relief (c	concave, conv	ex, none):	
Pre-mapped Alaska LNG/NWI classifica	ition: PSS 4/18		Soil Map Unit			
Are climatic/hydrologic conditions on the Yes No (if no expl		of year?		ormal Circums <u>メ</u> No		sent: plain in Notes.)
Are Vegetation, Soil, or Hyd	drologySignificant	ly Disturbed?	NoX	(If yes, expl	ain in Notes)	
Are Vegetation, Soil, or Hyd	drology Naturally F	Problematic?	NoX	(If yes, expl	ain in Notes	.)
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Yes_	X No	ls	the Sampled A	rea within a	Wetland?	YesX No
Hydric Soil Present? Yes	X No	We	etland Type:	PSS	18	
Wetland Hydrology Present? Yes_	× No	— Ala	aska Vegetation	n Classificatio	n (Viereck):	ICI
Notes and Site Sketch: Please include D	Directional & North Arrow	, Centerline, I	Length of featur	re, Distances	from Center	line, Photo Locations, and Survey
corridor.						
					0	
					7	urn area
1				0.00		
				Spruce	, –	
						~
						9
				<b>K</b> -	W607	1008
	1			èss.	IR	
				,		1
	1					1
						<i>f</i>
					1	Bircha
					-1	Spruce
				-	-	,
					)	

Page 1 of 4

VEGETATION (use scientific names of plants				
<u>Tree Stratum</u> (Plot sizes:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC: (A)
1,				Total Number of Dominant Species Across All Strata:(B)  % Dominant Species that are OBL, FACW, or FAC:(A/B
2.				Modificant Species that are OBL, PACVV, 01 PAC(A/B
3.				
4.				Prevalence Index worksheet:
Total Cover:	0		1	Total % Cover of: Multiply by:
50% of total cover:	<u>O</u> 20	% of total cov	ver:_O	OBL species: 33 X1= 33
Sapling/Shrub Stratum ( 26 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: $32$ $\times 2 = 64$ FAC species $88$ $\times 3 = 264$ FACU species $2$ $\times 4 = 16$
1.Betula nana	75	Y	FAC	UPL species O X 5 = O
2. Chamaedaphne calyculato		- K	FACW	Column Totals: 155 (A) 377 (B)
3. Rhododendrum tomento sun			FACW	PI = B/A = 2.43
4. Salix pulchra	8		FACW	
5. Salix fuscescens	8		FALW	
6. Vaccinium ulignosum	5		FAC	
7.				
8.				=1
9.				
Total Cover: 50% of total cover:		0% of total cov	/er: <u>22,4</u>	
VEGETATION (use scientific names of plants	)			40
Herb Stratum ( 20° )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%
1. Equisetum fluviatile	20	Y	OBL	Prevalence Index is ≤ 3.0 Morphological Adaptations¹ (Provide supporting data in
2. Comarum palustre	8	Ý	OBL	Notes)
3. Rubus arcticas	8.	7	FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)
4. Carex aquatilis	5		OBL	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless
5. Chamer Ion anoustifolium	2		FALU	disturbed or problematic
7.				% Bare Ground
8.				80 % Cover of Wetland Bryophytes
9.				
10-				% Cover of Water  Hydrophytic Vegetation Present (Y/N):
Total Cover:			<i>a</i> ,	Notes: (If observed, list morphological adaptations below):
50% of total cover:	علاء 20	)% of total cov	ver: _ Z, Lo	

Water Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):	SOIL PROFI	LE DESCRIPTION: (	Describe	e to the depth needed to	o documen	it the ma	ilcator or c	confirm the absent	ce or in	dicators.)
(inches) Color (moist) % Color (moist) % Type' Loc' Texture Notes  0 - 2 - 0	Depth	Matrix		Redox Features						
Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. **Location: PL=Pore Lining, M=Matrix.		Color (moist)	%	Color (moist)	% Ту	pe <sup>1</sup>	Loc <sup>2</sup>	Texture	Not	tes
"Type: C=Concentration, D=Depletion, RM=Reduced Matrix: CS=Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  HYDRIC SOIL NDICATORS Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Color Change (TA4)* Histosol or Histel (A1) X Alaska Gleyed (A13) Alaska Alpine Swales (TA5) Histosol or Histel (A3) Alaska Gleyed (A14) Alaska Alpine Swales (TA5) Histosol or Histel (A3) Alaska Gleyed Pores (A15) Alaska Alpine Swales (TA5) Histosol or Histel (A3) Alaska Gleyed Pores (A15) Alaska Gleyed without SY Hue or Redder Underlying Layer  Other (Explain in Notes)  Other (Explain in Notes)  Other (Explain in Notes)  Other (Explain in Notes)  Phydric Soil Present (YN):  Surface Soil Cracks (86) Leaves (89)  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) X Surface Soil Cracks (86) Leaves (89)  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) X Surface Soil Cracks (86) Leaves (89)  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Living Roots (C3)  Hydrogen Suffice Cody (C1)  Saturation (A3) X Sparsely Vegetated Concave Surface (B8)  Dry-Season Water Table (C2)  Water Marks (B1) Mart Deposits (B1) Order (Explain in Notes):  Notes: Water Present (YN):  Order (Explain in Notes):  Wettand Hydrology Present (YN):  Order (Explain in Notes):  Wettand Hydrology Present (YN):  Order (Explain in Notes):	0-20		_					Fibric	OY	radnics
Type: C-Concentration, D-Depletion, RM=Reduced Matrix, CS-Covered or Coated Sand Grains. *Location: PL=Pore Lining, M=Matrix.  **HYDRIC SOIL INDICATORS**    Histics of Intellet (A1)	20-22				-	_				
HYDRIC SOIL INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS   Histors of Hister (A1)										- yu
HYDRIC SOIL INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS   Histors of Hister (A1)										
HYDRIC SOIL INDICATORS  Histors of Hister (A1)										
HYDRIC SOIL INDICATORS   INDICATORS FOR PROBLEMATIC HYDRIC SOILS   Histors of Hister (A1)								- t-		
Histoso for Histel (A1)			1							
Alaska Gleyed (A13) Alaska Color Change (TA4)* Histic Epipedon (A2) Alaska Redox (A14) Alaska Redox (A14) Alaska Alpine Swales (TA5) Black Histic (A3) Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Redox (A14) Alaska Alpine Swales (TA5) Alaska Gleyed Pores (A15) Alaska Gleyed without 5Y Hue Alaska Gleyed without 5Y Hue Phydrogen Sulfide (A4) Defendicator of hydrophylic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic of orbital present (YiN):  Whydric Soil Present (YiN):  Notes: Depth (inches):  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) Surface Soil Cracks (B6) Leaves (B9) Plants (D1)  Inundation Visible on Aerial Imagery  (B7)  Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Living Roots (C3) Shallow Aquitard (D3)  Water Marks (B1) Marl Deposits (B15) Presence of Reduced Incorporaphic Relief (D4)  Sediment Deposits (B3) Dry-Season Water Table (C2)  Notes: Wetland Hydrology Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Notes:	<sup>1</sup> Type: C=Co	oncentration, D=Depl	etion, RN	/I=Reduced Matrix, CS	=Covered	or Coate	d Sand G	rains, <sup>2</sup> Location	n: PL=F	Pore Lining, M=Matrix.
Alaska Redox (A14) Alaska Redox (A15) Alaska Redox (A15) Alaska Redox (M15.2 y Hue Black Histic (A3) Alaska Gleyed Pores (A15) Alaska Redox with 2.5 y Hue Alaska Cleyed without 5Y Hue or Redder Underlying Layer Thick Dark Surface (A12) Other (Explain in Notes) One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic. Give details of color change in Notes. Restrictive Layer (if present): Type: Depth (inches):  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Alaska Redox with 2.5 y Hue or Redder Underlying Layer Other (Explain in Notes)  Depth (inches):  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Fraction of the present (Y/N):  HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1)  Surface Water (A1)  Inundation Visible on Aerial Imagery  Inundation Visible on Aerial Imagery  Inundation Visible on Aerial Imagery  Inundation (A3)  X  Sparsely Vegetated Concave Surface (B8)  Living Roots (C3)  Shallow Aquitard (D3)  Avater Marks (B1)  Mart Deposits (B15)  Presence of Reduced  Inundation Visible on Aerial Imagery  Presence of Reduced  Inundation Visible on Aerial Imagery  Inundation Visible on Aerial Imagery  Inundation Visible on Aerial Imagery  Inundation (A3)  Sparsely Vegetated Concave Surface (B8)  Living Roots (C3)  Shallow Aquitard (D3)  Avater Marks (B1)  Microtopographic  Relief (D4)  Presence of Reduced  Inundation Present (Y/N):  Notes:  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):  Notes:  Wetland Hydrology Present (Y/N):  Notes:  Wetland Hydrology Present (Y/N):  Popth (in):  Depth (in):  Depth (in):  Depth (in):  Popth (in):  Notes:  Wetland Hydrology Present (Y/N):  Notes:  Wetland Hydrology Present (Y/N):	HYDRIC SOI	L INDICATORS								
Alaska Gleyed Pores (A15) Alaska Redox with 2.5Y Hue Alaska Gleyed Without 5Y Hue or Redder Underlying Layer  Thick Dark Surface (A12) Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9) Stunted or Stressed Plants (D1)  Unification Visible on Aerial Imagery (B7) Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Using Roots (C3)  Shallow Aquitard (D3)  Other (Explain in Notes)  Other (Explain in Notes)  Water Marks (B1) Mari Deposits (B15) Presence of Reduced Infortopographic Relief (D4)  Phydrogen Sulfide Codor (C1) Salt Deposits (C5) FAC-Neutral Test (D5) X  Other (Explain in Notes):  Water Table (C2)  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):  Wetland Hydrology Present (Y/N):  Other (Explain in Notes):	Histosol or H	istel (A1)						Alaska Color (	Change	e (TA4) <sup>4</sup>
Alsaka Gleyed without 5Y Hue or Redder Underlying Layer  Thick Dark Surface (A12)  Other (Explain in Notes)  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9)  Plants (D1)  Water-stained Leaves (B9)  Plants (D1)  Orange Patterns (B10)  Geomorphic Position (D2)  Oxidized Rhizospheres along Living Roots (C3)  Shallow Aquitard (D3)  Nater Marks (B1)  Marl Deposits (B15)  Presence of Reduced Iron (C4)  Relief (D4)  Other (Explain in Notes):  Other (Explain in Notes):  Other (Explain in Notes):  Wetland Hydrology Present (Y/N):  Notes:  Wetland Hydrology Present (Y/N):  Nater Table Present (Y/N):  Nater Table Present (Y/N):  Opeth (in):  Other (Explain in Notes):	Histic Epiped	on (A2)		Alaska Redox (A	.14)			Alaska Alpine	Swales	s (TA5)
Layer   Layer   Layer   Cither (Explain in Notes)	Black Histic (	A3)		Alaska Gleyed P	ores (A15)	)		Alaska Redox	with 2.	5Y Hue
Thick Dark Surface (A12) Other (Explain in Notes)  One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):	Hydrogen Su	Ifide (A4)				1-0			withou	ut 5Y Hue or Redder Underlyi
**Cone indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.   **Give details of color change in Notes.**  **Restrictive Layer (if present): Type: Depth (inches):									in Not	oc)
disturbed or problematic.  Give details of color change in Notes.  Restrictive Layer (if present): Type: Depth (inches):			etation o	ne primary indicator of	wetland h	vdrology	and an a			•
Restrictive Layer (if present): Type:	disturbed or p	problematic.		no primary indicator or	wedana n	yarology,	, and an a	ppropriate landse	ape po	sition must be present unless
Notes: Saturation (As) X Surface Soil Cracks (B6) Water-stained Leaves (B9) Plants (D1) Geomorphic Position (D2) Saturation (As) X Sparsely Vegetated Concave Surface (B8) Surface of Reduced Iron (C4) Relief (D4) Presence of Reduced Iron (C4) Sediment Deposits (B2) Other (Explain in Notes):  Surface Water (B8) Sediment Present (Y/N): Depth (in): Water Table (Present (Y/N): Notes:  Wetland Hydrology Present (Y/N): Water (Y/N): Depth (in): Other (Explain in Notes):  SECONDARY INDICATORS (2 or more required)  Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3) Shallow Aquitard (D3) Presence of Reduced Iron (C4) Relief (D4) Relief (D4) Relief (D4) Sediment Deposits (B2) Other (Explain in Notes):  Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N): Saturation Present (Y/N): Parth (in): Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3) Sediment (D4) Relief (D4) Relief (D4) Relief (D4) Relief (D4) Sediment Deposits (B2) Other (Explain in Notes):  Wetland Hydrology Present (Y/N): Wetland Hydrology Present (Y/N): Saturation Present (Y/N): Parth (in): Oxidized Rhizospheres along Living Roots (C3) Shallow Aquitard (D3) Sediment (D4) Relief (D4) Relief (D4) Shallow Aquitard (D3) Shallow Aquitar	'Give details	of color change in No	otes.	Do	nth (incho	2).				
HYDROLOGY PRIMARY INDICATORS (any one indicator is sufficient)  Surface Water (A1) X	TOOLIOUVO EC	yor (ii prosent). Typ								
Surface Water (A1) X Surface Soil Cracks (B6) Water-stained Leaves (B9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Shallow Aquitard (D3) Shallow Aquitard (D3) Shallow Aquitard (D3) Sediment Deposits (B2) Shallow Sulfide Odor (C1) Shallow Concave Surface (B3) Shallow Aquitard (D3)		Present (Y/N):	7			5)				~
Surface Water (A1)	Notes:	Present (Y/N):	Y atura	trd orcyanics						
Saturation (A3) X Sparsely Vegetated Concave Surface (B8) Shallow Aquitard (D3) Shallow	Notes:	Present (Y/N):	Y atura	trd orcyanics		SEC	CONDARY	/ INDICATORS (2	2 or mo	
Water Marks (B1)	Notes:	Present (Y/N):	TORS (a	iny one indicator is suff	īcient)	SEC Wate	CONDARY ter-stained	/ INDICATORS (2	T	Stunted or Stressed
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   Drift Deposits (B3) Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N):	Notes:  HYDROLOG  Surface Wate	Present (Y/N):	TORS (a	iny one indicator is suff face Soil Cracks (B6) _	īcient)	SEC Wate	CONDARY ter-stained ves (B9) _	/ INDICATORS (2		Stunted or Stressed Plants (D1)
Sediment Deposits (B2) Hydrogen Sulfide Odor (C1) Salt Deposits (C5) FAC-Neutral Test (D5)   Dry-Season Water Table (C2) Notes:  Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N):  Depth (in):	Notes:  HYDROLOG  Surface Water  High Water T	Present (Y/N):	TORS (a	iny one indicator is suff face Soil Cracks (B6) _ ndation Visible on Aeria	īcient)	SEC Wate Leav Drai	CONDARY ter-stained ves (B9) _ tinage Patt	rindicators (2		Stunted or Stressed Plants (D1) Geomorphic Position (D2)
Dry-Season Water Table (C2)  Algal Mat or Crust (B4) Other (Explain in Notes):  Fron Deposits (B5)  Surface Water Present (Y/N):  Depth (in):  Water Table Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Depth (in):  Depth (in)	HYDROLOG Surface Wate High Water T Saturation (A	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  er (A1)X  able (A2)X  3)X	TORS (a	iny one indicator is suff face Soil Cracks (B6) _ indation Visible on Aeria ) _ ersely Vegetated incave Surface (B8)	icient) al Imagery	SEC Wate Leav Drai Oxid Livin	condary ter-stained ves (B9) _ inage Patt dized Rhiz ng Roots ( sence of F	r INDICATORS (2) erns (B10) ospheres along C3) Reduced		Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic
Algal Mat or Crust (B4) Other (Explain in Notes):  Surface Water Present (Y/N):  Depth (in):  Water Table Present (Y/N):  Depth (in):  Wetland Hydrology Present (Y/N):  Depth (in):	HYDROLOG Surface Water High Water T Saturation (A	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  er (A1)  able (A2)  (B1)	TORS (a Suil Inu (B7 Sp. Co Ma	iny one indicator is suff face Soil Cracks (B6) _ indation Visible on Aeria () _ arsely Vegetated incave Surface (B8) _ irl Deposits (B15) _ drogen Sulfide	icient) al Imagery	SEC Wate Leav Drai Oxid Livin Pres	condary ter-stained ves (B9) _ inage Patt dized Rhiz ng Roots ( sence of F (C4)	erns (B10)		Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water Present (Y/N): Depth (in):  Water Table Present (Y/N): Depth (in):  Saturation Present (Y/N): Depth (in):	HYDROLOG Surface Water High Water T Saturation (A: Water Marks Sediment De	Present (Y/N):	TORS (a Sui Inu (B7 Sp. Co Ma Hyu	iny one indicator is suff face Soil Cracks (B6) _ indation Visible on Aeria () _ arsely Vegetated incave Surface (B8) _ irl Deposits (B15) _ drogen Sulfide or (C1)	icient) al Imagery	SEC Wate Leav Drai Oxid Livin Pres Iron	condary ter-stained ves (B9) _ inage Patt dized Rhiz ng Roots ( sence of F (C4)	erns (B10)	_	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Surface Water Present (Y/N):  Water Table Present (Y/N):  Depth (in):  Depth (in):  Depth (in):  Depth (in):  Depth (in):	HYDROLOG Surface Water High Water T Saturation (A: Water Marks Sediment Deposits	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  Pr (A1)  able (A2)  (B1)  posits (B2)  (B3)	TORS (a Suil Inu (B7 Sp. Co Ma Hyu Od Dry Wa	iny one indicator is suff face Soil Cracks (B6) _ indation Visible on Aeria () _ arsely Vegetated incave Surface (B8) _ irl Deposits (B15) _ drogen Sulfide or (C1)	icient) al Imagery	SEC Wate Leav Drai Oxid Livin Pres Iron	condary ter-stained ves (B9) _ inage Patt dized Rhiz ng Roots ( sence of F (C4)	erns (B10)	_	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Water Table Present (Y/N): Depth (in): Depth (in): Wetland Hydrology Present (Y/N):	HYDROLOG Surface Water High Water T Saturation (A: Water Marks Sediment Deposits Algal Mat or C	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  Pr (A1)  able (A2)  (B1)  posits (B2)  (B3)  Crust (B4)	TORS (a Suil Inu (B7 Sp. Co Ma Hyu Od Dry Wa	iny one indicator is suff face Soil Cracks (B6) _ indation Visible on Aeria () _ arsely Vegetated incave Surface (B8) _ irl Deposits (B15) _ drogen Sulfide or (C1)	icient) al Imagery	SEC Wate Leav Drai Oxid Livin Pres Iron	condary ter-stained ves (B9) _ inage Patt dized Rhiz ng Roots ( sence of F (C4)	erns (B10)	_	Stunted or Stressed Plants (D1)  Geomorphic Position (D2) _  Shallow Aquitard (D3)  Microtopographic Relief (D4)
Saturation Present (Y/N):  Depth (in):  Depth (in):	HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment Deposits Algal Mat or C Iron Deposits	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  er (A1)  able (A2)  (B1)  posits (B2)  Crust (B4)  (B5)	TORS (a Sullander Inu (B7 Co Ma Hyu Od Dry Wa	iny one indicator is suff face Soil Cracks (B6) _ indation Visible on Aeria () _ arsely Vegetated incave Surface (B8) _ irl Deposits (B15) _ drogen Sulfide or (C1)	icient) al Imagery	SEC Wate Leav Drai Oxid Livin Pres Iron	condary ter-stained ves (B9) _ inage Patt dized Rhiz ng Roots ( sence of F (C4)	erns (B10)	_	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
	HYDROLOG Surface Water High Water T Saturation (A Water Marks Sediment Deposits Algal Mat or C Iron Deposits	Present (Y/N):  Present (Y/N):  Y PRIMARY INDICA  er (A1)  able (A2)  (B1)  posits (B2)  Crust (B4)  (B5)	TORS (a Sullander Inu (B7 Co Ma Hyu Od Dry Wa	Iny one indicator is suff face Soil Cracks (B6) ndation Visible on Aeria ncave Surface (B8) rl Deposits (B15) drogen Sulfide or (C1) -Season ter Table (C2) ler (Explain in Notes):	icient) al Imagery	SEC  Wate Leav  Drai  Oxid Livin  Pres Iron  Salt  Note	condary  ter-stained  ves (B9) _  inage Patt  dized Rhiz  ng Roots ( sence of F  (C4)  Deposits  es;	erns (B10) cospheres along C3) Reduced (C5)	_	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)
	HYDROLOG Surface Water High Water T Saturation (A: Water Marks Sediment Deposits Algal Mat or C Iron Deposits Surface Water	Present (Y/N):	TORS (a Sullander Inu (B7 Co Ma Hyu Od Dry Wa	iny one indicator is suff face Soil Cracks (B6) indation Visible on Aeria ) arsely Vegetated incave Surface (B8) irl Deposits (B15) drogen Sulfide or (C1) Season ter Table (C2) ier (Explain in Notes):	icient) al Imagery	SEC  Wate Leav  Drai  Oxid Livin  Pres Iron  Salt  Note	condary  ter-stained  ves (B9) _  inage Patt  dized Rhiz  ng Roots ( sence of F  (C4)  Deposits  es;	erns (B10) cospheres along C3) Reduced (C5)	_	Stunted or Stressed Plants (D1)  Geomorphic Position (D2)  Shallow Aquitard (D3)  Microtopographic Relief (D4)  FAC-Neutral Test (D5)

VEGETATION VARIABLES P= Plot, M= Matrix	
Primary Vegetation Type (P):     Vegetation Lacking     Forested-Deciduous-Needle-leaved     Forested-Deciduous-Broad-leaved       Forested-Evergreen-Needle-leaved     Scrub Shrub-Deciduous-Needle-leaved     Scrub Shrub-Deciduous-Broad-leaved       Scrub Shrub-Evergreen-Broad-leaved     Scrub Shrub-Evergreen-Needle-leaved     Emergent-Non-persistent     Emergent-Non-persistent	
Percent Cover (P): Tree (>5 dbh, >6m tall)       Sapling (<5 dbh, <6m tall)	<u>)</u>
Number of Wetland Types (M): Evenness of Wetland Type Distribution (M): Even Highly Uneven Moderately even	
Vegetation Density/Dominance (P):         Sparse (0-20%)         Low Density (20-40%)         Medium Density (40-60%)         High Density (6           80%)         Very High Density (80-100%)         Yes	0-
Interspersion of Cover & Open Water (P): 100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or Peripheral Cover N/A N/A	d or
Plant Species Diversity (P): Low (< 5 plant species) Medium (5-25 species) High (>25)	
Presence of Islands (M): Absent (none) One or Few Several to Many N/A	
Cover Distribution of Dominant Layer (P): No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Open Small Scattered Patches Continuous Cover	
Dead Woody Material (P): Low Abundance (0-25% of surface) Moderately Abundant (25-50% of surface) Abundant (>50% of surface)	
Vegetative Interspersion (P): Low (large patches, concentric rings) Moderate (broken irregular rings) High (small groupings, diverse and interspersed)X	
HGM Class (P): Slope FlatX    Lacustrine Fringe    Depressional    Riverine    Estaurine Fringe	
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Gravelly Mineral: Sandy Mineral: Silty Mineral: Clayey	
HYDROLOGIC VARIABLES	
HYDROLOGIC VARIABLES   Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial O	nial
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet P	
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/Perennial Outlet Per	
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet P	
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet	
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Intermittent Outlet Intermittent Inlet/Intermittent Inlet/Intermitten	
Inlet/Outlet Class (P): No Inlet/Outlet No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/No Outlet Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial	
Inlet/Outlet Class (P): No Inlet/Outlet	

### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featu	re ID: 187 Field Target: W60TI 008 Date: 06-03-14
For al	l items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?
	<ul><li>✓ Vegetation names are entered legibly for all strata present?</li><li>☐ Cover calculations are complete and correct?</li></ul>
	<ul><li>✓ All dominant species have been determined and recorded per strata?</li><li>✓ Indicator status is correct for each species?</li></ul>
	☐ Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>✓ Appropriate hydrology indicators are marked?</li> <li>✓ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	☑ Notes have been recorded at each site, including general description, sketch, and
	accuracy of pre-mapped wetland boundary as appropriate?  Each logbook page is initialed and dated?
7.	Maps
	✓ Wetland boundaries have been corrected if necessary? ✓ Maps are initialed and dated?

#### 8. Photos

- ☑ Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X Zor Meade X Sourcell
Wetland Scientist (print) Signature / Date

ield Crew Chief (print)

Signature / Date

white

RAQC Das

Site Description		41	
Date: Project Name & # Alaska LNG 2622 Investigators: VW, 7M	Field Target: 187		
Investigators: VW,ZM		Feature ID: W6071009	
Ce1°56' 48.06"	Longitude:	11' 42.66" ge#: B	Datum: WGS84
Logbook #:	Logbook Pa	ge #: <b>%</b>	P_W60T1009_N_S
Location Description:		MINISC	roles de Visite de Vi
worth of wigotion	08 m	Centri	ing
Common Species Observed (Scientific	: Name)		
Betula neoalaskana		Equist	tum sylvaticum
Rosa acicularis			97
Sallx pulchra			
Chambia anguSNFO Percent Cover of Dominant Structure Leve	Muni		
Percent Cover of Dominant Structure Level	el:		
Habitat Description:	1256		
burned upland are	U		
Alaska Vegetation Classification: Leve	el I, Level II, L	evel III	A demanded in the
II BQ II	E C Q		
Notes:		Aladail	N SECTION OF
Field Crew Chief:	Fie	ld Scientist/T	echnician

DAGE

Level I	Level II	Level III
L Forest	A Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland
	B. Broadleaf forest	Closed broadleaf forest     Open broadleaf forest     Broadleaf woodland
	C. Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland
Il Scrub	A. Dwarf tree scrub	(1) Closed dwarf tree scrub (2) Open dwarf tree scrub (3) Dwarf tree scrub woodland
	B. Tall scrub	(1) Closed tall scrub (2) Open tall scrub
	C. Low scrub	(1) Closed low scrub (2) Open low scrub
	D Dwarf scrub	(1) Dryas dwarf scrub (2) Ericaceous dwarf scrub (3) Willow dwarf scrub
III Herbeceous	A Graminoid herbaceous	Try graminoid herbaceous     West graminoid herbaceous     Wet graminoid herbaceous     (emergent)
	B. Forb herbaceous	(1) Dry forb herbaceous (2) Mesic forb herbaceous (3) Wet forb nerbaceous (emergent)
	C. Bryoid herbaceous	(1) Mosses (2) Lichens
	D Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marine aquatic herbaceous

Les	criptions of levels I, II, III, and IV follow the classification table
la	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more 1 Forest
1 b,	Trees over 3 meters (10 ft) tall are absent or neerly so, Less than 10 percent cover, (Dwarf trees, less than 3 meters (10 ft) tall may be present and abundant
I F	prest
2a	Over 75 percent of tree cover contributed by needleleaf (conifer) species
2b	Less than 75 percent of tree cover contributed by needleleaf (conflet) species
3a;	Tree canopy of 60-100 percent cover I.A.1 Closed needleleaf for
3b	Tree canopy of 25-59 percent cover
3с	Tree canopy of 10-24 percent cover
4a	Over 75 percent of tree cover contributed by broadleaf species IB Broadleaf fores
4b	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover
5a	Tree canopy of 60-100 percent cover
5b.	Tree canopy of 25-59 percent cover
5c	Tree canopy of 10-24 percent cover
6a	Tree canopy of 60-100 percent cover I/C 1 Closed mixed for
6b.	Tree canopy of 25-59 percent cover
6c	Tree canopy of 10-24 percent cover LC 3 Mixed wood
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [10 ft tail)
7b	Vegetation herbaceous (may have up to 25 percent shrub cover)

II. Sc	crub	
Ва	Vegetation with at least 10 percent cover of dwarf trees	II.A Dwarf tree scrub 9
8b	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees	
9a	Dwarf tree canopy of 60-100 percent cover	II.A.1 Closed dwarf tree scrub
9b	Dwarf tree canopy of 25-59 percent cover	II.A.2 Open dwarf tree scrub
9c.	Dwarf tree canopy of 10-24 percent cover	II A 3 Dwarf tree scrub woodland
10a	Shrubs more than 1 5 meters (5 ft) tall	II B Tall scrub
10b	Shrubs less than 15 meters (5ft)tall	
	Shrub canopy cover greater than 75 percent	
11 b	Shrub canopy cover of 25-74 percent	II B 2 Open tall scru
12a	Shrubs 20 centimeters to 1.5 meters tall	II.C Low scrub 1
12b	Shrubs under 20 centimeters in height	and a line of the state of the
13a	Shrub canopy cover greater than 75 percent	II C I Closed low scru
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present	II.C.2 Open low scrut
14a	Dryas species dominant in the dwarf shrub layer	II D 1 Dryas dwarf scru
14b	Ericaceous species dominant in the dwarf shrub layer	II D 2 Ericaceous dwarf scrui
14c.	Willow species dominant in the dwarf scrub layer	. II D 2 Willow dwarf scrub
10.1	Herbaceous	
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation	
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water	III.D Aquatic herbaceous 2

16a	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant
17a	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes. Typically (but not always) dominated by E/ymus spp., Festica spp. and Deschampsia spp. III A I Dry graminoid herbaceous
17b	On moist sites, but usually not with standing water. Usually dominated by Calamagrostis spp.  Cerex spp. or Eriophorum spp; tussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet fundra, bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails)
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b	On moist sites but without standing water, mostly within forested areas
19c	On wet sites, usually with standing water for part of the year III B 3 Wet forb herbaceous
20a	Vegetation cover dominated by mosses
20b.	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water
21c.	Vegetation submarged or floating III.D 3 Marine aquatic herbaceous

### **Vegetation Classification Data Form QA/QC Checklist**

This form is to be completed before leaving the field site.

For all items not checked, please provide detailed explanation in the notes section of data form.

Feature ID: WIOTION Field Target: 187

1. General Information
Location data recorded?
Photo taken and photo number recorded?
2. Location Description
Location of site recorded with enough detail to help relocate?
3. Common Species
Scientific name of common species recorded?
Percent cover of dominant structure level noted?
4. Habitat Description
Habitat described?
5. Classification
All three levels of classification recorded?
6. Field Log Book
Field form entries consistent with log book?
Y 0 0 10 10 10 10 10 10 10 10 10 10 10 10
X roe meade X yellhear
Field Technician (print) Signature
X valent worthing X Vallabath
Field Crew Chief (print) Signature

QAGC NCG

SITE DESCRIPTION						
Survey Type: Centerline X Ac	ccess Road (explain)	Other (expl	ain)	Field Targe	t: <u>186</u>	Map #: 121 Map Date: 5/27
Date: 06 - 03 - 14	Project Name & No.:	Alaska LNG	26221306		Feature Id	:W66TI010
Investigators: VW, Z	m					Team No.: ₩ 6 0
State: Alaska	Region: Alaska		Milepost:	691,1		
Latitude: 61° 56' 56.2	-1"	Longitude	:-150° 1		4"	Datum: WGS84
Logbook No.:	Logbook Page No.:	8				O-N-S-pit-plug
SITE PARAMETERS						
Subregion interior			Landform (hill	slope, terrace	hummock	s, etc.): SITGHT hummocks
Slope (%): 0 - 3			Local relief (c	oncave, conve	x, none):	slighty concave
Pre-mapped Alaska LNG/NWI classit	fication: PEM1BC		Soil Map Unit			3 10 1111
Are climatic/hydrologic conditions on YesX No (if no e	the site typical for this time explain in Notes)	of year?	Are "No Yes_X	ormal Circumst	ances" pre _ (If no, ex	sent: plain in Notes.)
Are Vegetation, Soil, or l	Hydrology Significantl	ly Disturbed?	No_X	_(If yes, expla	in in Notes	
Are Vegetation, Soil, or I	Hydrology Naturally P	roblematic?	No_X	_(If yes, expla	in in Notes	.)
SUMMARY OF FINDINGS						
Hydrophytic Vegetation Present? Ye	esX No	ls	the Sampled A	rea within a V	Vetland?	YesX No
Hydric Soil Present? Yes	sX No	We	etland Type: (	PSs1/	EMI	ds of
Wetland Hydrology Present? Yes	s No	— Ala	aska Vegetation	Classification	(Viereck):	II (2, III A2
Notes and Site Sketch: Please includ corridor.	e Directional & North Arrow,	, Centerline, I	Length of featur	e, Distances f	om Center	line, Photo Locations, and Survey
oomdor.	71	N	apland		PSS	48
W			- CAP - C			3
Or of						
						*
	7	JA 101 (	OT1010			
		P	OTIOIO SSI EMIB			PEMIXI
) :						
	upla.					~
	b	area		1		

VEGETATION (use scientific names of plants	)			
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	No. of Dominant Species that are OBL, FACW, or FAC:
1,		1		Total Number of Dominant Species Across All Strata: (6
2				% Dominant Species that are OBL, FACW, or FAC: <u>IOO</u> (A/
3				
4.				Prevalence Index worksheet:
Total Cover:	0			Total % Cover of: Multiply by:
50% of total cover		% of total cov	rer: O	OBL species: 68 x 1 = 68
Sapling/Shrub Stratum ( 261 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 30
1. Betula nana	(05	Y	FAC	UPL species
2. Chamaedaphne calyculata	20	Ý	FACW	Column Totals: 163 (A) 323 (B)
3. Andromeda politolia	10		FA(4)	PI = B/A = 1.98
4.				
5.				
6.				
7.				
8,				
9.				
Total Cover 50% of total cover	<u>47,5</u> 20	% of total cov	ver:_19	
Total Cover 50% of total cover VEGETATION (use scientific names of plants	: 47,5 20 s)			
Total Cover 50% of total cover	47,5 20	Dominant Species? (Y/N)	ver: 19 Indicator Status	Hydrophytic Vegetation Indicators:  Dominance Test is > 50%  X Prevalence Index is < 3.0
Total Cover 50% of total cover VEGETATION (use scientific names of plants	: <u>47,5</u> 20 s) Absolute	Dominant Species?	Indicator	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0
Total Cover 50% of total cover VEGETATION (use scientific names of plants Herb Stratum ( 2.0 ' )	: <u>47,5</u> 20 s) Absolute	Dominant Species?	Indicator	Dominance Test is > 50%
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20 ' )	47,5 20 Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20 ' )  1. Andromeda polifolia 2. Equisctum fluviatile 3. Comarum palusne	47,5 20 Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20 ' )  1. Andromeda polifolia 2. Equisctum fluviatile 3. Comarum palusne 4. Menyanthes +rr foliata	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20 ' )  1. Andromeda polifolia 2. Equisctum fluviative 3. Comarum palusne 4. Menyanthes +rr foliata	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20° )  1. Andromeda polifolia 2. Equisclum fluviative 3. Comarum palusne 4. Menyanthes trifoliata 5. Carex aquatifs	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20' )  1. Andromeda polifolia 2. Equisctum fluviative 3. Comarum palusne 4. Menyanthes +rr foliata 5. Carex aquativis 6.	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain)  ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20° )  1. Andromeda polifolia 2. Equisclum fluviative 3. Comarum palusne 4. Menyanthes trifoliata 5. Carex aquatives 6. 7.	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  Bare Ground
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20 ' )  1. Andromeda polifolia 2. Equisctum fluviative 3. Comarum palusne 4. Menyanthes +rr foliata 5. Carex aquativs 6. 7. 8. 9.	Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  BO % Bare Ground  CO % Cover of Wetland Bryophytes
Total Cover 50% of total cover  VEGETATION (use scientific names of plants  Herb Stratum ( 20' )  1. Andromeda polifolia 2. Equisctum fluviative 3. Comarum palusne 4. Menyanthes +rr foliata 5. Carex aquativis 6. 7. 8.	47,5 20 3 Absolute % Cover	Dominant Species?	Indicator Status  OBL  OBL  OBL	Dominance Test is > 50%  X Prevalence Index is ≤ 3.0  Morphological Adaptations¹ (Provide supporting data in Notes)  Problematic Hydrophytic Vegetation¹ (Explain) ¹ Indicators of hydric soil and wetland hydrology must be present unless disturbed or problematic.  % Bare Ground  % Cover of Wetland Bryophytes  Total Cover of Bryophytes

conductivity 25 mm

SOIL		1	Date 6/3/14 Feature ID 0	NOOTIC	010	Soil Pit Required (Y/N)
SOIL PROFI	LE DESCRIPTION: (	Describe	to the depth needed to documer	nt the indicato	r or confirm the absence	e of indicators.)
Depth	Matrix		Redox Features			
(inches)	Ches) Color (moist) % Color (moist) % Typ		pe <sup>1</sup> Loc <sup>2</sup>	Texture	Notes	
0-11		1 1			Fibric	organics
11-22	12			Fibrichemic	organics	
		-				J
1						
		etion, RM	=Reduced Matrix, CS=Covered	or Coated Sa		PL=Pore Lining, M=Matrix.
	L INDICATORS					FOR PROBLEMATIC HYDRIC SOILS
	stel (A1)		Alaska Gleyed (A13)			hange (TA4) <sup>4</sup>
	on (A2)		Alaska Redox (A14)		Alaska Alpine S	Swales (TA5)
Black Histic (	A3)		Alaska Gleyed Pores (A15)			with 2.5Y Hue
Hydrogen Su	lfide (A4)					without 5Y Hue or Redder Underlying
	urface (A12)				Layer Other (Explain	in Notes)
	· · · · · · · · · · · · · · · · · · ·	tation, on	e primary indicator of wetland hy	drology, and		pe position must be present unless
disturbed or p	roblematic.		NOTE AND ADDRESS OF THE PARTY O	37,		po producti de producti allico
Restrictive La	of color change in No yer (if present): Type	ites. e:	Depth (inches	).		
C. 4.4. (All )				7-		
Hydric Soil F	resent (Y/N):	Y				
Notes:		1				
	ated to si	ur fa	ce Coy	ld nuot a	ly deeper du	ue to roots and watch
- 3(   0	0.		7	ph.	,	
					- the	
HYDROLOG	PRIMARY INDICAT	TORS (an	y one indicator is sufficient)	SECOND	ARY INDICATORS (2	or more required)
Surface Wate	r (A1)X		ace Soil Cracks (B6)	Water-sta Leaves (F	ained 39)	Stunted or Stressed Plants (D1)
High Water Ta	able (A2)	(B7)	dation Visible on Aerial Imagery		Patterns (B10)	
Saturation (A	B)X	Spar Cond	sely Vegetated cave Surface (B8)	Oxidized Rhizospheres along Living Roots (C3)		Shallow Aquitard (D3)
Water Marks	(B1)	Marl	Deposits (B15)		of Reduced	Microtopographic Relief (D4)
Sediment Dep	oosits (B2)		ogen Sulfide · (C1)	Salt Depo	osits (C5)	FAC-Neutral Test (D5)
Drift Deposits	(B3)		Season er Table (C2)	Notes:		
Algal Mat or C	crust (B4)	Othe	r (Explain in Notes):	1001		
ron Deposits	(B5)					
Curface Meter	December (V/N).	Ì,	South Co.			
Juliace Water	Present (Y/N):	-	Depth (in):	Motland H	drology Present (Y/N)	<b>Y</b>
Water Table F	Present (Y/N):		Depth (in):	wettand ny	arology Present (1/N)	·—/
Saturation Pre (includes capi			Depth (in):			
Notes: WG	ter table	OII	Poclets a 5	tardine	gliater up	10 ~ 5 mines deep.

VEGETATION VARIABLES P= Plot, M	= Matrix
Forested-Evergreen-Needle-leaved Scrub Shrub-Evergreen-Broad-leaved Persistent Aquatic Bed	cking Forested-Deciduous-Needle-leaved Forested-Deciduous-Broad-leaved Scrub Shrub-Deciduous-Needle-leaved Scrub Shrub-Deciduous-Broad-leaved Scrub Shrub-Evergreen-Needle-leaved Emergent-Non-persistent Emergent-
Percent Cover (P): Tree (>5 dbh, >6m tall) Dwarf shrub (<0.5m) <u>3</u> Tall herb (≥1ı	Sapling (<5 dbh, <6m tall) Tall shrub (2-6m) Short shrub (0.5-2m) 65  m) Short herb (<1m) 65  Moss-Lichen 20 Floating Submerged
Number of Wetland Types (M): _3	Evenness of Wetland Type Distribution (M): EvenModerately evenModerately even
80%) Very High Density (80-100%)	(0-20%) Low Density (20-40%) Medium Density (40-60%) High Density (60-
Interspersion of Cover & Open Water (P): Peripheral Cover >75% Scattere	100% Cover or Open Water X <25% Scattered/Peripheral Cover 26-75% Scattered or d or Peripheral Cover X N/A
Plant Species Diversity (P): Low (< 5 plant s	species) Medium (5-25 species)X High (>25)
Presence of Islands (M): Absent (none)	/ One or Few Several to Many N/A 🔀
Cover Distribution of Dominant Layer (P): Open Small Scattered Patches	No Veg Solitary, Scattered Stems 1 or More Large Patches; Parts of Site Continuous Cover
Dead Woody Material (P): Low Abundance Abundant (>50% of surface)	(0-25% of surface) Moderately Abundant (25-50% of surface)
Vegetative Interspersion (P): Low (large High (small groupings, diverse and intersperse	patches, concentric rings) Moderate (broken irregular rings)Xed)
HGM Class (P): Slope Flat_	Lacustrine Fringe DepressionalX Riverine Estaurine Fringe
SOIL VARIABLES	
Soil Factors (P): Soil Lacking Mineral: Gravelly Mineral: Sandy	Histosol:Fibric Histosol:Hemic Histosol: Sapric Mineral: Silty Mineral: Clayey
HYDROLOGIC VARIABLES	zm
Inlet/Outlet Class (B): No Inlet/Outlet MM	
Outlet X Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In	No Inlet/Intermittent Outlet No Inlet/Perennial Outlet Intermittent Inlet/No Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Out
Outlet X Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inle
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial II  Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial In
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Created	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Outlet Perennial Inlet/No Outlet Perennial In
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P). Absent	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Inle
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Created Microrelief of Wetland Surface (P). Absent Frequency of Overbank Flooding (P): No Creater Interval >5 yrs Degree of Outlet Restriction (P): No Outflow	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Pe
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Of Sedimentation (P): No Evidence Of Sedimentation (P): No Evidence Of Sedimentation (P): No Outlet O	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Pe
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Of Sedimentation (P): No Evidence Of Sedimentation (P): No Evidence Of Sedimentation (P): No Outlet O	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Pe
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Intermittent Interm	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Pere
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Intermittent	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet/Pere
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Sevidence of Sedimentation (P): No Evidence Of Sedimentation (P): No Evidence Of Sedimentation (P): No Evidence Of Sedimentation (P): No Outlet Created Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water Comparison of Surficial Glacial Deposit Under Wetland (P) Glacial Till/Not Permeable Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Sedimentation of Seeps and Security of Sedimentation of Seeps and Security of Sedimentation of Seeps and Security of Sedimentation of Security of Sedimentation of Sedimentation of Security of Sedimentation of	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Outlet Perennial Inlet/Perennial Outlet Perennial Outlet
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial In Wetland Water Regime (P): Drier: Seas Wet: Perm. Flooded, Intermittently Exposed, Seaten Evidence of Sedimentation (P): No Outlet Of Return Interval >5 yrs  Degree of Outlet Restriction (P): No Outflow Water pH (P): No surface water Comparison of Surficial Glacial Deposit Under Wetland (P) Glacial Till/Not Permeable  Basin Topographic Gradient (M): Low Evidence of Seeps and Springs (P): No Sedimentation of Seeps and Sedimentation of Seeps and Sedimentation of Seeps and Sedimentation of Se	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inl
Outlet Intermittent Inlet/Intermittent Inlet/Intermittent Outlet Perennial Interval Perennial Inte	Outlet Intermittent Inlet/Perennial Outlet Perennial Inlet/No Outlet Perennial Inlet/Perennial Inlet

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### Wetland Determination Form QA/QC Checklist

This form to be completed before leaving the field site.

Featur	re ID: WGOTTOIO Field Target: 180 Date: 06-03-14
For all	items not checked, please provide detailed explanation in the notes section of data form.
1.	Site Description
	<ul><li>✓ Site description, site parameters and summary of findings are complete?</li><li>✓ A detailed site sketch is included in logbook?</li></ul>
2.	Vegetation
	At least 80% of onsite vegetation has been keyed to species, or collected for later identification?  Vegetation names are entered legibly for all strata present?  Cover calculations are complete and correct?  All dominant species have been determined and recorded per strata?  Indicator status is correct for each species?  Dominance Test and Prevalence Index have been completed?
3.	Soil
	<ul><li>✓ Soil profile is complete?</li><li>✓ Appropriate hydric soil indicators are marked?</li></ul>
4.	Hydrology
	<ul> <li>✓ Appropriate hydrology indicators are marked?</li> <li>✓ Surface water, water table, and saturation depths are recorded if present?</li> </ul>
5.	Functions and Values
	☑ Vegetation, soil, hydrologic variables, and landscape variables complete if site is a wetland?
6.	Field Logbook
	<ul> <li>✓ Notes have been recorded at each site, including general description, sketch, and accuracy of pre-mapped wetland boundary as appropriate?</li> <li>✓ Each logbook page is initialed and dated?</li> </ul>
7.	Maps
	☐ Wetland boundaries have been corrected if necessary? ☐ Mans are initialed and dated?

#### 8. Photos

- Four photos were taken for each Wetland Determination Data Form (2 vegetation, 1 soil pit, 1 soil plug)?
- ☑ Two photos were taken for each Observation Point (vegetation/site overview)?

X we mede X younedward Wetland Scientist (print) Signature / Date

X Valence waters X Valencerthy

ld Crew Chief (print) Signature / Da

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Site Description	THE PARTY OF A	On the state of	The state of the state of						
	(many charter)								
Date: 4/3/14	Project Name & # Alaska LNG 2622	Field Target:							
Investigators:	J, ZM		Feature ID: いんの丁1011						
Latitude: 6/056/5 Logbook #: ,	3.37	Longitude:	11'39.56"	Datum: WGS84					
Logbook #: /		Logbook F	age #:	Picture #: P_WWOTIOII_					
<b>Location Description</b>		1. 1. 1.							
South	2 WGOTIO	10							
Common Species Ob	served (Scientific	Name)		THE PROPERTY OF THE PARTY OF TH					
Between nevale	askyng		Equise	tum sylvaticum					
Rhododendrum	tomentusu	m	U						
Betula nang				*:					
· Vaccinium v	The idazer								
Percent Cover of Domi		el: ///)							
Habitat Description:			100						
Burrid	upland area	-pau	rous spa	uce / birch forest					
Alaska Vegetation Cla	assification: Leve	l I, Level II,	Level III						
IIB2	I								
Notes:	Notes:								
			1060						

Field Crew Chief: \_\_\_\_\_\_ Field Scientist/Technician \_\_\_\_\_\_

QAQC

Level I	Level II	Level III				
l Forest	A. Needleleaf (conifer) forest	(1) Closed needleleaf (conifer) forest (2) Open needleleaf (conifer) forest (3) Needleleaf (conifer) woodland				
	B. Broadleaf forest	(1) Closed broadleaf forest (2) Open broadleaf forest (3) Broadleaf woodland				
	C Mixed forest	(1) Closed mixed forest (2) Open mixed forest (3) Mixed woodland				
li Scrub	A Dwarf tree scrub	Closed dwarf tree scrub     Open dwarf tree scrub     Dwarf tree scrub woodland				
	B <sub> </sub> Tall scrub	(1) Closed tall scrub (2) Open tall scrub				
	C. Low scrub	(1) Closed low scrub (2) Open low scrub				
	D Dwarf scrub	(1) Dryas dwarf scrub (2) Ericaceous dwarf scrub (3) Willow dwarf scrub				
III Herbaceous	A Graminoid herbaceous	(1) Dry graminoid herbaceous (2) Mesic graminoid herbaceous (3) Wet graminoid herbaceous (emergent)				
	B Forb herbaceous	Dry forb herbaceous     Mesic forb herbaceous     Wet forb herbaceous (emergent)				
	C Bryoid herbaceous	(1) Mosses (2) Lichens				
	D. Aquatic (nonemergent) herbaceous	(1) Freshwater aquatic herbaceous (2) Brackish water aquatic herbaceous (3) Marine aquatic herbaceous				

Des	criptions of levels I, II, III, and IV follow the classification table.
la .	Trees over 3 meters (10 ft) tall are present and have a canopy cover of 10 percent or more I Forest
1 b	Trees over 3 meters (10 ft) tall are absent or nearly so, Less than 10 percent cover. (Dwarf trees, less than 3 meters (10 ft) tall may be present and abundant
I F	prest
2a	Over 75 percent of tree cover contributed by needleleaf (conifer) species I A Needleleaf forest
2b	Less than 75 percent of tree cover contributed by needleleaf (confler) species .
3a.	Tree canopy of 60-100 percent cover
3b.	Tree canopy of 25-59 percent cover
3с	Tree canopy of 10-24 percent cover I.A.3 Needleleaf woodla
4a	Over 75 percent of tree cover contributed by broadlesf species
4b	Broadleaf or needleleaf species contribute 25 to 75 percent of the tree cover
5a	Tree canopy of 60-100 percent cover LB 1 Closed broadlesf fo
5b.	Tree canopy of 25-59 percent cover
5c.	Tree canopy of 10-24 percent cover
ва	Tree canopy of 60-100 percent cover I.C.1 Closed mixed fo
6b.	Tree canopy of 25-59 percent cover
вc.	Tree canopy of 10-24 percent cover
7a	Vegetation with at least 25 percent cover of erect to decumbent shrubs or with at least 10 percent cover of dwarf trees (less than 3 meters [108] tall)
7b.	Vegetation herbaceous (may have up to 25 percent shrub cover) .

11. Sc	rub
Ba.	Vegetation with at least 10 percent cover of dwarf trees
8b.	Vegetation with at least 25 percent cover of shrubs and less than 10 percent cover of dwarf trees
9a.	Dwarf tree canopy of 60-100 percent cover
9b.	Dwarf tree canopy of 25-59 percent cover
9c.	Dwarf tree canopy of 10-24 percent cover
,	Shrubs more than 1.5 meters (5 ft) tall
	Shrubs less than 1.5 meters (5ft) tall
	Shrub canopy cover greater than 75 percent
11 b	Shrub canopy cover of 25-74 percent   II B 2 Open tall scrub
12a	Shrubs 20 centimeters to 1.5 meters tall
12b	Shrubs under 20 centimeters in height
13a	Shrub canopy cover greater than 75 percent II C   Closed low scrub
13b	Shrub canopy cover of 25-74 percent, or as low as 2 percent if little or no other vegetation cover present
14a	Dryas species dominant in the dwarf shrub layer
14b	Ericaceous species dominant in the dwarf shrub layer
14c	Willow species dominant in the dwarf scrub layer II D 2 Willow dwarf scrub
111. 1	· derbaceous
15a	Terrestrial vegetation, or if growing in the water, dominated by emergent vegetation
15b	Dominant vegetation growing submerged in water or floating on the water surface, but not emerging above the water

16a	Grasses, sedges, or rushes (graminoid) plants dominant
16b	Forbs or bryophytes dominant
	Grasslands of well-drained, dry sites, such as south-facing bluffs, old beaches, and sand dunes Typically (but not always) dominated by Elymus spp., Festica spp., and Deschampsia spp. III A I Dry graminoid herbaceous
	On moist sites, but usually not with standing water. Usually dominated by Calemagnostis spp. Carex spp. or Eniophorum spp.  Lussocks often present
17c	On wet sites, standing water present for part of the year; dominated by either sedges or grasses; includes wet fundra bogs, marshes, and fens
18a	Vegetation dominated by forbs (broadleaf herbs, ferns, or horsetails) (broadleaf herbs, ferns, or horsetails) (broadleaf herbs, ferns, or horsetails)
18b	Vegetation dominated by mosses or lichens
19a	On dry sites, usually rocky and well drained; mostly tundra sites
19b	On moist sites but without standing water, mostly within forested areas
19c	On wet sites, usually with standing water for part of the year
20a	Vegetation cover dominated by mosses
20b	Vegetation cover dominated by lichens
21a	Vegetation submerged or floating in fresh water
21 b	Vegetation submerged or floating in brackish water aquatic herbaceous
21c	Vegetation submerged or floating in salt water

## Vegetation Classification Data Form QA/QC Checklist

This form is to be completed before leaving the field site.

	WESTION UN
Fe	ature ID: WOOT 10 Field Target: 186 Date: 06-03-14
Fo	r all items not checked, please provide detailed explanation in the notes section of data form.
1.	General Information
	∠ Location data recorded?
	Photo taken and photo number recorded?
2.	Location Description
	✓ Location of site recorded with enough detail to help relocate?
3.	Common Species
	Scientific name of common species recorded?
	Percent cover of dominant structure level noted?
4.	Habitat Description
	☐ Habitat described?
<b>5</b> .	Classification
	All three levels of classification recorded?
6.	Field Log Book
	Field form entries consistent with log book?
	☑ Logbook clearly identifies the Field Target ID and Feature ID?
\	
_	Voc meade X Jemes Signature
Fie	eld Technician (print) Signature
	V
•	
>	Valerit watking X Vallabli

Signature

Field Crew Chief (print)

DEC

SITE DESCRIPTION						
Survey Type: Centerline * Acce	ss Road (explain)	Other (exp	lain) comidn	Field Ta	get: <u>185</u>	Map #: 100 Map Date: 5/07/
Date: 06 -03 - 14	Project Name & No.:	Alaska LNO	3 26221306		Feature Id	SIO ITOOW:
Investigators: Valerie Wat	ade				Team No.: W60 11011	
State: Alaska	Region: Alaska		Milepost:	A0.7		
Latitude: 61° 57' 19.13"		Longitude	: -1500 11			Datum: WGS84
Logbook No.:	Logbook Page No.:	9	Picture No.:	P-WE	5071012	- F-W- PA-Plug
SITE PARAMETERS						A RESIDENCE OF THE PARTY OF THE
Subregion: interior			Landform (hills	slope, terra	ce, hummock	s, etc.): hummocics
Slope (%): 0 - 3			Local relief (co			None
Pre-mapped Alaska LNG/NWI classifica	tion: PSSIB		Soil Map Unit	Name:		100
Are climatic/hydrologic conditions on the YesX No(if no expl	site typical for this time ain in Notes)	of year?			mstances" pre (If no, exp	sent: olain in Notes.)
Are Vegetation, Soil, or Hyd	IrologySignificantl	y Disturbed?	No_ <i>X</i>	_(If yes, ex	plain in Notes)	
Are Vegetation, Soil, or Hyd	Irology Naturally P	roblematic?	No_X	_(If yes, ex	plain in Notes	.)
SUMMARY OF FINDINGS			M.			
Hydrophytic Vegetation Present? Yes_	No	ls	the Sampled A	rea within	a Wetland?	Yes No
Hydric Soil Present? Yes_	No ✓	_ w	etland,Type:	uplo	in d	
Netland Hydrology Present? Yes_	/ No	— Al:	aska Vegetation	Classificat	ion (Viereck):	II(2
Notes and Site Sketch: Please include D	irectional & North Arrow,	Centerline,	Length of feature	e, Distance	s from Center	line, Photo Locations, and Survey
Burno Tall Dead	A arra ding spl	W			PSSYB	
		CE			with arre	9
PHURUM TON DEAD SPINGER	in	- W6	071012	Νţ	land	
	Spluu	pirah	forest			

VEGETATION (use scientific names of plants)				War and the second seco	
Tree Stratum (Plot sizes:)	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Dominance Test worksheet:  No. of Dominant Species that are OBL, FACW, or FAC:  (A)  Total Number of Dominant Species Across All Strata:  (B)	
1.				% Dominant Species that are OBL, FACW, or FAC: 100 (A/B)	
2.				75	
3.					
4.				Prevalence Index worksheet:	
Total Cover:_	0			Total % Cover of: Multiply by:	
50% of total cover:	<u>O</u> 20°	% of total cov	er: <b>Ò</b>	OBL species: 2 X1 = 2	
Sapling/Shrub Stratum ( 20 )	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	FACW species: 30	
1. Salex pulchra	30	Y	FACW	UPL speciesX 5 =O	
2. Betula nana	5	Υ	FAC	Column Totals: 72 (A) 222 (B)	
3. Betula neoglaskana	10	<u> </u>	FACU	PI = B/A = 3.1	
4. Vaccinium uliginosum	2		FAC		
5,					
6.					
7.					
8.			/ A		
9. Total Cover:	41				
50% of total cover:		% of total cov	rer: 9.4		
VEGETATION (use scientific names of plants)	)				
Herb Stratum(	Absolute % Cover	Dominant Species? (Y/N)	Indicator Status	Hydrophytic Vegetation Indicators:	
1. Calamagrostis (anadensi:	30	Y	FAC	Morphological Adaptations¹ (Provide supporting data in	
2. Comarum palustre	2		OBL	Notes)	
3. Equisetum arvense	2		FAC	Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)	
4 Iris setosa	1		FAC	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present unless	
5.				disturbed or problematic	
6.					
7.				% Bare Ground	
8.				% Cover of Wetland Bryophytes	
9.				OTotal Cover of Bryophytes	
10.				Cover of Water	
Total Cover:	35		Hydrophytic Vegetation Present (Y/N):/  Notes: (If observed, list morphological adaptations below):		
50% of total cover:		ver:1			

SOIL			Date 06   03   14 Fe	ature II	DW60	FIOIT		Soil Pit Required (Y/N)
SOIL PROFIL	E DESCRIPTION: (	Describe					confirm the absence	
Depth Matrix			Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Texture	Notes
0-5		-	Section and the second section of the second	****	-	And Carrellment of	Fibric	Organics
5-12	Procedure your games and the second		The Advisor of the Chart	-		PROBLEM .	hemic Isapric	organics
12-18	2.5Y 3/3	50	54R 314	50	C	M	Silt loam	3
18-21	10 YR 3/4	60	5 YR. 3/4	40	C	M	Silt loam	
1T., CC	D-Davis	tion DA	1 Deduced Mass			0 1 10 11	2	
	ncentration, D=Deple	tion, Ki	ri=Reduced Matrix, C	S=Cove	erea or	Coated Sand (		PL=Pore Lining, M=Matrix.
	stel (A1)		Alaska Clayad	(412)				OR PROBLEMATIC HYDRIC SOILS <sup>3</sup>
	on (A2)		Alaska Gleyed Alaska Redox					ange (TA4) <sup>4</sup>
	A3)		Alaska Gleyed					vales (TA5)
			Alaska Gleyeu	roles (	A 15)			ith 2.5Y Hue vithout 5Y Hue or Redder Underlying
Hydrogen Sulf	fide (A4)						Layer	ntilout 51 True of Reader Officerrying
	rface (A12)	_					Other (Explain in	
One indicator	of hydrophytic veget roblematic	tation, o	ne primary indicator	of wetla	nd hydr	ology, and an	appropriate landscap	e position must be present unless
<sup>4</sup> Give details o	of color change in No	tes.					1	
Restrictive Lay	yer (if present): Type	- 12	A	epth (in	iches):_	NIA		
United a Column	resent (Y/N):	-						
Hydric Soil P	resent (Y/N):		-					
Notes:	4							
HYDROLOGY	PRIMARY INDICAT	ORS (a	ny one indicator is su	ufficient)		SECONDAR	Y INDICATORS (2 o	r more required)
			face Soil Cracks (P6)			Water-staine		Stunted or Stressed
Surface vvaler	(A1)		ace Soil Cracks (B6)			Leaves (B9)		Plants (D1)
High Water Ta	ble (A2)	Inui (B7		n Visible on Aerial Imagery Drainage Pattern			tterns (B10)	Geomorphic Position (D2)
Saturation (A3		Spa	sely Vegetated			Oxidized Rhizospheres along		+
Saturation (AS	/ <del></del>	Cor	cave Surface (B8)			Living Roots	(C3)	Shallow Aquitard (D3)
Water Marks (	B1)	Mai	Deposits (B15)			Presence of Reduced		Microtopographic Relief (D4)
0 1 1 1 1	Y (D0)	Hvo	Irogen Sulfide		-			
Sealment Dep	osits (B2)	- Odd	or (C1)			Salt Deposits (C5) FAC-Neutral Test (D5) _		
Drift Deposits	(B3)	Dry	-Season			Notes:		
			ter Table (C2)					
Algal Mat or C	rust (B4)	Oth	er (Explain in Notes)					
Iron Deposits (	B5)							
					= 5,-			
Surface Water	Present (Y/N):		Depth (in): 1	(				٨.
Water Table P	resent (Y/N):		Depth (in): 15	. 6		Wetland Hydrology Present (Y/N):		у
Saturation Pre- (includes capill			Depth (in): 05					
Notes:	1 1 20	. 4	r 11					
20	turation o	KA.	5"					