

Appendix B
Jurisdictional Determination Report and
REV Classification

Jurisdictional Determination Report
and REV Classification

Portage Reserve Mitigation Bank

Alaska Railroad Corporation

Portage, Alaska

February 2017

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Acronyms and Abbreviations

| | |
|-------|---|
| ADCM | Anchorage Debit-Credit Method |
| ARRC | Alaska Railroad Corporation |
| CFR | Code of Federal Regulations |
| FAC | Facultative |
| FACU | Facultative Upland |
| FACW | Facultative Wetland |
| GIS | Geographic Information System |
| GPS | Global Positioning System |
| HDR | HDR, Inc. |
| LiDAR | Light Detection and Ranging |
| MOA | Municipality of Anchorage |
| NRCS | National Resources Conservation Service |
| NWI | National Wetlands Inventory |
| OBL | Obligate |
| PEM1 | Persistent Emergent |
| PRMB | Portage Reserve Mitigation Bank |
| PSS1 | Broad-leaved Deciduous Scrub-Shrub |
| PWS | Professional Wetland Scientists |
| REV | Relative Ecological Value |
| RPWs | Relatively Permanent Waters |
| SPN | Special Public Notice |
| TNWs | Traditional Navigable Waters |
| USACE | U.S. Army Corps of Engineers |
| USFWS | U.S. Fish and Wildlife Service |
| USGS | U.S. Geological Survey |



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1.0 Introduction and Purpose

The Alaska Railroad Corporation (ARRC) is taking preliminary steps to develop a wetland mitigation bank within the ARRC's Portage Terminal Reserve near Portage, Alaska. The Portage Terminal Reserve comprises 1,200 acres of developed and undeveloped land along the ARRC's main line and Whittier branch line. A portion of this area, the Portage Reserve Mitigation Bank area (PRMB area), has been identified as suitable for mitigation banking due to its high ecological value and potential for restoration projects. A requirement for development of a mitigation bank is preparation of a mitigation plan delineating wetlands and other waters of the U.S. (33 Code of Federal Regulations [CFR] 332.4 (c)(2)) within the mitigation bank site. The ARRC has contracted HDR, Inc. (HDR), to assist with the evaluation of the proposed mitigation bank parcel by identifying wetlands and other waters of the U.S. within the PRMB area. This report describes the wetlands and other waters of the U.S. delineated within the study area and classifies them by Relative Ecological Value (REV) using the Anchorage Debit-Credit Method (ADCM; Dean 2011).

The wetlands and other waters of the U.S. identified in this report are potentially subject to jurisdiction of the U.S. Army Corps of Engineers (USACE) under authority of Section 404 of the Clean Water Act of 1972 (as amended) or Section 10 of the Rivers and Harbors Act of 1899. Information presented herein complies with the USACE guidance for jurisdictional determination reports, Special Public Notice (SPN) 2010-45 (USACE 2010).

1.1 Study Area Description

The study area (PRMB area) comprises approximately 312 acres along 1.75 miles of the Alaska Railroad (Figure 1). The PRMB area has a width of 0.25 mile, with the northern boundary at Portage Glacier Road and the southern boundary 1.75 miles south of the same road. The Placer River runs parallel to the rail line, less than a mile to the west of the PRMB area.

The PRMB area is located within the Skookum Creek-Placer River and Portage Creek watersheds (hydrologic unit codes [HUCs] 190208000007 and 190203020304, respectively). These watersheds drain runoff from snow and glaciers visible from the PRMB area; the closest glaciers include Explorer Glacier, Portage Glacier, Byron Glacier, and Skookum Glacier. Many other glaciers upstream of the Placer River influence the hydrology in the area as well. The PRMB area can be found on the Seward D-6 U.S. Geological Survey (USGS) quadrangle located within Sections 5 and 6; Township 8 North, Range 3 East, Seward Meridian. The center of the parcel is located at a latitude/longitude of 60°48'22.12/-148°58'01.56 (NAD83).

The PRMB area is one of several private land parcels located in Portage, an area surrounded by Chugach National Forest. The town of Portage was abandoned after the 1964 Good Friday Earthquake, which lowered the elevation of the town and surrounding area by 6 feet. This caused the area to become inundated with saltwater, killing most of the trees. Much of the Portage area floods at high tide. Portage is now comprised of the Portage Section House (owned by ARRC) and the Alaska Wildlife Conservation Center, adjacent to Turnagain Arm.



1.2 Regulatory Definitions

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

Wetlands: "Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3(b)). Wetlands are a subset of "waters of the U.S." Note that according to the 1987 *Corps of Engineers Wetlands Delineation Manual (Wetlands Delineation Manual)* and in the 2007 *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Regional Supplement; USACE 1987, 2007)*, wetlands must possess the following three characteristics: (1) a vegetation community dominated by plant species that are typically adapted for life in saturated soils, (2) inundation or saturation of the soil during the growing season, and (3) soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions.

Other Waters of the U.S.: In addition to wetlands, waters of the U.S. include other waterbodies regulated by USACE, including navigable waters, lakes, ponds, and streams.

Uplands: Non-water and non-wetland areas are called uplands.

2.0 Methods

2.1 Field Work

HDR wetland scientists Malcolm Salway (Professional Wetland Scientist [PWS] # 1762), Zachary Halstead (PWS # 2046), Simon Wigren (PWS # 2669), and Andrew Dougherty conducted an on-site investigation of wetlands and waterbodies within the entire Portage Terminal Reserve on September 29 and 30, 2016; however, only field data collected within the PRMB area are included in this report. Soil conditions, hydrology, and vegetation communities were studied using methods described in the 1987 *Wetlands Delineation Manual* and 2007 *Regional Supplement* (USACE 1987, 2007). The field work occurred less than a week outside the USACE's recommended growing season (May 29 to September 27) for the Pacific Coastal Mountains ecoregion (USACE 2007). However, while the first hard frost (temperature below 28° Fahrenheit) of the fall occurred on September 28 (NRCS 2016), vegetation was still able to be identified to meet the requirements of the 2007 *Regional Supplement* (greater than 80 percent of plant species were identifiable).

Wetland/upland boundaries were determined by completing paired data points. This process involved completing standard USACE Wetland Determination Forms (taken from the 2007 *Regional Supplement*) near observable transition zones between wetter and drier areas. A determination form was completed in the wet area to verify its wetland status, and then a second determination form was completed in the drier area to verify its upland status. The wetland/upland boundary between the two data plots was then identified and marked on field maps.

Standard USACE Wetland Determination Forms were completed at 15 sites within the PRMB area. Photographs and observational data were collected at 56 additional Observation Points to document sites that exhibited characteristics similar to those of areas where a data form had already been completed, or to document the presence of a waterbody or stream. Locations of both Wetland Determination Form and Observation Point sites were logged into a handheld global positioning system (GPS) unit and are shown on Figure 3.

2.2 Wetland Mapping and Classification

Upon returning from the field, scientists analyzed field-collected data and reviewed the following datasets in a Geographic Information System (GIS) to help delineate and classify wetlands and waterbodies in the PRMB area:

- Digital color ortho-rectified aerial photography taken in 2015, at sub-meter horizontal accuracy ground pixel resolution provided by the Municipality of Anchorage (MOA; MOA 2015)
- Light Detection and Ranging (LiDAR) raster dataset, at a 3-foot ground pixel resolution provided by the MOA (MOA 2015)
- U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) digital wetland mapping (USFWS 2014; see Figure 2)
- Anchorage Wetland Management Plan wetland mapping (MOA 2005; see Figure 2)

GPS locations of field-visited sites were overlaid on the aerial photography in GIS to identify and classify wetlands and other waters present within the PRMB area. Aerial photography vegetation signatures from these field-visited sites were then extrapolated to similar locations throughout the PRMB area, and wetland/upland boundaries were digitized into GIS. Delineating wetlands from aerial photography involves the following methods:

- *Vegetation clues:* Scientists examine aerial photographs for saturation-adapted vegetation communities; indicative canopy structure and height; and presence of hydrophytic plant species.
- *Evidence of soil saturation:* A site's proximity to streams, open water habitat, and marshes can be indicative of shallow subsurface water. Scientists, therefore, look for visible evidence of wetland hydrology, including surface water and darker areas of photos indicating surface saturation.
- *Topography:* Evidence of topographic high points and sloped surfaces that would allow soils to drain supports classification of areas as upland. Topographic depressions, toes of slopes, and flat topography serve as indicators of potentially poor soil drainage.

Wetlands and waterbodies were classified based on a review of field notes, data forms, and site photographs. Polygons identifying homogeneous wetland and waterbody areas in the GIS-based mapping were attributed with NWI mapping codes based on the USFWS's *Classification of Wetlands and Deepwater Habitats of the U.S.* (Cowardin et al. 1979).

2.3 Relative Ecological Value (REV) Categorization

Wetland scientists analyzed field data and GIS mapping to classify the PRMB area by REV, according to the process detailed in the ADCM (Dean 2011). REV categories are a hierarchical way of indicating the "level of ecological function typically performed by a particular polygon" (Dean 2011). This wetland functional categorization is used within the MOA to determine appropriate compensatory mitigation during the Section 404/10 permitting process. Categories range from REV1 (highest functional value) to REV4 (lowest functional value), and are based on factors including landform, size, hydrologic regime, plant community, fish and wildlife use, extent of degradation, and adjacency to waterbodies.



The REVs assigned to wetlands and waterbodies within the PRMB area are presented in Section 7.0 of this report. Each REV was assigned based on the characteristics described in "Table 1: Polygons, and Relative Ecological Values (REVs), Grouped by Landform," found in the ADCM (Dean 2011).

3.0 Summary of Wetland Indicators

The vegetation, hydrology, and soil conditions described in this report are based on the field investigation conducted by HDR between September 29 and 30, 2016. Wetlands were identified in the field where scientists observed indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. Of the 15 locations where a data form was completed, 10 were determined to be wetland. Of the five remaining upland sites, two met the criteria for hydrophytic vegetation and wetland hydrology, but did not meet the criteria for hydric soil. Two sites met the criteria for hydrophytic vegetation but did not meet the criteria for hydric soil or wetland hydrology. The other upland site did not meet any of the three criteria required to be a wetland. Table 1 summarizes the Wetland Determination Form sites. The completed Wetland Determination Forms and photographs taken at each site are included in Appendix A.

In addition to the 15 locations where Wetland Determination Forms were completed, 56 Observation Points were documented. Observational data were collected at these points to describe the wetland or upland status of the community sampled, or to document the presence of a waterbody or stream feature. Photographs taken at each Observation Point are included in Appendix B.

Table 1. Summary of Wetland Determination Form Sites

| Plot Number | Latitude | Longitude | NWI Code ^a | HGM Class ^b | Hydrophytic Vegetation | Hydric Soils | Wetland Hydrology |
|-------------|----------|------------|-----------------------|------------------------|------------------------|--------------|-------------------|
| 1 | 60.80002 | -148.97209 | PSS1/EM1F | Flat | x | x | x |
| 2 | 60.79991 | -148.97136 | PSS1/EM1H | Flat | x | x | x |
| 3 | 60.80016 | -148.97053 | PSS1/EM1F | Flat | x | x | x |
| 6 | 60.80024 | -148.97208 | U | - | x | - | x |
| 13 | 60.80437 | -148.96992 | U | - | x | - | - |
| 19 | 60.80505 | -148.96814 | PEM1/SS1C | Flat | x | x | x |
| 31 | 60.80739 | -148.97004 | U | - | x | - | x |
| 36 | 60.80770 | -148.96951 | PEM1C | Flat | x | x | x |
| 38 | 60.80813 | -148.97040 | U | - | x | - | - |
| 46 | 60.81093 | -148.97140 | PSS1C | Riverine | x | x | x |
| 47 | 60.81055 | -148.97093 | PEM1C | Flat | x | x | x |
| 49 | 60.81015 | -148.97079 | U | - | - | - | - |
| 56 | 60.81183 | -148.97136 | PEM1F | Flat | x | x | x |
| 59 | 60.81425 | -148.97027 | PSS1/EM1C | Flat | x | x | x |
| 63 | 60.81546 | -148.96648 | PSS1/EM1C | Flat | x | x | x |

^a Source: Cowardin et al. 1979

^b Source: Brinson 1993

Note: **HGM**: hydrogeomorphic

3.1 Vegetation

A list of the dominant vascular plant species observed in the PRMB area during the field investigation and their indicator status (Lichvar et al. 2014; USACE 2016) is provided in Table 2. Synonyms of plant species names that were recorded in the field on Wetland Determination Forms are also included in the table. The dominant plant species were identified by using the "50/20 Rule" from the *Regional Supplement* (USACE 2007).

In total, 14 of the 15 sites where Wetland Determination Forms were completed met the requirements for hydrophytic vegetation; either through the dominance test or prevalence index (see Table 3). Hydrophytic vegetation was not always correlated with a wetland, as four sites with hydrophytic vegetation did not meet the remaining criteria to be classified as wetland. Site 49 was the only site not meeting the requirements for hydrophytic vegetation. Dominant plant species at Site 49 were red elder (*Sambucus racemosa*), narrow-leaf fireweed (*Chamaenerion angustifolium*), and bluejoint reedgrass (*Calamagrostis canadensis*).

Nine of the 14 sites where hydrophytic vegetation was documented were scrub-shrub communities. The remaining hydrophytic communities sampled were emergent (4 sites) and forested (1 site).

Table 2. Dominant Plant Species and Alaska Regional Indicator Status

| Scientific Name (Synonym) | Common Name | Indicator Status ^a | Scientific Name (Synonym) | Common Name | Indicator Status ^a |
|--|------------------------------|----------------------------------|------------------------------------|--------------------------|----------------------------------|
| <i>Alnus viridus</i> (<i>Alnus sinuata</i>) | Sitka Alder | FAC | <i>Myrica gale</i> | Sweetgale | OBL |
| <i>Athyrium cyclosum</i> (<i>Athyrium filix-femina</i>) | Western Lady Fern | FAC | <i>Pedicularis langsdorfii</i> | Langsdorf's Lousewort | FACW |
| <i>Calamagrostis canadensis</i> | Bluejoint reedgrass | FAC | <i>Picea glauca</i> | White Spruce | FACU |
| <i>Carex limosa</i> | Mud Sedge | OBL | <i>Populus balsamifera</i> | Balsam Poplar | FACU |
| <i>Carex utriculata</i> | Northwest Territory Sedge | OBL | <i>Salix barclayi</i> | Barclay's Willow | FAC |
| <i>Chamaenerion angustifolium</i> (<i>Epilobium angustifolium</i>) | Narrow-Leaf Fireweed | FACU | <i>Salix fuscescens</i> | Alaska Bog Willow | FACW |
| <i>Comarum palustre</i> (<i>Potentilla palustris</i>) | Purple Marshlocks | OBL | <i>Salix glauca</i> | Gray-Leaf Willow | FAC |
| <i>Dryopteris expansa</i> (<i>Dryopteris dilatata</i>) | Spreading Wood Fern | FACU | <i>Salix pulchra</i> | Diamond-Leaf Willow | FACW |
| <i>Eriophorum angustifolium</i> | Tall Cotton-Grass | OBL | <i>Salix scouleriana</i> | Scouler's Willow | FAC |
| <i>Equisetum arvense</i> | Field horsetail | FAC | <i>Sambucus racemosa</i> | Red Elder | FACU |
| <i>Equisetum fluviatile</i> | Water horsetail | OBL | <i>Viburnum edule</i> | Squashberry | FACU |

^a Wetland Indicator Status (Lichvar et al. 2014, USACE 2016). **FAC**: Facultative - species equally likely to occur in wetlands and non-wetlands; **FACU**: Facultative Upland - species usually occurs in non-wetlands; **FACW**: Facultative Wetland - species usually occurs in wetlands; **OBL**: Obligate Wetland - species almost always occurs under natural conditions in wetlands.



Table 3. Hydrophytic Vegetation Indicators at Wetland Determination Form Sites

| Site | Dominance Test (percent) | Hydrophytic Through Dominance Test | Prevalence Index | Hydrophytic Through Prevalence Index | Hydrophytic Vegetation Present? |
|--------------|--------------------------|------------------------------------|------------------|--------------------------------------|---------------------------------|
| 1 | 100 | X | 2.01 | X | X |
| 2 | 100 | X | 1.23 | X | X |
| 3 | 100 | X | 1.34 | X | X |
| 6 | 100 | X | 2.89 | X | X |
| 13 | 67 | X | 3.25 | - | X |
| 19 | 100 | X | 2.78 | X | X |
| 31 | 100 | X | 3.00 | X | X |
| 36 | 100 | X | 2.64 | X | X |
| 38 | 60 | X | 3.49 | - | X |
| 46 | 100 | X | 2.69 | X | X |
| 47 | 100 | X | 1.94 | X | X |
| 49 | 33 | - | 3.42 | - | - |
| 56 | 100 | X | 1.67 | X | X |
| 59 | 100 | X | 2.58 | X | X |
| 63 | 100 | X | 2.97 | X | X |
| TOTAL | - | 14 | - | 12 | 14 |

3.2 Soils

The PRMB area is not mapped by any detailed regionally specific National Resources Conservation Service (NRCS) soil survey. Site-specific soil characteristics were documented at each of the 15 Wetland Determination Form sites and are summarized in Table 4. Histosols were observed at three of the 15 Wetland Determination Form sites, and a histic epipedon was observed at another site. Hydrogen sulfide odor within 12 inches of the soil surface was detected at four of the sites, Alaska Redox at four sites, and Alaska Gleyed without Hue 5Y or Redder Underlying Layer was found at one site. Five Wetland Determination Form sites did not exhibit hydric soil characteristics and were classified as upland. These sites generally had shallow organic horizons, with 6 inches or less of an organic soil layer.

Specific information about the soil horizons and hydric soil indicators (e.g., depth of organic horizon) can be found on the data forms included in Appendix A. These indicators are further described in the 2007 *Regional Supplement* (USACE 2007).

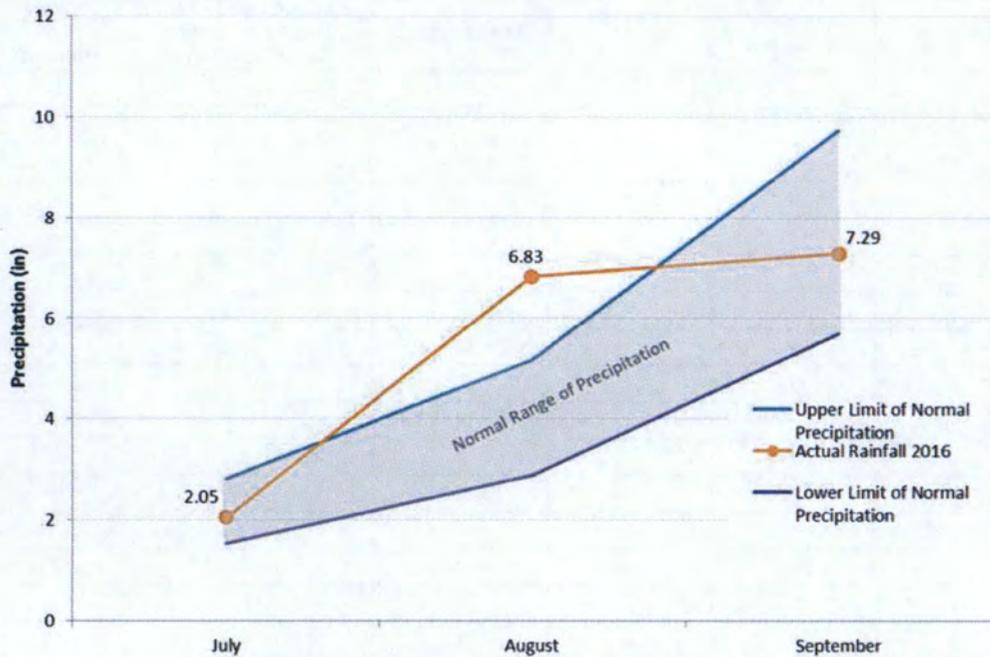
Table 4. Hydric Soil Indicators at Data Collection Sites

| Site | Histosol | Histic Epipedon | Hydrogen Sulfide | Alaska Redox | Alaska Gleyed without Hue 5Y or Redder Underlying Layer | Hydric Soil Present? |
|--------------|----------|-----------------|------------------|--------------|---|----------------------|
| 1 | X | - | X | - | - | X |
| 2 | X | - | - | - | - | X |
| 3 | X | - | - | - | - | X |
| 6 | - | - | - | - | - | - |
| 13 | - | - | - | - | - | - |
| 19 | - | - | X | X | - | X |
| 31 | - | - | - | - | - | - |
| 36 | - | - | X | - | - | X |
| 38 | - | - | - | - | - | - |
| 46 | - | - | - | X | - | X |
| 47 | - | - | - | X | - | X |
| 49 | - | - | - | - | - | - |
| 56 | - | X | X | - | - | X |
| 59 | - | - | - | X | - | X |
| 63 | - | - | - | - | X | X |
| TOTAL | 3 | 1 | 4 | 4 | 1 | 10 |

3.3 Hydrology

Precipitation data for the 3 months prior to the September 29 and 30 field investigation was reviewed to determine the degree to which any recent weather (e.g., abnormal wet or dry conditions) may have influenced field hydrology. Climate data for the surrounding region were obtained for the Alyeska weather station in Girdwood, approximately 11 miles northwest of the PRMB area. A closer weather station at the Portage Glacier Visitor Center (4.5 miles southeast of the PRMB) provides monthly precipitation data, but not the historical weather data necessary to determine normal conditions. The precipitation trends of the Portage Glacier Visitor Center in the preceding 3 months closely correlated that of the Alyeska weather station. Therefore, the Alyeska station was deemed sufficient to compare antecedent precipitation to normal conditions in the PRMB area.

The monthly precipitation totals preceding the field visit at Alyeska weather station were then compared to normal monthly totals derived from 1971 to 2000 using the NRCS *Engineering Field Handbook* method (NRCS 2014, 1997). This method weights the data by both the amount of precipitation and the relative age of a rainfall event. The results of the comparison are shown in Inset 1. Using the NRCS method, it was determined that the field work occurred during a period with normal antecedent precipitation.



Inset 1: Monthly precipitation totals in Girdwood, Alaska, compared to normal

The monthly precipitation totals preceding the field visit at Alyeska weather station were then compared to normal monthly totals derived from 1971 to 2000 using the NRCS *Engineering Field Handbook* method (NRCS 2014, 1997). This method weights the data by both the amount of precipitation and the relative age of a rainfall event. The results of the comparison are shown in Inset 1. Using the NRCS method, it was determined that the field work occurred during a period with normal antecedent precipitation.

Twelve of the fifteen Wetland Determination Form sites showed indicators of wetland hydrology. Of those twelve, six were inundated (see Table 5). The most common primary hydrology indicators displayed were saturation and/or a high water table present within the upper 12 inches. The most common secondary indicators observed were drainage patterns and a positive FAC-neutral test.

Specific information about the different wetland hydrology indicators (e.g., depth to saturation within the soil pit) can be found on the data forms included in Appendix A. These indicators are further described in the 2007 *Regional Supplement* (USACE 2007).

Table 5. Wetland Hydrology Indicators at Data Collection Sites

| Site | Primary Indicators | | | | | Secondary Indicators | | | | | Wetland Hydrology Present? |
|--------------|--------------------|------------------|------------|-------------|-----------------------|----------------------|-------------------|-----------------------|---------------------|------------------|----------------------------|
| | Surface Water | High Water Table | Saturation | Water Marks | Hydrogen Sulfide Odor | Water-Stained Leaves | Drainage Patterns | Oxidized Rhizospheres | Geomorphic Position | FAC-Neutral Test | |
| 1 | X | X | X | - | X | - | - | - | - | X | X |
| 2 | X | X | X | - | - | - | - | - | - | X | X |
| 3 | X | X | X | - | - | - | - | - | - | X | X |
| 6 | - | - | - | - | - | - | X | X | - | - | X |
| 13 | - | - | - | - | - | - | - | - | - | - | - |
| 19 | - | - | X | - | X | - | X | - | - | - | X |
| 31 | - | - | - | - | - | - | - | X | X | - | X |
| 36 | X | X | X | - | X | - | X | - | - | - | X |
| 38 | - | - | - | - | - | - | - | - | - | - | - |
| 46 | - | - | - | - | - | X | X | - | - | X | X |
| 47 | - | - | X | X | - | - | X | - | - | X | X |
| 49 | - | - | - | - | - | - | - | - | - | - | - |
| 56 | X | X | X | - | X | - | - | - | - | X | X |
| 59 | X | X | X | - | - | - | X | - | - | - | X |
| 63 | - | X | X | - | - | - | - | - | - | - | X |
| TOTAL | 6 | 7 | 9 | 1 | 4 | 1 | 5 | 3 | 1 | 6 | 12 |



4.0 Wetland and Waterbody Classification

Wetlands were identified where wetland scientists observed indicators of hydrophytic vegetation, wetland hydrology, and hydric soils. If any of these three requirements are not met under normal conditions, the site does not meet USACE criteria for classification as a wetland. Waterbodies were identified to their ordinary high water mark using procedures outlined in Regulatory Guidance Letter 05-05. Wetland/upland determinations were made at 15 sites where Wetland Determination Forms were completed and at 56 Observation Points.

4.1 Scrub-Shrub Wetlands

Broad-leaved deciduous scrub-shrub (PSS1) wetlands occupy 98.5 acres (approximately 32 percent) of the PRMB area (Inset 2). These wetlands are found throughout the PRMB area, particularly in the southern half, adjacent to the rail line.

Vegetation is typically dominated by sweetgale (*Myrica gale*), Barclay's willow (*Salix barclayi*), Sitka alder (*Alnus viridus*), and squashberry (*Viburnum edule*). Common herb species include bluejoint reedgrass (*Calamagrostis canadensis*), water horsetail (*Equisetum fluviatile*), tall cotton-grass (*Eriophorum angustifolium*), and mud sedge (*Carex limosa*).

Scrub-shrub wetlands mapped within the project area typically have a semipermanently flooded, seasonally flooded, or permanently flooded hydrologic regime. Soils are typically composed of at least 16 inches of organic material (Histosol) or contain mineral soil displaying Alaska Redox or Alaska Gleyed without Hue 5Y or Redder Underlying Layer. Soils with Alaska Gleyed without Hue 5Y or Redder Underlying Layer also had at least one primary indicator of wetland hydrology, hydrophytic vegetation, and were in an appropriate landscape position.



Inset 2: Semipermanently flooded broad-leaved deciduous scrub-shrub/ persistent emergent wetland (PSS1/EM1F) at Site 001

4.2 Emergent Wetlands

Persistent emergent (PEM1) wetlands comprise 164.6 acres (approximately 53 percent) of the PRMB area. These wetlands are part of large wetland complexes and found directly adjacent to waterbodies within the PRMB area.

Vegetation is typically dominated by bluejoint reedgrass (*Calamagrostis canadensis*), water horsetail (*Equisetum fluviatile*), and Northwest Territory sedge (*Carex utriculata*).

Approximately 92 percent of emergent wetlands mapped within the PRMB area have a semipermanently flooded or permanently flooded hydrologic regime (Inset 3). These areas are typically wetter than the immediately surrounding scrub-shrub vegetation communities. Hydric soil



Inset 3: Permanently flooded persistent emergent wetland at Site 65 (PEM1H)

indicators include a hydrogen sulfide odor within the upper 12 inches of the soil surface, Alaska Redox, and/or a histic epipedon.

4.3 Waterbodies

Waterbodies account for approximately 3 percent or 9.9 acres of the PRMB area. Waterbodies in the PRMB area were classified either as streams or ponds.

4.3.1 Streams

Streams within the PRMB area are both perennial and tidally influenced. Portage is located at the head of Turnagain Arm, which has a mean tidal range of 30 feet, the fourth largest tidal range in the world. These tides result in a fluctuating water level at the mouth of the Placer River and some of the surrounding streams within the PRMB area. These tidally influenced streams are relatively deep, with steep banks. They are permanently flooded with a silty unconsolidated bottom similar to the mudflats adjacent to Turnagain Arm (Inset 4). Perennial streams in the PRMB area are either permanently or seasonally flooded with an unconsolidated bottom or shore. Several streams flow through culverts beneath the rail line. These culverts connect the wetlands and streams within the PRMB area to the Placer and Portage Rivers as they flow into Cook Inlet.



Inset 4: Permanently flooded upper perennial unconsolidated bottom stream at Site 16 (R1UBV)

4.3.2 Ponds

Ponds within the PRMB area are permanently flooded waterbodies with either unconsolidated bottoms or aquatic beds. One small pond (Site 70; PUBHx) adjacent to the Portage Section House at the northern end of the PRMB area appears to be excavated out of uplands.



Inset 5: Excavated permanently flooded unconsolidated bottom pond at Site 70 (PUBHx)



4.4 Uplands

Uplands account for approximately 12 percent or 38.7 acres of the PRMB area. Forty-one percent of the uplands are disturbed and have been filled, such as along the rail line and a parking lot off Portage Glacier Road. The north section of the PRMB area also contains an overgrown, old compacted road and a narrow gravel trail.

The ARRC main line is a narrow band of disturbed upland running along the western boundary of the PRMB area. This gravel fill pad is typically bordered by a narrow band of uplands. The vegetation is generally closed alder thicket, spruce forest, or tall closed willow shrub.

Local topography is a major factor influencing wetland/upland status, with uplands present on elevated ground surfaces, above the influence of the water table. Common trees and shrubs in upland areas include Sitka alder, white spruce (*Picea glauca*), cottonwood (*Populus balsamifera*), diamond-leaf willow (*Salix pulchra*), and squashberry. Common herbs found include narrow-leaf fireweed (*Chamaenerion angustifolium*), bluejoint reedgrass, and spreading wood fern (*Dryopteris expansa*). Soils at upland sites were generally well-drained and sandy, with no indicators of hydrology.



Inset 6: Upland tall closed willow shrub (Site 6)

5.0 Wetland Mapping Results

Wetland/upland determinations were made at 15 sites where Wetland Determination Forms were completed and at an additional 56 sites where Observation Points were documented.

Approximately 272.9 acres (approximately 88 percent) of the 311.6-acre PRMB area were identified as wetlands and waterbodies. Wetland types include scrub-shrub and emergent wetlands. The remaining 38.7 acres of the PRMB area were identified as upland. Wetland and waterbody classes found within the PRMB area and acreages of each NWI classification type are provided in Table 6.

Figure 3 (Appendix A) displays the wetland, upland, and waterbody boundaries, and the boundaries between different wetland and waterbody types identified in the PRMB area. Locations of the Wetland Determination Form sites and Observation Points collected during the fieldwork are also shown on Figure 3.

Table 6. Wetland, Waterbody, and Upland Mapping Summary

| NWI Code | Description | Acres ^a |
|--|---|--------------------|
| Scrub-Shrub Wetlands | | |
| PSS1B | Saturated broad-leaved deciduous scrub-shrub wetland | 0.17 |
| PSS1C | Seasonally flooded broad-leaved deciduous scrub-shrub wetland | 10.24 |
| PSS1F | Semipermanently flooded broad-leaved deciduous scrub-shrub wetland | 0.13 |
| PSS1/EM1B | Saturated broad-leaved deciduous scrub-shrub/persistent emergent wetland | 0.35 |
| PSS1/EM1C | Seasonally flooded broad-leaved deciduous scrub-shrub/persistent emergent wetland | 29.22 |
| PSS1/EM1F | Semipermanently flooded broad-leaved deciduous scrub-shrub/ persistent emergent wetland | 40.37 |
| PSS1/EM1H | Permanently flooded broad-leaved deciduous scrub-shrub/ persistent emergent wetland | 17.99 |
| Total Scrub-Shrub Wetlands | | 98.46 |
| Emergent Wetlands | | |
| PEM1B | Saturated persistent emergent wetland | 0.30 |
| PEM1C | Seasonally flooded persistent emergent wetland | 0.92 |
| PEM1F | Semipermanently flooded persistent emergent wetland | 19.73 |
| PEM1H | Permanently flooded persistent emergent wetland | 108.66 |
| PEM1/SS1C | Seasonally flooded persistent emergent/ broad-leaved deciduous scrub-shrub wetland | 11.88 |
| PEM1/SS1F | Semipermanently flooded persistent emergent/ broad-leaved deciduous scrub-shrub wetland | 22.17 |
| PEM1/SS1H | Permanently flooded persistent emergent/ broad-leaved deciduous scrub-shrub wetland | 0.93 |
| Total Emergent Wetlands | | 164.58 |
| Waterbodies | | |
| Streams | | |
| R1UBV | Permanently flooded-tidal unconsolidated bottom stream | 2.63 |
| R2UBH | Permanently flooded lower perennial unconsolidated bottom stream | 0.53 |
| R2USC | Seasonally flooded lower perennial unconsolidated shore stream | 0.05 |
| Ponds | | |
| PABH | Permanently flooded aquatic bed wetland | 0.35 |
| PUBH | Permanently flooded unconsolidated bottom wetland | 5.84 |
| PUBHx | Permanently flooded unconsolidated bottom wetland (excavated) | 0.45 |
| Total Waterbodies | | 9.85 |
| Total Wetlands and Other Waters of the U.S. | | 272.89 |
| Uplands | | 38.68 |
| Total PRMB Area | | 311.57 |

^a Values have been rounded.

6.0 Jurisdictional Status

This wetland delineation was prepared in compliance with the USACE *Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement* (USACE 2007). The on-site determination conducted by HDR on September 29 and 30, 2016 indicates that of the total 311.6 acres in the project area, there are approximately 272.9 acres of potentially jurisdictional wetlands or waterbodies subject to USACE regulations.

Based on the current USACE guidance on jurisdiction, the USACE will assert jurisdiction over traditional navigable waters (TNWs), wetlands adjacent to TNWs, relatively permanent waters



(RPWs) that flow into TNWs, and wetlands that abut those RPWs. RPWs are defined as those tributaries that have flow year-round or at least seasonally (e.g. typically 3 months; USEPA and USACE 2008). All wetlands in the PRMB area are directly adjacent to relatively permanent tributaries flowing into the Placer River and Portage Creek. These streams flow into Cook Inlet, a TNW. Therefore, all wetlands and waterbodies within the PRMB area are preliminarily determined to be within the jurisdiction of the USACE under Section 404 of the Clean Water Act.

These preliminary determinations are based on current guidance in effect. New guidance has been released, the Clean Water Rule (33 CFR 328), but has been currently "stayed" nationwide by the 6th Circuit U.S. Court of Appeals. Enactment of the Clean Water Rule would not change the preliminary determination of the PRMB area wetlands.

7.0 REV Classification

The mapped wetlands, waterbodies, and uplands were classified into REV categories based on the ADCM. The results of the classification as well as any buffers and setbacks affecting the PRMB area are shown on Figure 4.

7.1 Wetland and Waterbody REV Classification

7.1.1 REV1 Areas

Approximately 90 percent (247.1 acres) of all wetlands and waterbodies within the PRMB area are classified as REV1 (see Table 7). The REV1 wetlands within the PRMB area are inundated from breakup through the end of June, are natural, and are part of a large wetland complex. All waterbodies within the PRMB area, with exception of the excavated pond, are classified REV1 because they are part of a wetland complex, and surface water is typically present through the end of June. Streams are classified as REV1 due to their perennial nature and the presence of salmonids. Although salmonids are present in PRMB area streams, fish passage in the PRMB area is typically restricted by culverts under the rail line.

Additionally, wetlands within a 100-foot setback of REV1 waterbodies and waterways that support salmonids are also considered REV1 wetlands. According to ADCM, the setbacks of these areas typically provide higher functions and values and are particularly vulnerable to disturbance.

7.1.2 REV2 Areas

The 25.4 acres of wetlands and waterbodies within the PRMB area categorized as REV2 are comprised of wetlands and a small excavated pond (see Table 7). The majority of REV2 wetlands in this area are inundated for at least 2 weeks during the growing season, are natural, and are part of a large wetland complex.

A small percentage of the REV2 wetlands (0.7 acre) is designated REV2 based on its location within a 300-foot buffer of a REV1 or REV2 aquatic resource. These areas typically provide higher value habitat than the same plant community elsewhere and therefore are also given a REV1 classification.

7.2 Upland REV Classification

A total of 22.0 acres of natural upland habitat was also categorized by REV value (Table 8). According to ADCM, these upland buffers protect the adjacent aquatic resource and are particularly susceptible to disturbance, as they are not protected by the Clean Water Act. A total of 12.2 acres of natural undisturbed uplands within 100-foot setback of a waterway or waterbody that supports

anadromous fish were classified as REV1, and 9.9 acres of natural undisturbed uplands within 300-foot buffer of a high value aquatic area were classified as REV2. No REV classification was given to disturbed uplands or natural undisturbed uplands outside a 300-foot buffer.

7.3 REV Classification Summary

A total of 295 acres were classified into REV categories based on their landform, size, hydrologic regime, plant community, fish and wildlife use, extent of degradation, and adjacency to waterbodies.

Table 7. Wetlands and Waterbodies by REV

| REV | Wetland Area (acres) | Waterbody Area (acres) |
|--|----------------------|------------------------|
| REV1 - based on polygon characteristics | 209.97 | 9.08 |
| REV1 - based on location within 100-foot setback of anadromous waterways | 28.08 | - |
| REV1 Total | 238.05 | 9.08 |
| REV2 - based on polygon characteristics | 24.33 | 0.45 |
| REV2 - based on location within 300-foot buffer of REV1 or REV2 area | 0.66 | - |
| REV2 Total | 24.99 | 0.45 |
| Total | 263.04 | 9.53 |

Table 8. Uplands by REV

| REV | Characteristic | Area (acres) |
|------|--|--------------|
| REV1 | Undeveloped upland within 100-feet of anadromous waterway or waterbody | 12.18 |
| REV2 | Undeveloped upland within 300 feet of REV1 or REV1 aquatic resource | 9.85 |
| | Total | 22.03 |



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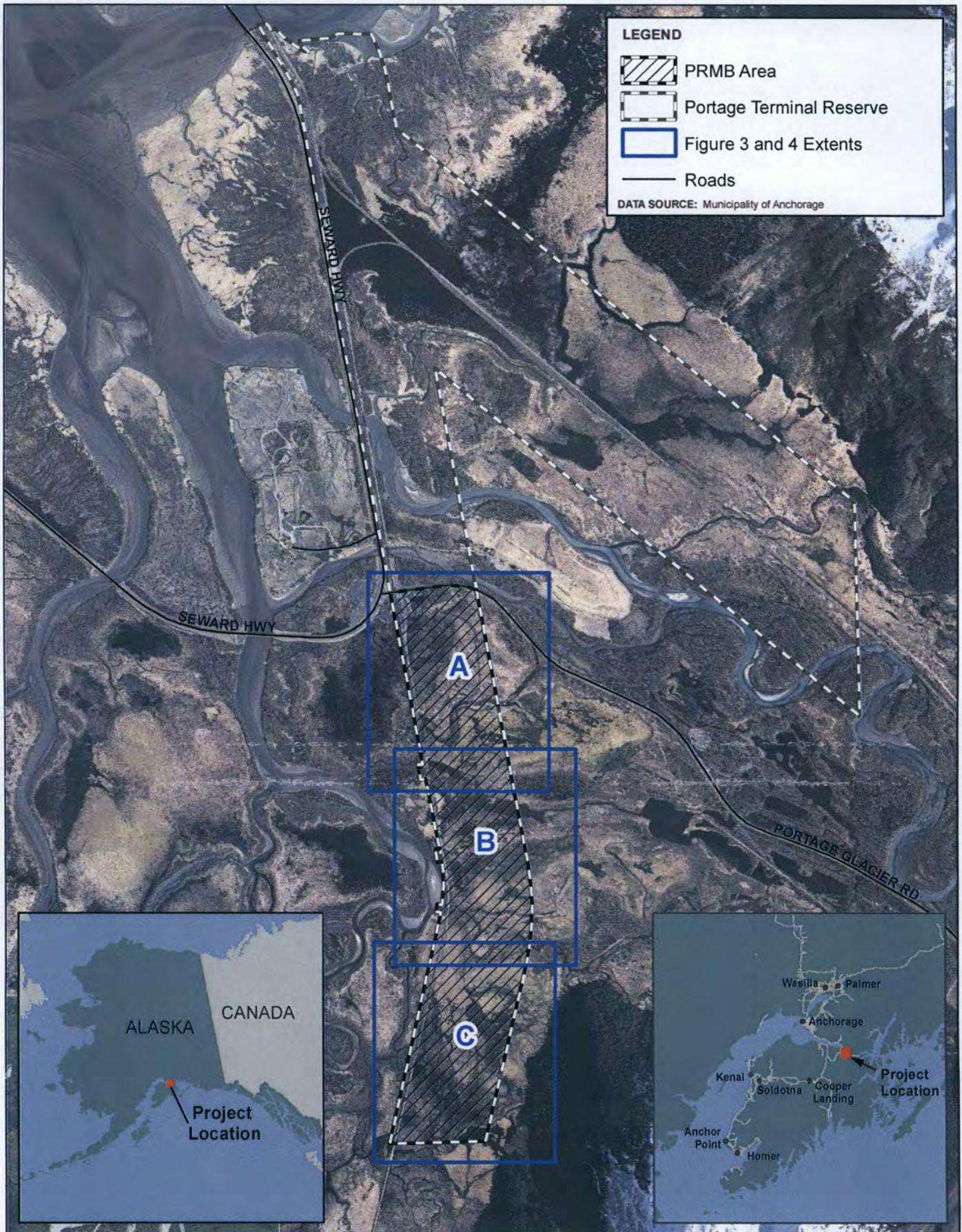
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Figures

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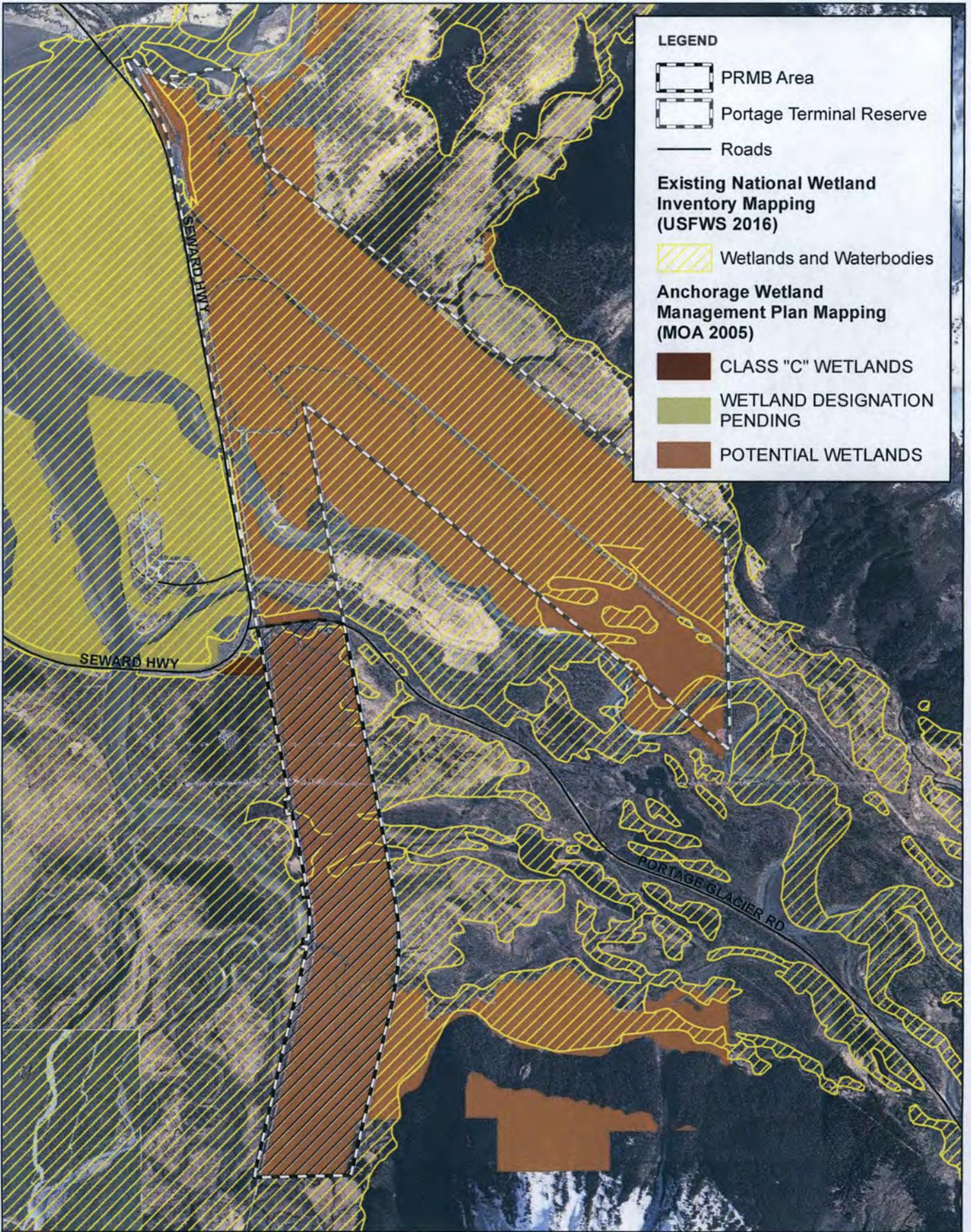
LEGEND

-  PRMB Area
-  Portage Terminal Reserve
-  Figure 3 and 4 Extents
-  Roads

DATA SOURCE: Municipality of Anchorage



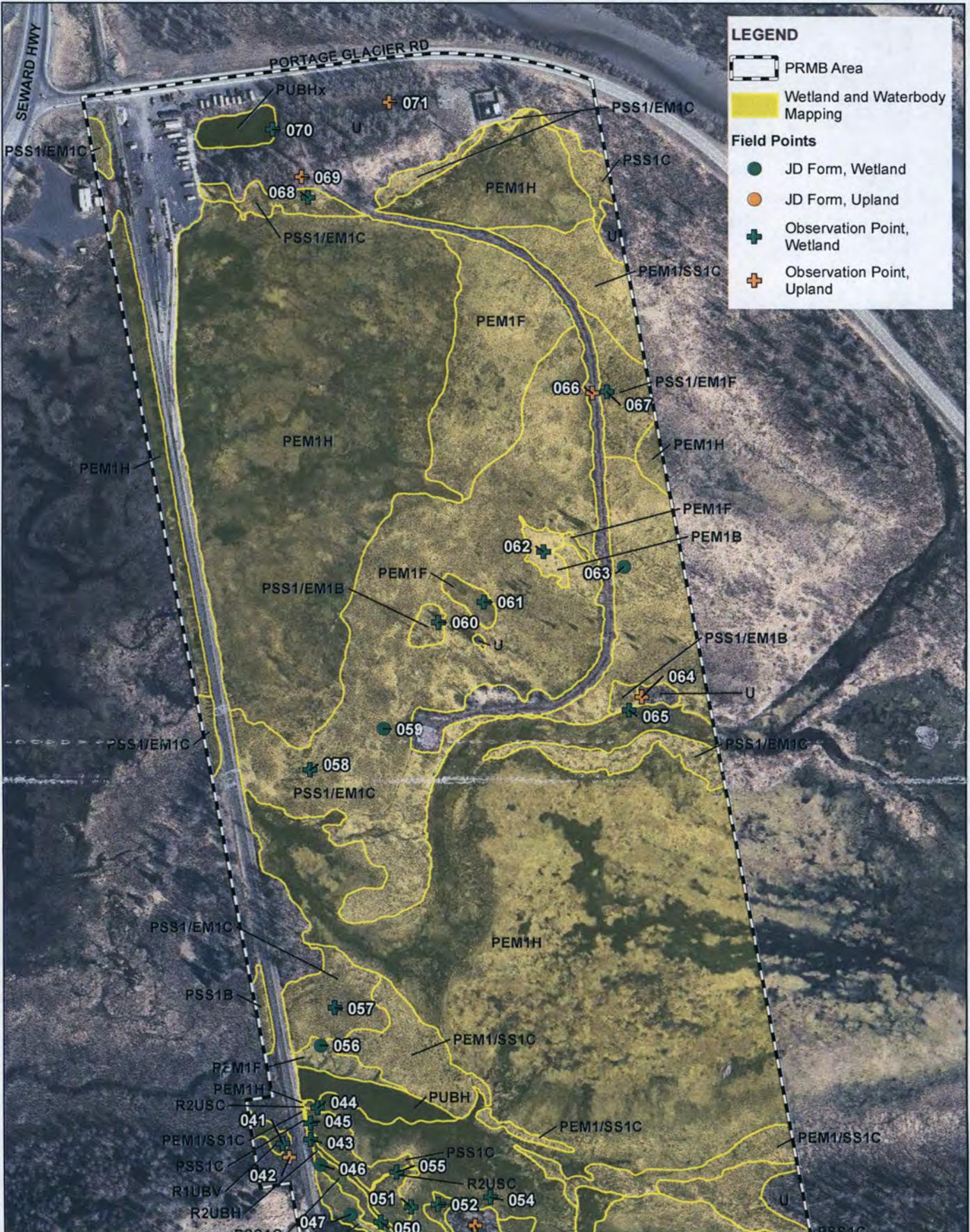
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PORTAGE RESERVE MITIGATION BANK

JURISDICTIONAL DETERMINATION REPORT AND REV CLASSIFICATION

FIGURE 2 - EXISTING WETLAND MAPPING

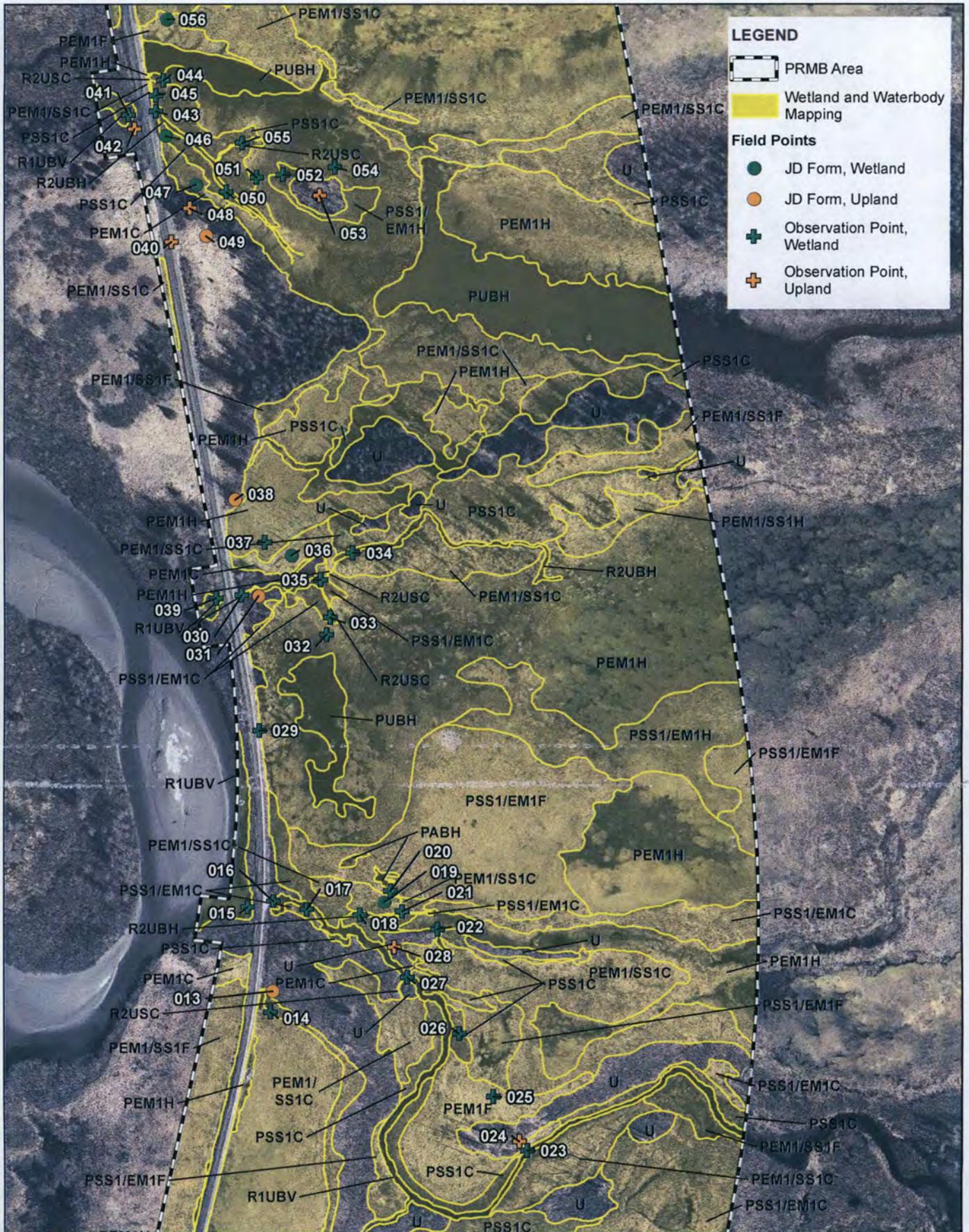


LEGEND

- PRMB Area
- Wetland and Waterbody Mapping

Field Points

- JD Form, Wetland
- JD Form, Upland
- Observation Point, Wetland
- Observation Point, Upland



LEGEND

- PRMB Area
- Wetland and Waterbody Mapping

Field Points

- JD Form, Wetland
- JD Form, Upland
- Observation Point, Wetland
- Observation Point, Upland

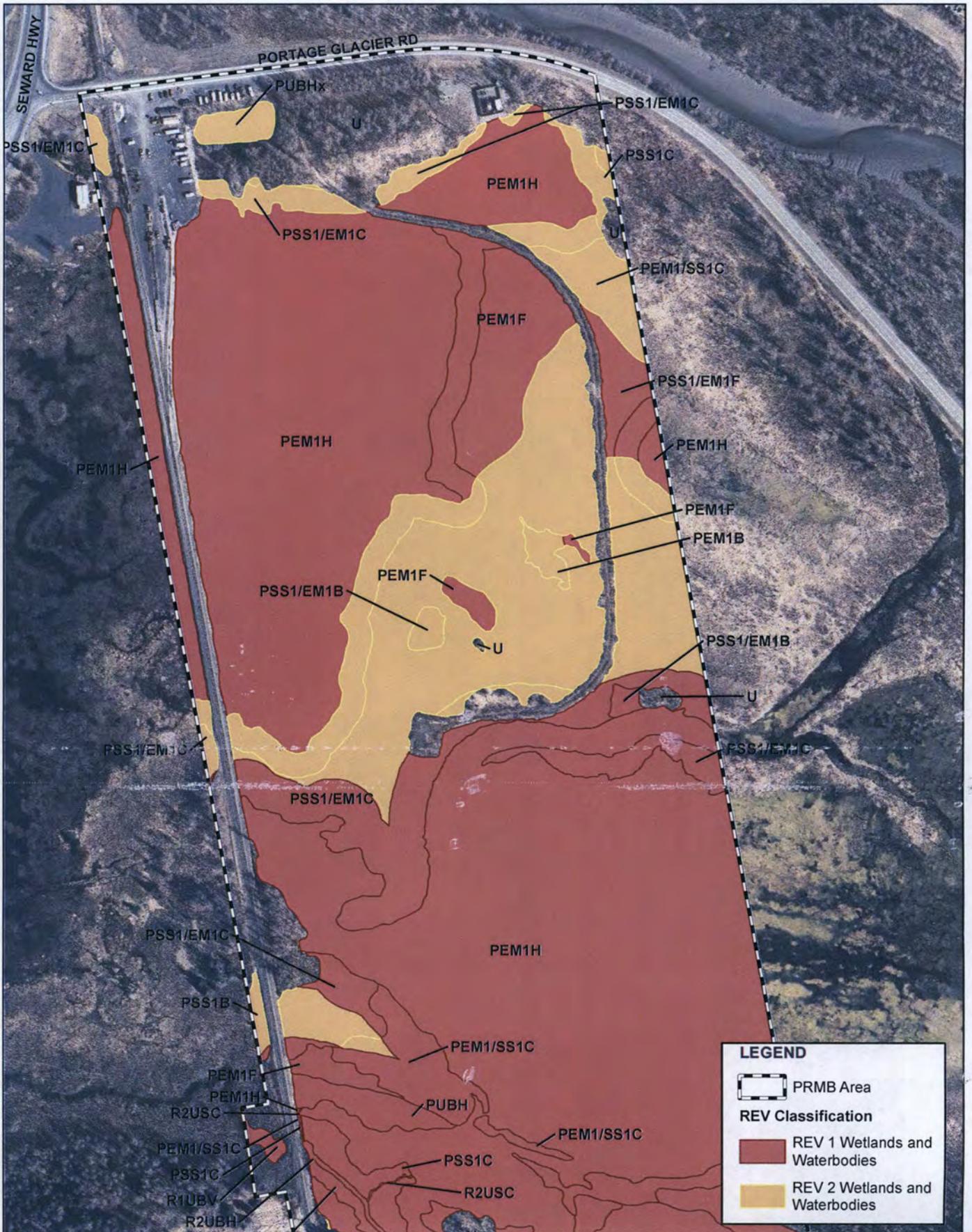


PORTAGE RESERVE MITIGATION BANK

JURISDICTIONAL DETERMINATION REPORT AND REV CLASSIFICATION

FIGURE 3B - WETLANDS MAPPING

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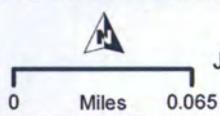
LEGEND

PRMB Area

REV Classification

REV 1 Wetlands and Waterbodies

REV 2 Wetlands and Waterbodies



PORTAGE RESERVE MITIGATION BANK

JURISDICTIONAL DETERMINATION REPORT AND REV CLASSIFICATION

FIGURE 4A - REV CLASSIFICATION

