Wetland Delineation Report

August 1, 2024

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK

Homer, Alaska

POA-XXXX-XXXX

Prepared by:

BISHOP ENGINEERING, LLC

PO Box 2501
Homer, AK 99603-2501
(907) 299-7609
www.bishop-engineering.com

Acronyms and Abbreviations

DT	Dominance Test
GPS	Global Positioning System
GNSS	Global Navigation Satellite System
HGM	Hydrogeomorphic
HDP	Hydrology Data Point
KWF	Kenai Watershed Forum
LiDAR	Light Detection and Ranging
NAD	North American Datum
NGS	National Geodetic Survey
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
NWPR	Navigable Waters Protection Rule
PEM	Palustrine, Emergent
PF	Palustrine, Forested
PI	Prevalence Index
PSS	Palustrine, Scrub Shrub
RDP	Rapid Data Point
RGL	Regulatory Guidance Letter
TNW	Traditional Navigable Water
UPL	Natural Upland
UPL/M	Human Modified Upland
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WDF	Wetland Data Form
WDR	Wetland Delineation Report
WSS	Web Soil Survey

Contents

This page intentionally left blank

1.0 Introduction

Kachemak Landing LLC has purchased 27 parcels of land totaling 71.61 acres, located in the unincorporated area of the Kenai Peninsula Borough, approximately 1 mile north of the City of Homer boundaries and split across two subdivisions. These lots include all 23 lots from the Tulin Skyline Heights Estates #2 that are on the south side of Cirrostratus Ave, and all 4 lots from Skyline Heights Estates Sub that are on the south side of Cirrostratus Ave. The full legal description of this land is "SUBDIVISION OF LOTS 33A, 33B, 34A, 34B, 34C, 34D, 35A, 35B, 36A, 36B, 36C, 36D, 37A, 37B, 37C, 37D, 38A, 39A, 40A, 41A, 43A, 44A & 48A TULIN SKYLINE HEIGHTS ESTATES #2 (HM 2008-90), AND LOTS 42, 45, 46 & 47 SKYLINE HEIGHTS ESTATES (HM 70-358) LOCATED IN THE NE1/4 SEC. 9 & THE NW1/4 SEC. 10, T. 6 S., R. 14 W., SEWARD MERIDIAN, KENAI PENINSULA BOROUGH, THIRD JUDICIAL DISTRICT, ALASKA." Additionally, work is expected to occur in Kenai Peninsula Borough right of ways, so for that purpose 14.9 acres of right of way were included in our wetland study, including 14.3 acres in the "project site" and an additional 0.6 acres lining Cirrus Rd, leading into the project. Our total area of study was approximately 86.4 acres.

Existing data on the area indicated that these parcels may contain wetlands under the jurisdiction of the United States Army Corps of Engineers. The proposed project would include improving existing roadways, improving an existing airstrip bisecting the parcels, installing electric and gas utilities, and subdividing the existing lots to be developed into residential housing and storage for small aircraft. The new subdivision is set to be called "Kachemak Landing Airpark," and is referred to as such in this report.

The chosen lots are located on the south side of Diamond Ridge Rd, approximately 1,300 feet east of Sterling Hwy, accessible via Cirrus Rd and Stratus Rd, and directly south of Cirrostratus Ave. Roadway development and improvement is set to occur along parts of Cirrostratus Ave, Aviation Way, Barred Moore Ave, and Miss Lassie St. Airstrip improvement is set to occur along the existing runway, which runs east to west centered between Cirrostratus Ave and Barred Moore Ave and is being used as a temporary roadway while improvement plans are finalized. Existing lots shall be replated and developed such that lots will line the runway on the north and south sides, with many of the lots being provided both runway access for small aircraft and roadway access for residential vehicles. Currently the lots are partially developed, with historical aerial imagery indicating development occurred when the runway was built between 2006 and 2011. At this time, multiple east to west ditches were installed across the lots both north and south of the runway, trees were cleared to either sides of the runway, culverts were placed crossing the runway, and multiple driveways were filled in to access various lots. Additionally, by 2015 beetle kill on the peninsula had cleared many more trees from the area, which was once densely forested. While previous development and beetle kill significantly altered hydrology and vegetation in the area, it has been several years since these changes have occurred and the land has acclimated to the new conditions. New vegetation has established itself and wetland communities have persisted.

In order to define permitting requirements, Bishop Engineering, LLC was retained by the Kachemak Landing LLC to complete a wetland delineation and performed both office research and fieldwork to determine the presence and distribution of wetland areas within the proposed project area. The study included classification and mapping of wetlands using aerial photography, elevation contours, hydrography data, soils information, best professional

judgment, and field data. Onsite wetland delineation data collection efforts were conducted across one day in June and six days in July of 2024 within a study area of about 86.2 acres, encompassing the areas slated for development both on property and in the right of ways. Additional visits had been conducted in March 2024 to collect geotechnical data for roadway design, and in November of 2023 to assess soil conditions for re-platting and future septic system design purposes. Data acquired during all visits were incorporated into our analysis of this site.

This report includes a map of wetland areas, a description and classification of wetlands and plant communities within the study area, and an appendix containing the data forms and photo documentation of sample sites (Appendix A). The soils report of the study area is included as Appendix B.

A hydrologic investigation was performed simultaneously with the wetland study to determine the jurisdictional status of wetlands found on the parcel and whether they qualified as navigable waters under the authority of the Navigable Waters Protection Rule.

FIGURE 1: VICINITY SITE MAP

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK

Jurisdictional Determination Report

Lat: 59.6721 Long: -151.6568

Seldovia C-5 NW Quadrangle

2,600 Feet

Figure 1. Airpark Development Vicinity Map

1.1 Conditions

According to the precipitation accumulation charts provided by the USDA, precipitation accumulation for the 2024 water year to date, encompassing the period from Oct 1, 2023 to July 24, 2024, precipitation has overall been within the 1991-2020 median range, with only brief periods of below median precipitation (Figure 1.A). However, a monthly breakdown of both snow water equivalent values (in) and precipitation month-to-date values (in) shows that snow water equivalent conditions were higher than median through the winter and into early spring, November 2023 – April 2024, and rainfall was high through April and May, and low through June (Figure 1.B). The deviations from median rainfall have not significantly affected vegetation development in the Homer region this season. Vegetation is growing well and is easily identified. The growing season for the Cook Inlet ecoregion is May 8 through October 5.

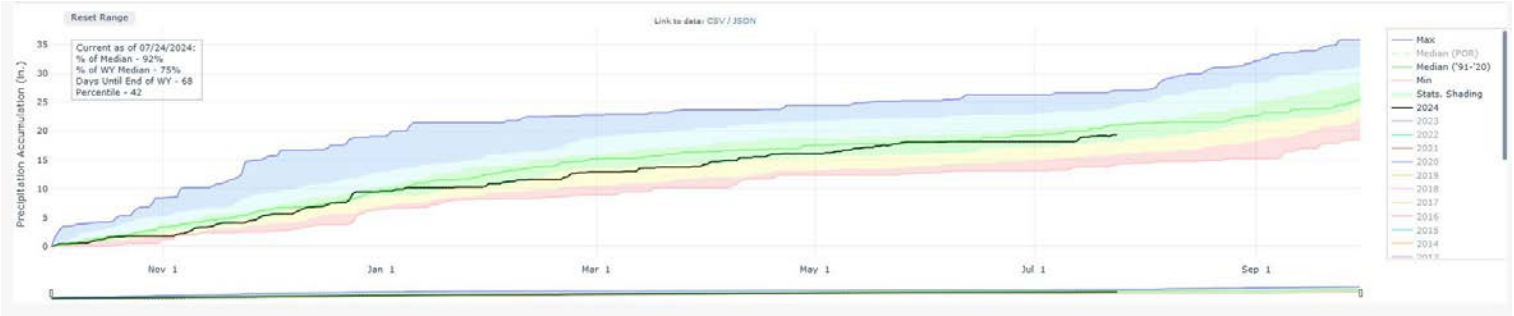


Figure 2. Mcneil Canyon Water Year to Date Precipitation (NRCS National Water and Climate Center)

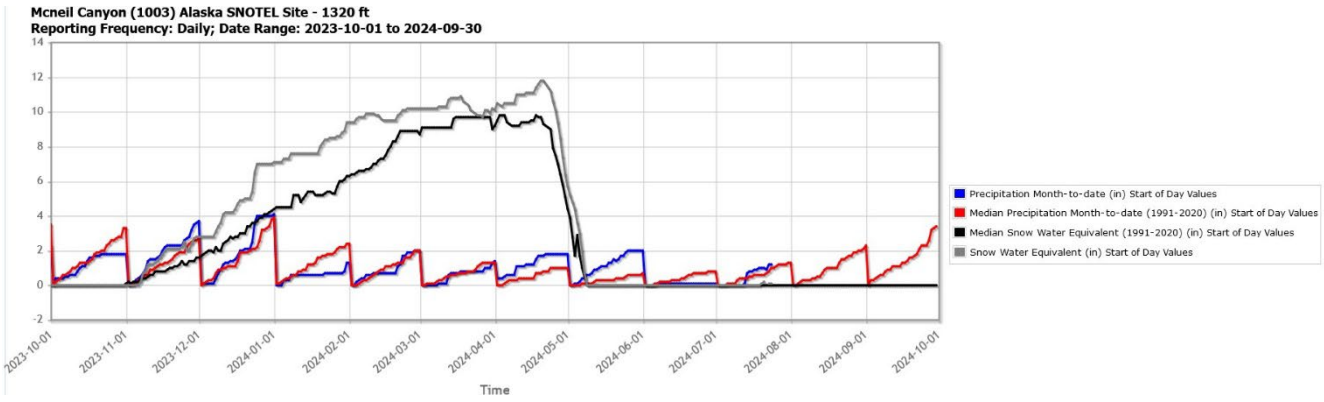


Figure 2.B. Calendar Year Month-to-Date Precipitation & Snow Water Equivalent (NRCS National Water and Climate Center)

Our surveys were taken across one day in June and six sunny days in July with some light rainfall between visits. The maximum rainfall during our field work was 1 inch of rain occurring between our July 11th visit and our July 15th visit. We found conditions on site were partially developed with an existing runway, roadways, ditches, and some driveways already in place. The runway, Aviation Way, Barred Moore Ave, and Miss Lassie St, and segments of Cirrostratus Ave are underdeveloped and unmaintained. Significant improvements including the installation of appropriate structural sections and widenings will be required to make these features fully functional. Aside from the roadways and runway, vegetation on site is well established and has largely recovered from previous clearing and development efforts.

2.0 Methods

Prior to the field investigation, existing information was reviewed including Natural Resource Conservation Service (NRCS) soils mapping, U.S. Fish and Wildlife Service (USFWS) National Wetland Inventory (NWI) mapping, Kenai Watershed Forum (KWF) Wetland Inventory, surveyed elevation data, and available aerial photography.

Wetland determinations were completed following the U.S. Army Corps of Engineers (USACE) three parameter approach (USACE 2007). Standard wetland determination forms (USACE 2007) were completed to document site conditions at each wetland determination plot (Appendix A). Verification plots were also recorded in upland communities on standard wetland delineation forms.

The field survey was completed between June 16th and July 31th, with the majority of the work conducted in July (see Figure 7). Sites were selected in the field based on current ground conditions and aerial imagery. Eight full wetland delineation forms (WDF) were completed and rapid data points were described at 256 sites.

A site must have hydric soils, wetland hydrology, and dominant hydrophytic vegetation to be classified as a wetland. Field plots were selected in representative vegetation types. At each determination site, plant species were identified and absolute percent cover across the tree, shrub/sapling, and herb strata was recorded. Plants were assigned hydrophytic indicator status using the 2022 Alaska Regional Plant List (U.S. Army Corps of Engineers. [2023]) and dominance was computed using the Dominance Test (DT) or Prevalence Index (PI), and morphological adaptations were considered when necessary.

Soil pits were excavated as described in the Field Indicators of Hydric Soils in the United States (Version 8.2, 2018). Soil profiles were described based on factors including color (Munsell Soil Color Chart 1992), moisture, texture, and reduction-oxidation features. Wetland hydrology was evaluated and described on the delineation forms at eight test plots. Site, vegetation, and soil photographs were taken at each plot. The site was walked by two field investigators and data points were marked using a hand-held Global Positioning System (GPS). For rapid data points (RDP), determinations were made via a mix of vegetation, the best judgement of the field investigator, and by digging shallow holes (less than 18”) to assess hydrological conditions. Surface water was counted as a positive hydrology indicator without digging any holes, but a lack of surface water was not counted as a positive or negative indicator. Where shallow holes were dug, the smell of hydrogen sulfide was counted as an immediate soil and hydrological wetland indicator. Where shallow holes were dug to examine hydrological features, dry soils and fresh scents (the absence of hydrogen sulfide odors), were counted as upland indicators. Delineation data sheets were not filled out for these RDP’s, however, field notes and GPS coordinates were recorded using a Garmin GPSMAP 67 unit and were incorporated into our AutoCAD Wetland Map. These notes are accessible in Appendix C.

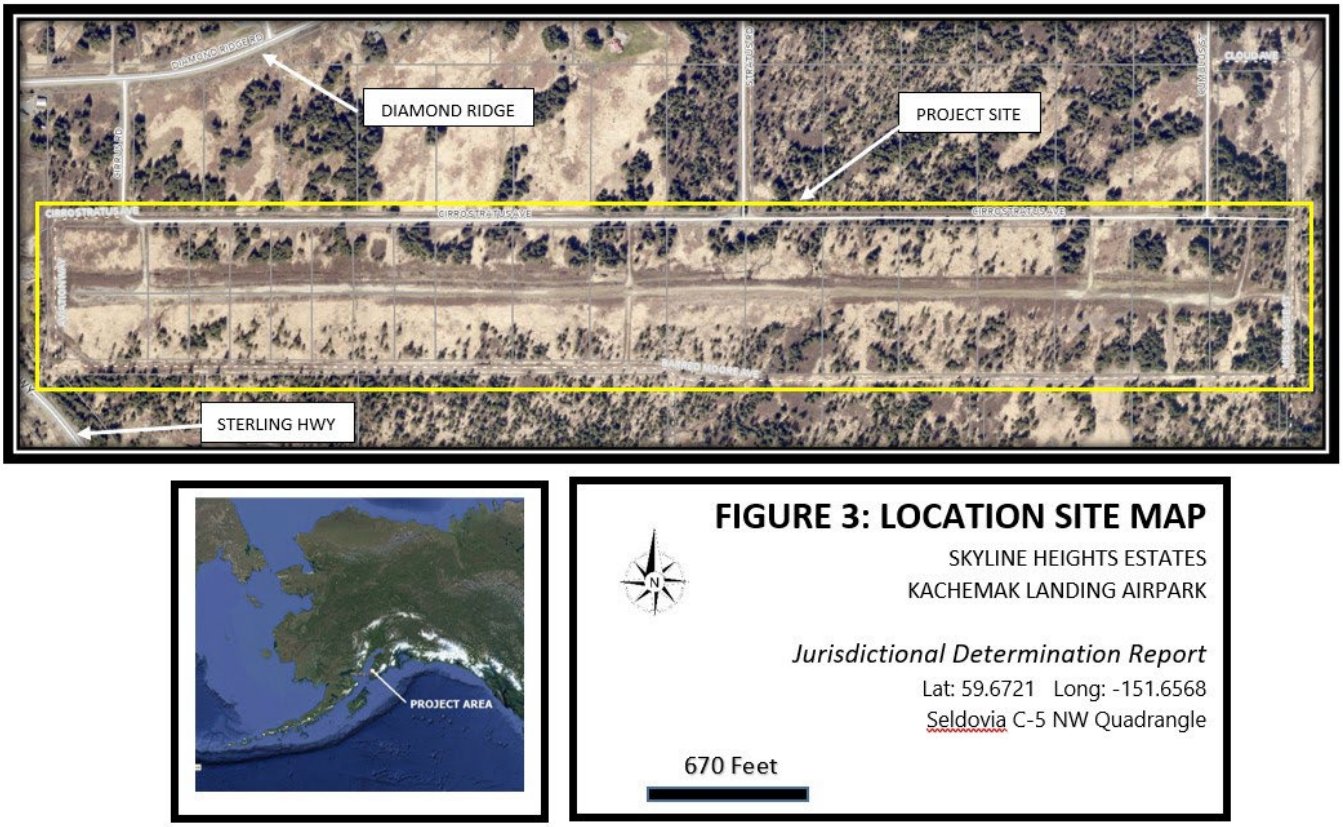


Figure 3. Project Location Map

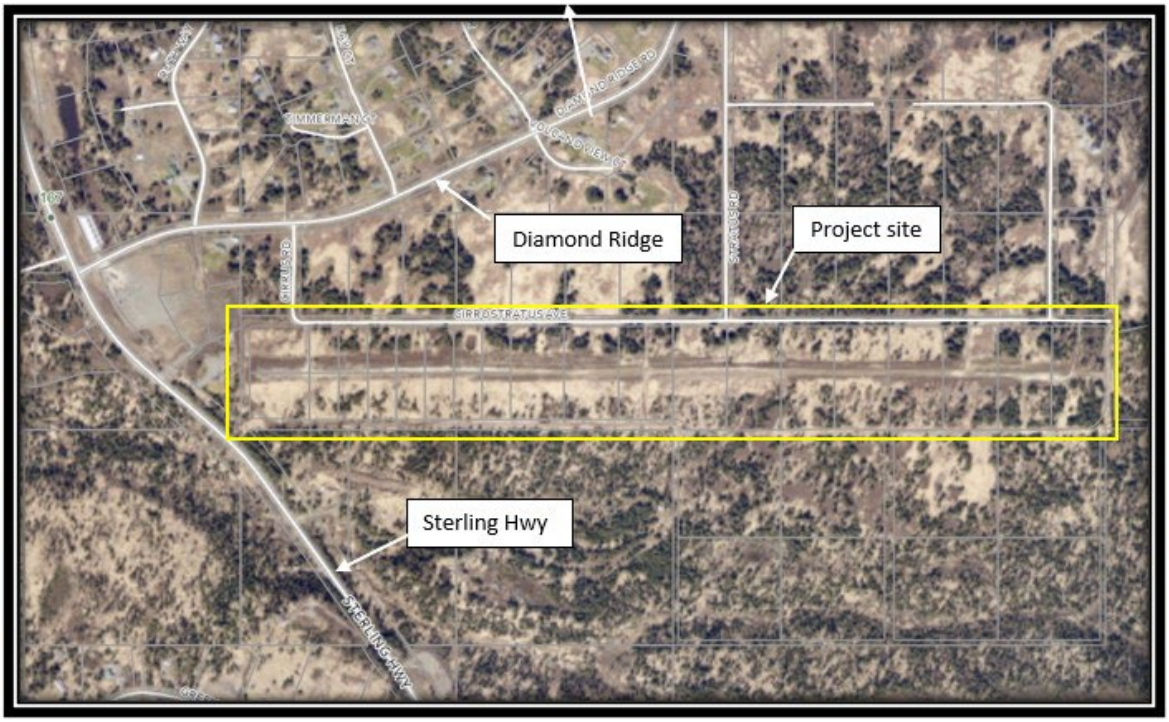


FIGURE 4: PROJECT SITE MAP

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK

Jurisdictional Determination Report

Lat: 59.6721 Long: -151.6568
Seldovia C-5 NW Quadrangle

1,000 Feet

Figure 4. Project Site Map

2.1 Wetland Mapping

Wetland geometries were determined by walking the property with a Garmin GPSMAP 67 unit and mapping on-site observations in Latitude/Longitude. The data were then mapped to the Alaska State Plane Coordinate System Zone 4-5004 based on NAD83(2011) via the NOAA NGS Coordinate Conversion and Transformation Tool (NCAT). The converted data, field notes, aerial imagery, existing contour data, soils report, and existing wetland maps were then imported to Autocad. Wetlands were categorized based on Cowardin et al. (1979), to at least class level, which describes the dominant vegetation. A wetland delineation plot was placed within an appropriate selection of wetland polygons bounding a wetland complex and a corresponding form was prepared in the representative uplands. In RDP situations, wetlands were mapped using GIS data and general field observations but complete data forms were not completed for these areas as they were similar enough in nature that they were represented by findings presented in data forms for adjacent wetlands. A mix of acronyms were used in field to record these rapid data points (Bdn, Clr, Clv, Dry, Rdp, Rdpd, Rdpw, Rvn, Swl, Wet, & Wtr) and were left unmodified in our maps, however, all points excluding our eight full test points (labeled WDTP #) were considered for this report to be “Rapid Data Points”. Point name variations were solely field descriptors found useful by the investigator.

The Kenai Watershed Forum (KWF) and USFWS National Wetlands Inventory (NWI) data layers were used in the wetland delineation. The KWF dataset was inferred remotely based on vegetation signature and landform interpretation and provided a solid starting point for the wetland delineation; however, the KWF dataset alone does not represent a complete or accurate picture of the entirety of wetland communities within the study area and were not found to be entirely accurate to field conditions. The polygons identified by the KWF were visited by the wetland investigator to confirm or refute the presence of wetlands in mapped or suspect areas, and to validate the areal extent of wetland boundaries based on field observations of wetland vegetation, soils, and hydrology. The KWF data layer overlain on the Kenai Peninsula Borough parcel map is shown in Figure 4A. The USFWS National Wetlands Inventory (NWI) maps are the most conservative maps we consult. While the positive indication of a wetland on the NWI map is strong evidence towards a region being a wetland, the lack of a wetland indicator per the NWI is not strong evidence for an upland. In the zone of this project, the NWI maps indicate the presence of wetlands cutting south through one of the central lots in this project via a riverine system classified as R5UBH, which connects to Diamond Creek, which outlets in Kachemak Bay. The NWI overlay is shown in Figure 4B.

Soils were mapped based on the Natural Resource Conservation Service (NRCS) Web Soil Survey (WSS) for the Western Kenai Peninsula Area. Both primary soils identified in the project area, Kachemak Silt Loam & Kachemak Silt Loam Forested, belong to Hydrologic Soil Group: B, indicating a well drained soils, with only a small portion on the southeast boundary identified as containing a third soil type, Spenard Peat, which is Hydric Soil Group: D, indicating poorly drained soils. The landform of the soil map units is primarily described as moraines on till planes.

The expected depth to the water table across both primary soil polygons is 80 inches or more. The soil mapping is shown in Figure 6.

In addition to using WWS data to understand the soils on site, we also utilized data gathered by our team during previous field work on this project site. For re-platting and future septic system design purposes, in November 2023 eleven test pits were excavated to depths ranging from 5 feet to 10 feet to assess soil conditions and drainage ability. In general, we found 8 to 18 inches of organic silt, roots, and sod over sandy silt soils of varying firmness. Groundwater was encountered at depths from 16 inches to 48 inches below the ground surface. Soil layers near the bottom of test pits, below the groundwater table, were found to be impermeable. Percolation tests were also performed at several test pit locations and generally indicate slow draining shallow soils. These test results are accessible in Appendix D and test locations are labeled on our map.

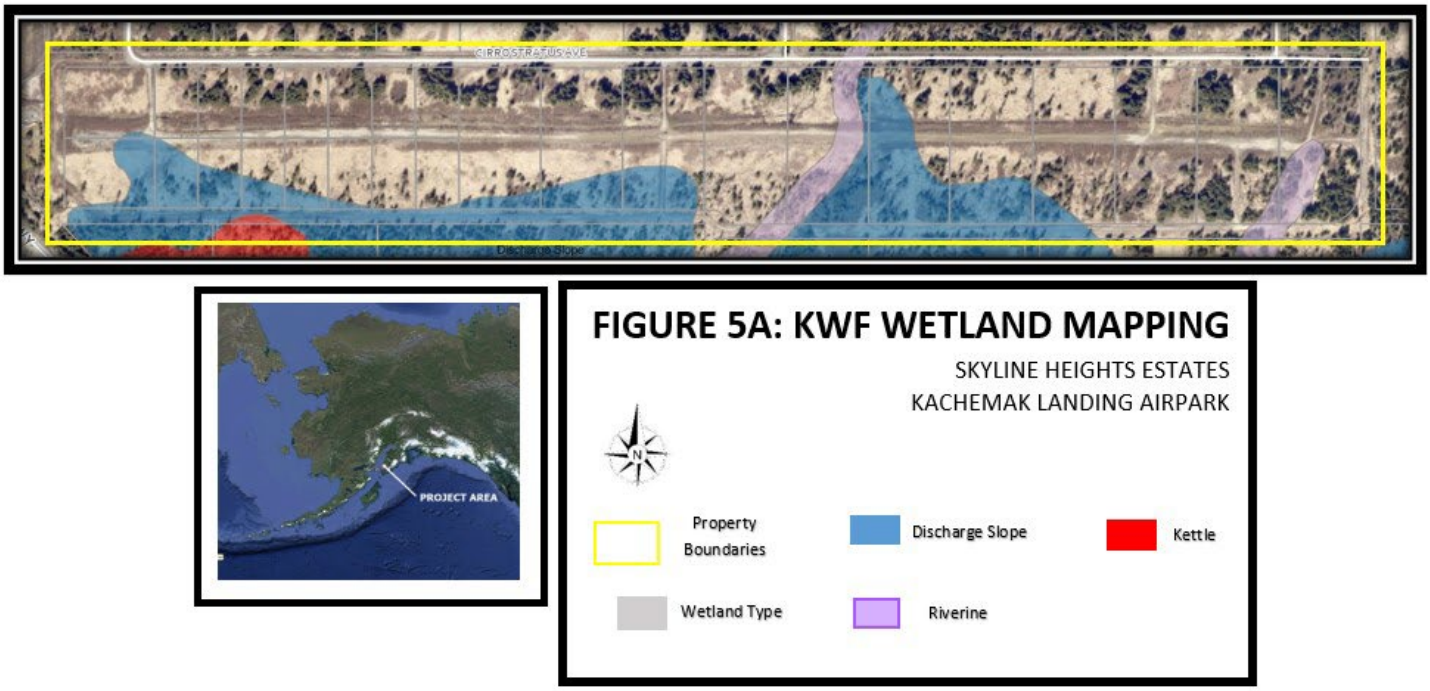


Figure 5A. Kenai Watershed Forum Wetland Mapping

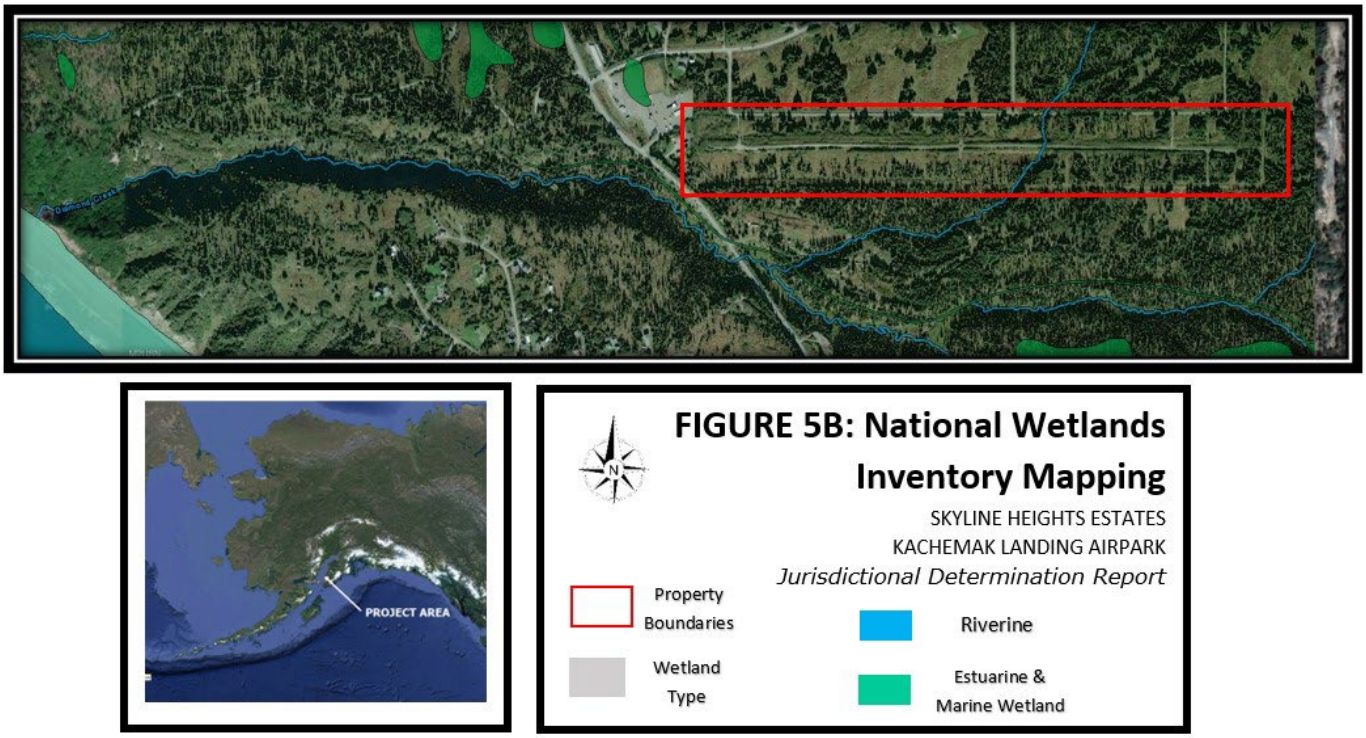


Figure 5B. National Wetlands Inventory Map

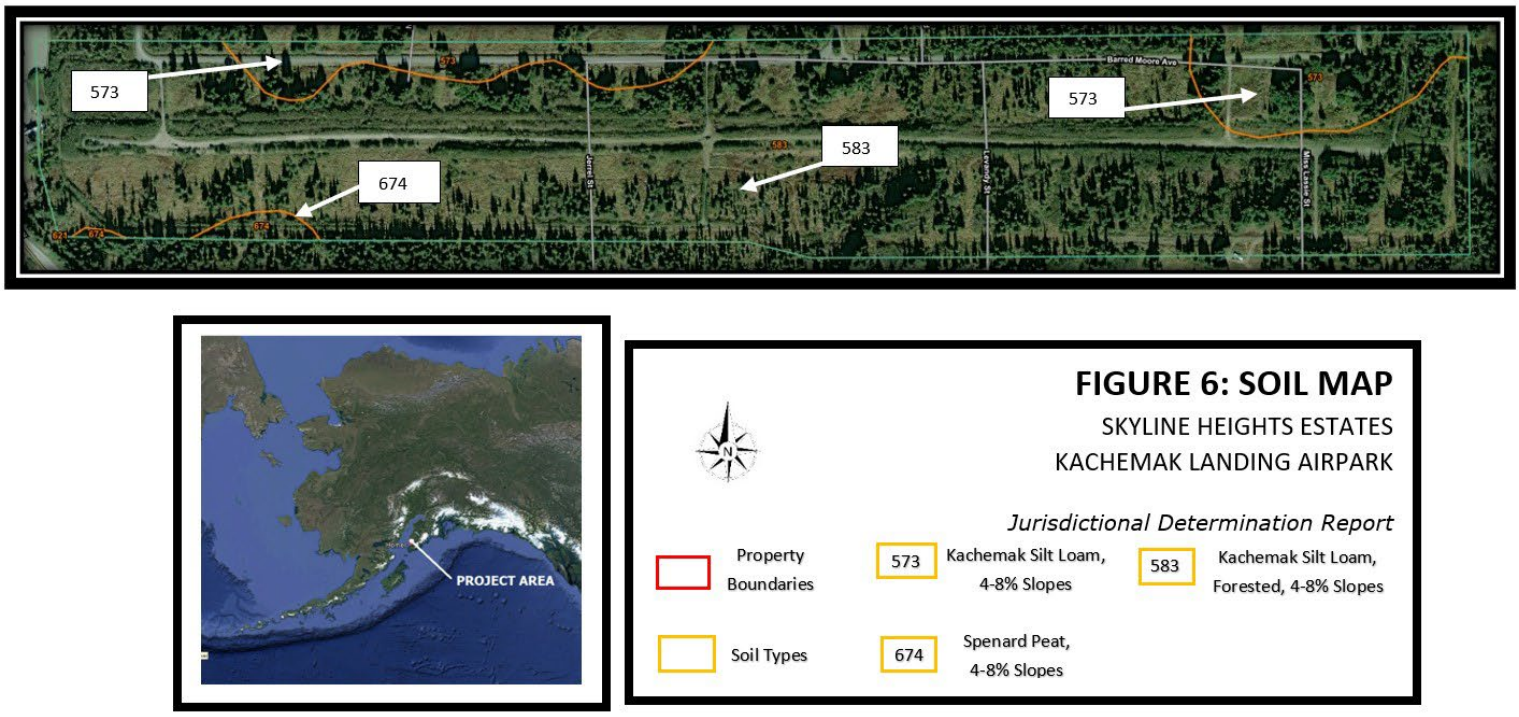


Figure 6. Web Soil Survey (NRCS National Water and Climate Center)

3.0 Results

Standard USACE field determinations were completed at 8 locations and Rapid Data Points were characterized qualitatively at 256 points, with field notes accessible in the wetland map in Appendix C. Six land types were identified across the property, with four types classified down to Cowardin subclass (Table 1): Four wetlands and two upland types were identified. Wetland communities were identified to subclass in accordance with the standards established in *Classification of Wetland and Deepwater Habitats of the United States* (Cowardin, et al, 1979), quoted in whole:

> "If vegetation (except pioneer species) covers 30% or more of the substrate, we distinguish Classes on the basis of the life form of the plants that constitute the uppermost layer of vegetation and that possess an aerial coverage 30% or greater. For example, an area with 50% areal coverage of trees over a shrub layer with a 60% areal coverage would be classified as Forested Wetland; an area with 20% areal coverage of trees over the same (60%) shrub layer would be classified as Scrub-Shrub Wetland. When trees or shrubs alone cover less than 30% of an area but in combination cover 30% or more, the wetland is assigned to the Class Scrub-Shrub. When trees and shrubs cover less than 30% of the area but the total cover of vegetation (except pioneer species) is 30% or greater, the wetland is assigned to the appropriate Class for the predominant life form below the shrub layer. Finer differences in life forms are recognized at the SUBCLASS level. For example, Forested Wetland is divided into the Subclasses Broad-leaved Deciduous, Needle-leaved Deciduous, Broad-leaved Evergreen, Needle-leaved Evergreen, and Dead. Subclasses are named on the basis of the predominant life form."

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

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

Figure 7: Delineation Wetland Map: A1 (see Appendix C for full size)

Data point locations were selected based on remote inferences and field observations. The site was walked thoroughly to describe hydrology at representative data points. Wetlands, uplands, test points, and rapid data point locations are shown in detail in Appendix C.

Table 1. Wetland types found within the study area

Wetland Type	Abbreviation
Palustrine Emergent Persistent	PEM
Palustrine Scrub-Shrub: Broad-leaved Deciduous	PSS
Palustrine Forested: Mixed	PF
Riverine Perennial	RP
Upland	UPL

Palustrine Emergent Persistent (PEM) wetland communities in the study area were typically dominated by *Calamagrostis canadensis* forming approximately 80% or more of the absolute cover, with a mix of *Chamaenerion angustifolium* ranging from 0-60% coverage. While *C. angustifolium* is generally considered an uplands plant and is classified as FACU by the Alaskan region of the 2022 National Wetland Plant List, our local specimens were observed onsite to exhibiting a morphological adaptation of growing specifically on the upper surface areas of established hummocks, which raises the plants above ground level and reduces their exposure to surface water or saturated soils. For this reason, where *C. angustifolium* was found growing in *C. canadensis* hummocks, *C. angustifolium* was counted as a FAC plant. When found growing outside of hummocks, where this morphological adaptation did not apply, *C. angustifolium* was counted as a FACU plant as usual.

Palustrine Scrub-Shrub (PSS) wetland communities in the study area were dominated by *Alnus viridis* with an herbaceous layer of *Impatiens noli-tangere.*

Palustrine Forested (PF) wetland communities were primarily Needle-Leaved Evergreen wetlands dominated by *Picea glauca* and *P. sitchensis* in the upper story, and *I. noli-tangere* and *Athyrium felix-femina* in the herbaceous layer. The boundaries between PF and PSS wetlands were not always clear and communities occasionally overlapped, forming Palustrine Forested Mixed wetlands. The PF wetland communities also exhibited mosaic characteristics, with localized upland regions found within the broader wetland community.

Two Riverine Perennial wetlands were found on site, one a mix of both lower perennial conditions and upper perennial conditions, and one solely a lower perennial system. For simplicity, both systems were labeled simply as Riverine Perennial (RP) systems. The PF on site that exhibited mixed perennial conditions was a continuous flowing creek that begins off site to the northeast, approximately bisects the project site, and then continues south off site until it connects to Diamond Creek and discharges into Kachemak Bay. Water flow through this creek was persistent but varied in velocity at different locations on site, classifying it as a mixed perennial system. Flow is also likely to fluctuate with season, with increased flow in the spring and fall. The second RP on site was a small, slow flowing, creek on the eastern half of the site that begins on a northeast lot and continues to flow off property to the south. Offsite this creek meets Diamond Creek, where it then continues on to Kachemak Bay. Vegetation in both Riverine Perennial regions varied based on surrounding wetland communities, but overall had herbaceous layers dominated by *I. noli-tangere* and *Caltha palustris.*

Two types of uplands were found on site, developed roadways/runways and vegetated uplands (including both undeveloped land and driveways where vegetation has reestablished itself). The vegetated upland communities varied across the site and contained a mix of spruce forests, alder thickets, fields of dense *C. angustifolium,* and open fields with a mixed variety of wildflowers, including *Castilleja unalaschcensis*, *Fritillaria camschatcensis*, and *Polemonium acutiflorum.*

Across all wetland communities, the presence of hydrophytic vegetation was indicated by the prevalence index and/or dominance test, with rapid data points primarily utilizing dominance tests. Soils were generally represented by a layer of decomposing organics from 0-7” deep and a 17-24” thick layer of silty mineral soils. Some color striations and soil reduction were noted, however, the presence of a hydrogen sulfide odor was the most consistent indicator of wetland

soils and hydrology across all wetland communities. Wetland indicators for full test pit forms are summarized in Table 3.

Table 2. Wetland Indicators at Wetland Delineation Test Pits

Sampling Point	Hydrophytic Vegetation	Hydric Soil	Wetland Hydrology	Cowardin Subclass
WDTP1	DT, PI	A4	A3, C1, C2	PEM
WDTP2	DT	A4, A14	C1	PF
WDTP3	DT	--	--	UPL
WDTP4	--	--	--	UPL
WDTP5	DT	--	--	UPL
WDTP6	--	--	--	PEM
WDTP7	--	--		PEM
WDTP8	PI	Other (C4)	C4	UPL

Figure 8. Ponding water near data point "PND" where culvert has failed (left) Marsh marigolds lining creek in eastern RP system (right)

Figure 9. Surface water, deadfall, and uneven terrain in southeastern PEM facing north (left) Uneven terrain visible from local high point on southeastern lot facing south (right)

Overall, we found this site to contain a mix of wetland and upland communities, with land generally growing wetter as you move south and to the east. Hydrology on site is not entirely unmodified, and the current wetland conditions reflect changes to the land that were made years ago during the initial development of the airpark. Extensive ditching was installed during the time of construction, including two sets of east-west ditches on the north side of the runway which collects and concentrates surface and most subsurface flows approaching the runway from the north and direct it into a series of culverts, which outlet on the south side of the runway. Over the years, wetland communities have formed around ditch banks and culvert outflows, and uplands have formed where water has been directed away. However, the ditches and culverts do not entirely block the natural flow of water, and large swaths of wetlands continue to act as discharge slopes, fed by water flowing through the soils underneath the runway.

This mix of natural and artificial drainage, as well as the changes in vegetation during the mass spruce tree die-offs due to beetle kill, have resulted in highly variable conditions onsite. Small zones of wetland and upland patches cluster in close proximity to each other, forming complex mosaic systems. Communities across site show mixtures of both wetlands and uplands vegetation, with some upland plants exhibiting morphological adaptations for survival in wet conditions. These highly variable conditions made identifying exact boundaries difficult, but regions were mapped as either wetlands or uplands to the best of our abilities by assessing the prevalence of wet to dry points within a region, and by utilizing a detailed topographic map to understand the flow of water on site.

While the wetlands on this site are separated by both roadways and runways, causing polygons to appear non-continuous in places, hydrology across this project site remains continuous via the aforementioned ditches and culverts. Water travels from the wetlands north of the runway into wetlands south of the runway before exiting off site along the southern boundary and flowing into off site wetlands. Not far south of the project limits, these offsite wetlands flow into Diamond Creek, which carries the water directly to Kachemak Bay. This means all the wetlands on site qualify as Waters of the U.S.

4.0 Conclusion

For the purposes of this project, which includes improving roadways in KPB maintained right of ways, about 14.9 acres of right of ways were studied as part of this project in addition to 71.61 acres of private property. Wetland conditions in these areas were included in both the wetland map efforts and acreage estimates. Overall, the project site consists of about 49.64 acres of wetlands, 29.86 acres of vegetated uplands, and 7.0 acres of existing runway/roadways. We found six classes of wetlands; Palustrine Emergent Persistent, Riverine Perennial, Palustrine Scrub-Shrub, Palustrine Forested, Vegetated Uplands, and Upland Roadway/Runways. For this project, mosaic wetlands were not counted as a distinct subset of wetlands but were counted as parts of the surrounding wetland communities. Vegetation in each community based on local conditions and surrounding communities, however, overall vegetation in the riverine wetlands is dominated by *C. palustris* and *I. noli-tangere*, *C. canadensis* and *E. arvense* in the emergent wetlands, *A. viridis* and *I. noli-tangere* in the scrub-shrub regions, and *P. glauca* in the forested regions, and either *P. glauca* or *C. angustifolium* in the uplands.

While past development on site has divided wetland communities into distinct regions, separated by runway and roadways, these distinct wetland polygons remain hydrologically connected by roadside ditches and cross runway culverts which direct water off property to the south, where it flows through continuous wetlands into Diamond Creek. Despite the upland regions identified on site, all the wetland polygons on this parcel were deemed to be directly hydrologically connected to Kachemak Bay, a TNW. All wetland polygons on property are therefore considered a WOUS and permitting shall be required before development occurs.

5.0 References

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. USFWS, Office of Biological Services, Washington, DC. 103 pp.

Environmental Laboratory. (1987). "Corps of Engineers Wetlands Delineation Manual," Technical Report Y-87-1, U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.

Munsell Soil Color Charts. 1992. Revised edition. Gretag Macbeth, New Windsor, NY.

U.S. Army Corps of Engineers. (2023). 2022 National Wetland Plant List, version 3.6. U.S. Army Engineer Research and Development Center, Vicksburg, MS. http://wetland-plants.usace.army.mil/.

U.S. Army Corps of Engineers (USACE). 2007. Regional supplement to the Corps of Engineers Wetland Delineation Manual: Alaska Region (Version 2.0). Report #ERDC/EL TR-07-24. Wetlands Regulatory Assistance Program. U.S. Army Engineering Research and Development Center, Vicksburg. 130 pp. September.

United States Department of Agriculture, Natural Resources Conservation Service. 2018. Field Indicators of Hydric Soils in the United States, Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils.

U.S. Fish and Wildlife Service (USFWS). 1997. National Wetlands Inventory website. U.S. Department of the Interior, Fish and Wildlife Service, Washington, DC. Available online at http://www.fws.gov/wetlands/. Accessed in June 2021.

Viereck, L.A., C.T. Dyrness, A.R. Batten, and K.J. Wenzlick. 1992. The Alaska vegetation classification. U.S. Department of Agriculture, Forest Service, Pacific Northwest Research

Appendix A:

Delineation

Forms & Photos

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 6/14/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP1

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.): Hummocks

Local relief (concave, convex, none): Concave Slope (%): 10

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6728 Long: -151.6430 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes X No ____
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes X No ____

Is the Sampled Area within a Wetland? **Yes** X **No** ____

Remarks:
Lot was previously cleared of large vegetation. Saplings beginning to grow back.

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. *Picea glauca*	3	No	FACU
3.			
4.			
	3	=Total Cover	
50% of total cover: 2	20% of total cover: 1		
Sapling/Shrub Stratum			
1. *Vaccinium uliginosum*	3	No	FAC
2.			
3.			
4.			
5.			
6.			
	3	=Total Cover	
50% of total cover: 2	20% of total cover: 1		
Herb Stratum			
1. *Sanguisorba canadensis*	90	Yes	FACW
2. *Festuca rubra*	90	Yes	FAC
3. *Chamaenerion angustifolium*	85	Yes	FACU
4. *Rubus arcticus*	60	No	FAC
5. *Equisetum arvense*	20	No	FAC
6.			
7.			
8.			
9.			
10.			
	345	=Total Cover	
50% of total cover: 173	20% of total cover: 69		

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 66.7% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	90	x 2 =	180
FAC species	173	x 3 =	519
FACU species	88	x 4 =	352
UPL species	0	x 5 =	0
Column Totals:	351 (A)		1051 (B)

Prevalence Index = B/A = 2.99

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%
X Prevalence Index is ≤3.0[1]
____ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
____ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Spruce sapings nearby in clearing

SOIL

Sampling Point: WDTP1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	10R 3/1	100					Loamy/Clayey	Silty, smooth
10-17	7.5YR 3/3	60	10YR 4/4	40	D	M	Loamy/Clayey	Silty
17-24	10YR 4/4	100					Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydrogen Sulfide smell 6" down from surfae

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- X Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes X No ___ Depth (inches): 22

Saturation Present? Yes X No ___ Depth (inches): 12

(includes capillary fringe)

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 6/14/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP2

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): none Slope (%): 7

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6718 Long: -151.6434 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, Forested, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation X , Soil ____ , or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____ , Soil ____ , or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:
Lot was previously cleared of large vegetation. Saplings beginning to grow back.

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. *Picea sitchensis*	40	Yes	FACU
3.			
4.			
	40	=Total Cover	
50% of total cover: 20	20% of total cover: 8		
Sapling/Shrub Stratum			
1. *Alnus viridis*	5	Yes	FAC
2. *Salix barclayi*	7	Yes	FAC
3.			
4.			
5.			
6.			
	12	=Total Cover	
50% of total cover: 6	20% of total cover: 3		
Herb Stratum			
1. *Equisetum arvense*	80	Yes	FAC
2. *Calamagrostis canadensis*	50	Yes	FAC
3. *Athyrium filix-femina*	25	No	FAC
4. *Sanguisorba canadensis*	15	No	FACW
5. *Rubus arcticus*	3	No	FAC
6.			
7.			
8.			
9.			
10.			
	173	=Total Cover	
50% of total cover: 87	20% of total cover: 35		

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 4 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 80.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	15	x 2 =	30
FAC species	170	x 3 =	510
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	225 (A)		700 (B)

Prevalence Index = B/A = 3.11

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Spruce sapings nearby in clearing

SOIL

Sampling Point: WDTP2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	5YR 2.5/1	100					Peat	Organic layer
6-16	10GY 4/1	85	10YR 5/8	15	C	PL	Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- X Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- X Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydrogen Sulfide smell 6" down from surfae

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 4

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 7/2/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP3

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.): hillside

Local relief (concave, convex, none): None Slope (%): 9

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6725 Long: -151.6458 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** Yes ____ No X
Hydric Soil Present?	Yes ____	No X	
Wetland Hydrology Present?	Yes ____	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Herb Stratum			
1. *Equisetum arvense*	100	Yes	FAC
2. *Calamagrostis canadensis*	90	Yes	FAC
3. *Chamaenerion angustifolium*	60	No	FACU
4. *Heracleum maximum*	40	No	FACU
5. *Angelica lucida*	30	No	FACU
6. *Castilleja unalaschcensis*	10	No	FAC
7. *Fritillaria camschatcensis*	5	No	FAC
8.			
9.			
10.			
	335	=Total Cover	
50% of total cover:	168	20% of total cover:	67

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	205	x 3 =	615
FACU species	130	x 4 =	520
UPL species	0	x 5 =	0
Column Totals:	335 (A)		1135 (B)

Prevalence Index = B/A = 3.39

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No ____

Remarks:

SOIL

Sampling Point: WDTP3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-2	7.5YR 2.5/1	100					Peat	Organic layer, dense roots
2-13	10YR 3/3	100					Loamy/Clayey	
13-16	10YR 3/2	100					Loamy/Clayey	
16-22	2.5Y 4/3	100					Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Reduced iron test strip negative

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): 4

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 7/10/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP4

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.):

Local relief (concave, convex, none): Concave Slope (%): 7

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6717 Long: -151.6522 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, Forested, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes	No X	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:
Lot was previously cleared of large vegetation. Saplings beginning to grow back.

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. *Picea sitchensis*	10	Yes	FACU
3. *Picea mariana*	5	Yes	FACW
4.			
	15	=Total Cover	
50% of total cover:	8	20% of total cover:	3
Sapling/Shrub Stratum			
1. *Oplopanax horridus*	10	Yes	FACU
2.			
3.			
4.			
5.			
6.			
	10	=Total Cover	
50% of total cover:	5	20% of total cover:	2
Herb Stratum			
1. *Calamagrostis canadensis*	100	Yes	FAC
2. *Equisetum arvense*	70	Yes	FACU
3. *Chamaenerion angustifolium*	60	Yes	FAC
4. *Dryopteris dilatata*	50	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	280	=Total Cover	
50% of total cover:	140	20% of total cover:	56

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes (Where applicable) Total Cover of Bryophytes

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	5	x 2 =	10
FAC species	160	x 3 =	480
FACU species	140	x 4 =	560
UPL species	0	x 5 =	0
Column Totals:	305 (A)		1050 (B)

Prevalence Index = B/A = 3.44

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%

___ Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes No X

Remarks:
More spruce trees just out of testing radius. Edge of wet forest

SOIL

Sampling Point: WDTP4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-10	7.5YR 2.5/3	100					Loamy/Clayey	Organic layer, silty with roots
10-16	10YR 3/4	100					Sandy	Gritty
16-24	5YR 4/6	70	5Y 5/1	30	D	M	Loamy/Clayey	Small chunks of depleted silt

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:
Reduced iron test negative

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes x	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Suspected boundary point

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 7/11/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP5

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.):

Local relief (concave, convex, none): None Slope (%): 8

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6726 Long: -151.6599 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No (If no, explain in Remarks.)

Are Vegetation , Soil , or Hydrology significantly disturbed? Are "Normal Circumstances" present? Yes x No

Are Vegetation , Soil , or Hydrology naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No	**Is the Sampled Area within a Wetland?** Yes No X
Hydric Soil Present?	Yes	No X	
Wetland Hydrology Present?	Yes	No X	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Sapling/Shrub Stratum			
1. *Alnus viridis*	8	Yes	FAC
2.			
3.			
4.			
5.			
6.			
	8 =Total Cover		
50% of total cover:	4	20% of total cover:	2

Herb Stratum			
1. *Equisetum arvense*	100	Yes	FAC
2. *Calamagrostis canadensis*	100	Yes	FAC
3. *Chamaenerion angustifolium*	40	No	FACU
4. *Sanguisorba canadensis*	40	No	FACW
5. *Angelica genuflexa*	30	No	FACW
6. *Salix barclayi*	3	No	FAC
7. *Polemonium acutiflorum*	2	No	FAC
8.			
9.			
10.			
	315 =Total Cover		
50% of total cover:	158	20% of total cover:	63

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes Total Cover of Bryophytes
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	70	x 2 =	140
FAC species	213	x 3 =	639
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals:	323 (A)		939 (B)

Prevalence Index = B/A = 2.91

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

Prevalence Index is ≤3.0[1]

Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes X No

Remarks:

SOIL

Sampling Point: WDTP5

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-7	7.5YR 3/3	100					Peat	Organic layer, dense roots
7-17	2.5YR 3/1	100					Loamy/Clayey	
17-24	10YR 4/3	80	5YR 4/4	20	C	PL	Loamy/Clayey	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** ___ **No** X

Remarks:

Reduced iron test strip negative. No sulfer smell

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- ___ Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- X FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No x Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes ___ No x Depth (inches): 4

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:


TPS
3/11


TPS
3/11

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 7/11/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP6

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.): Hummocks

Local relief (concave, convex, none): None Slope (%): 12

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6715 Long: -151.6694 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		
Herb Stratum			
1. *Calamagristis canadensis*	100	Yes	FAC
2. *Equisetum arvense*	100	Yes	FAC
3. *Angelica genuflexa*	1	No	FACW
4. *Chamaenerion angustifolium*	1	No	FACU
5.			
6.			
7.			
8.			
9.			
10.			
	202	=Total Cover	
50% of total cover:	101	20% of total cover:	41

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	1	x 2 =	2
FAC species	200	x 3 =	600
FACU species	1	x 4 =	4
UPL species	0	x 5 =	0
Column Totals:	202 (A)		606 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Spruce sapings nearby in clearing

SOIL

Sampling Point: WDTP6

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-1	2.5YR 2.5/1	100					Loamy/Clayey	Organic
1-8	7.5YR 4/4	20	10Y 5/1	20	D	M	Loamy/Clayey	Silty
8-13	10YR 2/1	100					Loamy/Clayey	Silty
13-18	N 4/	100			D	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: Silt

Depth (inches): 13

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Hydrogen Sulfide smell 6" down from surfae

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- x Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- x Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present? Yes ___ No X Depth (inches): ___

Water Table Present? Yes ___ No X Depth (inches): ___

Saturation Present? (includes capillary fringe) Yes X No ___ Depth (inches): 8

Wetland Hydrology Present? **Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:


TP6
7/11


TP6
7/11

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 7/11/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP7

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.): Hummocks

Local relief (concave, convex, none): Concave Slope (%): 6

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6725 Long: -151.6700 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes X	No ____	**Is the Sampled Area within a Wetland?** **Yes** X **No** ____
Hydric Soil Present?	Yes X	No ____	
Wetland Hydrology Present?	Yes X	No ____	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2.			
3.			
4.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Herb Stratum			
1. *Calamagrostis canadensis*	100	Yes	FAC
2. *Chamaenerion angustifolium*	20	No	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
	120 =Total Cover		
50% of total cover: 60	20% of total cover: 24		

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	120	x 3 =	360
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	120 (A)		360 (B)

Prevalence Index = B/A = 3.00

Hydrophytic Vegetation Indicators:

X Dominance Test is >50%

X Prevalence Index is ≤3.0[1]

x Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** X **No** ____

Remarks:
Fireweed growing on top of hummocks

SOIL

Sampling Point: WDTP7

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth	Matrix		Redox Features					
(inches)	Color (moist)	%	Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	2.5YR 2.5/1	100					Loamy/Clayey	Silty, smooth
6-10	10R 2.5/1	100					Loamy/Clayey	Silty
10-18	2.5YR 3/1	100					Loamy/Clayey	Silty

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- X Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- ___ Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Reduced iron test positive

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- X Hydrogen Sulfide Odor (C1)
- X Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- x Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___		
Water Table Present?	Yes X	No ___	Depth (inches): 17		
Saturation Present? (includes capillary fringe)	Yes X	No ___	Depth (inches): 15	**Wetland Hydrology Present?**	**Yes** X **No** ___

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

U.S. Army Corps of Engineers
WETLAND DETERMINATION DATA SHEET – Alaska Region
See ERDC/EL TR-07-24; the proponent agency is CECW-CO-R

OMB Control #: 0710-0024, Exp: 11/30/2024
Requirement Control Symbol EXEMPT:
(Authority: AR 335-15, paragraph 5-2a)

Project/Site: Skyline Heights Estates - Kachemak Landing Airpark Borough/City: Homer Sampling Date: 7/15/2024

Applicant/Owner: Kachemak Landing LLC Sampling Point: WDTP8

Investigator(s): John Bishop & Shannon Cefalu Landform (hillside, terrace, hummocks, etc.): Field

Local relief (concave, convex, none): Convex Slope (%): 9

Subregion: LRR W1, MLRA 224 (Cook Inlet Lowlands) Lat: 59.6716 Long: -151.6689 Datum: NAD83

Soil Map Unit Name: Kachemak Silt Loam, 4-8% Slopes NWI classification: Unclassified

Are climatic / hydrologic conditions on the site typical for this time of year? Yes x No ____ (If no, explain in Remarks.)

Are Vegetation ____, Soil ____, or Hydrology ____ significantly disturbed? Are "Normal Circumstances" present? Yes x No ____

Are Vegetation ____, Soil ____, or Hydrology ____ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ____ No X
Hydric Soil Present? Yes X No ____
Wetland Hydrology Present? Yes ____ No X

Is the Sampled Area within a Wetland? **Yes** ____ **No** X

Remarks:
Did not have lath for test pit. Recorded GPS point

VEGETATION – Use scientific names of plants.

Tree Stratum	Absolute % Cover	Dominant Species?	Indicator Status
1.			
2. *Picea glauca*	10	Yes	FACU
3.			
4.			
	10 =Total Cover		
50% of total cover: 5	20% of total cover: 2		

Sapling/Shrub Stratum			
1.			
2.			
3.			
4.			
5.			
6.			
	=Total Cover		
50% of total cover:	20% of total cover:		

Herb Stratum			
1. *Equisetum arvense*	75	Yes	FACW
2. *Athyrium felix-femina*	50	Yes	FAC
3. *Chamaenerion angustifolium*	50	Yes	FACU
4. *Calamagrostis canadensis*	30	No	FAC
5. *Sanguisorba canadensis*	30	No	FACW
6. *Heracleum maximum*	10	No	FACU
7.			
8.			
9.			
10.			
	245 =Total Cover		
50% of total cover: 123	20% of total cover: 49		

Plot Size (radius, or length x width) 10' Radius % Bare Ground 0

% Cover of Wetland Bryophytes ____ Total Cover of Bryophytes ____
(Where applicable)

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.0% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	105	x 2 =	210
FAC species	80	x 3 =	240
FACU species	70	x 4 =	280
UPL species	0	x 5 =	0
Column Totals:	255 (A)		730 (B)

Prevalence Index = B/A = 2.86

Hydrophytic Vegetation Indicators:

___ Dominance Test is >50%
___ Prevalence Index is ≤3.0[1]
___ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
___ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? **Yes** ____ **No** X

Remarks:
Spruce at edge of radius

SOIL

Sampling Point: WDTP8

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:

- ___ Histosol or Histel (A1)
- ___ Histic Epipedon (A2)
- ___ Black Histic (A3)
- ___ Hydrogen Sulfide (A4)
- ___ Thick Dark Surface (A12)
- ___ Alaska Gleyed (A13)
- ___ Alaska Redox (A14)
- ___ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ___ Depleted Below Dark Surface (A11)
- ___ Depleted Matrix (F3)
- ___ Redox Dark Surface (F6)
- ___ Depleted Dark Surface (F7)
- ___ Redox Depressions (F8)
- ___ Red Parent Material (F21)
- ___ Very Shallow Dark Surface (F22)

- ___ Alaska Color Change (TA4)[4]
- ___ Alaska Alpine Swales (TA5)
- ___ Alaska Redox With 2.5Y Hue
- ___ Alaska Gleyed Without Hue 5Y or Redder Underlying Layer
- X Other (Explain in Remarks)

[3]One indicator of hydrophytic vegetation, one primary indicator of wetland hydrology, and an appropriate landscape position must be present unless disturbed or problematic.

[4]Give details of color change in Remarks.

Restrictive Layer (if observed):

Type: ___

Depth (inches): ___

Hydric Soil Present? **Yes** X **No** ___

Remarks:

Reduced Iron test positive. Did not record soil colors but found brown/grey silt in bottom layer of hole. Too dark for Alaska Gleyed, but suspect Alaska color change would have occurred if the hole remained open.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (any one indicator is sufficient)

- ___ Surface Water (A1)
- ___ High Water Table (A2)
- ___ Saturation (A3)
- ___ Water Marks (B1)
- ___ Sediment Deposits (B2)
- ___ Drift Deposits (B3)
- ___ Algal Mat or Crust (B4)
- ___ Iron Deposits (B5)
- ___ Surface Soil Cracks (B6)
- ___ Inundation Visible on Aerial Imagery (B7)
- ___ Sparsely Vegetated Concave Surface (B8)
- ___ Marl Deposits (B15)
- ___ Hydrogen Sulfide Odor (C1)
- ___ Dry-Season Water Table (C2)
- ___ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ___ Water-Stained Leaves (B9)
- ___ Drainage Patterns (B10)
- ___ Oxidized Rhizospheres along Living Roots (C3)
- x Presence of Reduced Iron (C4)
- ___ Salt Deposits (C5)
- ___ Stunted or Stressed Plants (D1)
- ___ Geomorphic Position (D2)
- ___ Shallow Aquitard (D3)
- ___ Microtopographic Relief (D4)
- ___ FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?	Yes ___	No X	Depth (inches): ___
Water Table Present?	Yes ___	No x	Depth (inches): ___
Saturation Present? (includes capillary fringe)	Yes ___	No x	Depth (inches): ___

Wetland Hydrology Present? **Yes** ___ **No** X

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Local dry spot, surrounded by wet conditions

Appendix B:

Soils Report

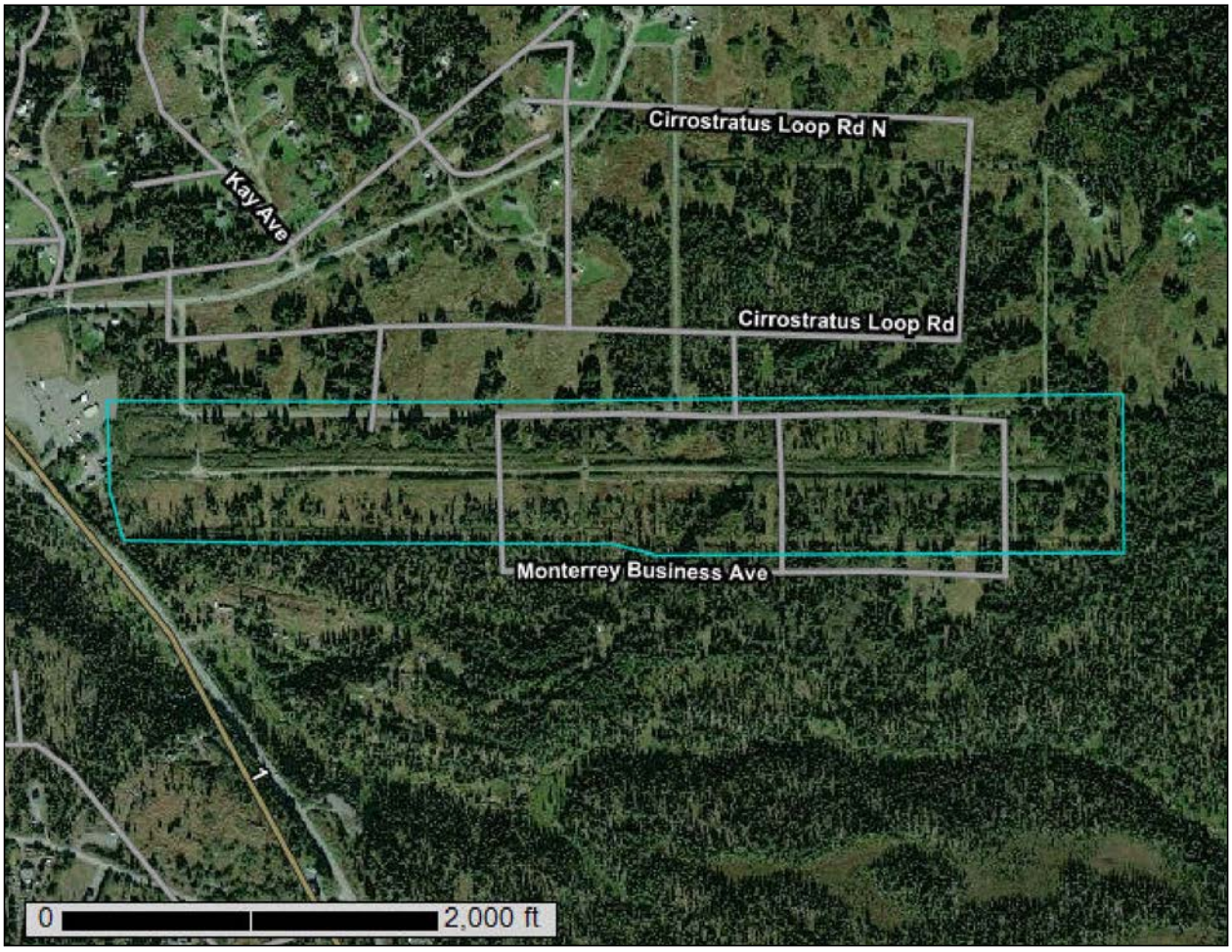
United States Department of Agriculture

NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for Western Kenai Peninsula Area, Alaska



July 24, 2024

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require

alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil

scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

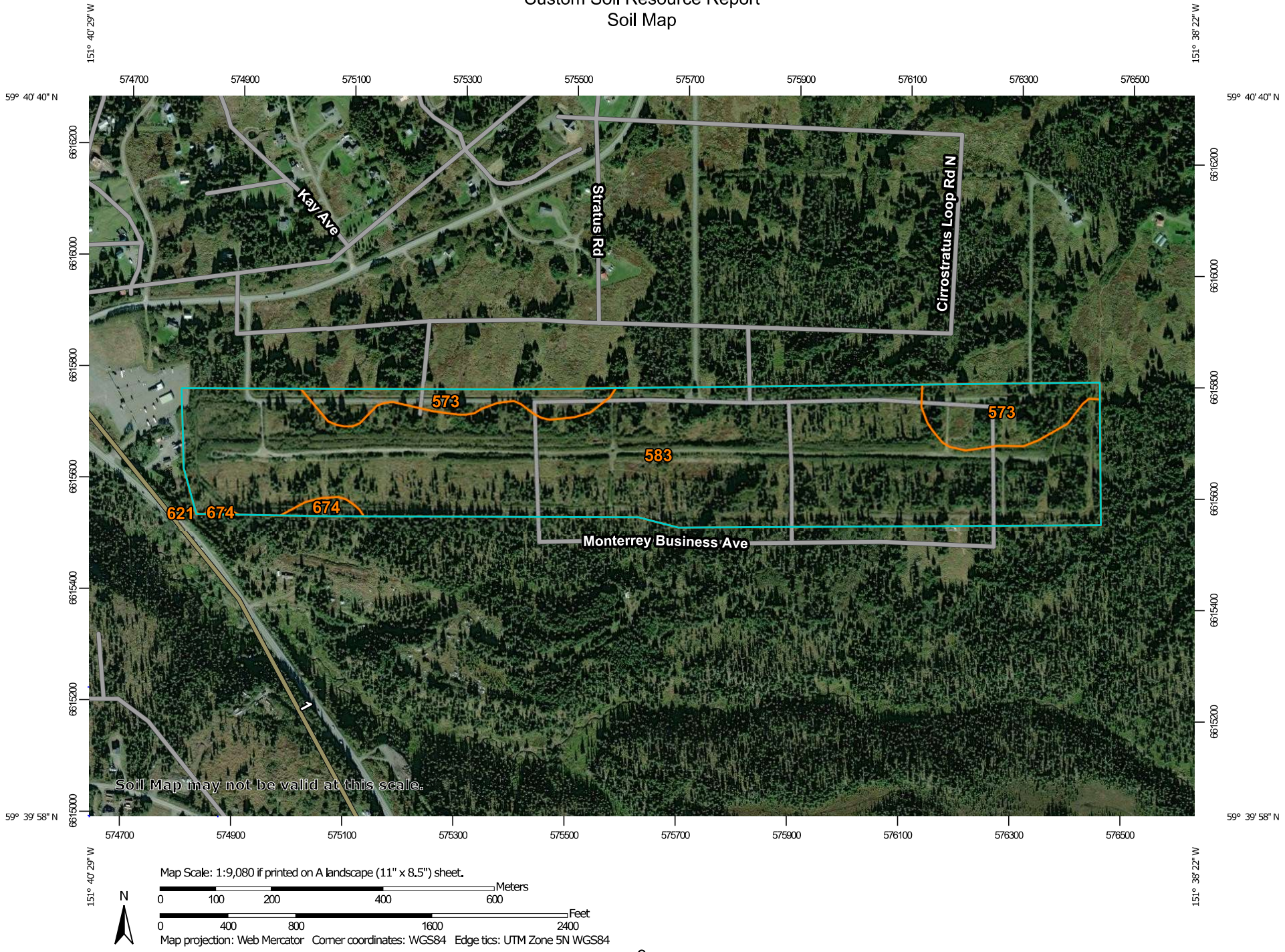
After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and

identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map



Map Scale: 1:9,080 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 400 800 1600 2400

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 5N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:25,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Western Kenai Peninsula Area, Alaska
Survey Area Data: Version 22, Sep 7, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 25, 2015—Oct 19, 2023

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
573	Kachemak silt loam, 4 to 8 percent slopes	12.9	13.1%
583	Kachemak silt loam, forested, 4 to 8 percent slopes	84.6	86.0%
621	Mutnala silt loam, 25 to 45 percent slopes	0.0	0.0%
674	Spenard peat, 4 to 8 percent slopes	0.9	1.0%
Totals for Area of Interest		**98.5**	**100.0%**

Map Unit Descriptions

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Western Kenai Peninsula Area, Alaska

573—Kachemak silt loam, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1lyd8
Elevation: 410 to 1,920 feet
Mean annual precipitation: 20 to 39 inches
Mean annual air temperature: 34 to 39 degrees F
Frost-free period: 85 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Kachemak and similar soils: 80 percent
Minor components: 20 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kachemak

Setting

Landform: Moraines on till plains
Landform position (two-dimensional): Backslope, shoulder, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Ash influenced loess over glacial drift

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material
A - 3 to 8 inches: silt loam
B - 8 to 30 inches: silt loam
2C - 30 to 60 inches: silt loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 15.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F224XY429AK - Picea xlutzii/Salix barclayi-Empetrum nigrum/Equisetum arvense
Hydric soil rating: No

Minor Components

Tuxedni

Percent of map unit: 10 percent

Landform: Till plains
Ecological site: R224XD927AK - Rolling Uplands
Hydric soil rating: No

Redoubt

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Shoulder, backslope
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F224XD443AK - Picea glauca-Betula papyrifera/Calamagrostis canadensis-Equisetum arvense
Hydric soil rating: No

583—Kachemak silt loam, forested, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1lydl
Elevation: 540 to 1,970 feet
Mean annual precipitation: 20 to 39 inches
Mean annual air temperature: 36 to 39 degrees F
Frost-free period: 90 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Kachemak, forested, and similar soils: 75 percent
Minor components: 25 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Kachemak, Forested

Setting

Landform: Moraines on till plains
Landform position (two-dimensional): Backslope, shoulder, summit
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Ash influenced loess over glacial drift

Typical profile

Oi - 0 to 3 inches: slightly decomposed plant material
A - 3 to 8 inches: silt loam
B - 8 to 30 inches: silt loam
2C - 30 to 60 inches: silt loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Low
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.20 to 1.98 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 15.4 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 3e
Hydrologic Soil Group: B
Ecological site: F224XY429AK - Picea xlutzii/Salix barclayi-Empetrum nigrum/Equisetum arvense
Hydric soil rating: No

Minor Components

Redoubt

Percent of map unit: 10 percent
Landform: Hills
Landform position (two-dimensional): Backslope, shoulder
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F224XD443AK - Picea glauca-Betula papyrifera/Calamagrostis canadensis-Equisetum arvense
Hydric soil rating: No

Tuxedni

Percent of map unit: 10 percent
Landform: Till plains
Ecological site: R224XD927AK - Rolling Uplands
Hydric soil rating: No

Starichkof

Percent of map unit: 5 percent
Landform: Fens
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R224XY900AK - Wetland Complex
Hydric soil rating: Yes

621—Mutnala silt loam, 25 to 45 percent slopes

Map Unit Setting

National map unit symbol: 1lyft
Elevation: 230 to 1,480 feet
Mean annual precipitation: 20 to 39 inches
Mean annual air temperature: 36 to 37 degrees F
Frost-free period: 90 to 120 days
Farmland classification: Not prime farmland

Map Unit Composition

Mutnala and similar soils: 85 percent

Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Mutnala

Setting

Landform: Moraines on till plains
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Ash influenced loess over loamy till

Typical profile

Oe - 0 to 4 inches: moderately decomposed plant material
EB - 4 to 7 inches: silt loam
Bw - 7 to 23 inches: silt loam
2C - 23 to 60 inches: gravelly sandy loam

Properties and qualities

Slope: 25 to 45 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: High
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.57 to 1.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 14.3 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 7e
Hydrologic Soil Group: B
Ecological site: F224XD443AK - Picea glauca-Betula papyrifera/Calamagrostis canadensis-Equisetum arvense
Hydric soil rating: No

Minor Components

Spenard

Percent of map unit: 5 percent
Landform: Moraines on till plains
Landform position (two-dimensional): Footslope, toeslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F224XY918AK - Drift deposits, very poorly drained
Hydric soil rating: Yes

Qutal

Percent of map unit: 5 percent
Landform: Moraines on till plains, depressions on till plains
Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F224XY918AK - Drift deposits, very poorly drained
Hydric soil rating: No

Kichatna

Percent of map unit: 5 percent
Landform: Terraces on outwash plains
Landform position (three-dimensional): Riser
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: F224XY909AK - Glaciofluvial deposits, thin surface
Hydric soil rating: No

674—Spenard peat, 4 to 8 percent slopes

Map Unit Setting

National map unit symbol: 1lyhj
Elevation: 0 to 1,790 feet
Mean annual precipitation: 16 to 39 inches
Mean annual air temperature: 34 to 39 degrees F
Frost-free period: 85 to 130 days
Farmland classification: Not prime farmland

Map Unit Composition

Spenard and similar soils: 67 percent
Minor components: 33 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Spenard

Setting

Landform: Depressions on till plains
Down-slope shape: Concave
Across-slope shape: Linear
Parent material: Ash influenced loess over glacial till

Typical profile

Oi - 0 to 9 inches: peat
E - 9 to 14 inches: silt loam
Bs - 14 to 25 inches: silt loam
2C - 25 to 60 inches: silt loam

Properties and qualities

Slope: 4 to 8 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Very poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Moderately high to high (0.71 to 1.98 in/hr)
Depth to water table: About 8 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Available water supply, 0 to 60 inches: Very high (about 12.1 inches)

Interpretive groups

Land capability classification (irrigated): None specified
Land capability classification (nonirrigated): 5w
Hydrologic Soil Group: D
Ecological site: F224XY918AK - Drift deposits, very poorly drained
Hydric soil rating: Yes

Minor Components

Mutnala

Percent of map unit: 15 percent
Landform: Moraines on till plains
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear
Ecological site: F224XD443AK - Picea glauca-Betula papyrifera/Calamagrostis canadensis-Equisetum arvense
Hydric soil rating: No

Qutal

Percent of map unit: 15 percent
Landform: Moraines on till plains, depressions on till plains
Landform position (two-dimensional): Footslope
Down-slope shape: Concave
Across-slope shape: Linear
Ecological site: F224XY918AK - Drift deposits, very poorly drained
Hydric soil rating: No

Doroshin

Percent of map unit: 3 percent
Landform: Fens on till plains, depressions on till plains
Down-slope shape: Linear
Across-slope shape: Linear
Ecological site: R224XY900AK - Wetland Complex
Hydric soil rating: Yes

References

American Association of State Highway and Transportation Officials (AASHTO). 2004. Standard specifications for transportation materials and methods of sampling and testing. 24th edition.

American Society for Testing and Materials (ASTM). 2005. Standard classification of soils for engineering purposes. ASTM Standard D2487-00.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deep-water habitats of the United States. U.S. Fish and Wildlife Service FWS/OBS-79/31.

Federal Register. July 13, 1994. Changes in hydric soils of the United States.

Federal Register. September 18, 2002. Hydric soils of the United States.

Hurt, G.W., and L.M. Vasilas, editors. Version 6.0, 2006. Field indicators of hydric soils in the United States.

National Research Council. 1995. Wetlands: Characteristics and boundaries.

Soil Survey Division Staff. 1993. Soil survey manual. Soil Conservation Service. U.S. Department of Agriculture Handbook 18. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_054262

Soil Survey Staff. 1999. Soil taxonomy: A basic system of soil classification for making and interpreting soil surveys. 2nd edition. Natural Resources Conservation Service, U.S. Department of Agriculture Handbook 436. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053577

Soil Survey Staff. 2010. Keys to soil taxonomy. 11th edition. U.S. Department of Agriculture, Natural Resources Conservation Service. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053580

Tiner, R.W., Jr. 1985. Wetlands of Delaware. U.S. Fish and Wildlife Service and Delaware Department of Natural Resources and Environmental Control, Wetlands Section.

United States Army Corps of Engineers, Environmental Laboratory. 1987. Corps of Engineers wetlands delineation manual. Waterways Experiment Station Technical Report Y-87-1.

United States Department of Agriculture, Natural Resources Conservation Service. National forestry manual. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=nrcs142p2_053374

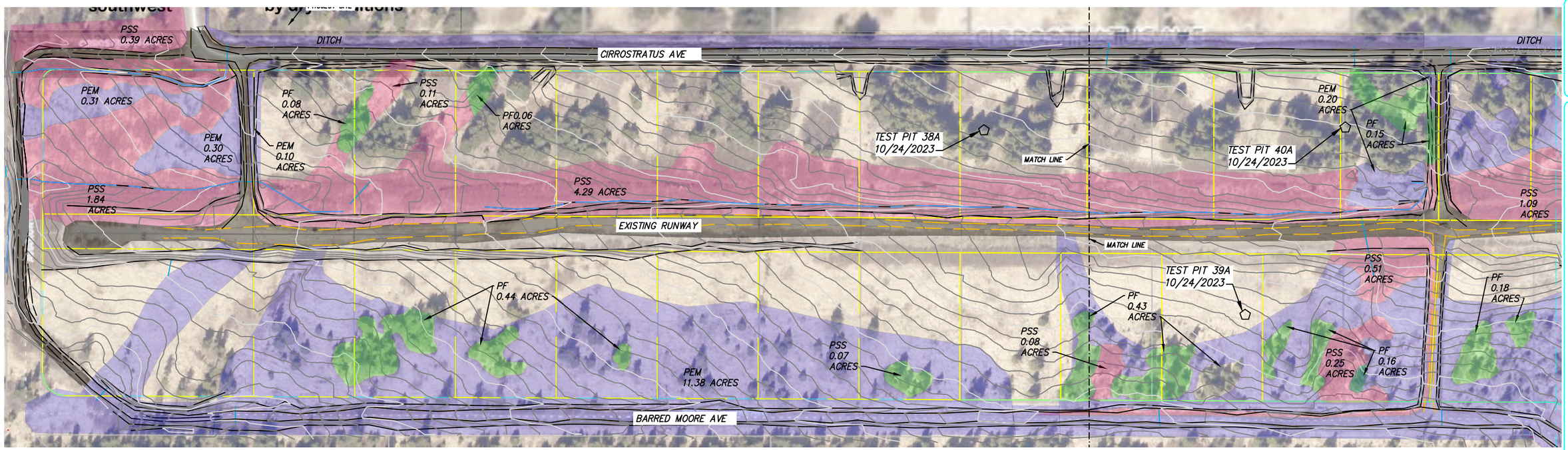
United States Department of Agriculture, Natural Resources Conservation Service. National range and pasture handbook. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/landuse/rangepasture/?cid=stelprdb1043084

United States Department of Agriculture, Natural Resources Conservation Service. National soil survey handbook, title 430-VI. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/scientists/?cid=nrcs142p2_054242

United States Department of Agriculture, Natural Resources Conservation Service. 2006. Land resource regions and major land resource areas of the United States, the Caribbean, and the Pacific Basin. U.S. Department of Agriculture Handbook 296. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/soils/?cid=nrcs142p2_053624

United States Department of Agriculture, Soil Conservation Service. 1961. Land capability classification. U.S. Department of Agriculture Handbook 210. http://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052290.pdf

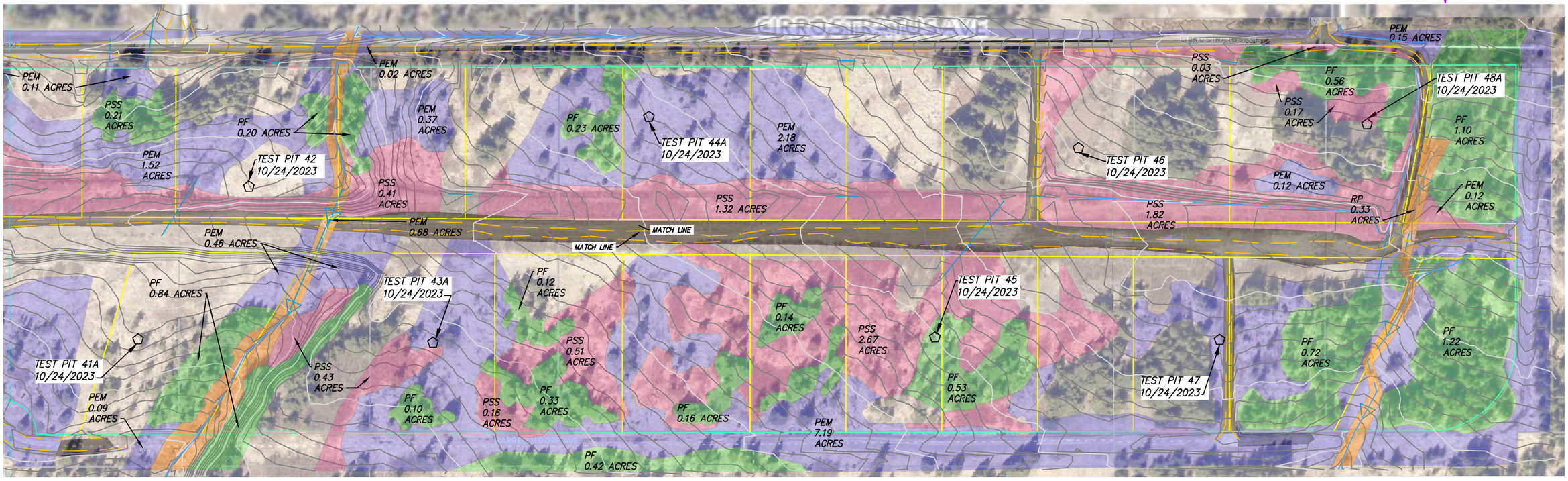
Appendix C:
Wetland Map



LEGEND & SYMBOLS

- RIVERINE PERENNIAL WETLANDS
- PALUSTRINE EMERGENT WETLANDS
- RAPID DATA TEST: DRY
- PALUSTRINE FORESTED WETLANDS
- PALUSTRINE SCRUB–SHRUB WETLANDS
- RAPID DATA TEST: WET
- ROADWAYS/RUNWAY
- EXCAVATED SOIL TEST PITS: 10/24/2023
- CULVERTS
- C/L DRAINAGE
- EDGE OF GRAVEL
- PROPOSED PROPERTY LINES

N



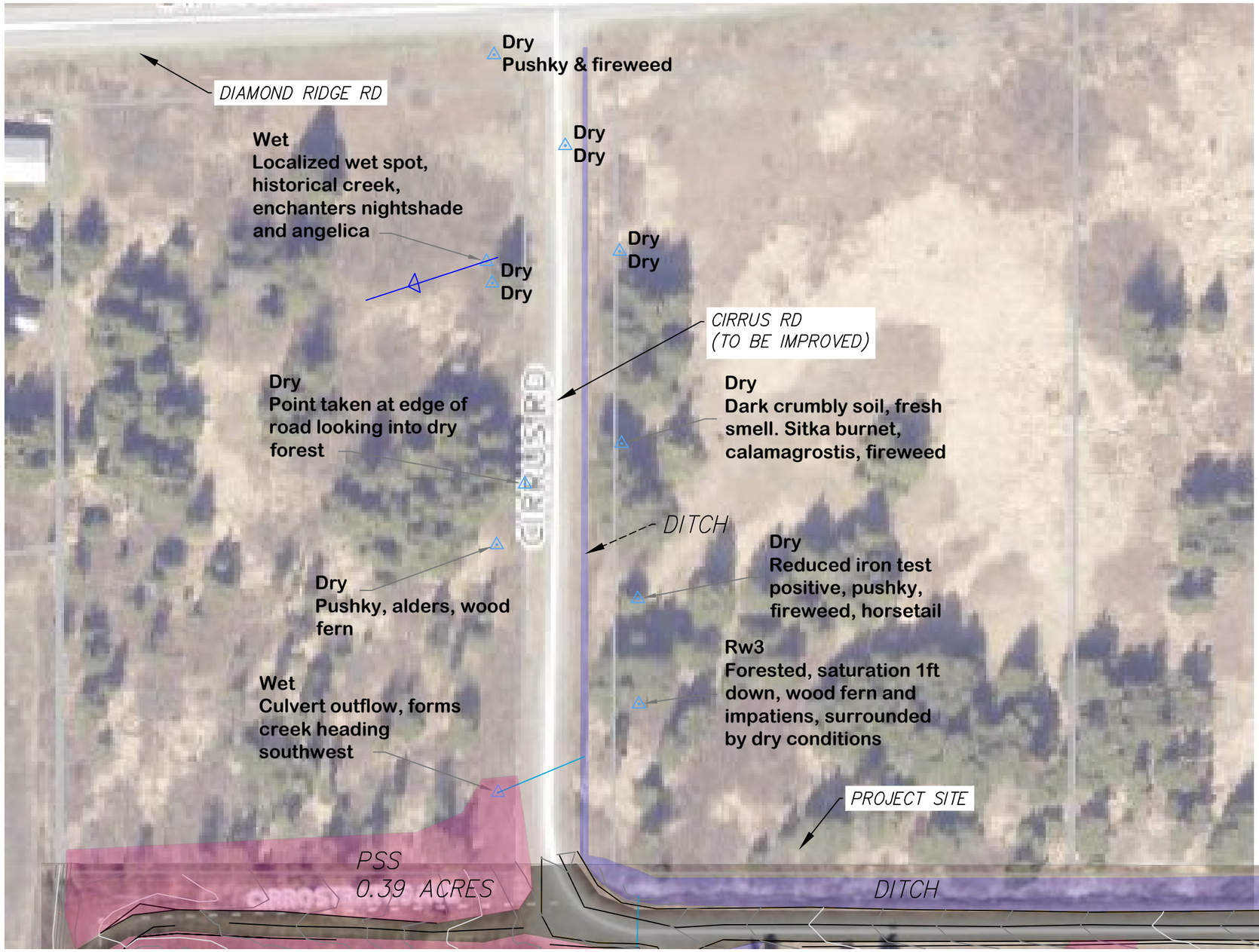
0 100 200 300 400
GRAPHIC SCALE

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK
WETLAND MAP: PROPERTY SITE

BISHOP ENGINEERING, LLC
PO BOX 2501, HOMER, ALASKA 99603
(907) 299-7609

DATE: 8/1/2024
CHK'D: JSB
SCALE: AS NOTED
PROJ. NO.: 2023129

SHEET NO.:
WM:A1



N

LEGEND & SYMBOLS

- RIVERINE PERENNIAL WETLANDS
- PALUSTRINE EMERGENT WETLANDS
- PALUSTRINE FORESTED WETLANDS
- PALUSTRINE SCRUB-SHRUB WETLANDS
- ROADWAYS/RUNWAY
- CULVERTS
- C/L DRAINAGE
- EDGE OF GRAVEL
- PROPOSED PROPERTY LINES
- RAPID DATA TEST: DRY
- RAPID DATA TEST: WET
- EXCAVATED SOIL TEST PITS: 10/24/2023

0 25 50 75 100
GRAPHIC SCALE

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK
WETLAND MAP: CIRRUS RIGHT OF WAY

BISHOP ENGINEERING, LLC
PO BOX 2501, HOMER, ALASKA 99603
(907) 299-7609

DATE: 8/1/2024
CHK'D: JSB
SCALE: AS NOTED
PROJ. NO.: 2023129

SHEET NO.:
WM:A2

creek heading southwest

impatiens, surrounded by dry conditions

Wtr4
See water discharging from slope

Sulfur smell and surface water nearby

Wet
Surface water

Wet4
Low wet depression

Wet5
Wet. Gley at 11 inches and positive reduced iron test

Wet3
Beginning of wet depressed drainage path

Dr11
Dry clearing north of alders

Fll4
Fill. Driveway

Dry8
Very round forest clearing

Rdp8
Dry. Feels wet but no sulfur or redox, moist, negative iron test, calamagrostis & fireweed

Clv
Clv

Wet
Calamagrostis hummocks

Wet
Ditch. Sulful smell, alders, calamagrostis, and lady fern

Rdp
Sulfur smell, fireweed, calamagrostis, sitka burnet, and horse tail

Dch
Dch

WDTP7
WDTP7

Wet6
Wet. Sulfur smell and hummocks

Swl2
Wet northeast swail. Dry pushky and fireweed field to the west

Wt12
North edge of wet depression

Dry1
Dry1

Dr12
Dry clearing. Fireweed

Wt10
Dry in the thick alders, wet inbetween

Dry9
Dry clearing of fireweed and pushky

Rd10
Dry Clearing

Dry7
Dry. Field of fireweed

Clv3
2nd ditch. N end of existing culvert

Wet2
South edge of wet depressed drainage path

Dr13
Dry cleaing. Twinflower on deadfall

Dry2
Dry2

Dr16
Fireweed

Bnd7
Dry. Soil fresh smelling, fireweed

Dry5
Dry5

Dch4
Boundary natural ditch

Dry3
Fireweed

Wt11
Small wet area

Wet8
Boundary. Wet to the south

Wet9
Boundary

Dr10
Dry alder thicket

Swl4
West edge of old creek. Wet basin about 30ft wide

MATCH LINE

Rd11
Wet clearing. Sulfur and calamagrostis

Rdp9
dry clearing with twinflower

Bnd
Dry to the north, wet to the south, 50% fireweed 100% calamagrostis

Dch6
Dch6

Swl1
Swail. Old water path visibe from roadway heading southwest

Rvn0
Old ravine path visible from road. Point taken edge of road

Rvn2
Rvn2

Rvn1
Rvn1

Dch3
2nd ditch

Dch2
2nd ditch

Dch7
Dch7

Dch1
2nd ditch

Dry
Hummocks but dry soil. Calamagrostis and some fireweed

Dry
Boundary. Edge of ravine

Bnd
Boundary. Dry to the north

Bnd
Bnd

Swl
Swale

Dry
Deep hummocks but fresh smelling soil and no signs of redox

Wet
Wet

Swl
Swale

Wet
Sulfur smell, calamagrosits hummocks

Wet
Saturated soil, reduced iron test positive, gleyed silt, calamagrostis hummocks

Wet
Sulfur smell and reduced silt layer, wtr seeps at 12", fireweed and calamagrostis

Wet
Saturated 12in down, faint sulfur smell, calamagrosis hummocks, some fireweed

Bnd3
Bnd3

Dry6
Dry fill. Abrubt change. Pushky, fireweed, meadow rue, ragwort

Bnd2
Bnd2

Bnd6
Sharp rise. Dry on west side

Dry
Dry

Dry
Dry

Swl
Hummocks with sulfur smell

Dry
Dry

Dry
Dry

Dry
Dry

Rdp
Dry

Dch
Ditch

Bnd1
Bnd1

Wet
Calamagrostis hummocks, muddy at surface

Wet
Wet

Bnd
Old silt fence. Marks modified vs unmodified ground. Dry to north and wet to south

Dry
Dry and fresh smelling 12in down, calagrostis and some fireweed

Bnd
Dry between trees

wet
Wet 18" down, calamagrostis hummocks

Dry
Moist but fresh smelling soil, fireweed, calamagrostis, and lady fern

Hea
Recommended HEA path

Bnd
Bnd

Dch
Ditch

Clv
Clv

Bnd
Boundary ravine

Wet1
Sulfur smell

Bnd
Bnd

Wet
Sulfur smell, horsetail, and calamagrostis

Wet
Immediate suction noise in soil. Very wet. Calamagrostis

WDTP6
WDTP6

WDTP8
Local dry point

Clv
Culvert outflow, south east edge of steep cliff

Bnd
Ravine boundary

Dch5
Dch5

Wt1
Sulfur smell

Swl3
South end of old swail

Wt2
Surface Water

Dry
Dry island surrounded by wet

Dry
Dry fireweed clearing on high ridge

Bnd
Boundary. Forest wet, field dry. John walked 100ft forward and it stayed dry

LEGEND & SYMBOLS

- RIVERINE PERENNIAL WETLANDS
- PALUSTRINE EMERGENT WETLANDS
- RAPID DATA TEST: DRY
- PALUSTRINE FORESTED WETLANDS
- PALUSTRINE SCRUB-SHRUB WETLANDS
- RAPID DATA TEST: WET
- ROADWAYS/RUNWAY
- EXCAVATED SOIL TEST PITS: 10/24/2023
- CULVERTS
- C/L DRAINAGE
- EDGE OF GRAVEL
- PROPOSED PROPERTY LINES

0 50 100 150 200
GRAPHIC SCALE

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK
WETLAND MAP POINTS: SHEET 1

BISHOP ENGINEERING, LLC
PO BOX 2501 HOMER, ALASKA 99603
(907) 299-7609

DATE: 8/1/2024
CHK'D: JSB
SCALE: AS NOTED
PROJ. NO.: 2023129

SHEET NO.:
WM:B1

N

Dr15
Dry clearing, calamagrostis, fireweed, angelica

Rdp7
Dry

Rdp6
Dry. Sitka burnet, coastal paintbrush

Dr14
Dry

WDTP5
WDTP5

Rdp4
Wet. South boundary of wet clearing

Wet7
Wet7

Dch0
2nd ditch. Wet

Rdp5
East west wet parallel to road. north boundary

Rd10
Sulfur smell, Calamagrostis, Angelica

Dry3
Dry3

Bnd7
Dry to the north, wet to the south

Rd9
Strong sulfur smell, cdalamagrostis, lady fern, impatiens, alders, and elderberries

Dry4
Pushky thicket

Wet1
Wet1

Rd8
Sulfur smell, Calamagrostis, some fireweed, silt soil and shallow groundwater

Clv2
Clv2

Wtr1
Surface water

Dry1
Dry forested area. Continues to driveway

Dry2
Dry to road

Rd7
Dry driveway, wet to either side

Bnd5
Bnd5

Fll3
Edge of fill

Bnd6
wet out of trees

Dog
Dogwood flowers

Pnd
Pnd

Clrd
Rd side cleared area. Dry

Bndy
Wet. More wet south, dry north

Wtr3
Wtr3

Bnd1
Bnd1

Bnd4
Bnd4

Dry
Dry

Wet3
Wet3

Rd6
Faint sulfur smell, dense fireweed to calamagrostis transition point

Wet
Sulfur smell, fireweed, calamagrostis, sitka burnet

Bndy
Bndy

Dry
Dry

Dry
Calamagrostis, fireweed, dry soil

Rd3
Dry

Rd13
Horsetail, blueberries, alders, skinny spruce trees, and sulfur smell

MATCH LINE

Rdp
Dense fireweed

Wet
Sulfur, calamagrostis hummocks with small patches fireweed

Swl
Swale heading south

Rd2
Rd2

Swl2
Local wet. Culvert clogged

MATCH LINE

Wet
Forest wet, lady ferns, alder, spruce

Dry
Dry

Wet
Sulfur smell, calamagrostis and fireweed

Bnd
Boundary from wet calamagrostis field to dry fireweed field

Wet
Dry forest wet clearing

Bnd
Ravine boundary, steep

Swl
Swale

Wet
Clearing

Swl
Swale

Bnd
Boundary swale

Dry
Forested, wood fern, sitka burnet, horsetail, fireweed

Dry
Fireweed and calamagrostis

Rd11
Mix of fireweed and Calamagrostis. Dry

Rd14
Swail outfall. Smells of sulfur, has blueberry bushes

Swl4
Swl4

Rd13
Mix of fireweed and Calagrostis. Dry

Dry5
Dense fireweed

Bnd3
Bnd3

Bnd2
Bnd2

Rd15
Wet. Sulfur smell, blueberries, calamagrostis, fireweed

Wet
Wet to the north

Wet2
Iron Deposits

Rd12
Dry: blueberries, lady ferns, fireweed, and horsetail

Bnd8
Edge dry before creek

Rd24
Dry. Dense fireweed and lady ferns

Rd18
Wet. Sulfur smell and positive reduced iron test, field mix of Calamagrostis and fireweed

Rd23
Boundary

Rd19
Wet. Currants growing on deadfall, Calamagrostis hummocks

Dry6
Dry6

Rd22
Boundary with Impatiens

Rd21
Dry along edge of road

Rd20
Wet. Mud patches with scum on top

WDTP4
WDTP4

Swl5
Edge east to west fill with swail below

Swl1
Swl1

Rd16
Wet. Sulfur smell, calamagrostis, lady ferns

Rd5
Dry: Horsetail, wood fern, local high point

Rd17
Wet. Sulfur smell, calagragrostis, lady ferns

BARRED MOUNTAIN

LEGEND & SYMBOLS

- RIVERINE PERENNIAL WETLANDS
- PALUSTRINE EMERGENT WETLANDS
- RAPID DATA TEST: DRY
- PALUSTRINE FORESTED WETLANDS
- PALUSTRINE SCRUB–SHRUB WETLANDS
- RAPID DATA TEST: WET
- ROADWAYS/RUNWAY
- EXCAVATED SOIL TEST PITS: 10/24/2023
- CULVERTS
- C/L DRAINAGE
- EDGE OF GRAVEL
- PROPOSED PROPERTY LINES

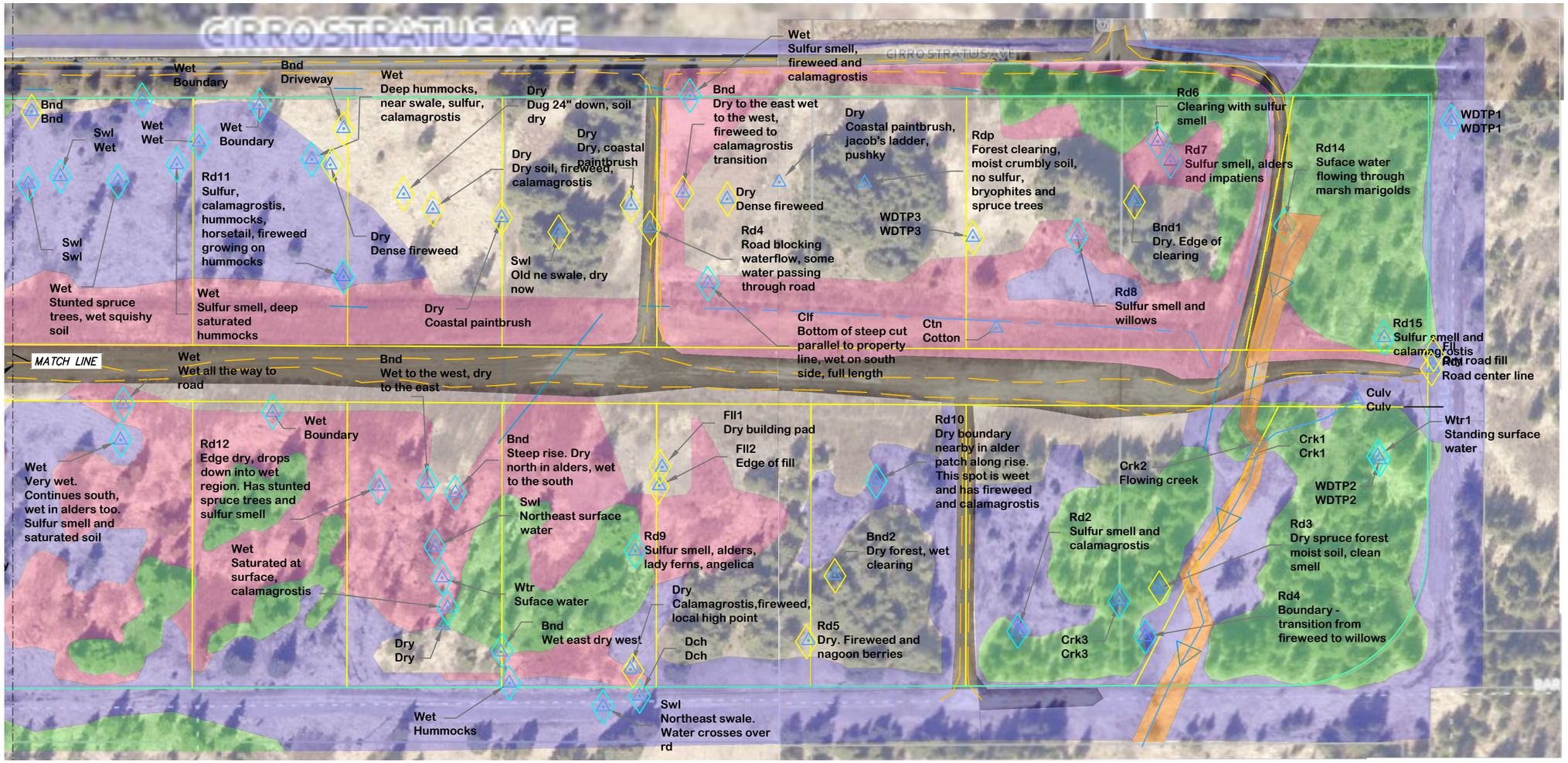
0 50 100 150 200
GRAPHIC SCALE

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK
WETLAND MAP POINTS: SHEET 2

BISHOP ENGINEERING, LLC
PO BOX 2501, HOMER, ALASKA 99603
(907) 299-7609

DATE: 8/1/2024
CHK'D: JSB
SCALE: AS NOTED
PROJ. NO.: 2023129

SHEET NO.:
WM:B2



N

LEGEND & SYMBOLS

- RIVERINE PERENNIAL WETLANDS
- PALUSTRING EMERGENT WETLANDS
- PALUSTRINE FORESTED WETLANDS
- PALUSTRINE SCRUB–SHRUB WETLANDS
- RAPID DATA TEST: DRY
- RAPID DATA TEST: WET
- EXCAVATED SOIL TEST PITS: 10/24/2023
- CULVERTS
- C/L DRAINAGE
- EDGE OF GRAVEL
- PROPOSED PROPERTY LINES

0 50 100 150 200
GRAPHIC SCALE

SKYLINE HEIGHTS ESTATES
KACHEMAK LANDING AIRPARK
WETLAND MAP POINTS: SHEET 3

BISHOP ENGINEERING, LLC
PO BOX 2501 HOMER, ALASKA 99603
(907) 299-7609

DATE: 8/1/2024
CHK'D: JSB
SCALE: AS NOTED
PROJ. NO.: 2023129

SHEET NO.:
WM:B3

Appendix D:
Soil Studies &
Percolation Test Logs

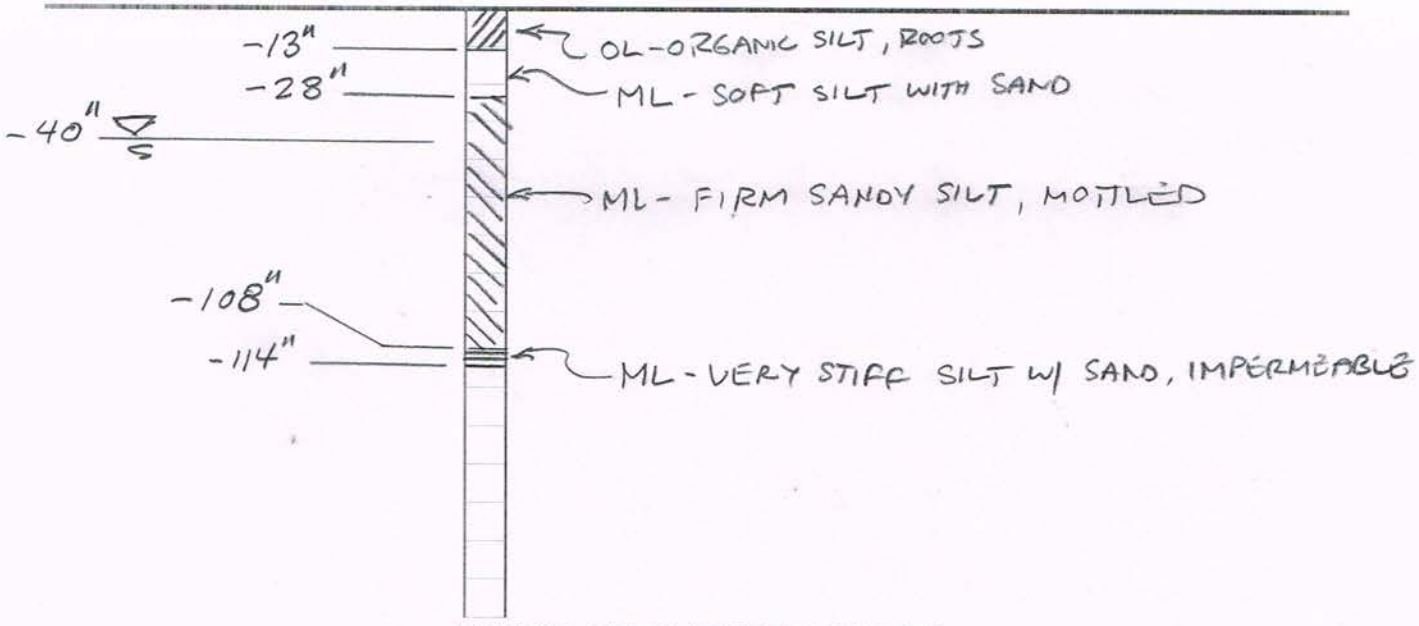
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 38A

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): 24 Hole diameter (inch): 7

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			
0:00	5:00	5	15.500	15.688	0.188	26.6	
0:00	5:00	5	15.375	15.563	0.188	26.6	
0:00	5:00	5	15.500	15.688	0.188	26.6	Steady State

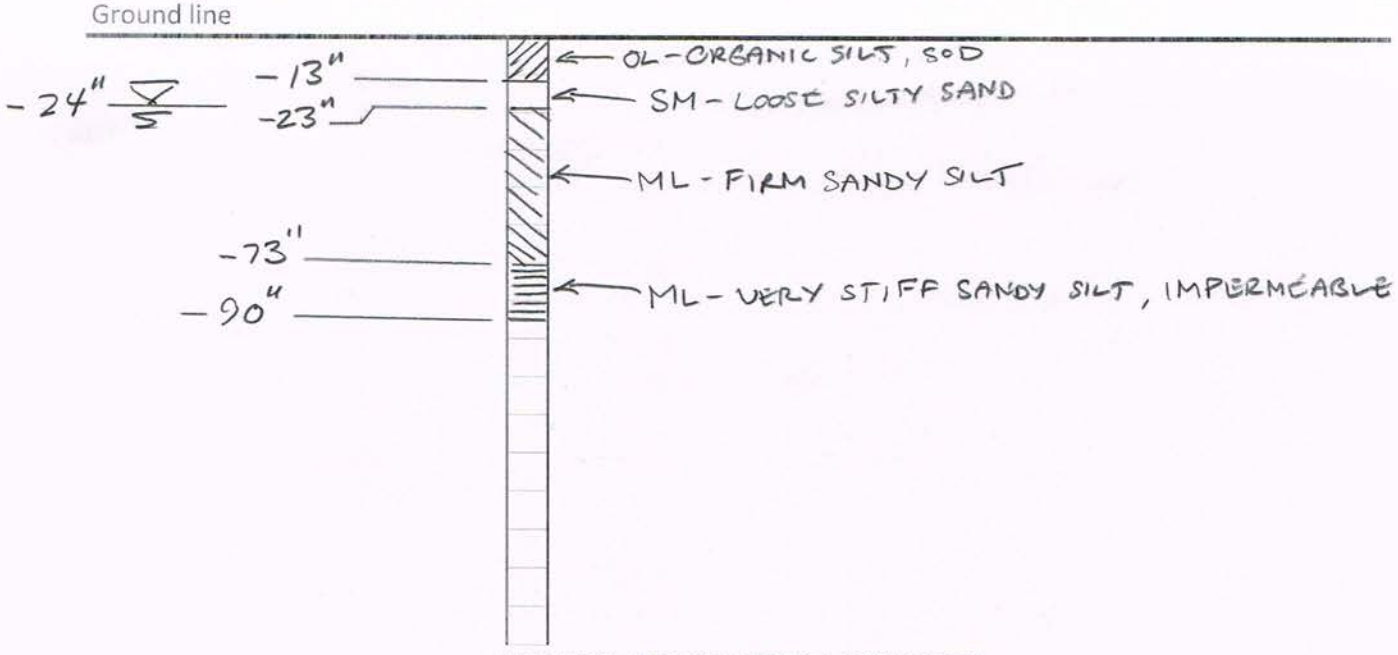
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 39A

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): 12 Hole diameter (inch): 7

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			
0:00	5:00	5	16.125	16.375	0.250	20.0	
0:00	5:00	5	16.125	16.375	0.250	20.0	
0:00	5:00	5	16.188	16.438	0.250	20.0	Steady State

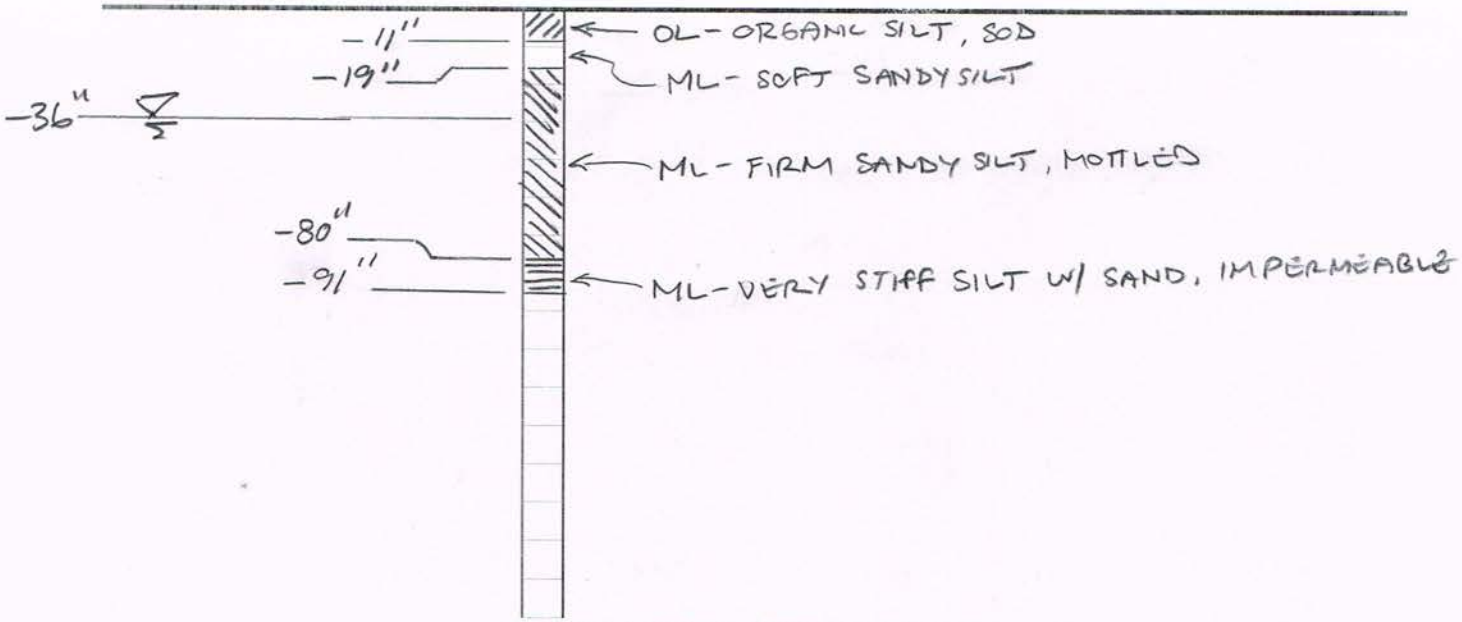
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 40A

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): N/A
Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			

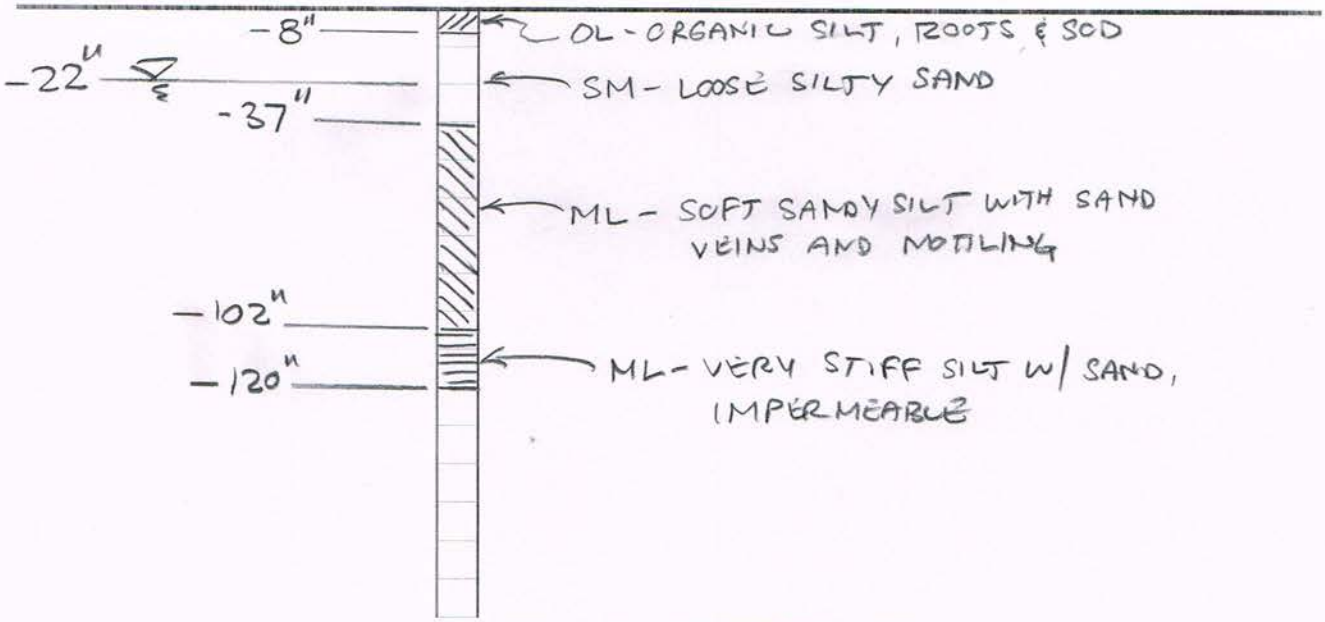
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 41A

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): N/A
Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			

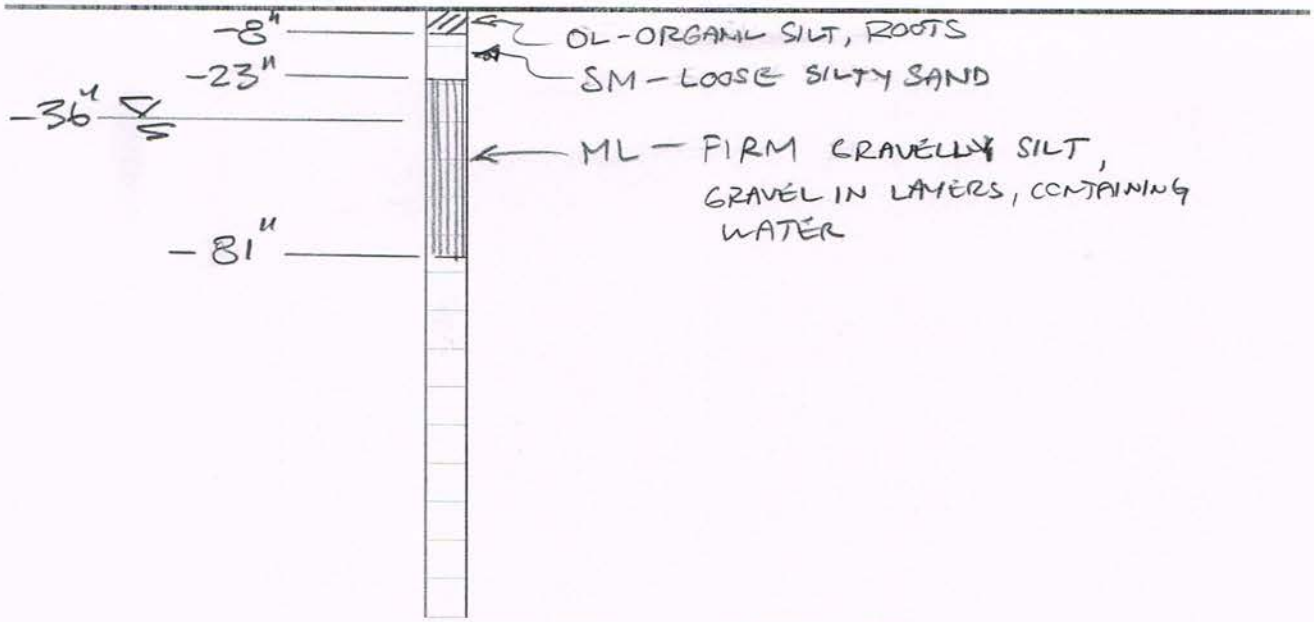
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 42

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): N/A
Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			

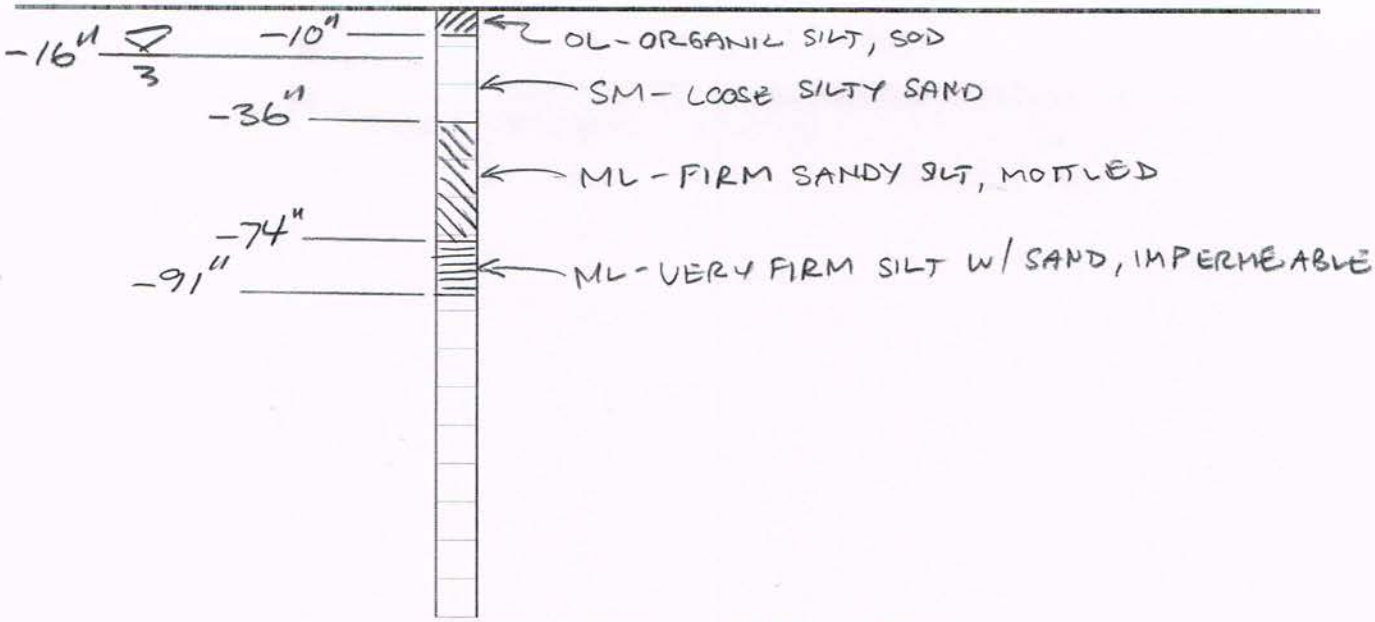
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 43A

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): N/A
Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			

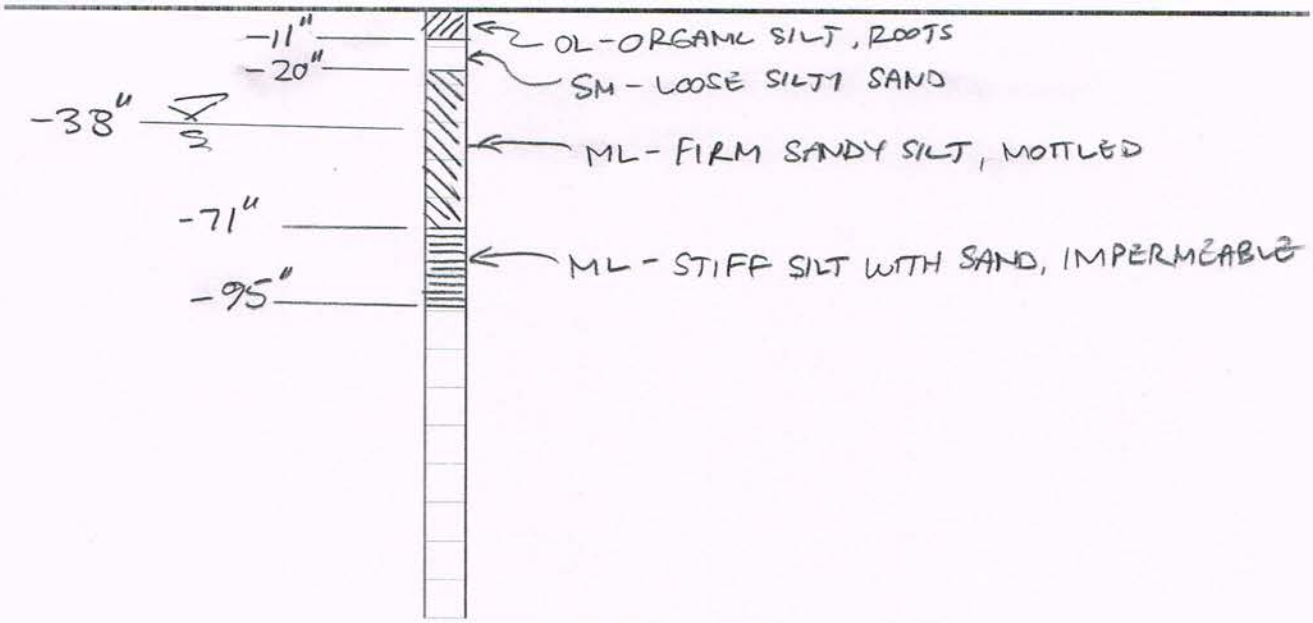
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 44A

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): 18 Hole diameter (inch): 7

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			
0:00	5:00	5	16.875	17.063	0.188	26.6	
0:00	5:00	5	16.813	17.000	0.187	26.7	
0:00	5:00	5	16.875	17.063	0.188	26.6	Steady State

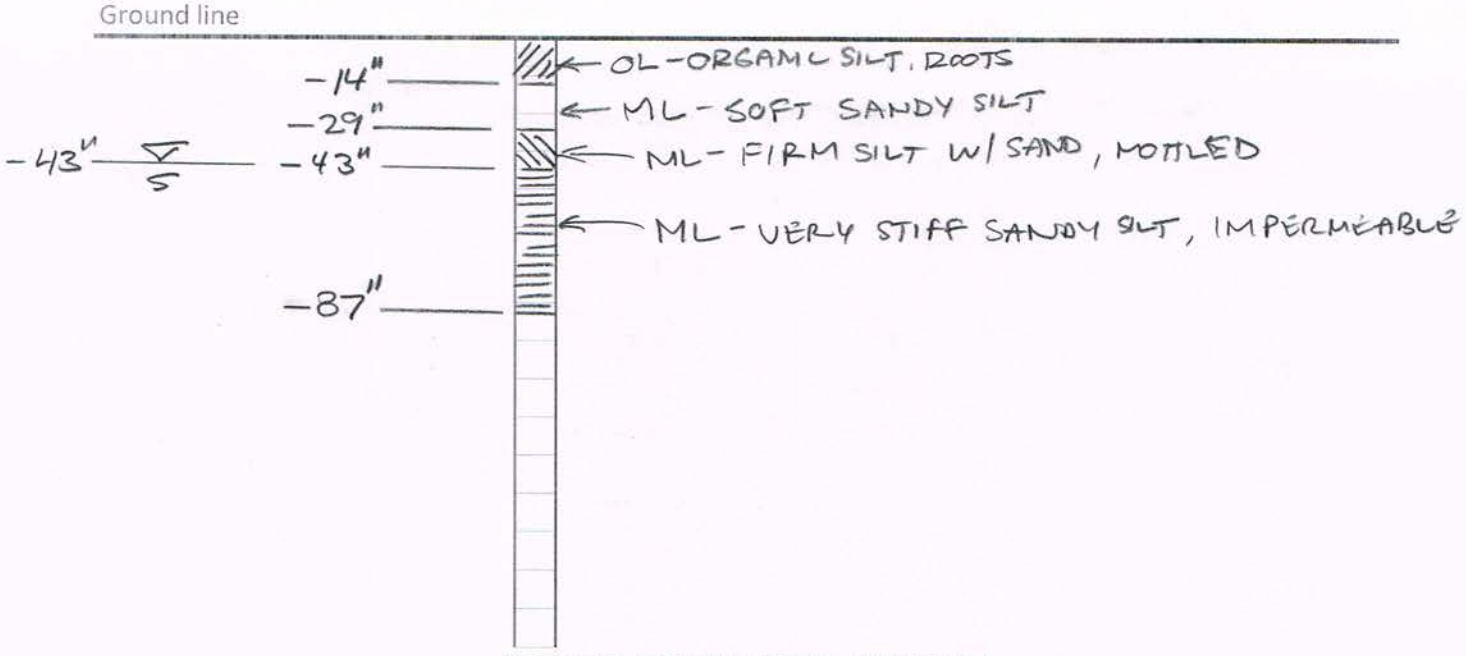
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 45

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): 18 Hole diameter (inch): 7

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			
0:00	5:00	5	16.875	17.313	0.438	11.4	
0:00	5:00	5	16.875	17.188	0.313	16.0	
0:00	5:00	5	16.875	17.188	0.313	16.0	Steady State

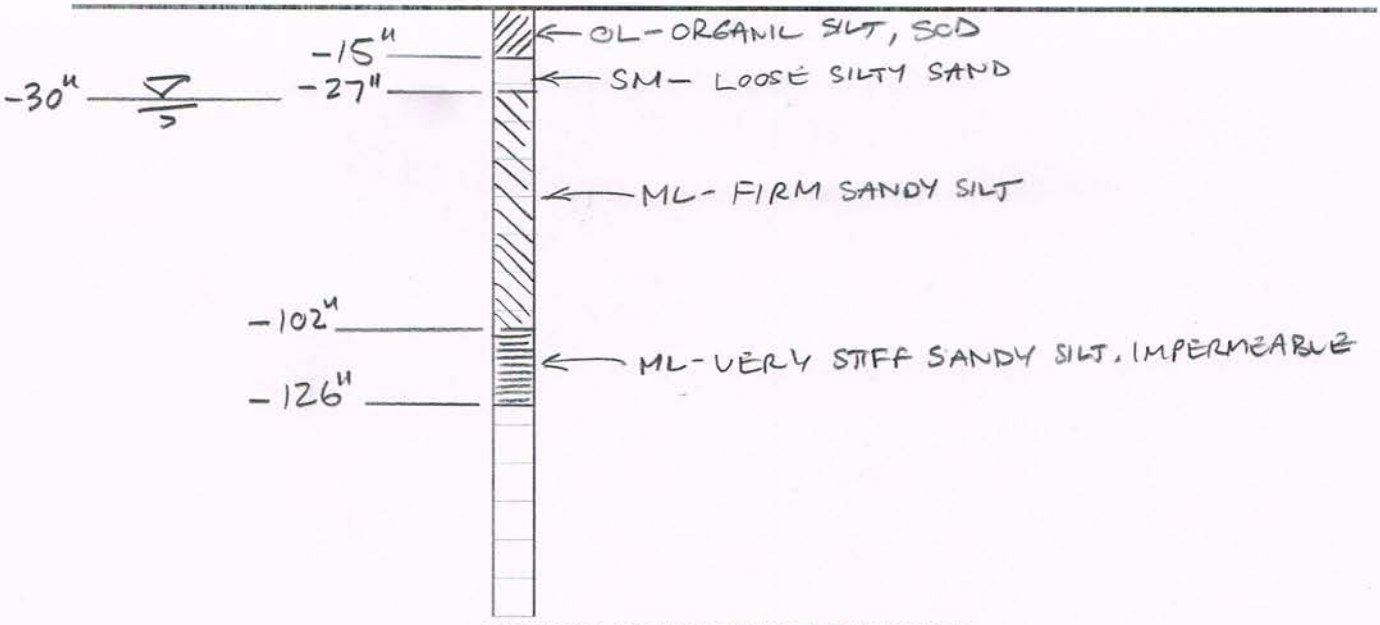
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 46

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): N/A
Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			

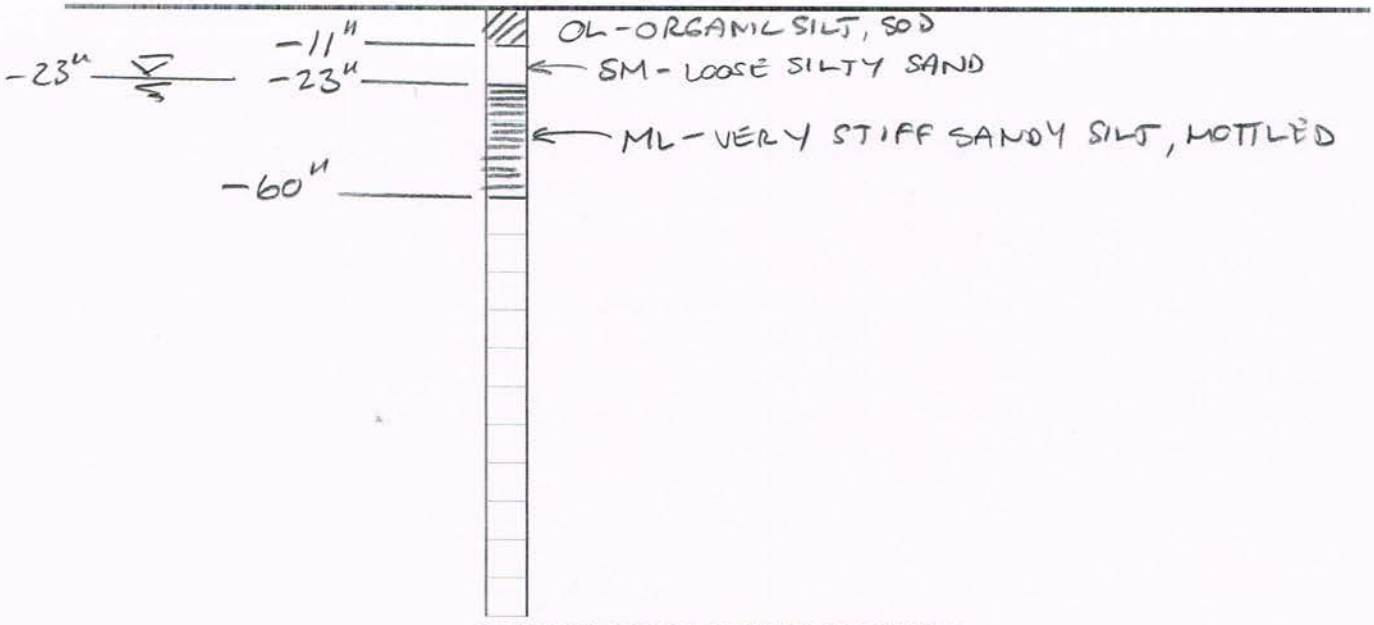
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 47

Property legal description: SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by: John S. Bishop
Date of test: 10/24/2023
Precipitation preceding 7 days: 0.16 inch

Depth of percolation test (inch bgs): N/A
Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			

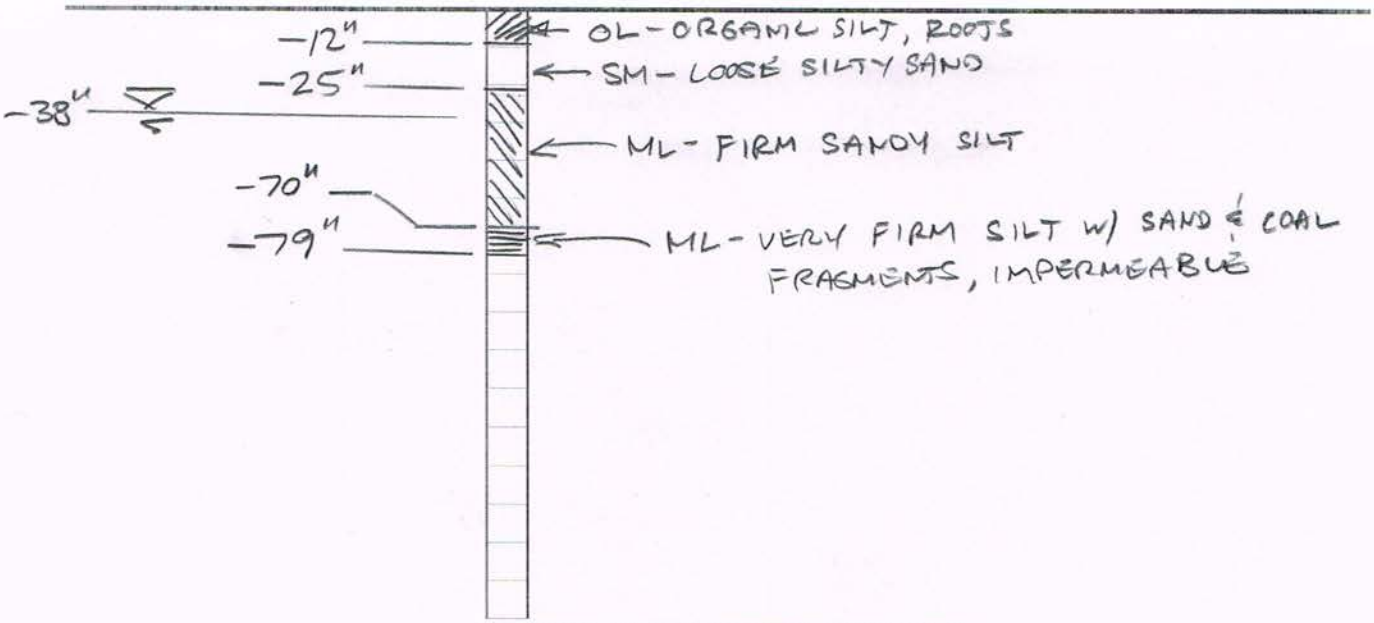
BISHOP ENGINEERING, LLC
PO Box 2501, Homer, AK 99603
(907) 299-7609
www.bishop-engineering.com

PERCOLATION TEST LOG - TEST HOLE NO. 48A

Property legal description:	SKYLINE HEIGHTS ESTATES KACHEMAK LANDING AIRPARK
Test performed by:	John S. Bishop
Date of test:	10/24/2023
Precipitation preceding 7 days:	0.16 inch

Depth of percolation test (inch bgs): N/A Hole diameter (inch): N/A

SOIL PROFILE



PERCOLATION TEST RESULTS

Start Time (mm:ss)	End Time (mm:ss)	Duration (min)	Water Level (in)		Δ in Level (inch)	Perc. Rate (min/inch)	Remarks
			Start	Finish			