Appendix C: Wetland Delineation and Functional Assessment

Jurisdictional Determination Report
Knik-Goose Bay Road Reconstruction Project
Wasilla, Alaska

Prepared for:

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1 Introduction and Purpose

The State of Alaska Department of Transportation and Public Facilities (DOT&PF) is evaluating roadway improvements along a 7.5 mile section of Knik-Goose Bay Road (KGB Road.) and a portion of Fairview Loop Road near its intersection with KGB Road in Wasilla, AK. The project area includes KGB Road between Centaur Avenue to the east and Vine Road to the west. To assist with the corridor evaluation, DOT&PF contracted HDR Alaska, Inc. (HDR) to perform a wetlands delineation and functional assessment. Through field work and mapping efforts, several wetland community types were identified within a single wetland complex. The wetland types include open black spruce scrub, open low alder shrub, and sedge meadow. This report provides a summary of the delineation field work, subsequent mapping, and functional assessment results. Information presented here complies with the U.S. Army Corps of Engineers (USACE) guidance for Jurisdictional Determination Reports, Special Public Notice (SPN) 2010-45. (USACE, 2010)

This report serves two objectives: to identify locations within the corridor that are subject to the jurisdiction of the USACE under authority of Section 404 of the Clean Water Act or Section 10 of the Rivers and Harbors Act of 1899; and to assess the ecological and hydrological functions of those areas for the purpose of assessing project impacts and calculating mitigation requirements. By federal law and associated policy, it is necessary to avoid project impacts to wetlands wherever practicable, minimize impacts that can not be avoidable, and in some cases compensate for unavoidable impacts. 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 Code of Federal Regulations [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 USACE's 1987 Wetlands Delineation Manual and the 2007 Alaska Regional Supplement, 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. (USACE 1987, 2007)
>
> *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:* Non-water and non-wetland areas are called uplands.

1.1 Project Area Description

KGB Road extends south from Wasilla to Goose Bay, Alaska. The length of road being evaluated is approximately 7.5 miles from the Centaur Avenue to Vine Road. Wetland mapping was completed for a corridor 500 feet wide extending 250 feet to each side of the road centerline (Figure 1). In addition, a portion of Fairview Loop Road was evaluated near its intersection with KGB Road. The legal description for this section of road is:

Township 17 North, Range 1 West, Sections 10, 15, 16, 17, 19, 20, Seward Meridian

Township 17 North, Range 2 West, Sections 24, 25, 26, 27, Seward Meridian

The corridor contains a mix of developed and undeveloped parcels, within the Cottonwood Creek watershed. In general, the corridor is located either on a terrace or along a ridge positioned above the Cottonwood Creek floodplain. Elevations range from 200 to 400 feet above sea level and the landscape within the corridor is typically flat to undulating. The majority of the undeveloped areas consist of mixed broadleaf forests that are well drained. One wetland was located within the project corridor; situated along the north side of the KGB Road. near Lakewood Drive. This wetland contains several distinct vegetation communities, hydric soils, and evidence of wetland hydrology.

2 Methods

Prior to conducting the field work, high resolution, true color, orthorectified aerial photography was reviewed in the office to locate potential wetlands and water bodies for field truthing. Two sets of photography were reviewed: Google Earth Imagery (2011 DigitalGlobe, GeoEye) and imagery provided by DOT&PF (Kodiak Mapping, Inc, 2010). The Google Earth imagery was captured in early spring before leaf-out, when runoff from snow melt was present in many roadside ditches and on flat gravel clearings. DOT&PF's imagery was captured on May 3rd, 2010, soon after leaf-out and significantly fewer areas had visible surface water. Sites with potential standing water, saturation tolerant vegetation, or dark soils (indicating surface saturation), as identified in either image, were marked with points in a Geographic Information System (GIS) for field truthing. Field maps were created in GIS and included these waypoints, DOT&PF's imagery, and two foot contour.

The field work was performed July 21, 2011, by Christopher Wrobel and George Hoden, environmental scientists at HDR. The field work occurred during the middle of the growing season for the Cook Inlet ecoregion of Alaska (USACE 2007). Data plots were studied using the methods described in the 1987 USACE Wetland Delineation Manual and the 2007 Alaska Regional Supplement (USACE 1987, 2007). Additionally a Wetland Assessment Data Form for the DOT&PFs Alaska Wetland Assessment Method (AKWAM) was completed as part of a wetland functional assessment.

Data were collected using two types of sample plots: wetland determination plots and photo points. Wetland determination plots included data forms from the 2007 Alaska Regional Supplement. Photo points included photographs of the soils and vegetation, plus field notes on the presence or absence of wetland indicators. Photo points were collected after vegetation, soil, and hydrology parameters were well documented by representative wetland determination plots.

Six wetland determination data forms were completed and seven additional photo points were recorded. In total, 13 locations were visited (Figure 1). Wetland determination data forms and photographs from each site are included in Appendix A. Coordinates of each location were recorded with a handheld global positioning system (GPS). Additional notes for mapping, such as wetland/upland boundaries and National Wetlands Inventory (NWI) coding were also recorded in the field.

One wetland area was observed within the project corridor. It contained several distinct vegetation communities and separate wetland data plots were collected at each community type. Along the eastern edge of the wetland, the wetland/upland boundary was unclear and paired plots were collected to delineate the boundary. The paired plot method involved collecting data at adjacent wetland and upland sites and observing the transition in the soils, plant species composition, and surface hydrology. The approximate wetland/upland boundary was drawn on the field map by correlating the on-site observations with the field map's contour data and aerial photography.

After the field work was complete, the remaining wetland/upland boundaries were drawn in GIS by interpreting the field data, aerial imagery, contour line data and reviewing reference mapping. Wetland mapping for the corridor was available from the U.S. Fish and Wildlife Services NWI mapping (USFWS 2011) and from the Matanuska-Susitna Borough (MSB) Wetland Mapping (Gracz 2011); both were reviewed for this project. Soil survey maps were also downloaded from the Natural Resource Conservation Service (NRCS) website and used to identify possible wetlands in the corridor. Wetland types were classified using NWI codes (Cowardin et. al 1979, USFWS 1995). Scientists also reviewed available MSB streams and waterbody mapping in GIS; none were identified within the project corridor.

3 Results

Wetlands were identified at field sites where the investigators observed indicators of hydrophytic vegetation, wetland hydrology, and hydric soils, and where similar characteristics were seen on the aerial photography. Table 1 lists each plot, the presence or absence of wetland indicators, and the NWI code. Note that all three wetland parameters (hydrophytic vegetation, hydric soils, and wetland hydrology) must all be present for a site to be considered a wetland. If any of these three requirements are not met, the site normally does not meet the USACE's criteria for being classified as a wetland, and therefore would not be subject to Section 404 regulations.

Table 1 Summary of Wetland Determination Field Plots.

Data Plot	Plot Type	Wetland Determination	Hydrophytic Vegetation	Hydric Soils	Wetland Hydrology	NWI Code
101	Data Form	Upland	N	N	N	U
102	Photo Point	Upland	N	N	N	U
103	Photo Point	Upland/Fill	N	N	N	U
104	Photo Point	Upland	N	N	N	U
105	Data Form	Upland	N	N	N	U
106	Photo Point	Upland/Fill	N	N	Y	U
107	Data Form	Upland	Y	N	Y	U
108	Data Form	Wetland	Y	Y	Y	PSS1/EM1C
109	Data Form	Wetland	Y	Y	Y	PEM1C
110	Data Form	Wetland	Y	Y	Y	PSS4/1B
111	Photo Point	Wetland	Y	Y	Y	PEM1/2C
112	Photo Point	Upland/Fill	N	N	N	U
113	Photo Point	Upland/Fill	Y	N/A (water body)	Y	PEM1/UBx

Key: Y = Yes, N= No, N/A = Not applicable

3.1 Vegetation

The corridor was dominated by upland mixed forest and development. One wetland complex containing several hydrophytic vegetation communities was observed just west of Lakewood Drive. The majority of this wetland contained open black spruce scrub. An open alder low shrub community was observed near the eastern edge of the wetland and sedge dominated meadows were intermixed in small openings. The vegetation within the wetland showed moderate disturbance. Standing dead paper birch (*Betula paperifera*) and black spruce (*Picea mariana*) trees were common and a pipeline/power line corridor was present near the wetland's eastern boundary.

Inset 1. Typical open black spruce scrub community.

Of the six plots where wetland determination data forms were completed, four had hydrophytic vegetation (Table 1). Brief descriptions of each hydrophytic community type are provided below, followed by a general description of the surrounding upland vegetation.

The most common hydrophytic community was open black spruce scrub (Inset 1); represented by field plot 110. Common plants included black spruce, (*Picea mariana*) dwarf birch (*Betula glandulosa*), Labrador tea (*Ledum groenlandicum*), leatherleaf (*Chamaedaphne calyculata*), cloudberry (*Rubus chamaemorus*) and russet's cotton-grass (*Eriophorum russeolum*). Standing dead black spruce trees were common throughout this community; their cover value was estimated at 20% within the data plot and they were common in surrounding areas as well. Open black spruce scrub is identified on the attached field forms (Appendix A) and map (Figure 2) by the NWI code PSS4/1B (palustrine, mixed needle leaved evergreen and broad leaved deciduous scrub-shrub, saturated wetland).

An open low alder shrub community was the second most abundant hydrophytic vegetation type observed (Inset 2). Common plants included Sitka alder (*Alnus sinuata*), paper birch saplings, blue-joint reedgrass (*Calamagrostis canadensis*), and marsh cinquefoil (*Potentilla palustris*). This community contained an abundance of standing dead paper birch trees, with no live trees present. This community was documented by field plot 108 and coded on the attached map as a PSS1/EM1C wetland (palustrine, mixed scrub-shrub and persistent emergent, seasonally flooded wetland).

Inset 2. Typical open alder low shrub community with emergent vegetation in the foreground.

Sedge meadow communities were dispersed throughout the wetland (Inset 3). Common plants included leatherleaf, russet's cotton-grass, hoary sedge (*Carex canescens*), and boreal bog sedge (*Carex magellanica*). Disturbance from a pipeline/powerline corridor forms the east and west boundaries of the largest sedge meadow within the wetland. Sedge meadows were documented by one wetland determination field plot (109) and one photo point (111). The species composition of both plots was similar with one general difference: water horsetail (*Equisetum fluviatile*) was more abundant at plot 111. The plots were coded PEM1C and PEM1/2C, respectively (palustrine, persistent emergent, seasonally flooded wetland; and palustrine, mixed persistent/non-persistent emergent, seasonally flooded wetland).

Inset 3. Typical sedge meadow community.

Two non-hydrophytic communities were documented with data plots in the project corridor: mixed paper birch and white spruce forest, and closed willow tall shrub. Both types were prevalent through the corridor and are represented by wetland determination plots 101, 105, and 107. Common plants

included paper birch, white spruce (*Picea glauca*), bebb willow (*Salix bebbiana*), high-bush cranberry (*Viburnum edule*), prickly rose (*Rosa acicularis*), woodland horsetail (*Equisetum silvaticum*), field horsetail (*Equisetum arvense*), oak fern (*Gymnocarpium dryopteris*), blue-joint reedgrass, and fireweed (*Epilobium angustifolium*). These non-hydrophytic communities were determined to be uplands, and were given the NWI code U.

Developed, partially vegetated, and unvegetated sites were documented at photo points 103, 104, 106, and 112. When vegetation was present (not cleared), it was non-hydrophytic and included a mix of cottonwood saplings (*Populus balsamifera*), Scouler willow (*Salix scouleriana*), blue-joint reedgrass, and common roadside weeds. The attached mapping includes these areas with surrounding uplands

Inset 4. Typical hydric soil with thick organic horizon.

3.2 Soils

NRCS soils mapping was available for the area showing the locations of hydric and non-hydric soil map units. Non-hydric soils dominate the corridor and were represented by Knik Silt Loam, Kalambach Silt Loam, and Deception Silt Loam. Two hydric map soil map units occur in one area, in the same approximate areas as the wetland described above. The hydric soil map units are Cryaquepts, depressional, 0 to 7 percent slopes; and Histosols (NRCS 2011).

As suggested by the NRCS mapping, hydric soils were not found to be widespread during the field work. Five data plots had hydric soils and these were located within the same wetland complex (plots 107-111). A typical hydric soil profile included an 8-20+ inch thick organic horizon with 4-10 inches of fibric material followed by 2-14 inches of hemic material (Inset 4). Mineral soil, a silt loam, was observed below the organic layers. Seasonal frost was also observed, between 12-20 inches below the ground surface. Hydric soil indicators included the presence of Histic Epipedon (A2) and Histosol (A1) conditions. The histic epipedon at plot 108 was only 8 inches deep, the minimum required for this indicator. The underlying silt loam was tested for reducing conditions with alpha-alpha dipyridyl; a positive reaction was observed, providing additional support for a hydric soil parameter at this data plot. Non-hydric soils were widespread throughout the remainder of the project corridor and are represented by 8 of the 13 data plots.

Inset 5. Test pit of a moderately well drained non-hydric soil.

Two typical non-hydric soil profiles were observed. Well drained sites showed evidence of spodic soil development and included a thin organic surface horizon, followed by A, E, Bhs, Bs, and Bw layers. Moderately well drained soils contained a thin organic layer, followed by Bw layers (Inset 5). Soil textures for both types were silt loam and dominant hues matched the 10YR page from the Munsell Soil Color Chart (Munsell 2009). Photographs showing soil conditions for each sampled site are included in Appendix A.

3.3 Hydrology

Precipitation data for the three-month period prior to the field investigation was reviewed to determine the degree to which any recent climatic events (i.e., abnormal wet or dry conditions) may have influenced field hydrology. The nearest available climate data was available from Anchorage (http://weather.gov/climate). Precipitation trends from Anchorage were assumed to be similar to the project area. The average precipitation totals over the three month period preceding the field visit were compared to normal totals from 1961 to 1990, using the NRCS Engineering Field Handbook method (NRCS 1997). This method weights the data by both the amount of precipitation and the relative age of a rainfall event. The values used for this comparison are shown in Table 2.

Table 2 Long Term Precipitation Analysis

Month	***3 yrs in 10 less than***	***3 yrs in 10 more than***	***Rain fall (actual)***	***Condition***	***Condition value***	***Month Weight Value***	***Sum Product (Condition x Weight)***
July	1.09	2.06	2.08	Wet	3	3	9
June	0.66	1.38	1.19	Normal	2	2	4
May	0.4	0.9	0.35	Dry	1	1	1
Sum							14
Conclusion: Antecedent precipitation was normal							

Using the NRCS method, it was determined that precipitation for the three months prior to the fieldwork was normal (Sum equals 14, where a value of 11 – 14 is normal). Conditions observed in the field data correlate with this analysis; hydrology observations were well supported by landscape position, hydrophytic vegetation, and hydric soils.

Evidence of wetland hydrology was observed at four plots where wetland determination forms were completed and at three additional photo points. The most common primary indicators were High Water Table (A2), Saturation (A3) and Dry-Season Water Table (C2). The most common secondary indicators were Stunted or Stressed Plants (D1), Geomorphic Position (D2) and FAC Neutral Test (D5).

One photo point, plot 106, had positive wetland hydrology from surface inundation but lacked positive vegetation or soil parameters. Several inches of water were perched on top of a compacted gravel parking lot. This area was determined to be an upland site.

Wetland determination plot 107 had wetland hydrology from two secondary indicators (Oxidized rhizospheres on living roots, C3, and D2) and hydrophytic vegetation, but it and lacked hydric soils. This plot was located on a toeslope above the wetland complex and was determined to be an upland site, although influenced by transitional hydrology.

Six data plots lacked wetland hydrology indicators. These plots were located throughout the corridor in flat or convex areas that were photo-interpreted to have potential wetland hydrology based on the Google Earth Imagery. During the field work, these sites were found to be well drained; often lacking any hydrophytic plants or hydric soil indicators. The surface inundation seen in the Google Earth Imagery was likely due to snowmelt temporarily perched above frozen ground.

4 Mapping Results

Figure 2 and Figure 3 provide wetland/upland boundaries within the project area. The figures also show where wetland determination data forms and photo points were completed. Table 3 summarizes the acreage of wetlands and uplands within the project area by NWI classification.

The project corridor encompasses approximately 604 acres with over 98% of the area mapped as uplands. Potentially jurisdictional wetlands comprise approximately 8 acres of scrub-shrub and emergent types. No water bodies or streams were identified on the project corridor.

The wetland mapping from the MSB (Gracz 2011) coded this wetland as “forested depression with shrubby areas.” This is different from HDR’s findings; trees were present but the abundance of live trees was too low to classify the wetland types as forested (standing dead trees were not included in the NWI classification criteria). Available NWI mapping was similar to HDR’s although it classified the wetland as one NWI type, PSS1/4B. Site specific data collected for the project supports classifying the wetland as three different NWI types. Also, the wetland’s eastern boundary extends further in this report than on the NWI mapping.

Table 3 Mapping Summary

Mapping Codes	***Description***	***Acres***
PSS4/1B	Saturated freshwater wetland with needle leaved evergreen scrub and broad leaved deciduous shrubs	*5.06*
PSS1/EM1C	Seasonally flooded freshwater wetland with broad leaved deciduous shrubs and persistent emergent vegetation	*1.28*
PEM1C	Seasonally flooded freshwater emergent wetland with persistent emergent vegetation	*1.00*
PEM1/2C	Seasonally flooded freshwater emergent wetland with persistent and non- persistent vegetation	*0.72*
	Total Wetland Area	*8.06*
U	Upland	*595.72*
PEM1/UBx	Stormwater run-off pond draining uplands (recommend non-jurisdictional)	*0.36*
	Total Mapped Area	*604.14*

5 Jurisdictional Status

The wetland area described within this report appears to be connected by subsurface hydrology to adjacent wetlands to the north and Cottonwood Creek, which is located less than 1,000 feet to the south. Cottonwood Creek is a tributary to Knik Arm, a navigable water (USACE 1995); because the wetland extends beyond the project corridor, scientists did not walk the entire wetland/upland border to look for surface water connections. However, due to the wetland's elevation above Cottonwood Creek, and probable groundwater connections, this wetland is assumed to be jurisdictional; subject to confirmation by the USACE.

A storm water collection pond is located near the corner of KGB Road and the Palmer-Wasilla Highway. It is shown on Figure 3 with the NWI code PEM1/UBx. The pond drains uplands, not wetlands, and by USACE definition, would be non-jurisdictional.

6 Wetland Functional Assessment

A functional assessment of the mapped wetland was performed using DOT&PF's Alaska Wetland Assessment Method (AKWAM). AKWAM assesses ten wetland functions and provides a quantitative method to evaluate their level of performance. Each function receives a rating from Low to High, and a score between 0 and 1, based on a combination of field observations and office based analysis. The scores, along with other indicators, are then used to rate the wetland in a Category from 1 to 4, where Category 1 wetlands rate the highest. Category ratings can be used to evaluate project alternatives and to determine compensatory mitigation ratios. The wetland identified in this report was evaluated as a single assessment area. The functional assessment data form is included in Appendix A. Table 4 summarizes the scores for each of the wetland functions and provides the Category rating for the wetland.

This wetland was found to perform seven out of 10 functions. One function was rated 'high', two functions were rated 'moderate', four functions were rated 'low', and three functions were not performed. The highest rated function was Sediment/Nutrient/Toxicant Retention and Removal. In order to obtain a high rating for this function, a wetland must receive deleterious materials such as sediments, excess nutrients, or toxicants and it must also have the ability to retain and treat those contaminants. The wetland evaluated in this report met those requirements due to the following conditions. It is located near development; road runoff, pet waste, and dust are potential sources of contaminants; and it had the requisite vegetation density and hydrology to perform a relatively high amount of on-site treatment.

The functions rated at a moderate level include: Water Storage and Groundwater Recharge. The functions rated at a low level include: Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern, General Wildlife Support (due to the amount of surrounding development), Production Export/Food Chain Support, and Uniqueness.

The following functions were not performed by this wetland and they did not receive a score. General Fish Support was not evident as there were no fish bearing water bodies within the assessment area, and therefore no fish habitat. Sediment/Shoreline Stabilization was performed as the assessment area does not occur on the banks of a water body and there was no flowing water observed in the wetland. Recreation/Education Potential was not applicable because there was no evidence that the wetland is currently, or planned for, these uses.

In addition to above ratings, each function was assigned Actual Functional Points. The wetland received a score of 2.8 total Functional Points out of 7 Possible Functional Points. The Percent of the Possible Score (Functional Points divided by Possible Functional Points) was 40%.

To determine the Category for the wetland, the percentage value is considered along with other criteria. For example, high ratings for Threatened or Endangered Species or Other Species of Concern, General

Fish Support, or Uniqueness can increase the Category for the wetland. This wetland did not meet any of the criteria and the Category ranking was determined based on the percentage value.

The overall rating for the wetland is Category 3, a moderate to low functioning wetland. Category 3 wetlands have a Percent of Possible Score between 35 and 49% (this wetland scored 40%) and they do not meet any criteria of a Category 1 or 2 wetland. This wetland received a lower rating than Category 1 or 2 wetlands because of the absence of any streams or other water bodies, disturbance within the wetland, adjacent development, an abundance of similar wetlands within watershed, and moderate to low wildlife and habitat values. While the wetland performs important ecological functions within the Cottonweed Creek watershed, these factors limit the wetland from performing those functions at a higher level.

Table 4 Summary of Wetland Assessment Ratings and Points

Functions and Services	Rating	Actual Functional Points	Possible Functional Points
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	L	0	1.0
B. General Wildlife Support	L	0.3	1.0
C. General Fish Support	N/A	N/A	N/A
D. Water Storage	M	0.7	1.0
E. Sediment/Nutrient/Toxicant Removal	H	1.0	1.0
F. Sediment/Shoreline Stabilization	N/A	N/A	N/A
G. Production Export/Food Chain Support	L	0.3	1.0
H. Groundwater Discharge/Recharge	M	0.4	1.0
I. Uniqueness	L	0.1	1.0
J. Recreation/Education Potential (bonus pts.)	N/A	N/A	N/A
Totals:		2.8	7
Percentage of Possible Score:	40%		
Category*	3		

Ratings: L=Low, M= Moderate, H=High

*Category is reported on a scale of 1 to 4 where Category 1 wetlands have the highest value.

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Potentially Non-Jurisdictional Stormwater Retention Pond

Wetland Area

Legend

GPS Data Collection Points

- ☆ Data Form Site
- ○ Photo Point
- Project Area
- Streams

N
W E
S

0 3

Miles

Figure 1: Overview

Knik-Goose Bay Road Reconstruction

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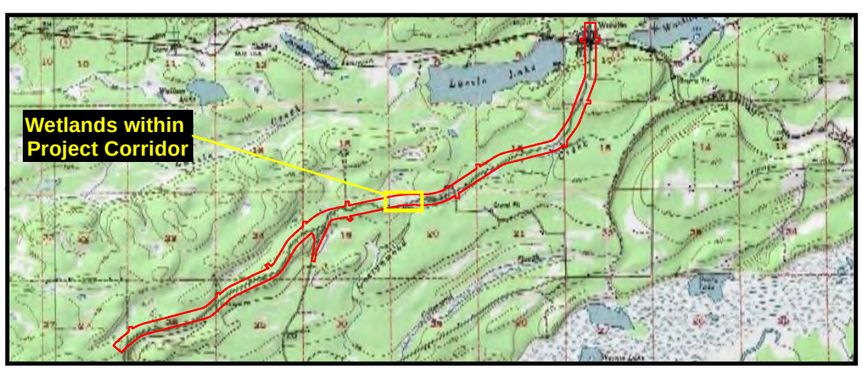
PEM1/2C
PSS4/1B
PEM1/2C
PEM1/2C
111
PSS4/1B
110
PEM1C
109
108
PSS1/EM1C
107
U
Cottonwood Creek



Legend

GPS Data Collection Points

- ☆ **Data Form Site**
- ○ **Photo Point**
- **Project Area**
- **Wetland/Upland or Wetland Type Boundary**
- **Streams**

N
W E
S

0 300

Feet

Figure 2: Wetland Delineation

Knik-Goose Bay Road Reconstruction

Alaska Department of Transportation and Public Facilities

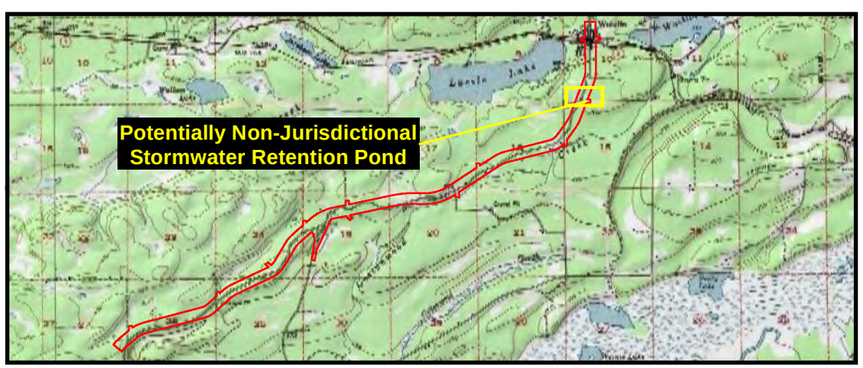
Jurisdictional Determination Report

HDR Alaska

U

113

PEM1/UBX



Legend

GPS Data Collection Points

- ☆ **Data Form Site**
- ○ **Photo Point**
- **Project Area**
- **Wetland/Upland or Wetland Type Boundary**
- **Streams**

N
W E
S

0 300

Feet

Figure 3: Stormwater Retention Pond

Knik-Goose Bay Road Reconstruction

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Appendix A

Field Collected Data

Jurisdictional Determination Forms and Site Photographs

WETLAND DETERMINATION DATA FORM – Alaska Region

Project: KGB ROAD WETLANDS Borough/City: MAT-SU Date: 7/21/2011

Applicant/Owner: AKDOT & PF Sampling Point #: ≈101

Investigator(s): CW, GH Firm: HDR Alaska, Inc.

Lat. (dec.°) N 61.53461 Long. W 149 58562 ± ' NAD 83 Recorded on GPS #: 191 Marked on map? ✓ Field Map #: 1

Subregion (circle one): SE Southcentral Western Aleutian Interior Northern Landform: RIDGE Slope (%): 0 Aspect: N/A

Shape across slope: linear / convex / concave Shape up/downslope: linear / convex / concave NWI classification:

Photo nos./descriptions: 516 (SOIL), 517 & 18 (VEG) Camera #: ___ Veg Type (Viereck Level 4 or other): N/A

Are climatic / hydrologic conditions on the site typical for this time of year? Yes: ✓ No: ___ HGM type:

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

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? If needed, explain answers here.

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the sampled area within a wetland?**	Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓		
Wetland Hydrology Present?	Yes ___	No ✓	Remarks (e.g., marginal?):	

VEGETATION (Use scientific names.)

Tree Stratum (dbh≥ 3")

Sp.	Abs.Cov.%	Dom?	Ind.	Species	Abs.Cov.%	Dom?	Ind.
1. BET PAP	75	✓	FACU	5.			
2. PIC GLU	1		FACU	6.			
3.				7.			
4.				8.			

Total Tree Cover: 76

50% of total cover: 38 20% of total cover: 15.2

Sapling/Shrub Stratum (woody plants < 3" dbh) 4/4

	Abs.Cov.%	Dom?	Ind.		Abs.Cov.%	Dom?	Ind.
1. VIB EDU	35	✓	FACU	7. PIC GLA	T		FacU
2. ROS ASI	5		FacU	8. BET PAP	3		FacU
3. RIB TRI	8		FAC	9. VAC VIT	3		FAC
4. RUB IDA	1		FAC	10.			
5. POP BAL	T		FacU	11.			
6. SAL SCO	T		FAC	12.			

Total Sapling/Shrub Cover: 55

50% of total cover: 27.5 20% of total cover: 11

Herb Stratum

	Abs.Cov.%	Dom?	Ind.		Abs. Cov.%	Dom?	Ind.
1. EPI ANG	10	X	FacU	12. PYR ASA	1		FAC
2. CAL CAN	5		FAC	13. EQU ARV	5		FacU
3. EQU SIL	8	X	FacU	14. MONESIS UNI	T		
4. ATH FIL	1		FAC	15.			
5. GYM DRY	12	X	FacU	16.			
6. DRY DIL	1		FacU	17.			
7. COR CAN	5		FacU	18.			
8. TRI ELA	2		FAC	19.			
9. POLY ACU	T			20.			
10. LIN BOR	1		UPL	21.			
11. MOR LAT	T			22.			

Total Herb Cover: 51

50% of total cover: 25.5 20% of total cover: 10.2

Circular 1/10-ac plot ✓ or other plot dimension: ___ % of bare ground: 0

% Cover of Wetland Bryophytes N/A % Total Cover of Bryophytes ___ %

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	X1=	0
FACW species	0	X2=	0
FAC species	16	X3=	48
FACU species	160	X4=	640
UPL + NL species	1	X5=	5
Column Totals:	177 (A)		693 (B)

Prevalence Index = B/A = 3.92

Hydrophytic Vegetation Indicators:

___ Dominance Test is>50% N

___ Prevalence Index is ≤3.0 N

___ 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: PLOT INCLUDES POWERLINE, CLEARED W/ EPI ANG DOMINANT

SOIL

Sampling Point #: 101

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

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	α,α dip. (pos/neg)	Remarks (or use comment number)
0-2	Oe									
2-4	A	10YR 2/2	100					SiL		ROOTS PRESENT
4-6	E	10YR 4/1	100					SiL		
6-7	Bs	10YR 4/4	100					SiL		
7-20	Bw	10YR 5/4	100					SiL		

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

Hydric Soil Indicators (check ones that apply, **msr from top of mineral layers unless otherwise noted**):

- ~ Histosol or Histel (A1) (≥16"organic surface, sat'd during wet period of growing season)
- ~ Histic Epipedon (A2)(8-16" organics, sat'd, underlain by mineral soil with chroma ≤2)
- ~ Hydrogen Sulfide (A4) (w/in 12"of ground surface; @ ____" in this pit
- ~ Thick Dark Surface (A12)
- ~ Alaska Gleyed (A13)
- ~ Alaska Redox (A14)
- ~ Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- ~ Alaska Color Change[4] (TA4)
- ~ Alaska Alpine Swales (TA5)
- ~ Alaska Redox with 2.5Y Hue
- ~ Alaska Gleyed without Hue 5Y or Redder Underlying Layer
- ~ Other (e.g., see p.91 of 2007 Supplement; 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 present)
Type: N/A
Depth (inches) ____

Drainage Class: WELL
Soil Map Unit Name: DRAINED N/A

Hydric Soil Present? Yes ____ No ✓

Comments:
1.
2.
3.

HYDROLOGY

Wetland Hydrology Indicators (check ones that apply, **msr from soil surface**):

Primary Indicators (any one indicator is sufficient)

- ~ Surface Water (A1)
- ~ High Water Table (A2) (w/in 12")
- ~ Saturation (A3) (w/in 12")
- ~ 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) (w/in 12")
- ~ Dry-Season Water Table (C2) (w/in 24")
- ~ Other (explain)

Secondary Indicators (at least 2 are required)

- ~ Water-Stained Leaves (B9)
- ~ Drainage Patterns (B10) ____
- ~ Oxid'd Rhizospheres on Living Roots (C3) (w/in 12")
- ~ Presence of Reduced Iron (C4) (pos. α,α or soil color change w/in 12")
- ~ Salt Deposits (C5)
- ~ Stunted or Stressed Plants (D1)
- ~ Geomorphic Position (D2)
- ~ Shallow Aquitard (D3) (w/in 24", can perch H2O w/in 12")
- ~ MIcrotopographic Relief (D4) (caused by water)
- ~ FAC Neutral Test (D5) (# OBL+FACW dominants > # FACU+UPL dominants)

Field Observations (in. from ground surface):
Surface Water Present? Yes ____ No ✓ Depth **of** water (in.) ____
Water Table Present? Yes ____ No ✓ Depth **to** water (in.) ____
Seeping in at that depth but not yet filled: ____
Saturation Present? Yes ____ No ✓ Depth **to** sat. (in.) ____
(includes capillary fringe) Epi Endo Unknown

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

Site 101. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 101. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 101. KGB Road Wetland Delineation – Photo taken July 21, 2011

WETLAND DETERMINATION DATA FORM – Alaska Region

Project: KGB ROAD WETLANDS Borough/City: MAT-SU Date: 07.21.11

Applicant/Owner: AK DOT & PF Sampling Point #: 105

Investigator(s): CLW GM Firm: HDR Alaska, Inc.

Lat. (dec.°) Long. ± ' NAD 83 Recorded on GPS #: ___ Marked on map? ✓ Field Map #: 3

Subregion (circle one): SE Southcentral Western Aleutian Interior Northern Landform: TOESLOPE Slope (%): 2 Aspect: S

Shape across slope: linear / convex / concave Shape up/downslope: linear / convex / concave NWI classification: U

Photo nos./descriptions: (SOIL) 0527, (VEG) 0528-29 Camera #: ___ Veg Type (Viereck Level 4 or other):

Are climatic / hydrologic conditions on the site typical for this time of year? Yes: ✓ No: ___ HGM type:

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

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? If needed, explain answers here.

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	Yes ___	No ✓	**Is the sampled area within a wetland?**	Yes ___ No ✓
Hydric Soil Present?	Yes ___	No ✓		
Wetland Hydrology Present?	Yes ___	No ✓	Remarks (e.g., marginal?):	

VEGETATION (Use scientific names.)

Tree Stratum (dbh≥ 3")

Sp.	Abs.Cov.%	Dom?	Ind.	Species	Abs.Cov.%	Dom?	Ind.
1. PIC GLA	15	___	FACU	5.	___	___	___
2. BET PAP	65	X	FACU	6.	___	___	___
3.	___	___	___	7.	___	___	___
4.	___	___	___	8.	___	___	___

Total Tree Cover: 80

50% of total cover: 40 20% of total cover: 16

Sapling/Shrub Stratum (woody plants < 3" dbh)

	Abs.Cov.%	Dom?	Ind.		Abs.Cov.%	Dom?	Ind.
1. VIB EDU	15	X	FACU	7.	___	___	___
2. ROS ASI	5	___	FACU	8.	___	___	___
3. SAL BEB	2	___	FAC	9.	___	___	___
4. VAC VIT	3	___	FACU	10.	___	___	___
5.	___	___	___	11.	___	___	___
6.	___	___	___	12.	___	___	___

Total Sapling/Shrub Cover: 25

50% of total cover: 12.5 20% of total cover: 5

Herb Stratum

	Abs.Cov.%	Dom?	Ind.		Abs. Cov.%	Dom?	Ind.
1. EPI ANG	5	X	FACU	12. CAREX CAN	T	___	FAC
2. GYM DRY	10	X	FACU	13.	___	___	___
3. EQU SIL	7	X	FACU	14.	___	___	___
4. COR CAN	2	___	FACU	15.	___	___	___
5. STR AMP	T	___	FAC	16.	___	___	___
6. FYR ASA	1	___	FAC	17.	___	___	___
7. CAL CAN	3	___	FAC	18.	___	___	___
8. LIN BOR	T	___	UPL	19.	___	___	___
9. EQU VAR	1	___	FACW	20.	___	___	___
10. TRI EUR	1	___	FAC	21.	___	___	___
11. UNKNOWN SHOOTS ACC DEL	T	___	UPL	22.	___	___	___

Total Herb Cover: 25

50% of total cover: 12.5 20% of total cover: 5

Circular 1/10-ac plot ___ or other plot dimension: ✓ % of bare ground: 0

% Cover of Wetland Bryophytes N/A % Total Cover of Bryophytes ___ %

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 0 (A)

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

Percent of Dominant Species That are OBL, FACW, or FAC: 0 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	X1=	0
FACW species	1	X2=	2
FAC species	10	X3=	30
FACU species	124	X4=	496
UPL + NL species	0	X5=	0
Column Totals:	135 (A)		528 (B)

Prevalence Index = B/A = 3.91

Hydrophytic Vegetation Indicators:

___ Dominance Test is>50% N

___ Prevalence Index is ≤3.0 N

___ 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 ✓

Remarks: PLOT DOES NOT INCLUDE POWERLINE

SOIL

Sampling Point #: 105

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

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	α,α dip. (pos/neg)	Remarks (or use comment number)
0-4	A	10YR3/2	100					SiL		
4-8	Bw1	10YR4/4	73	2.5Y4/1	20	D	M	SiL		
				5YR4/6	7	C	M			
8-16	Bw2	10YR3/4						SL		

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

Hydric Soil Indicators (check ones that apply, **msr from top of mineral layers unless otherwise noted**):

- N Histosol or Histel (A1) (≥16"organic surface, sat'd during wet period of growing season)
- N Histic Epipedon (A2)(8-16" organics, sat'd, underlain by mineral soil with chroma ≤2)
- N Hydrogen Sulfide (A4) (w/in 12"of ground surface; @ ____" in this pit
- N Thick Dark Surface (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- N Alaska Color Change[4] (TA4)
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed without Hue 5Y or Redder Underlying Layer
- N Other (e.g., see p.91 of 2007 Supplement; 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 present)
Type: _____
Depth (inches) _____

Drainage Class: MOD. WELL
Soil Map Unit Name: DRAINED

Hydric Soil Present? Yes ____ No ✓

Comments:
1. MOTTLES: RUNOFF FROM ADJACENT SLOPE. SHORT TERM SATURATION
2.
3.

HYDROLOGY

Wetland Hydrology Indicators (check ones that apply, **msr from soil surface**):

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- N High Water Table (A2) (w/in 12")
- N Saturation (A3) (w/in 12")
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- N Dry-Season Water Table (C2) (w/in 24")
- N Other (explain)

Secondary Indicators (at least 2 are required)

- N Water-Stained Leaves (B9)
- N Drainage Patterns (B10) _____
- N Oxid'd Rhizospheres on Living Roots (C3) (w/in 12")
- N Presence of Reduced Iron (C4) (pos. α,α or soil color change w/in 12")
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- Y Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", can perch H2O w/in 12")
- N Microtopographic Relief (D4) (caused by water)
- N FAC Neutral Test (D5) (# OBL+FACW dominants > # FACU+UPL dominants)

Field Observations (in. from ground surface):
Surface Water Present? Yes ____ No N Depth **of** water (in.) _____
Water Table Present? Yes ____ No N Depth **to** water (in.) _____
Seeping in at that depth but not yet filled: ____
Saturation Present? Yes ____ No N Depth **to** sat. (in.) _____
(includes capillary fringe) Epi Endo Unknown

Wetland Hydrology Present? Yes ____ No ✓

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

Remarks:

Site 105. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 105. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 105. KGB Road Wetland Delineation – Photo taken July 21, 2011

WETLAND DETERMINATION DATA FORM – Alaska Region

Project: KGB Rd. Borough/City: MAT-SU Date: 07.21.11

Applicant/Owner: AK DOT & PF Sampling Point #: 107

Investigator(s): G. HODEN, C. WROBEL Firm: HDR Alaska, Inc.

Lat. (dec.°) N. 61.55520 Long. W 149.50208 ± 2' NAD 83 Recorded on GPS #: 171 Marked on map? ✓ Field Map #: 4

Subregion (circle one): SE (Southcentral) Western Aleutian Interior Northern Landform: TOE SLOPE Slope (%): 3 Aspect: W

Shape across slope: (linear) / convex / concave Shape up/downslope: (linear) / convex / concave NWI classification: Upland

Photo nos./descriptions: SOIL: 0532, 33 VEG: 0534 0535, 0536 0537 Camera #: ____ Veg Type (Viereck Level 4 or other): ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes: ✓ No: ____ HGM type: ____

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

Are Vegetation N, Soil N, or Hydrology N naturally problematic? If needed, explain answers here.

SUMMARY OF FINDINGS

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 X	No ____	Remarks (e.g., marginal?):	

VEGETATION (Use scientific names.)

Tree Stratum (dbh≥ 3")

Sp.	Abs.Cov.%	Dom?	Ind.	Species	Abs.Cov.%	Dom?	Ind.
1. BET PAP	7	____	FacU	5.	____	____	____
2. SAL BEB	40	X	Fac	6.	____	____	____
3.	____	____	____	7.	____	____	____
4.	____	____	____	8.	____	____	____

Total Tree Cover: 47

50% of total cover: 23.5 20% of total cover: 9.4

Sapling/Shrub Stratum (woody plants < 3" dbh)

	Abs.Cov.%	Dom?	Ind.		Abs.Cov.%	Dom?	Ind.
1. BET PAP	2	X	FacU	7.	____	____	____
2. SAL BEB	4	X	Fac	8.	____	____	____
3. ROS ACI	2	X	FacU	9.	____	____	____
4. RIB TRI	1	____	Fac	10.	____	____	____
5. RUB IDE	2	X	Fac	11.	____	____	____
6.	____	____	____	12.	____	____	____

Total Sapling/Shrub Cover: 11

50% of total cover: 5.5 20% of total cover: 2.2

Herb Stratum

	Abs.Cov.%	Dom?	Ind.		Abs. Cov.%	Dom?	Ind.
1. EPI ANG	10	____	FacU	12. ATH FIL	1	____	Fac
2. CAL CAN	15	X	Fac	13.	____	____	____
3. EQU ARV	45	X	FacU	14.	____	____	____
4. GYM DRY	10	____	FacU	15.	____	____	____
5. MER PAN	12	____	FacU	16.	____	____	____
IND? 6. GER ERI	2	____	UPL	17.	____	____	____
7. VIC CRA	1	____	NI	18.	____	____	____
→ CHECK ST. 8. GAL TRIF	1	____	FacU	19.	____	____	____
9. TRI EUR	1	____	Fac	20.	____	____	____
10. VIRT DIO	1	____	FacU	21.	____	____	____
11. STR AMP	1	____	Fac	22.	____	____	____

Total Herb Cover: 100

50% of total cover: 50 20% of total cover: 20

Circular 1/10-ac plot X or other plot dimension: ____ % of bare ground: 2

% Cover of Wetland Bryophytes N/A (where applicable) % Total Cover of Bryophytes ____ %

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 7 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 57% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	X1=	0
FACW species	0	X2=	0
FAC species	65	X3=	195
FACU species	90	X4=	360
UPL + NL species	2	X5=	10
Column Totals:	157 (A)		565 (B)

Prevalence Index = B/A = 3.60

Hydrophytic Vegetation Indicators:

X Dominance Test is>50%

____ Prevalence Index is ≤3.0 N

____ 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:

SOIL

Sampling Point #: 107

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

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	α,α dip. (pos/neg)	Remarks (or use comment number)
0-2	Oi									
2-4	A	10YR 2.5/2	100					SIL		
4-6	BW1	10YR 3/2	100					SIL		
6-20	BW2	10YR 3/2	85	7.5YR 3/4	10	C	M	SIL		TIGHT HARD PACKED
				2.5Y 3/1	5	D	M	SIL		

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

Hydric Soil Indicators (check ones that apply, **msr from top of mineral layers unless otherwise noted**):

- N Histosol or Histel (A1) (≥16"organic surface, sat'd during wet period of growing season)
- N Histic Epipedon (A2)(8-16" organics, sat'd, underlain by mineral soil with chroma ≤2)
- N Hydrogen Sulfide (A4) (w/in 12"of ground surface; @ ____" in this pit
- N Thick Dark Surface (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- N Alaska Color Change[4] (TA4)
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed without Hue 5Y or Redder Underlying Layer
- N Other (e.g., see p.91 of 2007 Supplement; 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 present)
Type: N/A
Depth (inches) N/A

Drainage Class: MOD. WELL DRAINED
Soil Map Unit Name:

Hydric Soil Present? Yes ____ No ✓

Comments:
1. NO SATURATION
2.
3.

HYDROLOGY

Wetland Hydrology Indicators (check ones that apply, **msr from soil surface**):

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- N High Water Table (A2) (w/in 12")
- N Saturation (A3) (w/in 12")
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- N Dry-Season Water Table (C2) (w/in 24")
- N Other (explain)

Secondary Indicators (at least 2 are required)

- N Water-Stained Leaves (B9)
- N Drainage Patterns (B10) ____
- Y Oxid'd Rhizospheres on Living Roots (C3) (w/in 12")
- N Presence of Reduced Iron (C4) (pos. α,α or soil color change w/in 12")
- N Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- Y Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", can perch H2O w/in 12")
- N MIcrotopographic Relief (D4) (caused by water)
- N FAC Neutral Test (D5) (# OBL+FACW dominants > # FACU+UPL dominants)

Field Observations (in. from ground surface):
Surface Water Present? Yes ____ No ✓ Depth of water (in.) ____
Water Table Present? Yes ____ No ✓ Depth to water (in.) ____
Seeping in at that depth but not yet filled: ____
Saturation Present? Yes ____ No ✓ Depth to sat. (in.) ____
(includes capillary fringe) Epi Endo Unknown

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:

Site 107. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 107. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 107. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 107. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 107. KGB Road Wetland Delineation – Photo taken July 21, 2011

WETLAND DETERMINATION DATA FORM – Alaska Region

Project: KGB ROAD WETLANDS Borough/City: MAT-SU Date: ~~7/20~~ 7/21/2011

Applicant/Owner: AKDOT & PF Sampling Point #: 108

Investigator(s): CW GM Firm: HDR Alaska, Inc.

Lat. (dec.°) 61.55531 Long. 149.50522 ± ' NAD 83 Recorded on GPS #: ✓ Marked on map? ✓ Field Map #: 4

Subregion (circle one): SE Southcentral Western Aleutian Interior Northern Landform: FLAT Slope (%): 0 Aspect: N/A

Shape across slope: linear / convex / concave Shape up/downslope: linear / convex / concave NWI classification: PSS1/EM1C

Photo nos./descriptions: (SOIL) 0538-9, (VEG) 0540-1 Camera #: ____ Veg Type (Viereck Level 4 or other): ____

Are climatic / hydrologic conditions on the site typical for this time of year? Yes: ___ No: ___ HGM type: ____

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

Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? If needed, explain answers here.

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the sampled area within a wetland?**	Yes X No ___
Hydric Soil Present?	Yes ✓	No ___		
Wetland Hydrology Present?	Yes ✓	No ___	Remarks (e.g., marginal?):	

VEGETATION (Use scientific names.)

Tree Stratum (dbh≥ 3")

Sp.	Abs.Cov.%	Dom?	Ind.	Species	Abs.Cov.%	Dom?	Ind.
1. N/A				5.			
2.				6.			
3.				7.			
4.				8.			

Total Tree Cover: Ø

50% of total cover: — 20% of total cover: —

Sapling/Shrub Stratum (woody plants < 3" dbh)

	Abs.Cov.%	Dom?	Ind.		Abs.Cov.%	Dom?	Ind.
1. BET PAP	15	X	FACU	7.			
2. ALN SIN	35	X	FAC	8.			
IND → 3. SAL PUL	T		UPL	9.			
4. SAL BEB	T		FAC	10.			
5.				11.			
6.				12.			

Total Sapling/Shrub Cover: 50

50% of total cover: 25 20% of total cover: 10

Herb Stratum

	Abs.Cov.%	Dom?	Ind.		Abs. Cov.%	Dom?	Ind.
1. CAL CAN	35	X	FAC	12.			
2. POT PUL	20	X	OBL	13.			
3. EQU ARV	1		FACU	14.			
4. CAR CAN	15	X	OBL	15.			
5. STELLARIA SP.	T			16.			
6.				17.			
7.				18.			
8.				19.			
9.				20.			
10.				21.			
11.				22.			

Total Herb Cover: 71

50% of total cover: 35.5 20% of total cover: 14.2

Circular 1/10-ac plot ✓ or other plot dimension: ____ % of bare ground: Ø

% Cover of Wetland Bryophytes ____ % Total Cover of Bryophytes 65 %

(where applicable)

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 3 4 (A)

Total Number of Dominant Species Across All Strata: 3 5 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100 80% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	35	X1=	35
FACW species	0	X2=	0
FAC species	70	X3=	210
FACU species	16	X4=	64
UPL + NL species	0	X5=	0
Column Totals:	121 (A)		309 (B)

Prevalence Index = B/A = 2.55

Hydrophytic Vegetation Indicators:

X Dominance Test is>50%

X Prevalence Index is ≤3.0

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes ✓ No ___

Remarks: MANY DEAD BIRCH TREES & SAPLINGS.

SOIL

Sampling Point #: 10B

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

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	α,α dip. (pos/neg)	Remarks (or use comment number)
0-5	Oi									
5-8	Oe									
8-20	A	2.5Y3/2	100					SiL	Y	SEE COMMENTS

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

Hydric Soil Indicators (check ones that apply, **msr from top of mineral layers unless otherwise noted**):

- N Histosol or Histel (A1) (≥16"organic surface, sat'd during wet period of growing season)
- Y Histic Epipedon (A2)(8-16" organics, sat'd, underlain by mineral soil with chroma ≤2)
- N Hydrogen Sulfide (A4) (w/in 12"of ground surface; @ ____" in this pit
- N Thick Dark Surface (A12)*
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- N Alaska Color Change[4] (TA4)
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed without Hue 5Y or Redder Underlying Layer
- N Other (e.g., see p.91 of 2007 Supplement; 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 present)
Type: _____
Depth (inches) _____

Drainage Class: POORLY DRAINED
Soil Map Unit Name:

Hydric Soil Present? Yes ✓ No ____

Comments:
1. A LAYER VERY DARK & SMEARY, HIGH ORGANIC CONTENT.
2. A12 NOT CHECKED BECAUSE OF HIGH WATER TABLE
3.

HYDROLOGY

Wetland Hydrology Indicators (check ones that apply, **msr from soil surface**):

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- Y High Water Table (A2) (w/in 12")
- Y Saturation (A3) (w/in 12")
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- Y Dry-Season Water Table (C2) (w/in 24") ↑ Check in office
- ___ Other (explain)

Secondary Indicators (at least 2 are required)

- N Water-Stained Leaves (B9)
- N Drainage Patterns (B10) _____
- N Oxid'd Rhizospheres on Living Roots (C3) (w/in 12")
- Y Presence of Reduced Iron (C4) (pos. α,α or soil color change w/in 12")
- N Salt Deposits (C5)
- Y Stunted or Stressed Plants (D1)
- Y Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", can perch H2O w/in 12")
- N Microtopographic Relief (D4) (caused by water)
- Y FAC Neutral Test (D5) (# OBL+FACW dominants > # FACU+UPL dominants)

Field Observations (in. from ground surface):

Surface Water Present? Yes ___ No ✓ Depth of water (in.) _____
Water Table Present? Yes ✓ No ___ Depth to water (in.) 4
Seeping in at that depth but not yet filled: ___
Saturation Present? Yes ✓ No ___ Depth to sat. (in.) 0
(includes capillary fringe) Epi Endo Unknown

Wetland Hydrology Present? Yes ✓ No ___

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

Remarks: D1: DEAD BIRCH TREES & SAPLINGS

Site 108. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 108. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 108. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 108. KGB Road Wetland Delineation – Photo taken July 21, 2011

WETLAND DETERMINATION DATA FORM – Alaska Region

Project: KGB Rd. Borough/City: MAT-SU Date: 07.21.11

Applicant/Owner: AK DOT & PF Sampling Point #: 109

Investigator(s): G. HODEN, C. WROBEL Firm: HDR Alaska, Inc.

Lat. (dec.°) N 61.555727 Long. W. 149.50400 ± 20' NAD 83 Recorded on GPS #: 191 Marked on map? ___ Field Map #: 4

Subregion (circle one): SE Southcentral Western Aleutian Interior Northern Landform: FLAT Slope (%): 0 Aspect: N/A

Shape across slope: linear / convex / concave Shape up/downslope: linear / convex / concave NWI classification: PEMIC

Photo nos./descriptions: SOIL - 0542, 0543 VEG 0544-7 Camera #: ___ Veg Type (Viereck Level 4 or other): ___

Are climatic / hydrologic conditions on the site typical for this time of year? Yes: X No: ___ HGM type: FLAT

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

Are Vegetation N, Soil N, or Hydrology N naturally problematic? If needed, explain answers here.

SUMMARY OF FINDINGS

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 (e.g., marginal?):	

VEGETATION (Use scientific names.)

Tree Stratum (dbh≥ 3")

Sp.	Abs.Cov.%	Dom?	Ind.	Species	Abs.Cov.%	Dom?	Ind.
1.				5.			
2.				6.			
3.				7.			
4.				8.			

Total Tree Cover: 0

50% of total cover: N/A 20% of total cover: N/A

Sapling/Shrub Stratum (woody plants < 3" dbh)

	Abs.Cov.%	Dom?	Ind.		Abs.Cov.%	Dom?	Ind.
1. ALN SIN	1		FAC	7.			
2. BET PAP	1		FACU	8.			
3. CHA CAL	5	X	FACW	9.			
4. BET GLA	3	X	FAC	10.			
5.				11.			
6.				12.			

Total Sapling/Shrub Cover: 10

50% of total cover: 5 20% of total cover: 2

Herb Stratum

	Abs.Cov.%	Dom?	Ind.		Abs. Cov.%	Dom?	Ind.
1. CAR CAN	30	X	OBL	12.			
2. ERI RUS	15	X	FACW	13.			
3. POT PAL	10	X	OBL	14.			
4. ERI ANG	8		OBL	15.			
5. CAR LOL	5		OBL	16.			
6. VAC OXY	1		OBL	17.			
7. CAR UTR	3		OBL	18.			
8. CAR MAG	15	X	OBL	19.			
9. CAL CAN	5		FAC	20.			
10. CIC MAC	1		OBL	21.			
11. ERI GRA	1			22.			

IND? IND? IND?

Total Herb Cover: 92

50% of total cover: 46 20% of total cover: 18.4

Circular 1/10-ac plot ✓ or other plot dimension: ___ % of bare ground: 3

% Cover of Wetland Bryophytes (where applicable) 35 % Total Cover of Bryophytes ___ %

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 8 6 (A)

Total Number of Dominant Species Across All Strata: 8 6 (B)

Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	72	X1=	72
FACW species	20	X2=	40
FAC species	9	X3=	27
FACU species	1	X4=	4
UPL + NL species	0	X5=	0
Column Totals:	102 (A)		143 (B)

Prevalence Index = B/A = 1.40

Hydrophytic Vegetation Indicators:

X Dominance Test is>50%

X Prevalence Index is ≤3.0

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

___ Problematic Hydrophytic Vegetation[1] (Explain)

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point #: 109

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

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	α,α dip. (pos/neg)	Remarks (or use comment number)
0-6	Oi		100							
6-20	Oe		100							

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

Hydric Soil Indicators (check ones that apply, **msr from top of mineral layers unless otherwise noted**):

- Y Histosol or Histel (A1) (≥16"organic surface, sat'd during wet period of growing season)
- N Histic Epipedon (A2)(8-16" organics, sat'd, underlain by mineral soil with chroma ≤2)
- N Hydrogen Sulfide (A4) (w/in 12"of ground surface; @ ____" in this pit
- N Thick Dark Surface (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- N Alaska Color Change[4] (TA4)
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed without Hue 5Y or Redder Underlying Layer
- N Other (e.g., see p.91 of 2007 Supplement; 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 present)
Type: N
Depth (inches) N/A

Drainage Class: POORLY DRAINED
Soil Map Unit Name:

Hydric Soil Present? Yes X No ____

Comments:
1.
2.
3.

HYDROLOGY

Wetland Hydrology Indicators (check ones that apply, **msr from soil surface**):

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- Y High Water Table (A2) (w/in 12")
- Y Saturation (A3) (w/in 12")
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- Y Dry-Season Water Table (C2) (w/in 24")
- N Other (explain)

Secondary Indicators (at least 2 are required)

- N Water-Stained Leaves (B9)
- N Drainage Patterns (B10) ____
- N Oxid'd Rhizospheres on Living Roots (C3) (w/in 12")
- ___ Presence of Reduced Iron (C4) (pos. α,α or soil color change w/in 12")
- ___ Salt Deposits (C5)
- N Stunted or Stressed Plants (D1)
- Y Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", can perch H2O w/in 12")
- N Microtopographic Relief (D4) (caused by water)
- Y FAC Neutral Test (D5) (# OBL+FACW dominants > # FACU+UPL dominants)

Field Observations (in. from ground surface):

Surface Water Present? Yes ___ No N Depth **of** water (in.) ____
Water Table Present? Yes Y No ___ Depth **to** water (in.) 5"
Seeping in at that depth but not yet filled: ___
Saturation Present? Yes Y No ___ Depth **to** sat. (in.) 0
(includes capillary fringe) Epi Endo Unknown

Wetland Hydrology Present? Yes X No ___

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

Remarks:

Site 109. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 109. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 109. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 109. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 109. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 109. KGB Road Wetland Delineation – Photo taken July 21, 2011

WETLAND DETERMINATION DATA FORM – Alaska Region

Project: KGB ROAD Borough/City: MAT-SU Date: 7/21/2011
Applicant/Owner: AK DOT & PF Sampling Point #: 110
Investigator(s): CW & GH Firm: HDR Alaska, Inc.
Lat. (dec.°) 61.55526 Long. 149.50537 ±___' NAD 83 Recorded on GPS #: ___ Marked on map? ✓ Field Map #: 4
Subregion (circle one): SE (Southcentral) Western Aleutian Interior Northern Landform: FLAT Slope (%): 0 Aspect: 0
Shape across slope: (linear) / convex / concave Shape up/downslope: (linear) / convex / concave NWI classification: PSS4/1B
Photo nos./descriptions: (VEG) 0550-1, (SOIL) 0548-9 Camera #: ___ Veg Type (Viereck Level 4 or other): ___
Are climatic / hydrologic conditions on the site typical for this time of year? Yes: ✓ No: ___ HGM type: ___
Are Vegetation ___, Soil ___, or Hydrology ___ significantly disturbed? Are "Normal Circumstances" present? Yes ✓ No ___
Are Vegetation ___, Soil ___, or Hydrology ___ naturally problematic? If needed, explain answers here.

SUMMARY OF FINDINGS

Hydrophytic Vegetation Present?	Yes ✓	No ___	**Is the sampled area within a wetland?**	Yes ✓ No ___
Hydric Soil Present?	Yes ✓	No ___		
Wetland Hydrology Present?	Yes ✓	No ___	Remarks (e.g., marginal?):	

VEGETATION (Use scientific names.)

Tree Stratum (dbh≥ 3")

Sp.	Abs.Cov.%	Dom?	Ind.	Species	Abs.Cov.%	Dom?	Ind.
1. PIC MAR	15	X	FACW	5.			
2. DEAD SPRUCE	20			6.			
3.				7.			
4.				8.			

Total Tree Cover: 15
50% of total cover: 7.5 20% of total cover: 3

Sapling/Shrub Stratum (woody plants < 3" dbh)

	Abs.Cov.%	Dom?	Ind.		Abs.Cov.%	Dom?	Ind.
1. BET PAP	10		FACU	7. PIC MAR	20	X	FACW
2. PIC GLA	15	X	FAC	8.			
3. CHA CAL (ND?)	20	X	FACW	9.			
4. LED GRO	25	X	FACW	10.			
5. VAC OXY	3		OBL	11.			
6. VAC VIT	5		FAC	12.			

Total Sapling/Shrub Cover: 98
50% of total cover: 49 20% of total cover: 19.6

Herb Stratum

	Abs.Cov.%	Dom?	Ind.		Abs. Cov.%	Dom?	Ind.
1. RUB SPE	5	X	FACW	12.			
2. ERI RHI	5	X	FACW	13.			
3. EQU FLU	3	X	OBL	14.			
4. ERI BOR	T		OBL	15.			
5. CAL CAN	1		FAC	16.			
6.				17.			
7.				18.			
8.				19.			
9.				20.			
10.				21.			
11.				22.			

Total Herb Cover: 14
50% of total cover: 7 20% of total cover: 2.8
Circular 1/10-ac plot ✓ or other plot dimension: ___ % of bare ground: ___
% Cover of Wetland Bryophytes (where applicable) N/A % Total Cover of Bryophytes 25 %

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 7 (A)
Total Number of Dominant Species Across All Strata: 7 (B)
Percent of Dominant Species That are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	6	X1=	6
FACW species	90	X2=	180
FAC species	21	X3=	63
FACU species	10	X4=	40
UPL + NL species	0	X5=	0
Column Totals:	127 (A)		289 (B)

Prevalence Index = B/A = 2.28

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes X No ___

Remarks:

SOIL

Sampling Point #: 110

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

Depth (in.)	Horizon Name	Soil Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	α,α dip. (pos/neg)	Remarks (or use comment number)
0-10	Oi									
10-12	Oe									

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

Hydric Soil Indicators (check ones that apply, **msr from top of mineral layers unless otherwise noted):**

- N Histosol or Histel (A1) (≥16"organic surface, sat'd during wet period of growing season)
- Y Histic Epipedon (A2)(8-16" organics, sat'd, underlain by mineral soil with chroma ≤2)
- N Hydrogen Sulfide (A4) (w/in 12"of ground surface; @ ____" in this pit
- N Thick Dark Surface (A12)
- N Alaska Gleyed (A13)
- N Alaska Redox (A14)
- N Alaska Gleyed Pores (A15)

Indicators for Problematic Hydric Soils[3]:

- N Alaska Color Change[4] (TA4)
- N Alaska Alpine Swales (TA5)
- N Alaska Redox with 2.5Y Hue
- N Alaska Gleyed without Hue 5Y or Redder Underlying Layer
- N Other (e.g., see p.91 of 2007 Supplement; 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 present)
Type: _____
Depth (inches) _____

Drainage Class: Poorly
Soil Map Unit Name: DRAINED

Hydric Soil Present? Yes ✓ No ____

Comments:
1. FROZEN @ 12"
2.
3.

HYDROLOGY

Wetland Hydrology Indicators (check ones that apply, **msr from soil surface):**

Primary Indicators (any one indicator is sufficient)

- N Surface Water (A1)
- Y High Water Table (A2) (w/in 12")
- Y Saturation (A3) (w/in 12")
- N Water Marks (B1)
- N Sediment Deposits (B2)
- N Drift Deposits (B3)
- N Algal Mat or Crust (B4)
- N Iron Deposits (B5)
- N Surface Soil Cracks (B6)
- N Inundation Visible on Aerial Imagery (B7)
- N Sparsely Vegetated Concave Surface (B8)
- N Marl Deposits (B15)
- N Hydrogen Sulfide Odor (C1) (w/in 12")
- Y Dry-Season Water Table (C2) (w/in 24")
- N Other (explain)

Secondary Indicators (at least 2 are required)

- N Water-Stained Leaves (B9)
- N Drainage Patterns (B10) _____
- N Oxid'd Rhizospheres on Living Roots (C3) (w/in 12")
- N/A Presence of Reduced Iron (C4) (pos. α,α or soil color change w/in 12")
- N Salt Deposits (C5)
- Y Stunted or Stressed Plants (D1)
- Y Geomorphic Position (D2)
- N Shallow Aquitard (D3) (w/in 24", can perch H2O w/in 12")
- N Microtopographic Relief (D4) (caused by water)
- Y FAC Neutral Test (D5) (# OBL+FACW dominants > # FACU+UPL dominants)

Field Observations (in. from ground surface):

Surface Water Present? Yes ____ No ✓ Depth of water (in.) _____

Water Table Present? Yes ✓ No ____ Depth to water (in.) 3

Seeping in at that depth but not yet filled: ____

Saturation Present? Yes ✓ No ____ Depth to sat. (in.) 0
(includes capillary fringe) Epi Endo Unknown

Wetland Hydrology Present? Yes ✓ No ____

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

Remarks:
SEASONAL FROST @ 12"

Site 110. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 110. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 110. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 110. KGB Road Wetland Delineation – Photo taken July 21, 2011

Appendix A
Wetland Assessment Data Form

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

1. Project name and ADOT&PF #: KGB ROAD RECONSTRUCTION **2. Assessment Area #(s):** AA 1

3. Evaluation date: Mo. 7 Day 21 Yr. 2011 **4. Evaluator(s) and affiliation:** CW, GH HDR ALASKA

5. Purpose of evaluation:

✓ Wetland/waterbody potentially affected by a proposed project ____ Mitigation wetlands; pre-construction

____ Mitigation wetlands; post-construction ____ Other ____

6. Wetland location(s):

Legal: T 17 (N) or S (circle one); R 1 E or (W) S 20 ; and T 17 (N) or S; R 1 E or (W) S 19 ; SEWARD Meridian

Approx. stationing or mileposts or pertinent project component: LOCATED WEST OF LAKEWOOD DR ON N SIDE OF KGB RD

Lat/long: N 61.55531 W. 149.50322 **Datum:** NAD 83 **Nearest community:** WASILLA

Watershed: COTTONWOOD CK. (smallest named stream), tributary of KNIK ARM Ecoregion (from USCOE 2007): COOK INLET (115)

7. Identifying numbers of related data: wetland determination forms 108-111 photos 0538 - 0557

GPS waypoint # 108 other 109, 110, 111

Map (#) showing AA: 4 (closely follow the user's manual instructions for identifying the AA)

Briefly describe the features that define the limits of the AA (e.g., tributary, wetland/upland boundary, extreme low tide elevation):

WETLAND / UPLAND BOUNDARY

8. Wetland size (total acres, not just AA): ____ (visually estimated) or 15 acres (measured, e.g., in GIS)

9. Assessment area (AA) size: ____ acres (visually estimated) or 506 acres (measured) IN GIS

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

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

Class (Cowardin)	Water Regime (Cowardin)	Modifier (if any; Cowardin)	% of AA
SS/EM	S/I	Ø N/A	16 %
EM	S/I	Ø N/A	21 %
SS	T/E	Ø N/A	63 %

Farmed (**F**), Artificial (**A**), Beaver-modified (**B**)

Abbreviations:

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

Water (Inundation) Regimes: Permanent/Perennial (**P/P**), Seasonal/Intermittent (**S/I**), Temporary/Ephemeral/Saturated (**T/E**)

Modifiers: Excavated (**X**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**),

HGM Class (Brinson)	% of AA
F	100 %

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

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

(Circle one) Unknown <10% Rare 10-50 % (Common) > 50 % Abundant

What information sources did you use for this estimate?

- COTTONWOOD CREEK WSHED (6th LEVEL) OF HUC) 4175 acres of Wetland
- WETLAND ACRES W/IN FROM NWI MAPPING 631 acres of SS & EM ↳ 15 % of HUC 6

SOURCES: GIS FILES, COOK INLET WETLAND MAPPING (MJB), NATIONAL WETLAND INVENTORY, ADJUSTED DATA

~15 % OF HUC LEVEL 6 COTTONWOOD CK. WATERSHED WETLANDS ARE SIMILAR (SS &/OR EM) WETLANDS

12. General condition of AA:

i. Disturbance (see User's manual for descriptions of disturbance levels):

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

Describe the disturbance within the AA (type, age, intensity, source of disturbance, location):

SUBURBAN DEVELOPMENT, MODERATE INTENSITY

ii. Consider the 6th level HU containing the AA again. If you estimate that **more than 10% of the land in the 6th level HU is disturbed**, circle those bold words, cross out the disturbance level you selected in the matrix above and write in the next higher level of disturbance in the same box.

DEVELOPED AREA WITHIN 6TH LEVEL HU INCLUDES MUCH OF WASILLA CORE AREA

iii. List any noxious or invasive plant or animal species in the AA or surrounding lands (specify which are in the AA):

TYPICAL ROADSIDE WEEDS; VIC CRA - FEW WEEDS IN WETLANDS

Sp. list
Phleum pratense
Taraxacum sp
Vicia Cracca
Trifolium hybrid

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

AA LANDUSE: WILDLIFE HABITAT FOR MOOSE SUMMER/FALL
HABITAT TYPE: BLACK SPRUCE/ERICACEOUS BOG

SURROUNDING LAND
LANDUSE: SUBURBAN, RESIDENTIAL/COMMERCIAL
HABITAT TYPE: MIXED DEVELOPED/UPLAND FOREST

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

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

14A. Habitat for Federally Listed or Candidate Threatened or Endangered Plants or Animals or Other Species of Concern:

i. Species, Documentation, and Habitat Importance.

AA is Documented (D) or Suspected (S) to contain (circle one based on definitions contained in instructions):

Primary or critical habitat (**list species**) D S species: _____
Secondary habitat (**list species**) D S species: _____
Incidental habitat (**list species**) D S species: _____
None or unknown ☑

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

Highest Habitat Level	***doc/ primary***	***sus/ primary***	***doc/ secondary***	***sus/ secondary***	***doc/ incidental***	***sus/ incidental***	***none or unknown***
One or more of the species listed in 14A.i. is a federally Listed or Candidate Threatened or Endangered Species	1H	.8H	.9M	.7M	.3L	.1L	0L
Species listed in 14A.i. are all "Other Species of Concern" (i.e., not listed under the Endangered Species Act)	.8M	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented or suspected use (e.g., observations, records, etc):

iii. Final Score and Rating: 0L NONE Enter on the summary page on the Habitat for Federally Listed Species row.

14B. General Wildlife Support Rating:

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

Substantial (based on any of the following [check]):
- __ observations of abundant wildlife #s or high species diversity (during any period)
- __ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- __ presence of extremely limiting habitat features not available in the surrounding area
- __ interviews with local biologists with knowledge of the AA or its habitat type

~~***Minimal***~~ Low (based on any of the following [check]):
- __ few or no wildlife observations during peak use periods
- __ little to no wildlife sign
- __ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):
- ✓ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ✓ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ✓ upland food sources exist in moderate quantity
- __ interviews with local biologists with knowledge of the AA or its habitat type

ii. Wildlife habitat features Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating.
Structural diversity is from #13.
For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percentage of the AA (see #10).
Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent See instructions for further definitions of these terms.

Structural diversity (from #13)	***High***								***Moderate***								***Low***			
Class cover distribution (all vegetated classes)	***Even***				***Uneven***				***Even***				***Uneven***				***Even***			
Longest duration of surface water in ≥ 10% of AA, or immediately abutting the AA	***P/P***	***S/I***	***T/E***	***A***	***P/P***	***S/I***	***T/E***	***A***	***P/P***	***S/I***	***T/E***	***A***	***P/P***	***S/I***	***T/E***	***A***	***P/P***	***S/I***	***T/E***	***A***
***Low** disturbance at AA (see #12i & 12ii)*	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
***Moderate** disturbance at AA (see #12i & 12ii)*	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
***High** disturbance at AA (see #12i & 12ii)*	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

EDITS CW 7/29/11

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

iv. Final Score and Rating: .5M (0.3 L) Enter on the summary page on the General Wildlife Support row.
Comments:

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

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

Duration of surface water in AA	***Permanent / Perennial***			***Seasonal / Intermittent***			***Temporary / Ephemeral***		
Aquatic hiding / resting / escape cover in waterbody(Table 3 in manual)	***Optimal***	***Adequate***	***Poor***	***Optimal***	***Adequate***	***Poor***	***Optimal***	***Adequate***	***Poor***
Anadromous salmon species	1E	.8H	.6M	.9H	.7M	.5M	.7M	.5M	.3L
Resident and non-salmon sport and subsistence species	.9H	.7M	.5M	.8H	.6M	.4M	.6M	.4M	.2L
Other resident species	.8H	.6M	.4M	.7M	.5M	.3L	.5M	.3L	.1L

Sources used to identify fish species potentially found in AA: NOT USED BY FISH

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

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

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

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

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

iii. Final Score and Rating: N/A Enter on the summary page on the General Fish Support row.

Comments: NONE

GIS

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

i. Rating

Estimate the variation in the water volume stored in the **wetland** portion of the AA **that experiences surface ponding or flooding** during the typical year, between break-up and freeze-up. First, identify the part of the AA that is both wetland and has surface water sometime between breakup and freezeup (the "flooded wetland"). Estimate its area in acres: 4.83 acres = A.

Second, estimate the range in that flooded wetland's water surface elevation between its lowest and highest elevation during the unfrozen period, in feet. Call this D for depth: 0.33 feet = D. For example, if the water table is typically one foot below the ground surface during the driest part of summer, and is typically 6 inches above the surface following breakup, the range is 18 inches, or 1.5 feet. Consider evidence such as water marks, staining on vegetation or rocks, drift lines, and the depth to the water table in your soil pit. Consider also the elevation of the wetland surface relative to the elevation of the water surface in an adjacent stream (i.e., does the channel overflow its banks into the wetland?). During a flood, the depth of water over a stream channel is likely to be double its depth when the stream is full to its banks. Consider the area the stream would flood when the water is that deep.

Multiply the range in the flooded wetland's water surface elevation (D) times the area (A) to estimate the maximum storage volume in acre-feet. D 0.33 feet X A 4.83 acres = 1.59 acre-feet. Use this storage volume estimate in the matrix below.

Next, determine the portion of the flooded wetland that is forested, shrub-dominated, or is neither of those but is dominated by hummocks or tussocks at least one foot in height: % of AA that experiences water surface fluctuation that is forested or scrub/shrub 75 % plus the additional % of the flooded wetland that is hummocky 0 % = 75 % of flooded wetland with water-slowing roughness. Use this percentage in the second row of the matrix below.

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

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

ii. Final Score and Rating: .7M Enter on the summary page on the Water Storage row.

Comments:

iii. Potential Property Protection

Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (circle)? **Y** (**N**) **Comments:** AA < 10 ACRES

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

GO TO 14F

Edit GH 09.02.11

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use (including proposed future land use) has potential to deliver levels of sediments, nutrients, or toxicants at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication are present, or sources are suspected.				Waterbody is on Alaska's Section 303(d) List of Impaired Waterbodies or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or toxicants such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, unnatural turbidity, or signs of eutrophication are present.			
% cover of vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7H	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Edit (H 9/28/11)

ii. Final Score and Rating: ~~0.7H~~ _____ Enter on the summary page on the Sediment/Nutrient/Toxicant Retention row.

Comments: ~~N/A from 14E~~ 1H POTENTIAL EXISTS IF PROJECT UNDER CONSIDERATION IS BUILT. UPLAND BUFFER BETWEEN ROAD & WETLAND WILL LIKELY REDUCE SIZE AND USE INTEGRITY

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

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

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

ii. Final Score and Rating: 0 _____ Enter on the summary page on the Sediment/Shoreline Stabilization row.

Comments:

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

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [circle])

General Fish Habitat Rating (14C.iii.)	*General Wildlife Habitat Rating (14B.iii.)*		
	E/H	*M*	*L*
E/H	H	~~M~~ H	L
M	H	M	M
L	M	~~M~~ M	~~L~~ L
NA	M	~~M~~ M	~~L~~ L

CW EDITS 10/4/11

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

A	*Vegetated component >5 acres*						*Vegetated component 1-5 acres*						*Vegetated component <1 acre*					
B	*High*		*Moderate*		*Low*		*High*		*Moderate*		*Low*		*High*		*Moderate*		*Low*	
C	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*	*Yes*	*No*
P/P	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7M	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.5M	.5M	.3L	.3L	.2L
T/E or A	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

EDITS CW 7/28/11, & 10/4/11

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

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 2% noxious or invasive plant cover, and that is not subjected to periodic mechanical mowing or clearing (unless for weed control).

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

(Y) N *If yes, add 0.1 to the score in 14G.ii. above and adjust the rating accordingly:* ~~0.5M~~ 0.3L

iv. Final Score and Rating: ~~0.5M~~ _____ Enter on the summary page on the Production Export row.

Comments: 0.3L

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

i. Discharge Indicators

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

ii. Recharge Indicators (NA for fringe wetlands)

__✓__ Permeable substrate present without underlying impeding layer
____ Wetland contains inlet but no outlet
____ Stream is a known 'losing' stream; discharge decreases downstream
____ Other:_____

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

Criteria	**Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM***			
	P/P	*S/I*	*T/E*	*None*
Groundwater Discharge or Recharge Indicators Exist	1H	.7M	(.4M)	.1L
Permafrost Underlies Wetland or Insufficient Information Exists	NA			

iv. Final Score and Rating: .4M Enter on the summary page on the Groundwater Discharge/Recharge row.
Comments:

14I. Uniqueness:

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

Replacement potential	**AA contains irreplaceable wetland types [fens, bogs, springs, seeps, or mature (>80-yr-old) forested wetland type] OR a plant association listed as S1, S2, G1, or G2 by the AKNHP (Appendix J)**			**AA does not contain irreplaceable wetland types and structural diversity (#13) is high OR contains plant association listed as S3, G3, S?, or G? by the AKNHP (Appendix J)**			**AA does not contain irreplaceable wetland types and structural diversity (#13) is low to moderate (Appendix J)**		
Estimated relative abundance of wetland types (from 11)	*rare*	*common*	*abundant*	*rare*	*common*	*abundant*	*rare*	(*common*)	*abundant*
***Low** disturbance at AA (from 12.i. and ii.)*	1H	.6M	.5M	.8H	.5M	.4M	.7M	.4M	.3L
***Moderate** disturbance at AA (from 12.i. and ii.)*	.9H	.5M	.4M	.7M	.4M	.3L	.6M	.3L	.2L
***High** disturbance at AA (from12.i. and ii.)*	.7M	.3L	.2L	.5M	.2L	.1L	.4M	(.1L)	.1L

ii. Final Score and Rating: .1 L Enter on the summary page on the Uniqueness row.

Comments:

14J. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential recreation or education site: (circle) Y (N) (if 'Yes' continue with the evaluation; if 'No' then circle **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ___ Educational/scientific study; ___ Consumptive rec.; ___ Non-consumptive rec.; ___Other

iii. Rating (use the matrix below to arrive at [circle] the functional points and rating)

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

iv. Final Score and Rating: ____ Enter on the summary page on the Recreation/Education Potential row.
Comments:

General Site Notes:

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

Functions and Services	Rating (E, H, M, L)	Actual Functional Points (0 to 1.0)	Possible Functional Points	Optional: Functional Units Affected (Actual Points x AA Acreage Affected)	Indicate the four most prominent functions with an asterisk (*)
A. Habitat for Federally Listed/Candidate T&E Species or Other Species of Concern	L	0	1.0		
B. General Wildlife Support	L	0.3	1.0		
C. General Fish Support	N/A	N/A	N/A	N/A	N/A
D. Water Storage	M	0.7	1.0		
E. Sediment/Nutrient/Toxicant Removal	~~H~~ N/A	~~1.0~~ N/A	~~1.0~~ N/A	~~N/A~~	~~N/A~~
F. Sediment/Shoreline Stabilization	N/A	N/A	N/A	N/A	N/A
G. Production Export/Food Chain Support	L	0.3	1.0		
H. Groundwater ~~Discharge~~/Recharge	M	0.4	1.0		
I. Uniqueness	L	0.1	1.0		
J. Recreation/Education Potential (bonus points)	N/A	N/A	NA	N/A	N/A
Totals:		2.8	~~7~~		
Percentage of Possible Score (actual points divided by possible points)	~~0.3~~ 0.4	~~28~~ 40 %			

Edits GA 09.08.11

Category 1 Wetland: Must satisfy **one** of the following criteria; otherwise go to Category 2.
___ Score of 0.9 to 1 functional point for Threatened or Endangered Species or Other Species of Concern; **or**
___ Score of 0.9 or 1 functional point for Uniqueness; **or**
___ Score of 0.9 or 1 functional point for Water Storage **and** answer to Question 14D.ii. is "yes"; **or**
___ Score of 0.9 or 1 functional point for General Fish Support; **or**
___ Percent of possible score ≥ 70% (round to nearest whole number); or
___ Percent of possible score ≥ 50% **and** 6th level hydrologic unit subregion has already experienced ≥15% land development.

Category 2 Wetland: Criteria for Category 1 not satisfied **and** meets any **one** of the following criteria; otherwise go to Category 4.
___ Score of 0.8 functional point for Threatened or Endangered Species or Other Species of Concern; **or**
___ Score of 0.9 or 1 functional point for General Wildlife Support; **or**
___ Score of 0.6 to 0.8 functional point for General Fish Support; **or**
___ Score of 0.8 functional point for Uniqueness; **or**
___ Score 0.7 or 0.8 functional point for Water Storage **and** answer to Question 14D.ii. is "yes"; **or**
___ Percent of possible score ≥ 50% (round to nearest whole number).

Category 3 Wetland: Criteria for Categories 1, 2, and 4 are not satisfied.
X Does not qualify as Category 1, 2, or 4

Category 4 Wetland: Criteria for Categories 1 and 2 not satisfied **and** all of the following criteria are met; if not, go to Category 3.
___ Vegetated wetland component of AA < 1 acre (do not include upland vegetated buffer); **and**
___ Score of 0.5 or lower for Uniqueness; **and**
___ General Wildlife Support is 0.4 or lower; **and**
___ General Fish Support score is 0.3 or lower; **and**
___ If answer to 14D.ii. is "no", score for Water Storage is 0.2, 0.1, or NA; **and**
___ Is not rated "High" for any function or service; **and**
___ Percent of possible score < 35% (round to nearest whole number).

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

Category: 1 2 (3) 4

Field Collected Data

Photo Points

Site 102. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 102. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 102. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 103. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 103. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 103. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 104. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 104. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 106. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 106. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 111. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 111. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 111. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 111. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 111. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 112. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 112. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 113. KGB Road Wetland Delineation – Photo taken July 21, 2011

Site 113. KGB Road Wetland Delineation – Photo taken July 21, 2011