WETLAND DETERMINATION DATA FORM - Alaska Region

Vatana Hydroelectric Project	F	Borough/City:	Matanusk	xa-Susitna Borough Sampling Date: 04-Aug-13
ka Energy Authority				Sampling Point: SW13_T119_07
		Landform (hill	side, terrac	ce, hummocks etc.): Hillside
nvex, none): hummocky		Slope: 17.6	% / <u>10.</u> 0	0 ° Elevation: 894
ka Mountains	Lat.:	62.823706548	37	Long.:147.788087279
				NWI classification: Upland
Soil . , or Hydrology . Soil . , or Hydrology .	significantl naturally p	ly disturbed? roblematic?	Are "N (If nee	(If no, explain in Remarks.) Normal Circumstances" present? Yes No Ceded, explain any answers in Remarks.) s, transects, important features, etc.
y Present? Yes No (•	wi	thin a W	
scientific names of plants. I	List all spo	ecies in the	plot.	
			•	Dominance Test worksheet:
			Indicator Status	Number of Dominant Species
				That are OBL, FACW, or FAC: 4 (A)
				Total Number of Dominant Species Across All Strata: 5 (B)
	0			Percent of dominant Species
	0			That Are OBL, FACW, or FAC: 80.0% (A/B)
	0			Prevalence Index worksheet:
Total Cove	er: <u> </u>			Total % Cover of: Multiply by:
n 50% of Total Cover:	0 20%	6 of Total Cover:	0	OBL Species0 x 1 =0
sum	40	✓	FAC	FACW Species 12.1 x 2 = 24.20
	15	✓	FACU	FAC Species <u>65</u> x 3 = <u>195</u>
	10		FACW	FACU Species <u>15</u> x 4 = <u>60</u>
crispa	5		FAC	UPL Species 0 x 5 = 0
1	15	. 💆	FAC	Column Totals: <u>92.1</u> (A) <u>279.2</u> (B)
	0	. 📙		Prevalence Index = B/A = 3.031
	0			Frevalence index – B/A –
		. 📙		Hydrophytic Vegetation Indicators:
				✓ Dominance Test is > 50%
		. \square		Prevalence Index is ≤3.0
			: 17	Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet)
<u> </u>	2	. <u>~</u>	FACW	Problematic Hydrophytic Vegetation ¹ (Explain)
orus			FACW	Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
			FAC	be present, unless disturbed of probleffidue.
		. 📙		Plot size (radius, or length x width)
				% Cover of Wetland Bryophytes
				(Where applicable)
				% Bare Ground Total Cover of Bryophytes40
	0			
				Total cover of Bryophyces
	0			Hydrophytic Vegetation Present? Yes No
tin en	Invex, none): hummocky ska Mountains Invex, none): hummocky ska Mount	Invex, none): hummocky ska Mountains Lat.: conditions on the site typical for this time of year and of site typical for this time of years. Attach site map showing sare etation Present? Yes No pand of sdev bordered by lines of alder running etacientific names of plants. List all spread of site scientific names of plants. List all spread of scientific names of plant	Landform (hill ska Energy Authority Landform (hill shape 17.6	Landform (hillside, terrac Novex, none): hummocky ska Mountains Lat:: 62.8237065487 Slope: 17.6 % / 10.8 Are "No

US Army Corps of Engineers Alaska Version 2.0

SOIL Sampling Point: SW13 T119 07

O-3 7-7 107R 3/4 100 7-70 7.5 YR 2.5/2 100 Sandy Loam Sent ang gravel and cototes Sent ang	(inches) Color (moist)	%	Color (moist)	% Т	Type 1 Loc 2	Texture	Remarks
Type: C=Concentration. D=Depletion. RM=Reduced Matrix Indicators for Problematic Hydric Soils Histosol or Histel (A1)				,		77-		
Type: C=Concentration. D=Depletion. RM=Reduced Matrix ² Location: PL=Pore Lining, RC=Root Channel. M=Matrix Indicators Indicators: Indicators for Problematic Hydric Soils Alaska Gleyed Without Hue SY or Redder Underlying Layer La	3-7 10YR	3/4	100				Sandy Loam	semi ang gravel and cobbles
Type: C=Concentration. D=Depletion. RM=Reduced Matrix. Indicators for Problematic Hydric Solls?	7-20 7.5YR	2.5/2	100				Sandy Loam	
ydric Soil Indicators: Histosol or Histel (A1)	7.20							
ydric Soil Indicators: Histosol or Histel (A1)								-
Histosol or Histel (A1)								
Histosol or Histel (A1)								
Histosol or Histel (A1)								
Histosol or Histel (A1)								
Histosol or Histel (A1) Histo Epipedom (A2) Histosol or Histel (Epipedom (A2) Histosol or Histel (A1) Histosol or Histel (A2) Alaska Alpine swales (TA5) Hordery Sulface (A4) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) * Give details of color change in Remarks * Setrictive Layer (if present): Type: Type: Depth (inches): **Branks:** * Type: Depth (inches): **Branks:* * Type: Depth (inches): **Branks:* * Type: Depth (inches): **Branks:* * Type: Depth (inches): Depth (i	Type: C=Concentration.	D=Depletion	ı. RM=Reduced	I Matrix ² Locatio	n: PL=Pore Li	ning. RC=Root C	hannel. M=Matrix	
Histic Epipedon (A2) Alaska Alpine swales (TA5) Underlying Layer	ydric Soil Indicators:		:	Indicators for P	roblematic H	ydric Soils: ³		
Thick Dark Surface (A12) Alaska Redox With 2.57 Hue Other (Explain in Remarks) Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Redox With 2.57 Hue Other (Explain in Remarks) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks Strictive Layer (if present): Type: Hydric Soil Present? Yes No	Histosol or Histel (A1)		[Alaska Color C	Change (TA4)			nout Hue 5Y or Redder
Thick Dark Surface (A12) Alaska Gleyed (A13) Alaska Gleyed (A13) Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Type: Depth (inches): Hydric Soil Present? Yes	Histic Epipedon (A2)		[Alaska Alpine	swales (TA5)			
Alaska Gloyed (A13) Alaska Redox (A14) Alaska Redox (A14) Alaska Gloyed Pores (A15) **Give details of color change in Remarks* **Hydric Soil Present? Yes No ● **POROLOGY** **POROLOGY** **POROLOGY** **POROLOGY** **POROLOGY** **Porology Indicators observed **Porology Indicators observed **Porology Indicators observed **POROLOGY** **Porology Indicators observed **Porology Indicators obs	Hydrogen Sulfide (A4	1		Alaska Redox	With 2.5Y Hue		Other (Explain in R	Remarks)
Alaska Redox (A15) Alaska Redox (A15) Alaska Redox (A15) Alaska Gleyed Pores (A15) Alaska Gleyed Remarks: Hydric Soil Present? Yes \ No \ O Post Glear Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Pores (A15) Alaska Gleyed Poresent? Alaska Gleyed Glear	_ `	12)		3 One indicator of	f buduanbutia u	ogotation one n	winners in diseases of west	dand hydrology
Alaska Gleyed Pores (A15) 4 Give details of color change in Remarks estrictive Layer (if present): Type: Depth (inches): Pry PROLOGY Fettand Hydrology Indicators: Indicators (any one is sufficient) Surface Water (A1) Surface Water (A1) Surface Water (A2) Saturation (A3) Marl Deposits (B1) Water Marks (B1) Water Marks (B1) Surface Water (A1) Sediment Deposits (B2) Dry-Season Water Table (C2) Sediment Deposits (B3) Dry-Season Water Table (C2) Situnted or Stressed Plants (D1) Sediment Deposits (B3) Surface Water (A16) Drift Deposits (B3) Surface Water (A17) Sediment Deposits (B3) Dry-Season Water Table (C2) Sediment Deposits (B3) Surface Water (A18) Sediment Deposits (B3) Dry-Season Water Table (C2) Situnted or Stressed Plants (D1) Sediment Deposits (B3) Surface Water Present? Ves No Depth (inches): Surface Water Present? Ves No Depth (inches): Surface Water Present? Ves No Depth (inches): Surface Water Table Present? Ves No Depth (inches	_							dana nyarology,
Additional Content of the prosent (Present): Type: Depth (inches): ### Hydric Soil Present? Yes No ● PROLOGY Present	` ′			4 Give details of o	color change in	Remarks		
Type: Depth (inches): PAPROLOGY Petland Hydrology Indicators: Secondary Indicators (two or more are required) Water Stained Leaves (B9) Water Stained Leaves (B9) Depth (inches): Water Marks (B1) Hydrogen Sulfide Odor (C1) Salt Deposits (B1) Dry-Season Water Table (C2) Stained Deposits (B3) Other (Explain in Remarks) Stained Stained Leaves (B6) Shallow Aquitard (D3) Microtopographic Relief (D4) Shallow Aquitard (D3) Microtopographic Relief (D4) Shallow Aquitard (D3) Microtopographic Relief (D4) Shallow Aquitard (D3) Surface Soil Cracks (B6) Depth (inches): Wetland Hydrology Present? Yes No Depth (inches):		415)		ove details or e	color change in	remano		
POROLOGY etland Hydrology Indicators: climary Indicators (any one is sufficient) Surface Water (A1) Surface Water (A1) Surface Water (A1) Surface Water (A2) Sparsely Vegetated Concave Surface (B8) Sutration (A3) Marl Deposits (B15) Presence of Reduced Iron (C4) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Drift Deposits (B2) Drift Deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Water Present? Yes No Depth (inches): Wetland Hydrology Present? Yes No O Depth (inches): Presence of Reduced Iron (C4) Salt Deposits (C5) Salt Depo	estrictive Layer (if preser	t):						
## Properties of the properti	Type:						Hydric Soil Pre	esent? Yes \cup No $ullet$
PROLOGY etland Hydrology Indicators: cimary Indicators (any one is sufficient) High Water Table (A2) Saturation (A3) Water Marks (B1) Drift Deposits (B2) Drift Deposits (B3) Drift Deposits (B3) In Indicators (B4) Drift Deposits (B4) Drift Deposits (B5) Saturation (Caste (B4) Drift Deposits (B5) Surface Water Present? Presence of Reduced Iron (C4) Saturation (C2) Stunted or Stressed Plants (D1) Drift Deposits (B5) Microtopographic Relief (D4) Saturation (D2) Shallow Aquitard (D3) Iron Deposits (B5) Surface Soil Cracks (B6) eld Observations: Part Table Present? Ves No Depth (inches): Water Table Present? Yes No Depth (inches): Baturation Present? Yes No Persent Present	* *						_	
rimary Indicators:	Depth (inches):	served						
rimary Indicators (any one is sufficient) Surface Water (A1) High Water Table (A2) Sparsely Vegetated Concave Surface (B8) Oxidized Rhizospheres along Living Roots (C Saturation (A3) Water Marks (B1) Hydrogen Sulfide Odor (C1) Sediment Deposits (B2) Dry-Season Water Table (C2) Stunted or Stressed Plants (D1) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Surface Water Present? Water Stained Leaves (B9) Drainage Patterns (B10) Oxidized Rhizospheres along Living Roots (C C) Salt Deposits (C5) Salt Deposits (C5) Salt Deposits (C5) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Eld Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Depth (inches): Saturation Present? Yes No Depth (inches): Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available:	Depth (inches):	served						
Surface Water (A1)	Depth (inches): emarks: hydric soil indicators ob	served						
High Water Table (A2)	Depth (inches): emarks: hydric soil indicators ob						Secondar	y Indicators (two or more are required)
Saturation (A3)	Depth (inches): emarks: hydric soil indicators ob YDROLOGY etland Hydrology Ind	icators:	ıt)					
Water Marks (B1)	Popth (inches): emarks: hydric soil indicators ob YDROLOGY retland Hydrology Indirimary Indicators (any or Surface Water (A1)	icators: ne is sufficien	ıt)				Wate	er Stained Leaves (B9) nage Patterns (B10)
Sediment Deposits (B2) Dry-Season Water Table (C2) Drift Deposits (B3) Other (Explain in Remarks) Geomorphic Position (D2) Shallow Aquitard (D3) Shallow Aquitard (D3) Microtopographic Relief (D4) Surface Soil Cracks (B6) FAC-neutral Test (D5) Surface Water Present? Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Saturation Present? Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available: Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available:	Popth (inches): emarks: hydric soil indicators ob YDROLOGY etland Hydrology Indirimary Indicators (any or Surface Water (A1) High Water Table (A2)	icators: ne is sufficien	nt)	Sparsely Veg	getated Concav		Wate Drain	er Stained Leaves (B9) nage Patterns (B10) ized Rhizospheres along Living Roots (C
Drift Deposits (B3)	Poppth (inches): emarks: hydric soil indicators ob YDROLOGY etland Hydrology Ind rimary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3)	icators: ne is sufficien	ıt)	Sparsely Veg	getated Concav ts (B15)	e Surface (B8)	Wate Drain Oxid	er Stained Leaves (B9) nage Patterns (B10) ized Rhizospheres along Living Roots (C ence of Reduced Iron (C4)
Algal Mat or Crust (B4) Iron Deposits (B5) Surface Soil Cracks (B6) Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available:	Poppth (inches): emarks: hydric soil indicators ob YDROLOGY etland Hydrology Ind rimary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	icators: ne is sufficien	ıt)	Sparsely Veg Marl Deposit Hydrogen St	getated Concav ts (B15) ulfide Odor (C1	ve Surface (B8)	Wate Drain Oxid Pres Salt	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5)
Iron Deposits (B5)	Popth (inches): Pemarks: hydric soil indicators ob Populogy etland Hydrology Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B	icators: ne is sufficien	ıt)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Concav ts (B15) ulfide Odor (C1 Water Table (C	ve Surface (B8))	Wate Drain Oxid Pres Salt Stun	er Stained Leaves (B9) nage Patterns (B10) ized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) tted or Stressed Plants (D1)
Surface Soil Cracks (B6) FAC-neutral Test (D5)	Popth (inches): Pemarks: hydric soil indicators ob Populogy Populogy Petland Hydrology Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B3)	icators: ne is sufficien 2)	ıt)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Concav ts (B15) ulfide Odor (C1 Water Table (C	ve Surface (B8))	Wate Drain Oxid Pres Salt Stun Geor	er Stained Leaves (B9) nage Patterns (B10) ized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) ited or Stressed Plants (D1) morphic Position (D2)
Reld Observations: Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available: Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available:	Popth (inches): Pemarks: Phydric soil indicators ob the property of the prop	icators: ne is sufficien 2)	nt)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Concav ts (B15) ulfide Odor (C1 Water Table (C	ve Surface (B8))	Wate Drain Oxid Pres Salt Stun Geor	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lited or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3)
Surface Water Present? Yes No Depth (inches): Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available: Secribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available:	Popth (inches): Pemarks: Inhydric soil indicators ob Population of the population	icators: ne is sufficien 2) 2)	ıt)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Concav ts (B15) ulfide Odor (C1 Water Table (C	ve Surface (B8))	Wate Drain Oxid Pres Salt Stun Geoi Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4)
Water Table Present? Yes No Depth (inches): Saturation Present? Yes No Depth (inches): Includes capillary fringe) Depth (inches): Depth (inch	Popth (inches): Pemarks: Inhydric soil indicators ob Populogy Petland Hydrology Indirimary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (B1) Iron Deposits (B5) Surface Soil Cracks (I	icators: ne is sufficien 2) 2)	nt)	Sparsely Veg Marl Deposit Hydrogen St Dry-Season	getated Concav ts (B15) ulfide Odor (C1 Water Table (C	ve Surface (B8))	Wate Drain Oxid Pres Salt Stun Geoi Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4)
Saturation Present? includes capillary fringe) Yes No Depth (inches): escribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available: emarks:	Popth (inches): emarks: hydric soil indicators ob YDROLOGY etland Hydrology Ind rimary Indicators (any or Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B3) Algal Mat or Crust (B2) Iron Deposits (B5) Surface Soil Cracks (Ield Observations:	icators: ne is sufficien 2) 2) 4)		Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Concav ts (B15) ulfide Odor (C1 Water Table (C ain in Remarks)	ve Surface (B8))	Wate Drain Oxid Pres Salt Stun Geoi Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4)
includes capillary fringe) Tes O NO O Depth (Incnes): escribe Recorded Data (stream gauge, monitor well, aerial photos, previous inspection) if available: emarks:	Popth (inches): Pemarks: Phydric soil indicators ob the property of the prop	icators: ne is sufficien 2) 2) 4) 4) Yes) No ⊙	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Concav ts (B15) ulfide Odor (C1 Water Table (C ain in Remarks)	re Surface (B8)	Wate Drain Oxid Pres Salt Stun Geor Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4) neutral Test (D5)
emarks:	Popth (inches): Pemarks: Inhydric soil indicators ob properties of the properties o	icators: ne is sufficien 2) 2) 4) Yes Yes	No ●No ●No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Concaves (B15) ulfide Odor (C1 Water Table (Casin in Remarks) es):	re Surface (B8)	Wate Drain Oxid Pres Salt Stun Geor Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4) neutral Test (D5)
	Popth (inches): Pemarks: Inhydric soil indicators ob Population of the population	icators: ne is sufficien 2) 2) 4) Yes Yes	No ●No ●No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Concaves (B15) ulfide Odor (C1 Water Table (Casin in Remarks) es):	re Surface (B8)	Wate Drain Oxid Pres Salt Stun Geor Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4) neutral Test (D5)
	Poppth (inches): Pemarks: Inhydric soil indicators ob Popper and Hydrology Indicators (any or	icators: ne is sufficien 2) 2) 4) Yes Yes Yes	No ●No ●No ●No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Concaves (B15) ulfide Odor (C1 Water Table (Cain in Remarks) es): es):	ve Surface (B8)	Wate Drain Oxid Pres Salt Stun Geor Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4) neutral Test (D5)
	POROLOGY Tetland Hydrology Indicators of the state of th	icators: ne is sufficien 2) 2) 4) Yes Yes Yes	No ●No ●No ●No ●	Sparsely Veg Marl Deposit Hydrogen St Dry-Season Other (Expla	getated Concaves (B15) ulfide Odor (C1 Water Table (Cain in Remarks) es): es):	ve Surface (B8)	Wate Drain Oxid Pres Salt Stun Geor Shal	er Stained Leaves (B9) nage Patterns (B10) lized Rhizospheres along Living Roots (C ence of Reduced Iron (C4) Deposits (C5) lted or Stressed Plants (D1) morphic Position (D2) low Aquitard (D3) otopographic Relief (D4) neutral Test (D5)

U.S. Army Corps of Engineers Alaska Version 2.0