

# **TECHNICAL MEMORANDUM**

Date:	March 28, 2020
To:	April Gerth, Highways Assistant Group Manager, Robert Peccia and Associates
Copy to:	Montana Department of Transportation
From:	Susan Wall, Professional Wetland Scientist
Subject:	Addendum to Gore Hill Interchange STPX 15 5(141)278 BRR/PBA

# INTRODUCTION

Herrera prepared this addendum to the Biological Resources Report and Preliminary Biological Assessment (BRR/PBA) (Herrera 2019) for the Gore Hill Interchange project to evaluate the project's potential effects on wetlands. Although the available data sources reviewed by Herrera do not indicate any wetlands or hydric soils in the study area, a potential wetland area was noted during the initial site visit in November 2019. This area, north of I-15, contains a seep on the hillslope that drains to ditches along the highway. The hillslope shows visible signs of instability (slumping) and there is a network of pipes and drains on the slope.

Herrera wetland biologist Susan Wall visited the site again on March 5 and March 26, 2020 and conducted a routine wetland delineation in accordance with the U.S. Army Corps of Engineers Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2) (USACE 2010).

# **METHODS**

To identify potential wetlands, Herrera evaluated field conditions in the entire study area and delineated wetlands based on data collected on three parameters as defined by the Regional Supplement. The three-parameter approach relies on the presence of field indicators for hydrophytic vegetation, hydric soils, and hydrology, as described in the sections below. Although the delineation was conducted outside of the growing season it was possible to obtain data on these indicators because the ground was not frozen, there was no snow cover, and vegetation was readily identifiable. On the basis of the collected data, a wetland/non-wetland determination was made for each area examined.

# **Wetland Delineation**

## Vegetation

For each test plot in the study area, the following data were recorded: dominant plant species, size of the test plot, absolute percentage of cover for each plant species, and the species' corresponding wetland indicator status. The indicator status was determined using the Great Plains 2016 Regional Wetland Plant List (Lichvar et al. 2016), which categorizes plant species according to their tolerance for growing in wetland conditions. The categories (from most tolerant to least) are obligate wetland (OBL), facultative wetland (FACW), facultative (FAC), facultative upland (FACU), and upland (UPL). Species dominance was established according to overall percent cover. When FAC or wetter species dominate, it indicates the presence of hydrophytic vegetation. Plant nomenclature is based on the *Manual of Montana Vascular Plants* (Lesica 2012).

## Soils

The presence of hydric soil indicators was determined using the Regional Supplement as a reference. The color (hue, value, and chroma) and texture for the soil matrix and redoximorphic features were determined by comparison to a Munsell Soil Color Chart (Munsell Color 2000).

# Hydrology

Presence or absence of wetland hydrology, as defined in the Regional Supplement, was determined at each sampling point.

# Mapping

Wetland boundaries were mapped using a sub-meter accuracy GPS unit. Shapefiles were provided to Robert Peccia and Associates for inclusion in the roadway design.

# **Wetland Classification and Functional Assessment**

Wetlands observed in the study area were classified according to the hydrogeomorphic (HGM) system, which is based on an evaluation of attributes such as position of the wetland within the surrounding landscape, source and location of water just before it enters the wetland, and the pattern of water movement in the wetland (Brinson 1993). Wetlands were also classified according to the US Fish and Wildlife Service (USFWS) classification system (FGDC 2013), which is based on an evaluation of attributes such as vegetation class, hydrologic regime, salinity, and substrate type.



Wetland functions were assessed using the MDT Montana Wetland Assessment Method (MWAM) (Berglund and McEldowney 2008). This method is designed to evaluate wetland functions and values for linear transportation projects in Montana, such as highways, railroads, pipelines, and transmission lines.

# RESULTS

Herrera identified three wetlands, Wetland 1a, 1b, and 1c, in the study area north of I-15 that are hydrologically connected by surface water seepage from the hillslope. Highway runoff and seepage from these wetlands drains through culverts under I-15 to concrete lined ditches. Based on aerial photo interpretation it appears that flow from the wetlands eventually disperses and infiltrates in fields south of I-15. There does not appear to be a connection to any other streams or waterbodies.

Wetlands 1a, 1b, and 1c received a functional rating of Category IV. Their primary functions are toxicant removal due to capturing and infiltrating highway runoff, and groundwater discharge due to seepage from the hill slope. Their vegetation diversity is low, and they do not provide valuable or desirable wildlife habitat.

A figure showing the location of the wetlands is provided in Appendix A. Wetland determination data forms are included in Appendix B, photographs are included in Appendix C and the functional assessment rating form is included in Appendix D. Wetlands and adjacent uplands are described below.

# Wetland 1a

Wetland 1a is an emergent depressional wetland in a ditch north of I-15. The wetland is 1,829 square feet (0.042 acre) in size. Vegetation is dominated by common cattail (*Typha latifolia*) and Baltic rush (*Juncus balticus*). The water sources for this wetland are highway runoff, precipitation, snowmelt, and seepage from the adjacent hillslope. There is a small patch of sandbar willow (*Salix exigua*) within the wetland. Several metal drainage gutters convey water to the wetland from the adjacent hillslope and standing water was observed in the ditch. The wetland determination is documented on data form WL1a SP1 in Appendix B.

# Wetland 1b

Wetland 1b is a seep wetland on the hillslope north of I-15. The wetland is 5,092 square feet (0.112 acre) in size. Vegetation is dominated by common cattail with a minor amount of Baltic rush. The water source for this wetland is primarily groundwater. The slope has obvious signs of slumping, and small drainage channels emerge from the downslope side of the wetland. The wetland determination is documented on data form WL1b SP1 in Appendix B.



# Wetland 1c

Wetland 1c is an emergent and scrub/shrub depressional wetland in a ditch north of I-15, similar to Wetland 1a. The wetland is 11,682 square feet (0.268 acre) in size. Vegetation is dominated by common cattail and sandbar willow. The water sources for this wetland are highway runoff, precipitation, snowmelt, and seepage from the adjacent hillslope. Standing water was observed in the ditch. The wetland drains to a culvert under I-15. The wetland determination is documented on data form WL1c SP1 in Appendix B.

# **Adjacent Upland**

Vegetation on the upland slope adjacent to Wetlands 1a, 1b, and 1c is dominated by smooth brome (*Bromus inermis*) and patches of tall hedge-mustard (*Sisymbrium altissimum*), Canada thistle (*Cirsium arvense*) and showy milkweed (*Asclepias speciosa*).The non-wetland determinations for each wetland are documented on data forms WL1a SP2, WL1b SP2 and WL1c SP2 in Appendix B.

# CONCLUSION

This addendum provides documentation to support the Aquatic Resources section of the BRR/PBA submitted by Herrera in December 2019. Based on the study results, the areas displayed as wetlands on the figure in Appendix A meet the criteria established by the USACE 1987 Wetland Delineation Manual and the Regional Supplement for being classified as wetland.



# REFERENCES

Berglund, J., and R. McEldowney. 2008. MDT Montana Wetland Assessment Method. Prepared for Montana Department of Transportation by Post, Buckly, Schuh, and Jernigan. Helena, Montana.

Brinson, M.M. 1993. A Hydrogeomorphic Classification for Wetlands. Technical Report WRPDE4. US Army Engineer Waterways Experiment Station, Vicksburg, Mississippi. August.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. US Army Corps of Engineers, Waterways Experiment Station, Vicksburg, Mississippi.

FGDC. 2013. Classification of Wetlands and Deepwater Habitats of the United States. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and US Fish and Wildlife Service, Washington, DC.

Herrera. 2019. Biological Resources Report/Preliminary Biological Assessment Gore Hill Interchange STPX 15 5(141)278 Great Falls, Montana. Prepared for Montana Department of Transportation. Prepared by Herrera Environmental Consultants, Missoula, Montana through Robert Peccia and Associated, Helena, Montana.

Lesica. 2012. Manual of Montana Vascular Plants. Botanical Research Institute of Texas Press, Fort Worth, Texas.

Lichvar et al. 2016. Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 215 Available at

https://www.codot.gov/programs/environmental/wetlands/nwpl\_gp\_2016v1.pdf

Munsell Color. 2000. Munsell Soil Color Charts. GretagMacbeth. New Windsor, New York.

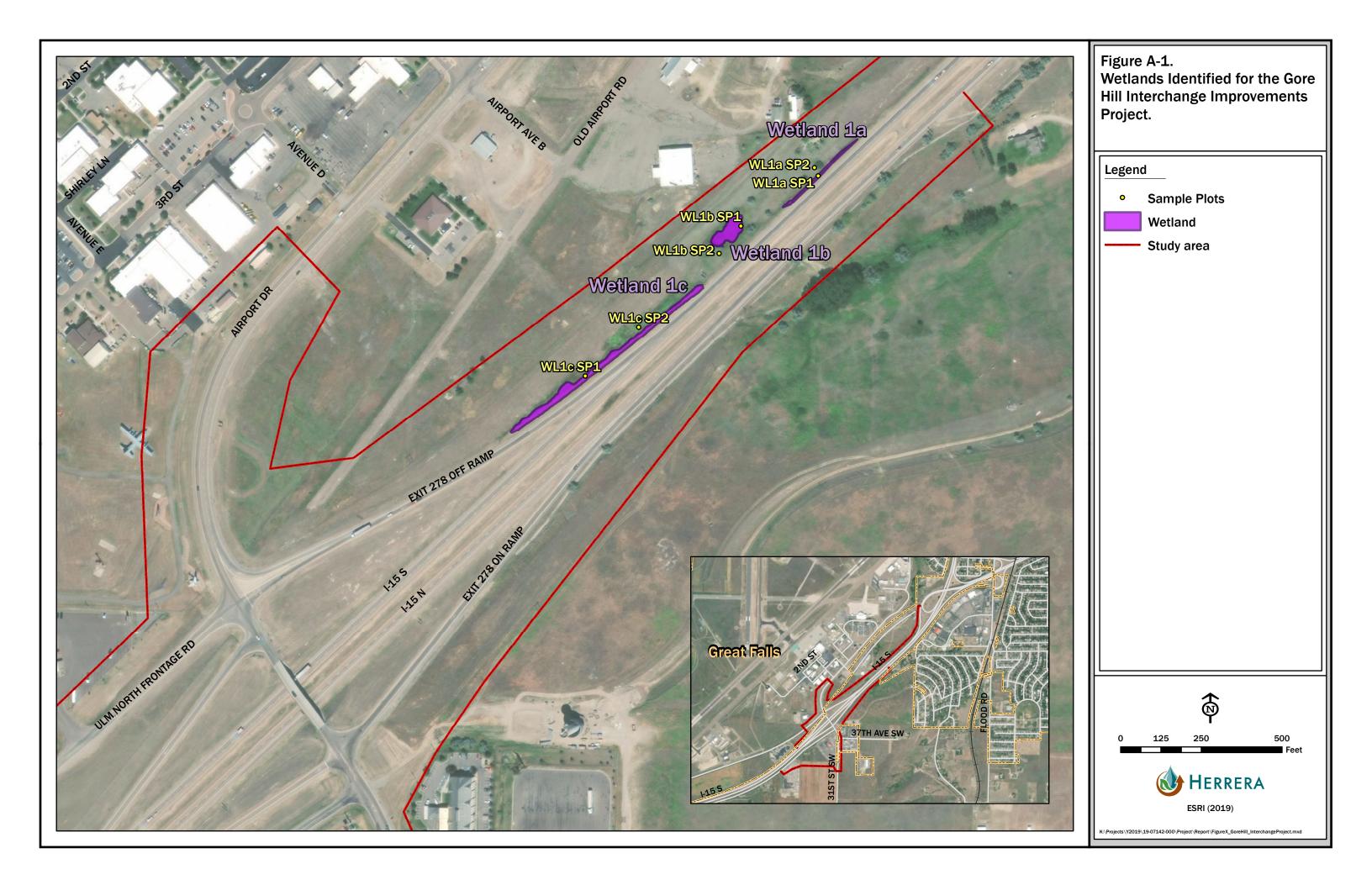
USACE. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0). ERDC/EL TR-10-1. US Army Corps of Engineers Research and Development Center, Vicksburg, Mississippi.



# **APPENDIX A**

# **Wetland Figure**





# **APPENDIX B**

# **Data Forms**



Project Site:	Gore Hill Interchange		City/Cour	ntv.	Great Falls, Cascade	Sampling D	ate:	3/26/2020
Applicant/Owner:	Montana Department of Transpo	ortation			State: MT	Sampling P	oint:	WL1a SP1
Investigator(s):	S. Wall			Secti	on, Township, Ra	nge: S21 T20	ON R03E	
Landform (hillslope, ter	rrace, etc.): hillslope	L	Local relief (conca	ave, convex,	none): convex		Slop	e (%): 5
Subregion (LRR):	F	Lat: 47.4768361	Long:	,-111.354	15833	I	Datum:	
Soil Map Unit Name:	Tally-Castner complex, 15	to 35 percent slopes			NWI cla	ssification:	PEM	
Are climatic / hydrologi	c conditions on the site typical fo	this time of year?	Yes 🛛	No 🗆	(If no, explain ir	Remarks.)		
Are Vegetation D,	Soil 🔲, Or Hydrology 🛛	], significantly distur	rbed?	Are "Nor	mal Circumstance	es" present?	Yes	🛛 No 🗆
Are Vegetation D,	Soil 🔲, Or Hydrology	], naturally problema	atic? (If nee	eded, explair	any answers in F	Remarks.)		

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

Hydrophytic Vegetation Present?	Yes	$\boxtimes$	No					
Hydric Soil Present?	Yes	$\boxtimes$	No	Is the Sampled Area within a Wetland?	YES	$\boxtimes$	NO 🗆	
Wetland Hydrology Present?	Yes	$\boxtimes$	No					

Remarks: All three wetland parameters are met.

VEGETATION – Use scientific names of plants						
Tree Stratum (Plot Size: 3m radius)	Absolute <u>% Cover</u>	Dominant Species?	Indicator <u>Status</u>	Dominance Test Worksheet:		
1.				Number of Dominant Species That Are	2	(A)
2.				OBL, FACW, or FAC:	2	(~)
3.				Total Number of Dominant Species Across	2	(B)
4.				All Strata:	-	(D)
Sapling/Shrub Stratum (Plot Size: 3m radius)	0	= Total Cover	r	Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)
1.				Prevalence Index worksheet:		
2.				Total % Cover of:	Multiply by:	
3.				OBL species	x1 =	
4.				FACW species	x2 =	
5.				FAC species	x3 =	
	0	= Total Cover	r	FACU species	x4 =	
Herb Stratum (Plot Size: 1m radius)				UPL species	x5 =	
1. Typha latifolia	80	х	OBL	Column Totals: (A)		(B)
2. Juncus arcticus	20	х	FACW	Prevalence Index = B/A =	:	
3.				Hydrophytic Vegetation Indicators:		
4.				x 1 – Rapid Test for Hydrophytic V	egetation	
5.				x 2 – Dominance Test is >50%		
6.				3 – Prevalence Index is <3.0 <sup>1</sup>		
7.				4 – Morphological Adaptations <sup>1</sup> (		data in
8.				Remarks or on a separate sheet)		
9.				Problematic Hydrophytic Vegetat	ion <sup>1</sup> (Explain)	
10.						
11.				<sup>1</sup> Indicators of hydric soil and wetland hydrolo	gy must be present	t,
	100	= Total Cover	r	unless disturbed or problematic.		
Woody Vine Stratum (Plot Size: 3m radius)						
1.				Hydrophytic Vegetation	_	
2.				Present? Yes	🛛 No	
	0	= Total Cover	r			
% Bare Ground in Herb Stratum = 0						
Remarks: Meets criteria for hydrophytic vegetati	on					

#### SOIL Sampling Point: WL1a SP1 Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) Redox Features Depth Matrix Loc<sup>2</sup> (inches) Color (moist) % Color (Moist) % Type<sup>1</sup> Texture Remarks 0-3 10YR 3/1 100 Sandy loam <sup>1</sup>Type: C= Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. <sup>2</sup>Location: PL=Pore Lining, M=Matrix Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.) Indicators for Problematic Hydric Soils3: Sandy Gleyed Matrix (S4) 1 cm Muck (A9) (LRR I, J) Histosol (A1) Histic Epipedon (A2) □ Sandy Redox (S5) Coast Prairie Redox (A16) (LRR F, G, H) Black Histic (A3) Stripped Matrix (S6) Dark Surface (S7) (LRR G) Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) High Plains Depressions (F16) (LRR H outside Loamy Gleyed Matrix (F2) Stratified Layers (A5) (LRR F) of MLRA 72 & 73) Depleted Below Dark Surface (A11) Depleted Matrix (F3) Reduced Vertic (F18) Thick Dark Surface (A12) Redox Dark Surface (F6) Red Parent Material (TF2) Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Very Shallow Dark Surface (TF12) 2.5 cm Mucky Peat or Peat (S2) (LRR G, H) Redox Depressions (F8) Other (Explain in Remarks) 5 cm Mucky Peat or Peat (S3) (LRR F) High Plains Depressions (F16) (MLRA 72 & 73 of <sup>3</sup>Indicators of hydrophytic vegetation and wetland LRR H) hydrology must be present, unless disturbed or problematic. Restrictive Layer (if present): Hydric Soil Present? Yes $\boxtimes$ No Angular cobble Type: Depth (inches): 3 Remarks: Hydric soil indicator A4 is present. HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (2 or more required) Surface Water (A1) Salt Crust (B11) Surface Soil Cracks (B6) High Water Table (A2) Aquatic Invertebrates (B13) Sparsely Vegetated Concave Surface (B8) - (10) 0.464.044.04 **•** • ... \_ . . . . **-** ... (5 4 6)

X	Saturation (A3)					Hydrogen Sulfide Odor (C1)	×	Drainage Patterns (B10	)		
	Water Marks (B1)					Dry-Season Water Table (C2)		Oxidized Rhizospheres	on Living	Roots	(C3)
	Sediment Deposits (B2)	)				Oxidized Rhizospheres along Living Roots	s (C3)	(where tilled)			
	Drift Deposits (B3)					(where not tilled)		Crayfish Burrows (C8)			
	Algal Mat or Crust (B4)					Presence of Reduced Iron (C4)		Saturation Visible on A	erial Image	ery (C	9)
	Iron Deposits (B5)					Thin Muck Surface (C7)	$\boxtimes$	Geomorphic Position (D	2)		
	Inundation Visible on A	erial Ima	gery (B	7)		Other (Explain in Remarks)	$\boxtimes$	FAC-Neutral Test (D5)			
	Water-Stained Leaves	(B9)						Frost-Heave Hummock	s (D7) ( <b>LF</b>	RRF)	
Field	Observations:										
Surfa	ce Water Present?	Yes		No		Depth (inches):					
Wate	r Table Present?	Yes		No		Depth (inches):	Wetland I	lydrology Present?	Yes	$\boxtimes$	No
	ation Present? des capillary fringe)	Yes	$\boxtimes$	No		Depth (inches): 0		.,			
Desc	ribe Recorded Data (stre	am gaug	je, moni	itoring	well, a	erial photos, previous inspections), if availab	ole:				

Indicator A3, B10, D2, and D5 are present. Patches of surface water is present in the wetland but not at the sample plot. Remarks:

Project Site:	Gore Hill	Interchange					City/Cou	unty:		Great Fa Cascade	/	Sampling I	Date:	3/26	/2020	
Applicant/Owner:	Montana	Department	of Transp	portation					5	State:	MT	Sampling I	Point:	WL1	a SP2	2
Investigator(s):	S. Wall								Section	on, Tow	nship, Rang	ge: S21 T2	20N R03E			
Landform (hillslope,	terrace, etc.	): hillslop	е			Local re	lief (conc	ave, cor	nvex, r	none):	convex		Slop	e (%):	20	
Subregion (LRR):	F			Lat:	47.4768333		Long:	,-111.	3546 <sup>-</sup>	139			Datum:			
Soil Map Unit Name	: Tally-C	Castner con	nplex, 15	5 to 35	percent slope	S					NWI class	sification:	none			
Are climatic / hydrole	ogic conditio	ns on the site	e typical f	or this ti	me of year?	Yes	$\boxtimes$	No		(lf no,	explain in F	Remarks.)				
Are Vegetation D,	Soil [	], Or Hy	drology	□, :	significantly dist	urbed?		Are	e "Norr	mal Circ	umstances	'present?	Yes	$\boxtimes$	No	
Are Vegetation D,	Soil [	], Or Hy	drology	<b>□</b> , ı	naturally proble	matic?	(lf ne	eded, e	xplain	any ang	wers in Re	marks.)				

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

Hydrophytic Vegetation Present?	Yes 🗌	No 🛛			
Hydric Soil Present?	Yes 🛛	No 🗌	Is the Sampled Area within a Wetland?	YES 🗆	NO 🛛
Wetland Hydrology Present?	Yes 🛛	No 🖾			
Remarks: Hydroc soil is present, but hydrophytic ve	egetation and	d wetland h	ydrology are lacking.		

VEGETATION – Use scientific names of plants Absolute Dominant Indicator Tree Stratum (Plot Size: 3m radius) **Dominance Test Worksheet:** % Cover Species? <u>Status</u> 1 Number of Dominant Species That Are 0 (A) OBL, FACW, or FAC: 2. 3. **Total Number of Dominant Species Across** 1 (B) All Strata: 4. 0 = Total Cover Percent of Dominant Species That Are 0 (A/B) OBL, FACW, or FAC: Sapling/Shrub Stratum (Plot Size: 3m radius) 1. Prevalence Index worksheet: 2. Total % Cover of: Multiply by: 3. **OBL** species x1 = 4. FACW species x2 = 5. FAC species x3 = = Total Cover FACU species x4 = Herb Stratum (Plot Size: 1m radius) UPL species x5 = Bromus inermus 100 UPL (B) 1. (A) х Column Totals: 2. Prevalence Index = B/A = Hydrophytic Vegetation Indicators: 3. 4. 1 - Rapid Test for Hydrophytic Vegetation 5. 2 - Dominance Test is >50% 6. 3 - Prevalence Index is <3.01 7. 4 – Morphological Adaptations<sup>1</sup> (Provide supporting data in

= Total Cover

= Total Cover

0

Remarks: No hydrophytic vegetation indicators present.

Woody Vine Stratum (Plot Size: 3m radius)

% Bare Ground in Herb Stratum = 0

8. 9.

10. 11.

1.

2.

 $\boxtimes$ 

No

Yes

Remarks or on a separate sheet)

unless disturbed or problematic.

Hydrophytic Vegetation

Present?

Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)

<sup>1</sup>Indicators of hydric soil and wetland hydrology must be present,

### SOIL

											Sampling Poin				
Profile Descri	ption: (Describe	to the dep	pth neede	ed to d	locumen	t the indicator	or confirm the a	ibsence o	of indica	tors.)					
Depth	Matrix	(				Redox Featur									
(inches)	Color (moist)	%		Color (N	Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Tex	ture		Re	marks		
0-5	10YR 3/2	100							loa						
5-12	10YR 2/1	50					_		Platy si		The 5-12 in	ch layei	has m	ixed m	atrix
5-12	10YR 3/2	30		10YR	6/6	20	С	М	Sandy	loam					
	centration, D=Dep						ed Sand Grains.	<sup>2</sup> Locatio		-					
	dicators: (Applica	able to all	I LRRs, u			-					or Problemat	•		S <sup>3</sup> :	
Histosol (	,					leyed Matrix (S	4)				Muck (A9) (L				
_	pedon (A2)				-	edox (S5)					Prairie Redo			, G, H	)
Black Hist						Matrix (S6)					Surface (S7) (				
	Sulfide (A4)				-	Nucky Mineral (F	-			-	Plains Depres		-16) ( <b>L</b> l	R H C	outsi
_	Layers (A5) (LRR				-	Bleyed Matrix (F	2)		_		f MLRA 72 &	,			
	Below Dark Surfa	ce (A11)			•	Matrix (F3)					ced Vertic (F1	,			
	k Surface (A12)					ark Surface (F6	-				Parent Materia	` '			
-	icky Mineral (S1)	(0.0) / <b>/ -</b>				Dark Surface (	-				Shallow Dark		. ,	)	
	ucky Peat or Peat	. , .	. ,			epressions (F8)			31		(Explain in Re				
J 5 cm Muo	cky Peat or Peat (	53) ( <b>LRR</b>	F)		LRR H)	ins Depressions	s (F16) ( <b>MLRA 7</b> 2	2 & 73 01	h		f hydrophytic must be prese ic.	0			
estrictive La	yer (if present):														
epth (inches)	Angular cobb 12 Soil meets indicato							Hydric	Soil Pre	sent?	Ye	s 🛛		No	
epth (inches): emarks: S	: 12							Hydric	Soil Pre	sent?	Ye	s 🛛		No	
2000 (inches): Remarks: S (DROLOGY	: 12	or F6.						Hydric	Soil Pre	sent?	Ye	s 🛛		No	
Yepth (inches): Remarks: S YDROLOGY Vetland Hydro	: 12 Soil meets indicato	or F6.	ed; check	all tha	t apply)			Hydric			Yes dicators (2 or r		quired)	No	
epth (inches)) emarks: S DROLOGY /etland Hydro	: 12 Goil meets indicato	or F6.	ed; check	all tha		rust (B11)		Hydric		ndary Inc		nore re	quired)	No	
epth (inches): emarks: S DROLOGY /etland Hydro rimary Indicat Surface High Wa	2 12 Soil meets indicator blogy Indicators: ors (minimum of o Water (A1) tter Table (A2)	or F6.	ed; check		Salt Ci Aquati	c Invertebrates		Hydric	<u>Seco</u>	ndary Inc Surface Sparsely	dicators (2 or r Soil Cracks (E γ Vegetated C	nore re 36) oncave	. ,		
epth (inches): emarks: S DROLOGY /etland Hydro rimary Indicat ] Surface ] High Wa ] Saturatio	2 12 Soil meets indicators blogy Indicators: ors (minimum of o Water (A1) tter Table (A2) on (A3)	or F6.	ed; check		Salt Ci Aquati Hydrog	c Invertebrates gen Sulfide Odo	r (C1)	Hydric	_ <u>Seco</u> 	ndary Inc Surface Sparsely Drainag	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1	nore re 36) oncave 0)	Surfac	e (B8)	
epth (inches): emarks: S DROLOGY /etland Hydro rimary Indicat ] Surface ] High Wa ] Saturatio ] Water M	2 12 Soil meets indicators ology Indicators: ors (minimum of of Water (A1) ter Table (A2) on (A3) arks (B1)	or F6.	ed; check		Salt Ci Aquati Hydrog Dry-Se	c Invertebrates gen Sulfide Odo eason Water Tal	r (C1) ble (C2)		<u>Seco</u>	ndary Inc Surface Sparsely Drainag Oxidized	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere	nore re 36) oncave 0)	Surfac	e (B8)	
epth (inches): emarks: S DROLOGY fetland Hydrd rimary Indicat ] Surface ] High Wa ] Saturatid ] Saturatid ] Water M ] Sedimer	2 12 Soil meets indicators: ors (minimum of c Water (A1) tter Table (A2) on (A3) arks (B1) at Deposits (B2)	or F6.	ed; check		Salt Ci Aquati Hydrog Dry-Se Oxidize	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere	r (C1)		<u>Seco</u>	ndary Inc Surface Sparsely Drainag Oxidizec (where	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled)	nore re- 36) oncave 0) s on Liv	Surfac	e (B8)	
epth (inches): emarks: S DROLOGY /etland Hydru rimary Indicat ] Surface ] High Wa ] Saturatio ] Water M ] Sedimer ] Drift Dep	2 12 Boil meets indicators: Dology Indicators: Ors (minimum of of Water (A1) ther Table (A2) on (A3) arks (B1) ht Deposits (B2) posits (B3)	or F6.	ed; check		Salt Ci Aquati Hydrog Dry-Se Oxidize (when	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled)	r (C1) ble (C2) s along Living Ro			ndary Inc Surface Sparsely Drainag Oxidizec (where Crayfish	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8)	nore re- 36) oncave 0) s on Liv	Surfac	e (B8) ots (CC	
Perth (inches):     emarks: S     Content of the second seco	2 12 Soil meets indicators of the set of the	or F6.	ed; check		Salt Cı Aquati Hydrog Dry-Se Oxidiz (whei Preser	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) nce of Reduced	r (C1) ble (C2) s along Living Ro Iron (C4)			ndary Inc Surface Sparsely Drainag Oxidizec (where Crayfish Saturatio	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on /	nore re 36) oncave 0) s on Liv Aerial In	Surfac	e (B8) ots (CC	
	2 12 Soil meets indicators ology Indicators: ors (minimum of o Water (A1) tter Table (A2) on (A3) arks (B1) nt Deposits (B2) posits (B3) tt or Crust (B4) posits (B5)	one require			Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin N	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) nce of Reduced luck Surface (C	r (C1) ole (C2) s along Living Ro Iron (C4) 7)			ndary Ind Surface Sparsely Drainag Oxidized (where Crayfish Saturatio Geomor	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position	nore re 36) oncave 0) s on Liv Aerial In D2)	Surfac	e (B8) ots (CC	
	2 12 Soil meets indicators of meets indicators of minimum of of Water (A1) tter Table (A2) on (A3) arks (B1) arks (B1) arks (B1) tt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria	or F6.			Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin N	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) nce of Reduced	r (C1) ole (C2) s along Living Ro Iron (C4) 7)			ndary Ind Surface Sparsely Drainag Oxidized (where Crayfish Saturatio Geomor FAC-Ne	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position ( utral Test (D5	nore re 36) oncave 0) s on Liv Aerial In D2)	Surfac ving Ro	e (B8) ots (C3	
Pepth (inches): Pepth (inches): Pepth (inches): Pepth (inches): Pertinant Notes Pertinant Not	2 12 Soil meets indicators: Ors (minimum of of Water (A1) ter Table (A2) on (A3) arks (B1) nt Deposits (B2) oosits (B3) tt or Crust (B4) oosits (B5) on Visible on Aeria tained Leaves (B5)	or F6.			Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin N	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) nce of Reduced luck Surface (C	r (C1) ole (C2) s along Living Ro Iron (C4) 7)			ndary Ind Surface Sparsely Drainag Oxidized (where Crayfish Saturatio Geomor FAC-Ne	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position	nore re 36) oncave 0) s on Liv Aerial In D2)	Surfac ving Ro	e (B8) ots (C3	
Pepth (inches): Remarks: S  Primary Indicat Surface High Wa Saturatic Water M Sedimer Algal Ma Inon Dep Inundatii Water-S  Tield Observa	2 12 Soil meets indicators ors (minimum of o Water (A1) tter Table (A2) on (A3) arks (B1) it Deposits (B2) oosits (B3) at or Crust (B4) iosits (B5) on Visible on Aeria tained Leaves (B5) tions:	or F6.	y (B7)		Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin M Other	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) nce of Reduced luck Surface (C (Explain in Re	r (C1) ole (C2) s along Living Ro Iron (C4) 7)			ndary Ind Surface Sparsely Drainag Oxidized (where Crayfish Saturatio Geomor FAC-Ne	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position ( utral Test (D5	nore re 36) oncave 0) s on Liv Aerial In D2)	Surfac ving Ro	e (B8) ots (C3	
	2 12 Soil meets indicators of the set of the	al Imagery	y (B7) ] No		Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin M Other	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) ince of Reduced luck Surface (C (Explain in Re-	r (C1) ole (C2) s along Living Ro Iron (C4) 7)	nots (C3)		ndary Inc Surface Sparsely Drainag Oxidized (where Crayfish Saturation Geomor FAC-Ne Frost-He	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position utral Test (D5 eave Hummod	nore re 36) oncave 0) s on Liv Aerial In D2) ) ks (D7)	Surfac ring Ro nagery (LRR I	e (B8) ots (C3	3)
	12 Soil meets indicators of the set of the s	or F6.	y (B7) ] No ] No		Salt Cr Aquati Hydrog Dry-Se Oxidiz (whei Preser Thin M Other	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) nce of Reduced luck Surface (C (Explain in Re	r (C1) ole (C2) s along Living Ro Iron (C4) 7)	nots (C3)		ndary Inc Surface Sparsely Drainag Oxidized (where Crayfish Saturation Geomor FAC-Ne Frost-He	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position ( utral Test (D5	nore re 36) oncave 0) s on Liv Aerial In D2)	Surfac ring Ro nagery (LRR I	e (B8) ots (C3 (C9) F)	3)
	12 Soil meets indicators of the set of the s	al Imagery Yes Yes Yes	y (B7)   No   No   No		Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin M Other De De	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) ince of Reduced luck Surface (C' (Explain in Re epth (inches): epth (inches):	r (C1) ole (C2) s along Living Ro Iron (C4) 7) emarks)	oots (C3)		ndary Inc Surface Sparsely Drainag Oxidized (where Crayfish Saturation Geomor FAC-Ne Frost-He	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position utral Test (D5 eave Hummod	nore re 36) oncave 0) s on Liv Aerial In D2) ) ks (D7)	Surfac ring Ro nagery (LRR I	e (B8) ots (C3 (C9) F)	3)
	12 Soil meets indicators ology Indicators: ors (minimum of o Water (A1) iter Table (A2) on (A3) arks (B1) it Deposits (B2) oosits (B3) it or Crust (B4) oosits (B5) on Visible on Aeria tained Leaves (B9) tions: Present? esent? esent? sent? ary fringe)	al Imagery ) Yes Yes Gauge, m	y (B7) ] No ] No ] No nonitoring		Salt Ci Aquati Hydrog Dry-Se Oxidiz (when Preser Thin M Other De De	c Invertebrates gen Sulfide Odo eason Water Tal ed Rhizosphere re not tilled) ince of Reduced luck Surface (C' (Explain in Re epth (inches): epth (inches):	r (C1) ole (C2) s along Living Ro Iron (C4) 7) emarks)	oots (C3)		ndary Inc Surface Sparsely Drainag Oxidized (where Crayfish Saturation Geomor FAC-Ne Frost-He	dicators (2 or r Soil Cracks (E / Vegetated C e Patterns (B1 d Rhizosphere tilled) Burrows (C8) on Visible on / phic Position utral Test (D5 eave Hummod	nore re 36) oncave 0) s on Liv Aerial In D2) ) ks (D7)	Surfac /ing Ro nagery (LRR I	e (B8) ots (C3 (C9) F)	3)

Project Site:	Gore Hill Interch	hange				City/Cou	unty:	Cascad	е	Sampling I	Date:	3/5/2	2020	
Applicant/Owner:	Montana Depar	tment of Trans	portation					State:	MT	Sampling I	Point:	WL1	1b SP <sup>.</sup>	1
Investigator(s):	S. Wall						Sec	tion, Tow	nship, Ran	ige: S21 T2	20N R03E			
Landform (hillslope, ter	race, etc.): h	illslope			Local re	lief (conc	ave, convex	, none):	convex		Slop	e (%):	25	
Subregion (LRR):	F		Lat:	47.4776		Long:	-111.353	38			Datum:			
Soil Map Unit Name:	Tally-Castne	er complex, 1	5 to 35	percent slope	S				NWI clas	ssification:	PEM			
Are climatic / hydrologi	c conditions on t	the site typical f	or this ti	me of year?	Yes	$\boxtimes$	No 🗆	(lf no	explain in	Remarks.)				
Are Vegetation D,	Soil □,	Or Hydrology	□, ;	significantly dist	turbed?		Are "No	ormal Cire	cumstances	s" present?	Yes	$\boxtimes$	No	
Are Vegetation D,	Soil □,	Or Hydrology	<b>□</b> , ı	naturally proble	matic?	(lf ne	eeded, expla	in any an	swers in R	emarks.)				

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

Hydrophytic Vegetation Present?	Yes	$\boxtimes$	No					
Hydric Soil Present?	Yes	$\boxtimes$	No	Is the Sampled Area within a Wetland?	YES 🛛	⊠ N	o 🗆	
Wetland Hydrology Present?	Yes	$\boxtimes$	No					

Remarks: All three wetland parameters are met.

Tree Stratum (Plot Size: 3m radius)	Absolute <u>% Cover</u>	Dominant Species?	Indicator <u>Status</u>	Dominance Test Worksheet:		
1. 2.				Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
3. 4.				Total Number of Dominant Species Acro All Strata:	<sup>DSS</sup> 1	(B)
 Sapling/Shrub Stratum (Plot Size: <b>3m radius</b> )	0	= Total Cove	er	Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/E
1.				Prevalence Index worksheet:		
2.				Total % Cover of:	Multiply by:	
3.				OBL species	x1 =	
4.				FACW species	x2 =	
5.				FAC species	x3 =	
	0	= Total Cove	ər	FACU species	x4 =	
Herb Stratum (Plot Size: <b>1m radius</b> )				UPL species	x5 =	
1. Typha latifolia	100	х	OBL	Column Totals: (A)		(B)
2.				Prevalence Index = E	3/A =	
3.				Hydrophytic Vegetation Indicators:		
4.				x 1 – Rapid Test for Hydrophy	tic Vegetation	
5.				x 2 – Dominance Test is >50%		
6.				3 – Prevalence Index is <3.0	1	
7. 8.				4 – Morphological Adaptation Remarks or on a separate sl		orting data i
9.				Problematic Hydrophytic Ve	petation <sup>1</sup> (Explain)	
10.					( , , ,	
11.				<sup>1</sup> Indicators of hydric soil and wetland hydric	drology must be pr	esent
	100	= Total Cove	er	unless disturbed or problematic.	alology must be pr	000111,
Woody Vine Stratum (Plot Size: 3m radius)						
1.						
2.				Hydrophytic Vegetation Present?	′es 🛛 🛛 N	lo 🗆
	0	= Total Cove	ər	i resent :		
% Bare Ground in Herb Stratum = 0						

## SOIL

Sampling Point: WL1b SP1

(inches)	Color (moist)	%	Co	or (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Text	ure		Remarks		
0-10	2.5Y 3/2	100		. ,				Clay I	loam				
10-16	2.5Y 3/2	80	1	0YR 5/6	20	С	Μ	Clay I	oam				
ydric Soil In Histosol ( Histic Ep Black His Hydroger Stratified Depleted Thick Da	pedon (A2) tic (A3) n Sulfide (A4) Layers (A5) (LRR I Below Dark Surfac rk Surface (A12)	ble to all L	RRs, unl             	ess otherwi Sandy C Sandy F Stripped Loamy f Loamy f Deplete	se noted.) Gleyed Matrix (S Redox (S5) I Matrix (S6) Mucky Mineral ( Gleyed Matrix ( d Matrix (F3) Dark Surface (F	54) (F1) F2) 6)	ins. <sup>2</sup> Locati		icators for Pro 1 cm Muck Coast Prair Dark Surfac High Plains of MLR Reduced V Red Parent	bblematic F (A9) (LRR ie Redox (A ce (S7) (LR Depression 2A 72 & 73) ertic (F18) Material (T	I, J) A16) (LRR   R G) ns (F16) (L	F, G, H) RR H o	
Sandy M	ucky Mineral (S1)		I	Deplete	d Dark Surface	(F7)			Very Shallo	w Dark Sur	face (TF12	2)	
2.5 cm M	ucky Peat or Peat (	S2) (LRR 0	G, H) [	Redox [	Depressions (F8	3)			Other (Expl	ain in Rema	arks)		
] 5 cm Mu	cky Peat or Peat (S	3) ( <b>LRR F</b> )	I	High Pla	ains Depressior	ns (F16) ( <b>MLR</b>	A 72 & 73 o	hy	licators of hydr /drology must roblematic.	1 2 0	,		
Surctive La	yer (if present):												
							Hydri	Soil Pros	cont?	Voc		No	
epth (inches)	: Meets indicator F6						Hydrid	c Soil Pres	sent?	Yes		No	
epth (inches) emarks:	Neets indicator F6						Hydrid	c Soil Pres	sent?	Yes		No	
(DROLOGY Vetland Hydr	Veets indicator F6	ne required	; check a	I that apply)			Hydrid		sent?				
Pepth (inches) Remarks: I (DROLOGY Vetland Hydr Primary Indica	Neets indicator F6	ne required			trust (B11)		Hydrid	Seco		rs (2 or mor			
epth (inches) emarks: 1 /DROLOGY /etland Hydr rimary Indica Surface	Neets indicator F6 , ology Indicators: tors (minimum of o	ne required		Salt C	rust (B11)	(B13)	Hydrid	<u>Seco</u> i	ndary Indicato	rs (2 or mor Tracks (B6)	e required;	)	
epth (inches) emarks: 1 /DROLOGY /etland Hydr rimary Indica ] Surface ] High Wa	Veets indicator F6 , ology Indicators: tors (minimum of o Water (A1) ater Table (A2)	ne required		Salt C	( )		Hydrid	<u>Seco</u> i	ndary Indicato Surface Soil C	rs (2 or mor Cracks (B6) etated Conc	e required;	)	
PROLOGY PROLOGY /etland Hydr rimary Indica Surface High Wi Saturati	Veets indicator F6 , ology Indicators: tors (minimum of o Water (A1) ater Table (A2)	ne required		Salt C Aquat Hydro	ic Invertebrates	or (C1)	Hydrid	Secol	ndary Indicato Surface Soil C Sparsely Veg	rs (2 or mor Cracks (B6) etated Conc erns (B10)	re required)	) Ce (B8)	
epth (inches) emarks: 1 DROLOGY /etland Hydr rimary Indica ] Surface ] High W: ] Saturati ] Saturati ] Water N ] Sedime	Veets indicator F6 , ology Indicators: tors (minimum of o Water (A1) ater Table (A2) on (A3)	ne required		Salt C Aquat Hydro	ic Invertebrates ogen Sulfide Od	or (C1) able (C2)		<u>Seco</u> l   	ndary Indicato Surface Soil C Sparsely Vege Drainage Patt	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o	re required)	) Ce (B8)	
Perth (inches) emarks: 1 PROLOGY fetland Hydr rimary Indica Surface High Wa Saturati Water M Sedime Sedime Drift De	Veets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3)	ne required		Salt C Aquat Hydro Dry-S Oxidiz (whe	ic Invertebrates Igen Sulfide Od eason Water Ta zed Rhizospher Pre not tilled)	or (C1) able (C2) es along Living			ndary Indicator Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o	e required cave Surfac	) ce (B8) pots (C3	
Pepth (inches) emarks: 1 (DROLOGY /etland Hydr rimary Indica Surface High Wa Saturati Water M Sedime Drift De Algal M	Meets indicator F6 ology Indicators: tors (minimum of o Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)	ne required		Salt C Aquat Hydro Dry-S Oxidiz (whe Prese	ic Invertebrates ogen Sulfide Od eason Water Ta zed Rhizospher ere not tilled) nce of Reduced	or (C1) able (C2) es along Living d Iron (C4)			ndary Indicato Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o ows (C8) ible on Aeri	e required) cave Surfac n Living Ro ial Imagery	) ce (B8) pots (C3	
	Veets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5)			Salt C Aquat Hydro Dry-S Oxidiz (whe Prese Thin N	ic Invertebrates igen Sulfide Od eason Water Ta red Rhizospher ere not tilled) nce of Reduced Muck Surface (0	or (C1) able (C2) es along Living d Iron (C4) C7)		Secol	ndary Indicato Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o bws (C8) ible on Aeri Position (D2	e required) cave Surfac n Living Ro ial Imagery	) ce (B8) pots (C3	
DROLOGY PROLOGY /etland Hydr rimary Indica Surface High Wa Saturati Water M Sedime Drift De Algal M Iron De Innondat	Veets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria	l Imagery (E		Salt C Aquat Hydro Dry-S Oxidiz (whe Prese Thin N	ic Invertebrates ogen Sulfide Od eason Water Ta zed Rhizospher ere not tilled) nce of Reduced	or (C1) able (C2) es along Living d Iron (C4) C7)		Secol	ndary Indicato Surface Soil C Sparsely Veg Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F FAC-Neutral	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5)	e required) cave Surfac n Living Ro ial Imagery	) ce (B8) pots (C3	
Epth (inches)     Emarks:     Emarks:     Compare 1     Compare 1	Veets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria stained Leaves (B9)	l Imagery (E		Salt C Aquat Hydro Dry-S Oxidiz (whe Prese Thin N	ic Invertebrates igen Sulfide Od eason Water Ta red Rhizospher ere not tilled) nce of Reduced Muck Surface (0	or (C1) able (C2) es along Living d Iron (C4) C7)		Secol	ndary Indicato Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5)	e required) cave Surfac n Living Ro ial Imagery	) ce (B8) pots (C3	
Peth (inches)     emarks:     I      DROLOGY      /etland Hydr rimary Indica     Surface     High Wa     Saturati     Water N     Sedime     Drift De     Algal M     Iron De     Inundat     Water-S     ield Observa	Meets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) Marks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria stained Leaves (B9) titions:	l Imagery (f	37)	Salt C Aquat Hydro Dry-S Oxidiz Oxidiz Vwhe Prese Thin N Othe	ic Invertebrates ogen Sulfide Od eason Water Ta zed Rhizospher ore not tilled) nce of Reduced Muck Surface (C r (Explain in F	or (C1) able (C2) es along Living d Iron (C4) C7)		Secol	ndary Indicato Surface Soil C Sparsely Veg Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F FAC-Neutral	rs (2 or mor Cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5)	e required) cave Surfac n Living Ro ial Imagery	) ce (B8) pots (C3	
Provide a constraint of the second seco	Meets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria itained Leaves (B9) tions: Present?	I Imagery (E	37) No	Salt C Aquat Hydro Dry-S Oxidiz (whe Prese Thin N Othe	ic Invertebrates igen Sulfide Od eason Water Ta red Rhizospher ere not tilled) nce of Reduced Muck Surface (C r (Explain in F pepth (inches):	or (C1) able (C2) es along Living d Iron (C4) C7)	g Roots (C3)	Secol	ndary Indicato Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F FAC-Neutral T Frost-Heave F	rs (2 or mor cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5) tummocks	re required) cave Surfact in Living Ro ial Imagery (D7) (LRR	) bots (C3 (C9) F)	)
	Meets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria stained Leaves (B9) tions: Present?	l Imagery (f	37)	Salt C Aquat Hydro Dry-S Oxidiz Oxidiz Vwhe Prese Thin N Othe	ic Invertebrates ogen Sulfide Od eason Water Ta zed Rhizospher ore not tilled) nce of Reduced Muck Surface (C r (Explain in F	or (C1) able (C2) es along Living d Iron (C4) C7)	g Roots (C3)	Secol	ndary Indicato Surface Soil C Sparsely Veg Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F FAC-Neutral	rs (2 or mor cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5) tummocks	re required) cave Surfact in Living Ro ial Imagery (D7) (LRR	) ce (B8) pots (C3	)
PROLOGY     emarks:     I      PROLOGY     /etland Hydr     rimary Indica     Surface     High W:     Saturati     Water N     Sedime     Drift De     Algal M     Iron De     Inundat     Mater-S     ield Observa urface Water     /ater Table P     aturation Pre     ncludes capil	Meets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria stained Leaves (B9) tions: Present?	I Imagery (f	37) No No No	Salt C         Aquat         Hydro         Dry-S         Oxidiz         (whe         Prese         Thin N         Othe         Image: Difference of the state of the stat	ic Invertebrates igen Sulfide Od eason Water Ta red Rhizospher ere not tilled) nce of Reduced Muck Surface (C r (Explain in F repth (inches): repth (inches):	or (C1) able (C2) es along Living d Iron (C4) C7) Remarks) 18	g Roots (C3)	Secol	ndary Indicato Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F FAC-Neutral T Frost-Heave F	rs (2 or mor cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5) tummocks	re required) cave Surfact in Living Ro ial Imagery (D7) (LRR	) bots (C3 (C9) F)	)
PROLOGY     emarks:     I      PROLOGY     /etland Hydr     rimary Indica     Surface     High W:     Saturati     Water N     Sedime     Drift De     Algal M     Iron De     Inundat     Mater-S     ield Observa urface Water     /ater Table P     aturation Pre     ncludes capil	Meets indicator F6 ology Indicators: tors (minimum of or Water (A1) ater Table (A2) on (A3) farks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aeria itained Leaves (B9) tions: Present? Sent? ary fringe)	I Imagery (f	37) No No No	Salt C         Aquat         Hydro         Dry-S         Oxidiz         (whe         Prese         Thin N         Othe         Image: Display the second seco	ic Invertebrates igen Sulfide Od eason Water Ta red Rhizospher ere not tilled) nce of Reduced Muck Surface (C r (Explain in F repth (inches): repth (inches):	or (C1) able (C2) es along Living d Iron (C4) C7) Remarks) 18	g Roots (C3)	Secol	ndary Indicato Surface Soil C Sparsely Vege Drainage Patt Oxidized Rhiz (where tilled) Crayfish Burro Saturation Vis Geomorphic F FAC-Neutral T Frost-Heave F	rs (2 or mor cracks (B6) etated Conc erns (B10) ospheres o bows (C8) ible on Aeri Position (D2 Fest (D5) łummocks	re required) cave Surfact in Living Ro ial Imagery (D7) (LRR	) bots (C3 (C9) F)	)

Project Site:	Gore Hill Inter	change				City/Cou	unty:	(	Cascade	e	Sampling	Date:	3/5/	2020	
Applicant/Owner:	Montana Depa	artment of Trans	portatior	l				5	State:	MT	Sampling	Point:	WL	1b SP2	2
Investigator(s):	S. Wall							Section	on, Tow	nship, Rang	ge: S21 T2	20N R03E			
Landform (hillslope, ter	race, etc.):	hillslope			Local re	elief (conc	cave, cor	nvex, r	none):	convex		Slop	e (%):	25	
Subregion (LRR):	F		Lat:	47.4776		Long:	-111.	3538	3			Datum:			
Soil Map Unit Name:	Tally-Castr	er complex, 1	5 to 35	percent slope	es					NWI class	sification:	none			
Are climatic / hydrologi	c conditions on	the site typical f	for this ti	me of year?	Yes	$\boxtimes$	No		(lf no,	explain in F	Remarks.)				
Are Vegetation D,	Soil □,	Or Hydrology	□,	significantly dis	sturbed?		Are	e "Norr	mal Circ	umstances'	' present?	Yes	$\boxtimes$	No	
Are Vegetation D,	Soil □,	Or Hydrology	□,	naturally proble	ematic?	(lf ne	eeded, e	xplain	any ans	swers in Re	marks.)				

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

Hydrophytic Vegetation Present?	Yes 🗌	No [	$\boxtimes$			
Hydric Soil Present?	Yes 🛛	No [		Is the Sampled Area within a Wetland?	YES 🗌	NO 🖾
Wetland Hydrology Present?	Yes 🗌	No [	$\boxtimes$			

Remarks: Soil meets hydric soil criteria, but hydrology and hydrophytic vegetation lacking.

VEGETATION – Use scientific names of plants									
Tree Stratum (Plot Size: 3m radius)	Absolute <u>% Cover</u>	Dominant Species?	Indicator <u>Status</u>	Dominance Test W	orksheet:				
1.				Number of Dominant		at Are	0		(A)
2.				OBL, FACW, or FAC	):		U		(~)
3.				Total Number of Dor	minant Specie	es Across	2		(B)
4.				All Strata:			-		(D)
	0	= Total Cove	er	Percent of Dominant		it Are	0		(A/B)
Sapling/Shrub Stratum (Plot Size: 3m radius)				OBL, FACW, or FAC	):		-		( )
1.				Prevalence Index w	vorksheet:				
2.				<u>Total %</u>	Cover of:		Multiply	/ by:	
3.				OBL species			x1 =		
4.				FACW species			x2 =		
5.				FAC species	10		x3 =	30	
	0	= Total Cove	er	FACU species	20		x4 =	80	
Herb Stratum (Plot Size: 1m radius)				UPL species	<u>70</u>		x5 =	<u>350</u>	
1. Bromus inermis	70	х	UPL	Column Totals:	100	(A)		460	(B)
2. Sisymbrium altissimum	20	x	FACU		Prevalence li	ndex = B/A	= 4.6		
3. Asclepias speciosa	10		FAC	Hydrophytic Vegeta	ation Indicat	ors:			
4.					d Test for Hyd		egetation		
5.				2 – Domi	inance Test is	s >50%			
6.				3 – Preva	alence Index	is <3.0 <sup>1</sup>			
7.				4 – Morn	hological Ada	antations <sup>1</sup> (F	Provide s	upportin	a data in
8.					s or on a sepa			apportai	gaaan
9.				Problema	atic Hydrophy	rtic Vegetati	ion <sup>1</sup> (Exp	lain)	
10.									
11.				<sup>1</sup> Indicators of hydric	soil and wetla	and hydrolo	av must	oe prese	nt
	100	= Total Cove	er	unless disturbed or p	problematic.		g)		,
Woody Vine Stratum (Plot Size: 3m radius)									
1.									
2.				Hydrophytic Ve Present		Yes		No	$\boxtimes$
	0	= Total Cove	er	Fresent	Lſ				
% Bare Ground in Herb Stratum = <b>0</b>	-								
Remarks: No indicators of hydrophytic vegetati	on			1					

SOIL

SOIL									Samp	ling Point: WI	L1b SP2		
Profile Desci	ription: (Describe to th	e depth nee	eded to	documen	t the indicator of	or confirm the	absence	of indic	ators.)				
Depth	Matrix				Redox Feature	es							
(inches)	Color (moist)	%	Color (	Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>	Te	xture		Remarks	;	
0-8	10YR 3/3	100											
8-16	10YR 3/1	95	2.5Y	5/4	5	С	М	Plat	y shale				
	ncentration, D=Depletio					ed Sand Grains	. <sup>2</sup> Locati						
_	ndicators: (Applicable	to all LRRs			•			_	dicators for Pr	-	-	ils³:	
Histosol				-	leyed Matrix (S4	l)				k (A9) ( <b>LRR I</b> ,			
	bipedon (A2)			-	edox (S5)					rie Redox (A1		F, G, F	1)
Black Hi					Matrix (S6)					ce (S7) ( <b>LRR</b>			
	en Sulfide (A4)				lucky Mineral (F	,		Ľ	-	s Depressions	s (⊢16) (L	-RK H	outside
	d Layers (A5) (LRR F)			-	leyed Matrix (F2	2)		_	_	RA 72 & 73)			
	d Below Dark Surface (A	(11)		-	Matrix (F3)					. ,			
	ark Surface (A12)				ark Surface (F6)					t Material (TF			
	lucky Mineral (S1)			-	Dark Surface (F	-7)				ow Dark Surfa	-	2)	
	Mucky Peat or Peat (S2)				epressions (F8)			_ ،		lain in Remar			
∐ 5 cm M	ucky Peat or Peat (S3) (	LRR F)		LRR H)	ns Depressions	(F16) (MLRA /	2 & 73 0		ndicators of hyd hydrology must				
				,					problematic.				
Restrictive L	ayer (if present):												
Туре:							Hydrid	: Soil Pr	esent?	Yes	$\boxtimes$	No	
Depth (inches	s):												
Remarks:	Meets indicator F6												
HYDROLOG	Y												
Wetland Hyd	rology Indicators:												
Primary Indic	ators (minimum of one re	equired; che	ck all that	at apply)				Sec	ondary Indicato	ors (2 or more	required	)	
Surface	e Water (A1)			Salt Cr	ust (B11)				Surface Soil	Cracks (B6)			
🔲 🛛 High W	/ater Table (A2)			Aquatio	c Invertebrates (	B13)			Sparsely Veg	etated Conca	ave Surfa	ce (B8)	)
Satura	tion (A3)			Hydrog	jen Sulfide Odor	r (C1)			Drainage Pat	terns (B10)			
□ Water	Marks (B1)			Dry-Se	ason Water Tab	ole (C2)			Oxidized Rhiz	zospheres on	Living R	oots (C	;3)
Sedime	ent Deposits (B2)			Oxidize	ed Rhizospheres	s along Living R	loots (C3)		(where tilled	)			
Drift De	eposits (B3)			(wher	e not tilled)				Crayfish Burr	ows (C8)			
Algal N	fat or Crust (B4)			Presen	ce of Reduced I	Iron (C4)			Saturation Vis	sible on Aeria	I Imagery	/ (C9)	
Iron De	eposits (B5)			Thin M	uck Surface (C7	7)			Geomorphic	Position (D2)			
🗌 Inunda	tion Visible on Aerial Im	agery (B7)		Other	(Explain in Re	emarks)			FAC-Neutral	Test (D5)			
Water-	Stained Leaves (B9)								Frost-Heave	Hummocks (E	07) ( <b>LRR</b>	F)	
Field Observ	ations:												
Surface Wate	r Present? Yes		lo 🛛	De	epth (inches):								
Water Table I	Present? Yes		lo 🛛	De	epth (inches):			Netland	Hydrology Pre	sent?	Yes [		No 🛛
Saturation Pr	YAS		lo 🛛	De	epth (inches):				,				- 2
(includes cap	lliary fringe)												
Describe Rec	orded Data (stream gau	ige, monitori	ng well,	aerial pho	tos, previous ins	spections), if av	allable:						

Remarks: No wetland hydrology indicators present

Project Site:	Gore Hill Intere	change			City/Cou	inty:	Cascade	)	Sampling I	Date:	3/5/2020
Applicant/Owner:	Montana Depa	artment of Trans	portation				State:	MT	Sampling I	Point:	WL1c SP1
Investigator(s):	S. Wall					Sec	tion, Towr	nship, Rang	je: S21 T2	20N R03E	
Landform (hillslope, ter	rrace, etc.):	ditch		Local re	lief (conc	ave, convex,	none):	concave		Slope	e (%): 5
Subregion (LRR):	F		Lat:	47.47604	Long:	-111.36844				Datum:	
Soil Map Unit Name:	Tally-Castne	r complex, 15 to	35 percent slopes					NWI class	sification:	PEM/PS	S
Are climatic / hydrologi	c conditions on	the site typical f	or this time of year?	Yes	$\boxtimes$	No 🗌	(If no,	explain in F	Remarks.)		
Are Vegetation D,	Soil □,	Or Hydrology	□, significantly of	disturbed?		Are "No	rmal Circ	umstances'	present?	Yes	🛛 No 🗆
Are Vegetation D,	Soil □,	Or Hydrology	□, naturally prol	blematic?	(lf ne	eded, explai	n any ans	wers in Re	marks.)		

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

Hydrophytic Vegetation Present?	Yes 🛛	No 🗌				
Hydric Soil Present?	Yes 🛛	No 🗌	Is the Sampled Area within a Wetland?	YES 🖾	NO 🗆	
Wetland Hydrology Present?	Yes 🖾	No 🗌				
Remarks: All three wetland parameters are met						

three wetland parameters are met.

VEGETATION – Use scientific names of plants Tree Stratum (Plot Size: 3m radius)	Absolute	Dominant	Indicator	Dominance Test Worksheet:		
、	<u>% Cover</u>	Species?	Status			
1. 2.				Number of Dominant Species That Are OBL, FACW, or FAC:	1	(A)
2.						
4.				Total Number of Dominant Species Across All Strata:	1	(B)
<del></del>	0	= Total Cove	r			
Sapling/Shrub Stratum (Plot Size: <b>3m Radiius</b> )	U	- 10101 0000	1	Percent of Dominant Species That Are OBL, FACW, or FAC:	100	(A/B)
1.				Prevalence Index worksheet:		
2.				Total % Cover of:	Multiply by:	
3.				OBL species	x1 =	
4.				FACW species	x2 =	
5.				FAC species	x3 =	
	0	= Total Cove	r	FACU species	x4 =	
Herb Stratum (Plot Size: 1m radius)	•			UPL species	x5 =	
1. Typha latifolia	100	х	OBL	Column Totals: (A)		(B)
2.	100	~	OBE	Prevalence Index = $B/A$ =	_	(2)
3.				Hydrophytic Vegetation Indicators:		
4.				x 1 – Rapid Test for Hydrophytic V	(egetation	
5.				x 2 – Dominance Test is >50%	ogotation	
6.				$3 - Prevalence Index is < 3.0^1$		
7.				4 – Morphological Adaptations <sup>1</sup> (		data in
8.				Remarks or on a separate sheet		data m
9.				Problematic Hydrophytic Vegeta	tion <sup>1</sup> (Explain)	
10.						
11.				<sup>1</sup> Indicators of hydric soil and wetland hydrolo	oav must be preser	ıt.
		= Total Cove	r	unless disturbed or problematic.		,
Woody Vine Stratum (Plot Size: 3m radiius)						
1.						
2.				Hydrophytic Vegetation Yes Present?	🛛 No	
	0	= Total Cove	r			
% Bare Ground in Herb Stratum = 0						
Remarks: Vegetation meets rapid test and domin	nance test fo	or hydrophytic	vegetation	·		
<b>2</b>			5			

SOIL

Sampling Point: WL1c SP1

Depth	Matrix	the depth	neeueu		iment the indicator Redox Featur		in the abse	nce or	muicau	515.)			
(inches)	Color (moist)	%	Col	or (Mois		Type <sup>1</sup>	Lo	2 <sup>2</sup>	Textu	ıre		Remarks	
<u>,                                     </u>				0. (	<u>,,,                                  </u>	.,,,,,			Sandy			rtomanto	
0-8	10YR 3/1	100							loan	n			
8-16	10YR 3/1	90	1(	0YR 4/6	10	С	Μ	I	Sandy loan				
ydric Soil Ind ] Histosol (/ ] Histic Epi	<b>dicators: (Applicat</b> A1) pedon (A2)		RRs, unle [	ess othe San San	dy Gleyed Matrix (S dy Redox (S5)		Grains. ²Lo	ocation	India	cators for Pr 1 cm Muc Coast Prai	oblematic k (A9) (LRF rie Redox (	A16) ( <b>LRR F</b>	
Black Hist	. ,				oped Matrix (S6)					Dark Surfa			
	Sulfide (A4)				my Mucky Mineral (I					-	-	ons (F16) ( <b>LF</b>	IR H OUts
	Layers (A5) (LRR F				my Gleyed Matrix (F	-2)			_		RA 72 & 73	<b>B</b> )	
	Below Dark Surface	(A11)	[		leted Matrix (F3)	-				Reduced V	· · ·		
	k Surface (A12)		[		lox Dark Surface (F6	,					t Material (		
-	ucky Mineral (S1)				leted Dark Surface					=		Irface (TF12)	
_	ucky Peat or Peat (S				lox Depressions (F8	,		<b>70</b> - (	31.5.45		lain in Rem		
] 5 cm Muo	cky Peat or Peat (S	) ( <b>LKK F</b> )	L	High	n Plains Depression: R <b>H</b> )	S (F10) (IVI	LKA 72 & 1	5 01	hyo			getation and t, unless dist	
estrictive La	yer (if present):												
	,												
epth (inches)	: Soil meets indicator	F6					Ну	/dric S	oil Prese	ent?	Yes		No 🗆
Depth (inches): Remarks: S	Soil meets indicator	F6					Hy	ydric S	oil Prese	ent?	Yes		No 🗆
Pepth (inches): Remarks: S	Soil meets indicator	F6					Hy	vdric S	oil Prese	ent?	Yes		No 🗆
Pepth (inches): Remarks: S <b>/DROLOGY</b> Vetland Hydro	Soil meets indicator		check al	I that ap			Hy	/dric S		ent?			No 🗆
Pepth (inches): Remarks: S <b>DROLOGY</b> Vetland Hydro rimary Indicat	Soil meets indicator				ply) alt Crust (B11)		Hy	ydric S	Secon		ors (2 or mc	ore required)	No 🗆
Pepth (inches): Remarks: S <b>DROLOGY</b> Vetland Hydro rimary Indicat Surface	Soil meets indicator ology Indicators: tors (minimum of on		I	⊐ Sa		(B13)	Hy	ydric S	Secon	dary Indicato	ors (2 or mc Cracks (B6	ore required)	
epth (inches): emarks: S DROLOGY /etland Hydro rimary Indicat Surface High Wa	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2)			□ Sa □ Ao	alt Crust (B11)		Hy	vdric S	Secon	dary Indicato	ors (2 or mc Cracks (B6 Jetated Cor	ore required) ) incave Surface	
epth (inches): emarks: S DROLOGY /etland Hydro rimary Indicat Surface High Wa Saturatio	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2)			Sa Ac Hy	alt Crust (B11) quatic Invertebrates	or (C1)	Hy	vdric S	Secon Secon S S S S S S S S S S	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat	ors (2 or mo Cracks (B6 jetated Cor terns (B10)	ore required) ) incave Surface	e (B8)
epth (inches): emarks: S <b>DROLOGY</b> /etland Hydro rimary Indicat Surface High Wa Saturatio Water M	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) tter Table (A2) on (A3)		   		alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odd	or (C1) Ible (C2)			Secon	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat	ors (2 or mo Cracks (B6 Jetated Cor terns (B10) zospheres	ore required) ) hcave Surface	e (B8)
Pepth (inches): Permarks: S P	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1)		   		alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta	or (C1) Ible (C2)			Secon Secon S S S S C S S C S S C S S S S S S S S	dary Indicato Surface Soil Sparsely Veg Drainage Pat Dxidized Rhi:	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres (J)	ore required) ) hcave Surface	e (B8)
	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2)			Sa Ad Hy Di O: (	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odc ry-Season Water Ta xidized Rhizosphere	or (C1) Ible (C2) es along Li			Secon Secon S S S S C S C C C C C	dary Indicato Surface Soil Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres ( I) ows (C8)	ore required) ) hcave Surface	€ (B8) ots (C3)
Depth (inches):         temarks:       S         2       CDROLOGY         Vetland Hydro       Surface         1       Surface         2       High Wa         3       Saturatio         1       Water M         2       Sedimer         3       Drift Dep         3       Algal Ma	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3)			Sa     Ac     Ac	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled)	or (C1) Ible (C2) es along Li I Iron (C4)			Secon □ \$ □ \$ □ \$ □ \$ □ \$	dary Indicato Surface Soil Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres ( 1) ows (C8) sible on Ae	ore required) ) hcave Surface ) on Living Ro rial Imagery	€ (B8) ots (C3)
	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4)	e required;		Si     Ai     Ai     Ai     Di     Di     Oi     Oi     Oi     Oi     Oi     Oi     Th	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced	or (C1) able (C2) es along Li I Iron (C4) 57)			Secon           Image: Secon	dary Indicato Surface Soil Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi	ors (2 or mo Cracks (B6 Jetated Cor terns (B10) zospheres J) ows (C8) sible on Ae Position (D	ore required) ) hcave Surface ) on Living Ro rial Imagery	€ (B8) ots (C3)
Vepth (inches):         temarks:       S         YDROLOGY         Vetland Hydro         trimary Indicat         Surface         High Wa         Saturation         Water M         Sedimer         Drift Dep         Algal Ma         Iron Dep         Inundation	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5)	e required;		Si     Ai     Ai     Ai     Di     Di     Oi     Oi     Oi     Oi     Oi     Oi     Th	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced nin Muck Surface (C	or (C1) able (C2) es along Li I Iron (C4) 57)			Secon           Secon </td <td>dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral</td> <td>ors (2 or mo Cracks (B6 Jetated Cor terns (B10) zospheres I) ows (C8) sible on Ae Position (D Test (D5)</td> <td>ore required) ) hcave Surface ) on Living Ro rial Imagery</td> <td>≥ (B8) ots (C3) (C9)</td>	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral	ors (2 or mo Cracks (B6 Jetated Cor terns (B10) zospheres I) ows (C8) sible on Ae Position (D Test (D5)	ore required) ) hcave Surface ) on Living Ro rial Imagery	≥ (B8) ots (C3) (C9)
Depth (inches):         Remarks:       S         Z       Z         Z       Saturation         Saturation       Water M         Saturation       Water M         Sedimer       Drift Dep         Algal Mater       Inundation         Water-S       Nater-S	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial tained Leaves (B9)	e required;		Si     Ai     Ai     Ai     Di     Di     Oi     Oi     Oi     Oi     Oi     Oi     Th	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced nin Muck Surface (C	or (C1) able (C2) es along Li I Iron (C4) 57)			Secon Secon S S S S S C S S C S S S C S S S C S S S C S	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral	ors (2 or mo Cracks (B6 Jetated Cor terns (B10) zospheres I) ows (C8) sible on Ae Position (D Test (D5)	ore required) ) ncave Surfaco ) on Living Roo rial Imagery 2)	≥ (B8) ots (C3) (C9)
	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial tained Leaves (B9) tions:	e required; Imagery (E	 	Si     Ai     Ai     Ai     Di     Di     Oi     Oi     Oi     Oi     Oi     Oi     Th	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced nin Muck Surface (C	or (C1) able (C2) es along Li I Iron (C4) 57)			Secon Secon S S S S S C S S C S S S C S S S C S S S C S	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral	ors (2 or mo Cracks (B6 Jetated Cor terns (B10) zospheres I) ows (C8) sible on Ae Position (D Test (D5)	ore required) ) ncave Surfaco ) on Living Roo rial Imagery 2)	≥ (B8) ots (C3) (C9)
Depth (inches):         Remarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Primary Indicat       S         Surface       High Wa         Sedimer       Drift Dep         Drift Dep       Algal Ma         Iron Dep       Inundation         Water-S       Water-S	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) posits (B3) at or Crust (B4) posits (B5) on Visible on Aerial tained Leaves (B9) tions: Present? Ye	e required; Imagery (E	 	Sa Ad Ad Di Di Di C C Pr C Tr C	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced hin Muck Surface (C ther (Explain in R	or (C1) able (C2) es along Li I Iron (C4) 57)		(C3)	Second           2         5           2         5           2         5           2         5           2         6           1         6           1         6           2         6           2         6           3         6           1         6           1         6           1         6           1         6           1         7	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres ( 1) ows (C8) sible on Ae Position (D Test (D5) Hummocks	ore required) ) ncave Surfaco ) on Living Roo rial Imagery 2)	e (B8) ots (C3) (C9)
Depth (inches):         Remarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Primary Indicat       High Wa         Zemarks:       Sufface         High Wa       Saturation         Sedimer       Drift Dep         Algal Ma       Iron Dep         Inundation       Water-S         Gurface Water       Vater Table Prisaturation Presencludes capill	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) on Visible on Aerial tained Leaves (B9) tions: Present? Ye sent? Ye ary fringe) Ye	e required; Imagery (E es es es es	 	Si     Ac     Ac	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odd ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced nin Muck Surface (C ther (Explain in R Depth (inches): Depth (inches):	or (C1) able (C2) es along Li l Iron (C4) 77 eemarks)	ving Roots	(C3) We	Second           2         5           2         5           2         5           2         5           2         6           1         6           1         6           2         6           2         6           3         6           1         6           1         6           1         6           1         6           1         7	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral Frost-Heave	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres ( 1) ows (C8) sible on Ae Position (D Test (D5) Hummocks	ore required) ) ncave Surfaco ) on Living Roo rial Imagery 2) 5 (D7) ( <b>LRR I</b>	e (B8) ots (C3) (C9)
Depth (inches):         Remarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Zemarks:       S         Primary Indicat       High Wa         Zemarks:       Sufface         High Wa       Saturation         Sedimer       Drift Dep         Algal Ma       Iron Dep         Inundation       Water-S         Gurface Water       Vater Table Prisaturation Presencludes capill	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) on Visible on Aerial tained Leaves (B9) tions: Present? Ye sent? Ye ary fringe) Ye	e required; Imagery (E es es es es	 	Si     Ac     Ac	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odo ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced hin Muck Surface (C ther (Explain in R Depth (inches): Depth (inches):	or (C1) able (C2) es along Li l Iron (C4) 77 eemarks)	ving Roots	(C3) We	Second           2         5           2         5           2         5           2         5           2         6           1         6           1         6           2         6           2         6           3         6           1         6           1         6           1         6           1         6           1         7	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral Frost-Heave	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres ( 1) ows (C8) sible on Ae Position (D Test (D5) Hummocks	ore required) ) ncave Surfaco ) on Living Roo rial Imagery 2) 5 (D7) ( <b>LRR I</b>	e (B8) ots (C3) (C9)
Pepth (inches):         remarks:       S         Problematics       S         Petland Hydro       S         rimary Indicat       Surface         High Wa       Saturation         Saturation       Sedimer         Drift Deg       Algal Ma         Inoundation       Water N         Sedimer       Inoundation         Inoundation       Water-S         ield Observa       Sedimer         Autrace Water       Vater-S         ield Observa       Sedimer         Autrace Water       Vater Table Presencludes capill         Vescribe Recoord       Sedimer	Soil meets indicator ology Indicators: tors (minimum of on Water (A1) ater Table (A2) on (A3) larks (B1) nt Deposits (B2) cosits (B3) at or Crust (B4) cosits (B5) on Visible on Aerial tained Leaves (B9) tions: Present? Ye sent? Ye ary fringe) Ye	e required; Imagery (E es es auge, mor	I I I No No No nitoring w	Sa     Ac     Ac	alt Crust (B11) quatic Invertebrates ydrogen Sulfide Odd ry-Season Water Ta xidized Rhizosphere where not tilled) resence of Reduced nin Muck Surface (C ther (Explain in R Depth (inches): Depth (inches): Depth (inches): I photos, previous ir	or (C1) able (C2) es along Li l Iron (C4) 77 eemarks)	ving Roots	(C3) We	Second           2         5           2         5           2         5           2         5           2         6           1         6           1         6           2         6           2         6           3         6           1         6           1         6           1         6           1         6           1         7	dary Indicato Surface Soil ( Sparsely Veg Drainage Pat Dxidized Rhi: (where tilleo Crayfish Burr Saturation Vi Geomorphic FAC-Neutral Frost-Heave	ors (2 or mc Cracks (B6 Jetated Cor terns (B10) zospheres ( 1) ows (C8) sible on Ae Position (D Test (D5) Hummocks	ore required) ) ncave Surfaco ) on Living Roo rial Imagery 2) 5 (D7) ( <b>LRR I</b>	e (B8) ots (C3) (C9)

Gore Hill Inter	change				City/Cou	nty:			,	Sampling I	Date:	3/26	/2020	
Montana Depa	artment of Transp	portation	I					State:	MT	Sampling I	Point:	WL1	c SP2	2
S. Wall							Secti	on, Tow	nship, Rang	ge: S21 T2	20N R03E			
rrace, etc.):	hillslope			Local re	lief (conc	ave, co	nvex,	none):	convex		Slop	e (%):	20	
F		Lat:	47.4755333		Long:	-111.	3568´	194			Datum:			
Tally-Castn	ner complex, 18	5 to 35	percent slopes	5					NWI class	sification:	none			
c conditions on	the site typical f	or this ti	me of year?	Yes	$\boxtimes$	No		(lf no,	explain in F	Remarks.)				
Soil □,	Or Hydrology	□, :	significantly distu	irbed?		Ar	e "Nor	mal Circ	cumstances	" present?	Yes	$\boxtimes$	No	
Soil □,	Or Hydrology	<b>□</b> , ı	naturally problem	natic?	(If ne	eded, e	explain	any an	swers in Re	marks.)				
	Montana Depa S. Wall rrace, etc.): F Tally-Castrr c conditions or Soil,	S. Wall rrace, etc.): hillslope F Tally-Castner complex, 1 c conditions on the site typical f Soil	Montana Department of Transportation S. Wall rrace, etc.): hillslope F Lat: Tally-Castner complex, 15 to 35 ic conditions on the site typical for this til Soil [], Or Hydrology [], s	Montana Department of Transportation S. Wall rrace, etc.): hillslope F Lat: 47.4755333 Tally-Castner complex, 15 to 35 percent slopes ic conditions on the site typical for this time of year? Soil [], Or Hydrology [], significantly distu	Montana Department of Transportation S. Wall rrace, etc.): hillslope Local re F Lat: 47.4755333 Tally-Castner complex, 15 to 35 percent slopes c conditions on the site typical for this time of year? Yes Soil _, Or Hydrology _, significantly disturbed?	Montana Department of Transportation         S. Wall         trace, etc.):       hillslope         Local relief (conc         F       Lat:         47.4755333       Long:         Tally-Castner complex, 15 to 35 percent slopes         ic conditions on the site typical for this time of year?       Yes         Soil □,       Or Hydrology □,       significantly disturbed?	Montana Department of Transportation         S. Wall         trrace, etc.):       hillslope         Local relief (concave, co         F       Lat:         47.4755333       Long:         Tally-Castner complex, 15 to 35 percent slopes         Ic conditions on the site typical for this time of year?       Yes         Soil       □,       Or Hydrology       □,         significantly disturbed?       Ar	Gore Hill Interchange       City/County:         Montana Department of Transportation       Secti         S. Wall       Secti         rrace, etc.):       hillslope       Local relief (concave, convex,         F       Lat:       47.4755333       Long:       -111.3568'         Tally-Castner complex, 15 to 35 percent slopes       conditions on the site typical for this time of year?       Yes       No       Inc.         Soil       I.       Or Hydrology       I.       significantly disturbed?       Are "Nor	Gore Hill Interchange       City/County:       Cascade         Montana Department of Transportation       State:         S. Wall       Section, Tow         rrace, etc.):       hillslope       Local relief (concave, convex, none):         F       Lat:       47.4755333       Long:       -111.3568194         Tally-Castner complex, 15 to 35 percent slopes       conditions on the site typical for this time of year?       Yes       No       (If no, Soil 🔲, Or Hydrology 🔄, significantly disturbed?	Montana Department of Transportation       State:       MT         S. Wall       Section, Township, Range         rrace, etc.):       hillslope       Local relief (concave, convex, none):       convex         F       Lat:       47.4755333       Long:       -111.3568194         Tally-Castner complex, 15 to 35 percent slopes       NWI class         c conditions on the site typical for this time of year?       Yes       No       (If no, explain in F         Soil	Gore Hill Interchange       City/County:       Cascade       Sampling I         Montana Department of Transportation       State:       MT       Sampling I         S. Wall       Section, Township, Range:       S21 T2         rrace, etc.):       hillslope       Local relief (concave, convex, none):       convex         F       Lat:       47.4755333       Long:       -111.3568194         Tally-Castner complex, 15 to 35 percent slopes       NWI classification:       c         c conditions on the site typical for this time of year?       Yes       No       (If no, explain in Remarks.)         Soil	Gore Hill Interchange       City/County:       Cascade       Sampling Date:         Montana Department of Transportation       State:       MT       Sampling Point:         S. Wall       Section, Township, Range:       S21 T20N R03E         rrace, etc.):       hillslope       Local relief (concave, convex, none):       convex       Slope         F       Lat:       47.4755333       Long:       -111.3568194       Datum:         Tally-Castner complex, 15 to 35 percent slopes       NWI classification:       none         c conditions on the site typical for this time of year?       Yes       No       (If no, explain in Remarks.)         Soil	Gore Hill Interchange       City/County:       Cascade       Sampling Date:       3/26         Montana Department of Transportation       State:       MT       Sampling Point:       WL1         S. Wall       Section, Township, Range:       S21 T20N R03E         rrace, etc.):       hillslope       Local relief (concave, convex, none):       convex       Slope (%):         F       Lat:       47.4755333       Long:       -111.3568194       Datum:         Tally-Castner complex, 15 to 35 percent slopes       NWI classification:       none         c conditions on the site typical for this time of year?       Yes       No       (If no, explain in Remarks.)         Soil	Gore Hill Interchange       City/County:       Cascade       Sampling Date:       3/26/2020         Montana Department of Transportation       State:       MT       Sampling Point:       WL1c SP2         S. Wall       Section, Township, Range:       S21 T20N R03E         rrace, etc.):       hillslope       Local relief (concave, convex, none):       convex       Slope (%):       20         F       Lat:       47.4755333       Long:       -111.3568194       Datum:         Tally-Castner complex, 15 to 35 percent slopes       NWI classification:       none         c conditions on the site typical for this time of year?       Yes       No       (If no, explain in Remarks.)         Soil

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

Hydrophytic Vegetation Present?	Yes		No	$\boxtimes$				
Hydric Soil Present?	Yes	$\boxtimes$	No		Is the Sampled Area within a Wetland?	YES	NO 🛛	
Wetland Hydrology Present?	Yes	$\boxtimes$	No					

Remarks: Hydric soil and wetland hydrology present, but hydrophytic vegetation lacking. Wetland hydrology (saturation) likely due to recent snowmelt.

<b>VEGE</b>	TATION – Use scientific names of plants								
	Stratum (Plot Size: 3m radius)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Workshe	et:			
1.					Number of Dominant Specie	es That Are	0		(A)
2.					OBL, FACW, or FAC:		0		(A)
3.					Total Number of Dominant S	Species Across	3		(B)
4.					All Strata:		5		(D)
		0	= Total Cove	r	Percent of Dominant Specie	s That Are	0		(A/B)
Sapl	ing/Shrub Stratum (Plot Size: <b>3m radius</b> )				OBL, FACW, or FAC:		•		(,,,,,)
1.					Prevalence Index workshe	et:			
2.					Total % Cover	of:	Multiply by:		
3.					OBL species		x1 =		
4.					FACW species		x2 =		
5.					FAC species		x3 =		
		0	= Total Cove	r	FACU species		x4 =		
Herb	<u>9 Stratum (</u> Plot Size: <b>1m radius</b> )				UPL species	_	x5 =		
1.	Bromus inermus	85	х	UPL	Column Totals:	(A)			(B)
2.	Verbascum thapsus	10		UPL	Prevalen	ce Index = B/A =			
3.	Cirsium arvense	5		FACU	Hydrophytic Vegetation In	dicators:			
4.					1 – Rapid Test f	or Hydrophytic Ve	egetation		
5.					2 – Dominance	Test is >50%			
6.					3 – Prevalence I	ndex is <3.0 <sup>1</sup>			
7.					4 – Morphologic	al Adaptations <sup>1</sup> (F	Provide suppo	ortina	data in
8.					Remarks or on a	separate sheet)			
9.					Problematic Hyd	Irophytic Vegetati	ion <sup>1</sup> (Explain)		
10.									
11.					<sup>1</sup> Indicators of hydric soil and	wetland hydrolo	gy must be pi	resent	
		100	= Total Cove	r	unless disturbed or problem	atic.			
Woo	dy Vine Stratum (Plot Size: <b>3m radius</b> )								
1.									
2.					Hydrophytic Vegetatio Present?	on Yes		No	$\boxtimes$
		0	= Total Cove	r	T TOSCHET				
% B	are Ground in Herb Stratum = 0								
Rem	arks: No hydrophytic vegetation indicators	present.			1				
		F. 300.00							

## SOIL

0-4 10 4-10 10	Matrix or (moist) YR 3/2 YR 2/1 YR 3/2 on, D=Depletion	3 depth % 100 70 20	Co	olor (M	Redox Fea			nc <sup>2</sup> T Platy	exture loam r silt loam	The 4-10 incl	Rema h layer ha		d matri	
(inches)         Cold           0-4         10           4-10         10           4-10         10           4-10         10           4-10         10           Histosol (A1)         10           Histosol (A1)         10	or (moist) YR 3/2 YR 2/1 YR 3/2 Drn, D=Depletior	100 70		×	Moist) %	Туре		Platy	loam silt loam	The 4-10 incl			d matri	
0-4         10           4-10         10           4-10         10           4-10         10           Yupe: C= Concentration         10           Histosol (A1)         10           Histic Epipedon (A1)         10	YR 3/2 YR 2/1 YR 3/2 on, D=Depletior	100 70		×				Platy	loam silt loam	The 4-10 incl			d matri	
4-10 10 4-10 10 Type: C= Concentration lydric Soil Indicators Histosol (A1) Histic Epipedon (A	YR 2/1 YR 3/2 on, D=Depletior	70		5YR 3	3/4 10	С	Ν	Platy	silt loam	The 4-10 incl	h layer ha	s mixed	d matri	
4-10 10 Type: C= Concentration Indicators Histosol (A1) Histic Epipedon (A)	YR 3/2 on, D=Depletior			5YR 3	3/4 10	С	N			The 4-10 Incl	n layer na	is mixed	a matri	
Type: C= Concentratio Iydric Soil Indicators Histosol (A1) Histic Epipedon (A	on, D=Depletior	20		SYR	3/4 10	C	N.	/ 200						x
lydric Soil Indicators Histosol (A1) Histic Epipedon (A							i.	301	idy loam					
Histic Epipedon (			RRs, un	nless o	otherwise noted.)		d Grains. <sup>2</sup> Li	li	ndicators f	or Problematic	•	Soils <sup>3</sup> :		
					Sandy Gleyed Matrix	(S4)				Muck (A9) (LR	-			
Black Histic (A3)	42)			_	Sandy Redox (S5)					t Prairie Redox		R F, G	, H)	
. ,	(A. 1)			_	Stripped Matrix (S6)					Surface (S7) (L				
Hydrogen Sulfide					Loamy Mucky Minera			1	-	Plains Depressi		) (LRR	H outs	sid
Stratified Layers (					Loamy Gleyed Matrix	(F2)				of MLRA 72 & 7	,			
Depleted Below D		11)		_	Depleted Matrix (F3)					ced Vertic (F18	,			
Thick Dark Surfac	. ,				Redox Dark Surface	. ,				Parent Material	. ,			
Sandy Mucky Mir					Depleted Dark Surface				-	Shallow Dark S	-	F12)		
2.5 cm Mucky Pe		-			Redox Depressions (					r (Explain in Rer				
] 5 cm Mucky Pea	t or Peat (S3) (I	RR F)			High Plains Depressi LRR H)	ons (F16) (	(MLRA 72 & 1	73 of 3		of hydrophytic ve must be preser iic.				
estrictive Layer (if p	resent):													
ype: An	gular cobble						H	ydric Soil P	resent?	Yes	$\boxtimes$	No		
<b>DROLOGY</b> Vetland Hydrology Ir	dicators													
Primary Indicators (mir		auired.	check ?	all that	t apply)			Se	condary In	dicators (2 or m	ore requi	red)		
Surface Water (		qui ou,	0.100110		Salt Crust (B11)			<u> </u>		Soil Cracks (B6		00)		
High Water Tab	,				Aquatic Invertebrat	es (B13)				y Vegetated Co	,	rface (E	38)	
Saturation (A3)					Hydrogen Sulfide (				-	e Patterns (B10				
Water Marks (B	1)				Dry-Season Water	( )	)		-	d Rhizospheres		Roots	(C3)	
Sediment Depos					Oxidized Rhizosph	. ,	,			tilled)			. ,	
Drift Deposits (E				_	(where not tilled)		5			n Burrows (C8)				
Algal Mat or Cru					Presence of Reduc	ed Iron (C4	4)		-	on Visible on A	erial Imac	erv (C9	))	
Iron Deposits (B					Thin Muck Surface		,			rphic Position (E			,	
Inundation Visib		agery (B	7)		Other (Explain ir	Remarks	s)			eutral Test (D5)				
Water-Stained L	eaves (B9)		,				,			eave Hummock	s (D7) ( <b>L</b> l	RR F)		
ield Observations:	. ,													
Surface Water Present	? Yes		No	$\boxtimes$	Depth (inches)	:								
Vater Table Present?	Yes		No	$\boxtimes$	Depth (inches)	:		Wetland	Hydrolog	y Present?	Yes		No	[
	Yes		No		Depth (inches)			Wenand	. iyarolog	y riesentr	103			
Saturation Present? includes capillary fring	5													
Saturation Present?		ge, moni	itoring v	well, a	erial photos, previou	s inspectio	ns), if availab	le:						

# **APPENDIX C**

# Photographs



# GORE HILL INTERCHANGE WETLAND ADDENDUM-PHOTOGRAPHIC LOG

Photo Number	Photo Description
1	Wetland 1a SP1 wetland, and 1a SP2 upland sample plots
2	Wetland 1b SP1 sample plot, upland in background
3	Wetland 1b slumping on downslope side
4	Wetland 1c (right) and WL1c SP2 upland sample plot(left)







2. Wetland 1b SP1 sample plot, upland in background



3. Wetland 1b slumping on downslope side



4. Wetland 1c (right) and WL1c SP2 upland sample plot(left)



# **APPENDIX D**

# **Functional Assessment**



#### MDT Montana Wetland Assessment Form (revised March Gore Hill Interchange Improvements 2. MDT Project 1. Project STPX 15 Control 5(141)278 3. Evaluation 3/5/2020 4. Evaluator Susan Wall Wetlands 1a, 1b, and 1c 5. Wetlands/Site # T20N,R3E,21 6. Wetland Location(s): i. ii. Approx. Stationing or Mileposts: MP 278 iii. 10030104 Watershed Name, Middle Missouri, Cascade 7. a. Evaluating Montana Department of Transportation 8. Wetland Min: 0.042 acres, Max: 0.268 acres, Avg: 0.155 acres (estimated) b. Purpose of 1. X Wetlands potentially affected by MDT project 0.042 acres, Max: 9. Assessment area Min: 0.268 2. \_\_\_ Mitigation wetlands; pre-construction acres, Avg: 0.155 acres (estimated) 3. \_\_ Mitigation wetlands; post-construction 4. \_\_ Other: 10. Classification of Wetland and Aquatic Habitats in AA Abbreviation HGM Class Class Modifier Water Regime % of AA (see manual for definitions) (Brinson) (Cowardin) (Cowardin) HGM Classes: Riverine (R), Depressional (D), Slope (S), Mineral Soil Flats (MSF), Organic Soil Flats (OSF), Lacustrine Fringe (LF); D ΕM Е SI 75 Cowardin Classes: Rock Bottom (RB), Unconsolidated bottom (UB), S ΕM NA SI 25 Aquatic Bed (AB), Unconsolidated Shore (US), Moss-lichen Wetland (ML), Emergent Wetland (EM), Scrub-Shrub Wetland (SS), Forested Wetland (FO) Modifiers: Excavated (E), Impounded (I), Diked (D), Partly Drained (PD), Farmed (F), Artificial (A) Water Regimes: Permanent / Perennial (PP), Seasonal / Intermittent

### (SI), Temporary / Ephemeral (TE)

11. Estimated relative abundance: ABUNDANT

(of similarly classified sites within the same Major Montana Watershed Basin, see definitions)

12. General condition of i.

(use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (ANVS) list)

	Predominar	t conditions adjacent to (within 50	0 feet of) AA
Conditions within AA	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is >=15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is <= 30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is > 30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is <= 15%.	low disturbance	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is > 30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): Wetlands adjacent to I-15, subject to grading, weed control

ii. Prominent noxious, aquatic nuisance, & other exotic vegetation species: Spotted knapweed, Canada thistle

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: Wetlands are in roadside ditches and on hillslope north of I-15, near the Great Falls International Airport off ramp. Land use surrounding the wetland is commercial and agricultural.

### 13. Structural Diversity: (based on number of "Cowardin" vegetated classes present [do not include unvegetated classes], see #10

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	ls current manage (passive) exister vegetated	nce of additional	Modified Rating
>= 3 (or 2 if 1 is forested) classes	Н	NA	NA	NA
2 (or 1 if forested) classes	М	NA	NA	NA
1 class, but not a monoculture	М	< NO	YES>	L
1 class, monoculture (1 species comprises >= 90% of total	L	NA	NA	NA

Comments: Common cattail is the dominant species with minor amount of Baltic rush

## SECTION PERTAINING to FUNCTIONS & VALUES

14A. Habitat for Federally Listed or Proposed Threatened or Endangered Plants or Animals:

S

S

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

Primary or critical habitat (list Secondary habitat (list species)

Incidental habitat (list species)

No usable habitat

#### ii. Rating (use the conclusions from 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
Functional Points and Rating	1H	.9H	.8H	.7H	.3L	.1L	0L

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

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed

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

Primary or critical habitat (list

Secondary habitat (list species)

Incidental habitat (list species) No usable habitat

### ii. Rating (use the conclusions from 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
S1 Species: Functional Points and Rating	1H	.8H	.7H	.6H	.2L	.1L	0L
S2 and S3 Species: Functional Points and Rating	.9H	.7H	.6H	.5H	.2L	.1L	0L

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

### 14C. General Wildlife Habitat 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
- \_\_ interviews with local biologists with knowledge of the AA

- Minimal (based on any of the following [check]):
- \_\_\_ few or no wildlife observations during peak use periods
- X 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.

\_\_\_\_ adequate adjacent upland food sources

\_\_ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, circle appropriate AA attributes in matrix to arrive at rating. Structural 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 interms of their percent composition 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 (see				Hi	gh							Mod	erate					Lo	w	
Class cover distribution (all vegetated classes)		E١	/en			Une	even			Εv	ren			Une	even			Εv	ren	
Duration of surface water in >=10% of AA	P/P	S/I	T/E	А	P/P	S/I	T/E	А	P/P	S/I	T/E	А	P/P	S/I	T/E	А	P/P	S/I	T/E	А
Low disturbance at AA (see #12i)	E	Е	E	н	Е	Е	н	Н	Е	н	Н	М	Е	Н	М	М	Е	н	М	М
Moderate disturbance at AA (see #12i)	н	Н	н	Н	Н	Н	Н	М	Н	Н	М	М	Н	М	М	L	Н	М	L	L
High disturbance at AA (see #12i)	м	М	М	L	М	М	L	L	М	М	L	L	М	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

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

Comments Observed some deer and small mammal tracks during November site visit

14D. General Fish Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not used by fish, fish use is not restorable due to constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then mark <u>X</u> NA and proceed to 14E.)

Type of Cold Water (CW) X Warm Water (WW) Use the CW or WW guidelines in the user manual to complete the

<ol> <li>Habitat Quality and Known / Susp</li> </ol>	Dected Fish Species in AA (	use matrix to arrive at Icircle	I the functional points and rating)

Duration of surface water in AA	Permanent / Perennial				Seasonal / Intermittent						Temporary / Ephemeral							
Aquatic hiding / resting / escape cover	Opt	imal	Adeo	quate	Po	oor	Opt	imal	Adeo	quate	Po	or	Opt	imal	Adeo	quate	Po	oor
Thermal cover optimal / suboptimal	0	S	0	S	0	S	0	S	0	S	0	S	0	S	0	S	0	s
FWP Tier I fish species	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.2L
FWP Tier II or Native Game fish	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in

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

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity or is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support, or do aquatic nuisance plant or animal species (see Appendix E) occur in fish habitat? \_\_\_\_ If yes, reduce score in i above by 0.1.

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.comments) for native fish or introduced game fish? \_\_\_\_\_ If yes, add 0.1 to the adjusted score in i or iia.

iii. Final Score and NA Comments:

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded in-channel or overbank flow, mark <u>X</u> NA and proceed to 14F.)

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

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)		/ entrench	,		itely entrei stream typ		Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or	75%	25-	<25%	75%	25-	<25%	75%	25-	<25%
AA contains no outlet or restricted outlet		.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains unrestricted outlet	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Entrenchment ratio (ER) estimation – see User's Manual for additional guidance. Entrenchment ratio = (flood-prone width)/(bankfull width) Flood-prone width = estimated horizontal projection of where 2 x maximum bankfull depth elevation intersects the floodplain on each side of the stream.

/	=		×
Flood-prone width	Bankfull width	Entrenchment ratio (ER)	2 x Bankfull Depth Flood-prone Width Bankfull Width
			Bankfull Depth

	Slightly Entrenched ER = >2.2		Moderately Entrenched		Entrenched ER = 1.0 - 1.4				
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type			

ii. Are 10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods mile downstream of the AA (circle)? \_\_\_\_ Comments:

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, mark \_\_\_\_ NA and proceed to 14G.)

i. Rating (Working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating. Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; and T/E = temporary/ephemeral [see instructions for further definitions of these terms].)

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic	>!	5 acre fe	et	1.1 t	o 5 acre	feet	<=1 acre foot		oot
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond >= 5 out of 10 years	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond < 5 out of 10 years	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments Wetlands A and C hold stormwater runnoff and seepage from adjacent slope

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with potential to receive sediments, nutrients, or toxicants influx of surface or ground water or direct input. If no wetlands in the AA are subject to such input, mark \_\_\_\_ NA and proceed to 14H.)

(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	AA rece	Waterbody on MDEQ list of waterbodies in need of							
input levels within AA	potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of				TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such				
	nutrients or toxicants, or signs of eutrophication present.				sedimenta	ation, sources o	bstantially impa f nutrients or to nication present.	kicants, or	
% cover of wetland vegetation in	>= 7	70%	< 7	0%	>=	70%	< 70%		
Evidence of flooding / ponding in	Yes	No	Yes	No	Yes	No	Yes	No	
AA contains no or restricted	1H	1H .8H .7M .5M		.5M	.5M	.4M	.3L	.2L	
AA contains unrestricted outlet	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L	

Comments Wetland C has a culvert that restricts outflow. Wetlands A and B do not have evidence of an outlet.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, mark <u>X</u> NA and proceed to 14I.)

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

% Cover of wetland streambank	Duration of surface water adjacent to rooted vegetation							
or shoreline by species with stability ratings of >=6 (see	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral					
>= 65%	1H	.9H	.7M					
35-64%	.7M	.6M	.5M					
35%	.3L	.2L	.1L					

Comments

#### 14I. Production Export/Food Chain Support:

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

General Fish Habitat	General	General Wildlife Habitat Rating (14C.iii.)						
Rating (14D.iii.)	E/H	М	L					
E/H	Н	Н	М					
М	Н	М	М					
L	М	М	L					
N/A	Н	М	L					

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 (14I.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 previously defined, and A = "absent" [see instructions for further definitions of these terms].)

A		Vegetat	ed comp	onent >	5 acres			Vegetat	ed comp	onent 1	-5 acres	6	Vegetated component < 1				< 1 acre	
В	Hi	gh	Mode	erate	Lo	w	Hi	gh	Mode	erate	Lo	w	Hi	gh	Mod	erate	Lo	w
С	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/A	.8H	.5M	.6M	.3L	.4M	.2L	.7M	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

iii. Modified Rating (NOTE: Modified score cannot exceed 1 or be less than 0.1.) Vegetated Upland Buffer (VUB): Area with >= 30% plant cover, = 15% noxious weed or ANVS cover, and that is not subjected to periodic mechanical mowing or clearing (unless for

a) Is there an average >= 50 foot-wide vegetated upland buffer around >= 75% of the AA circumference? \_\_\_\_ If yes, add 0.1 to the score in ii above.

iv. Final Score and

0.30L

Comments: No evidence of connection to a downstream waterbody. Water in Wetlands A and B appears to infiltrate. Culvert under I-15 conveys flow from Wetland A to a concrete lined ditch. Based on aerial photo interpretation it appears that flow from the wetlands eventually disperses and infiltrates in fields south of I-15. There does not appear to be a connection to any other streams or waterbodies.

## 14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & ii below)

	i. Discharge Indicators	ii. Recharge Indicators
Х	The AA is a slope wetland	Permeable substrate present without underlying impeding layer
	Springs or seeps are known or observed	Wetland contains inlet but no outlet
Х	Vegetation growing during dormant season/drought	Stream is a known 'losing' stream; discharge volume decreases
	Wetland occurs at the toe of a natural slope	Other:
Х	Seeps are present at the wetland edge	
	AA permanently flooded during drought periods	

Wetland contains an outlet, but no inlet

Shallow water table and the site is saturated to the surface

Other:

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

	Duration of saturation at AA Wetlands <u>FROM</u> <u>GROUNDWATER DISCHARGE OR WITH WATER THAT IS</u> <u>RECHARGING THE GROUNDWATER SYSTEM</u>								
Criteria	P/P	S/I	Т	None					
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L					
Insufficient Data/Information	N/A								

Comments Estimated duration of saturation is based on general climate pattern for Great Falls.

14K.

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

Replacement potential	springs of forest	tains fen, boy or mature (>8 ed wetland o on listed as " MTNHP	30 yr-old) r plant	cited ran divers contains	not contain p e types and s sity (#13) is h plant associa S2" by the MT	structural igh or tion listed	AA does not contain pr cited rare types or asso and structural diversity low-moderate rare common		sociations y (#13) is
Estimated relative abundance	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7M	.6M	.6M	.4M	.3L	.3L	.2L	.1L

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

\_\_\_ Other :

i. Is the AA a known or potential rec./ed. site: (circle) (if 'Yes' continue with the evaluation; if 'No' then mark X NA and proceed to the overall summary and rating page)

ii. Check categories that apply to the

\_ Educational/scientific \_\_\_\_ Consumptive \_\_\_\_ Non-consumptive

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	.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	.1M	.05L

Comments

General Site Notes

The wetlands are highly disturbed, have little vegetation diversity, provide little value for wildlife and are not in a desirable location for wildlife.

### FUNCTION & VALUE SUMMARY & OVERALL RATING FOR

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0.00	1		
B. MT Natural Heritage Program Species	L	0.00	1		
C. General Wildlife Habitat	L	0.20	1		*
D. General Fish Habitat	NA				
E. Flood Attenuation	NA				
F. Short and Long Term Surface Water	L	0.30	1		*
G. Sediment/Nutrient/Toxicant Removal	н	1.00	1		*
H. Sediment/Shoreline Stabilization	NA				
I. Production Export/Food Chain Support	L	0.30	1		
J. Groundwater Discharge/Recharge	М	0.70	1		*
K. Uniqueness	L	0.10	1		
L. Recreation/Education Potential (bonus points)	NA				
Totals:		2.60	8.00		
Percent of Possible Score			33%		

Category I Wetland: (must satisfy one of the following criteria; otherwise go to Category II)

\_\_\_\_\_ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; or

\_\_\_\_\_ Score of 1 functional point for Uniqueness; or

\_\_\_\_\_ Score of 1 functional point for Flood Attenuation and answer to Question 14E.ii is "yes"; or

\_\_\_\_\_ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied and meets any one of the following criteria; otherwise go to

\_\_\_\_\_ Score of 1 functional point for MT Natural Heritage Program Species Habitat; or

\_\_\_\_\_ Score of .9 or 1 functional point for General Wildlife Habitat; or

\_\_\_\_\_ Score of .9 or 1 functional point for General Fish Habitat; or

"High" to "Exceptional" ratings for both General Wildlife Habitat and General Fish/Aquatic Habitat; or

\_\_\_\_\_ Score of .9 functional point for Uniqueness; or

Percent of possible score > 65% (round to nearest whole #).

Category III Wetland: (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; otherwise go to Category III)

\_\_X "Low" rating for Uniqueness; and

X Vegetated wetland component 1 acre (do not include upland vegetated buffer); and

IV

 $\underline{\quad X}$  Percent of possible score 35% (round to nearest whole #).

OVERALL ANALYSIS AREA