MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2009

Meriwether-East
Glacier County, Montana

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Avenue
Helena, MT 59620-1001

Prepared by:

POST, BUCKLEY, SCHUH, AND JERNIGAN
801 North Last Chance Gulch, Suite 101
Helena, MT 59601-3360

October 2009

PBS&J Project No: 0B4308802.04.04

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Meriwether-East
Glacier County, Montana

MDT Project Number NH 1-3(36)234 F

Control Number B594

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Cover: View is northeast at the developing wetland communities at Site 2 of the Meriwether-East Wetland Mitigation Project.

1.0 INTRODUCTION

The Meriwether-East Wetland Mitigation Site was constructed during 2005 to partially mitigate for wetland impacts associated with Montana Department of Transportation (MDT) project NH 1-3(36)234F (Meriwether-East) (**Figure 1**). The Meriwether-East wetland mitigation project was constructed along Highway 2 in Glacier County. It consists of two areas: Site 1 was built near milepost 236 and was designed to encompass approximately 2.67 acres (ac) and Site 2 was built near milepost 239 and was designed to encompass approximately 6.62 ac. Combined, the on-site mitigation project was designed to create 9.29 ac of new wetland in areas that had no prior wetlands.

Wetland hydrology was designed to be supplied from the neighboring wetlands, interception of the water table, and ponding of direct precipitation. It is anticipated that, over time, vegetation would be comprised of emergent wetland species.

2.0 METHODS

2.1 Monitoring Dates and Activities

Site 1 and Site 2 were visited on July 20, 2009 to document vegetation, soil, and hydrologic conditions that are used to delineate wetlands. For the fourth consecutive year, Site 1 showed no indication of wetland development. As per MDT's instruction, since Site 1 did not show any indication of wetland development during the annual summer reconnaissance, then the site was not monitored any further and a report on Site 1 was not produced (MDT 2007).

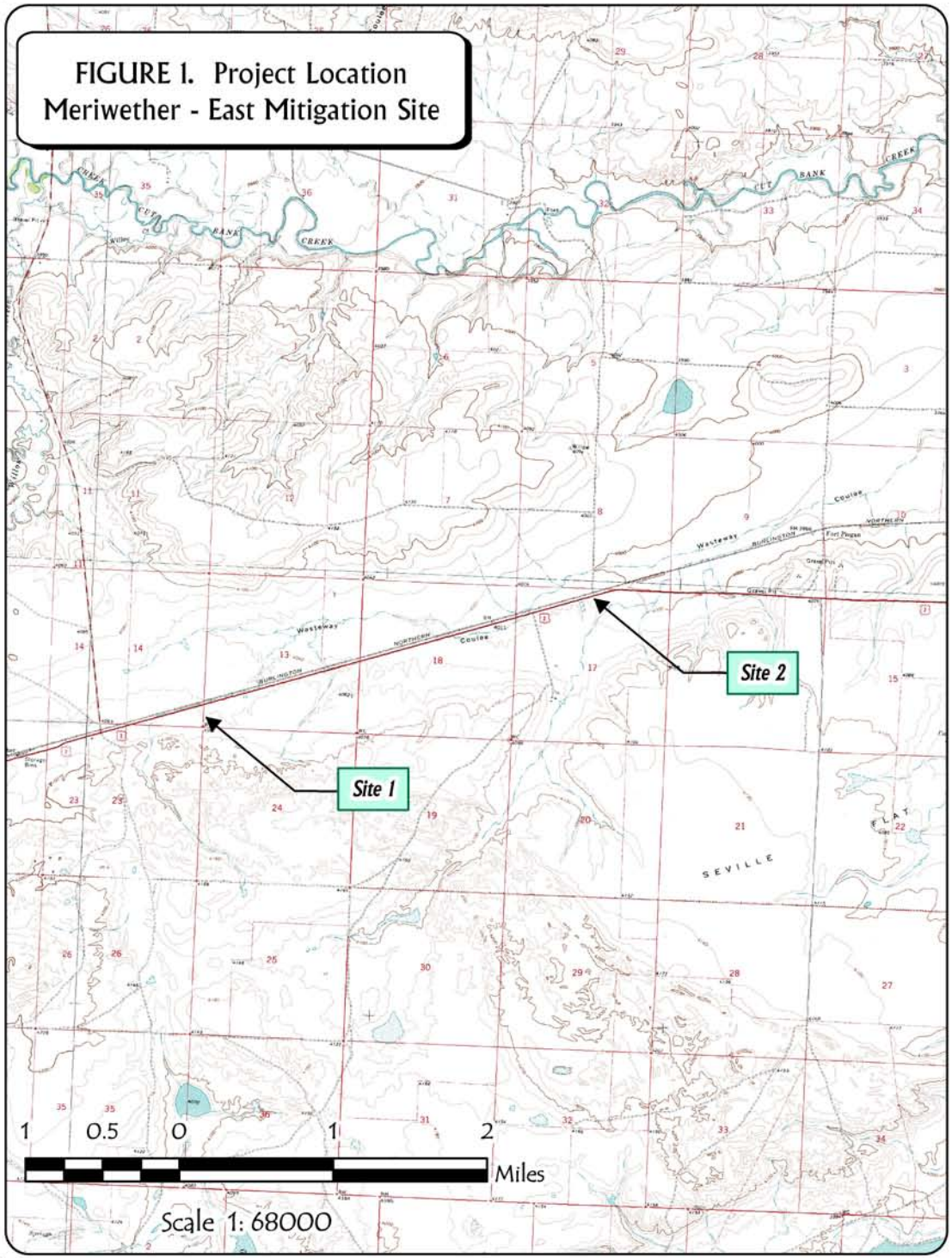
In contrast to Site 1, Site 2 did show wetland development. All information contained on the Wetland Mitigation Site Monitoring Form was collected at Site 2 on July 20th (**Appendix B**). Activities conducted and information collected at this site included: wetland delineation; vegetation community mapping; vegetation transect monitoring; soils data collection; hydrology data collection; bird and wildlife use documentation; and photo point documentation.

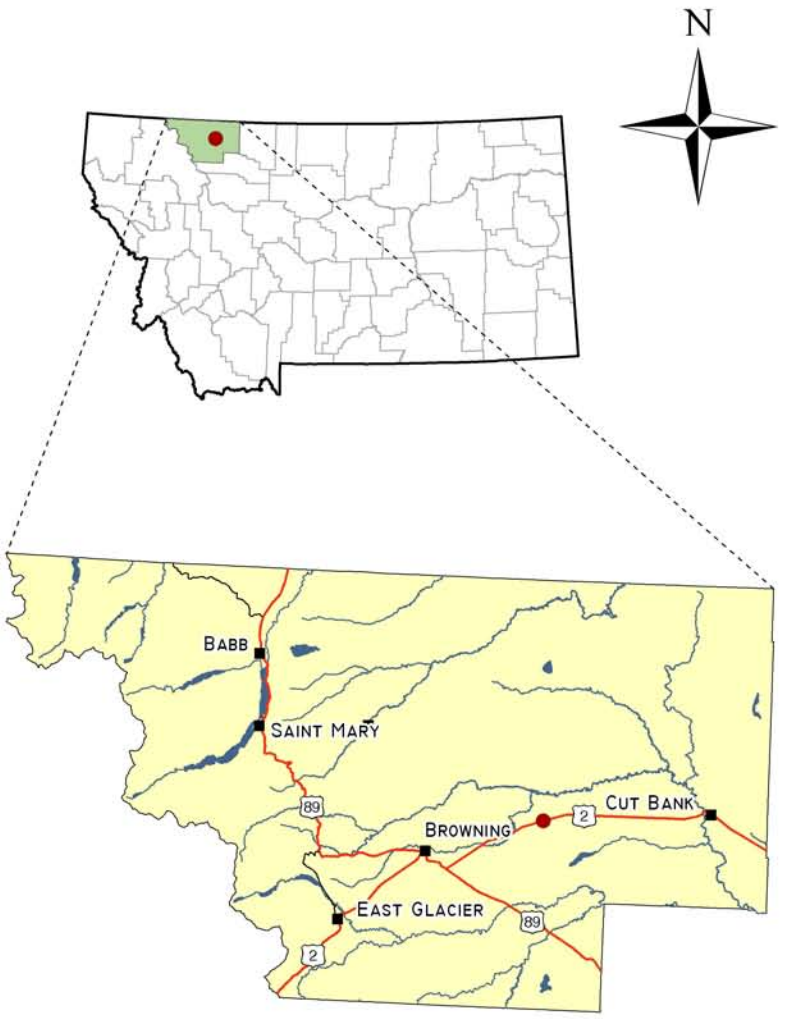
2.2 Hydrology

Wetland hydrology at Site 2 was designed to be provided by groundwater, seepage from the adjacent wetland, and direct precipitation. Impoundment areas are indicated on the proposed project plan sheets.

Hydrologic indicators were evaluated during the mid-season visit in 2009. Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded onto COE Routine Wetland Delineation Data Forms (**Appendix B**).

FIGURE 1. Project Location
Meriwether - East Mitigation Site





PROJECT #: B43054.00 0309
DATE: November 2006
LOCATION: Meriwether East
PROJECT MANAGER: A. Pipp
DRAWN BY: MSA

PBS&J
801 N. Last Chance Gulch, Ste. 101 Helena, MT 59601

No groundwater monitoring wells are present at the site. Groundwater depths were only documented if groundwater was located within 12 inches of the ground surface. Groundwater depths within soils pits were recorded onto COE Routine Wetland Delineation data forms (**Appendix B**).

2.3 Vegetation

General dominant species-based vegetation community types were delineated onto the 2009 aerial photograph. Standardized community mapping was not employed as many of these techniques are geared towards climax vegetation. Estimated percent cover of the dominant species in each community type was recorded on the Wetland Mitigation Site Monitoring Form (**Appendix B**). Plants observed were identified using *Flora of the Pacific Northwest* (Hitchcock and Conquist 1975), *Plants of Montana* (Dorn 1984), *Field Guide to Intermountain Sedges* (Hurd et. al. 1998), and *Field Guild to Intermountain Rushes* (Hurd et. al. 1997). Nomenclature primarily follows that of Dorn (1984).

A single 10-foot wide belt transect was sampled during the mid-season monitoring event to represent the range of current vegetation conditions. Percent cover was estimated for each vegetative species encountered within the "belt" within each community type using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%).

The transect location is depicted on **Figure 2** in **Appendix A**. All data were recorded onto the Wetland Mitigation Site Monitoring Form (**Appendix B**). Transect photographs were taken from both ends during the mid-season visit. No monitoring of planted species was conducted as no woody species were planted at the site.

2.4 Soils

Soils were evaluated during the mid-season visit according to procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Forms (**Appendix B**). The web soil survey was consulted to determine the pre-construction soil types (NRCS 2006).

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit in accordance with the 1987 COE Wetland Delineation Manual. In July 2008, consultation with the COE (Steinle pers. comm.) confirmed that, where the 1987 manual was used to establish baseline wetland conditions at MDT wetland mitigation sites, it should continue to be applied at such sites for the duration of the monitoring period. Consequently, application of the new *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (COE 2008) was not required or undertaken at this site in 2009.

All habitats within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation, and hydric soils. The indicator status of vegetation was derived from the *National List of Plant Species that Occur in Wetlands: Northwest Region 9* (Reed 1988). The

information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). Wetland delineation data collected during 2009 were compared to the pre-construction acreage of wetland in order to estimate that acreage of wetland created at each mitigation site.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during the site visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. Observations were recorded during all visits as the observer traversed the site while conducting other required activities. Direct sampling methods such as snap traps, live traps, and pitfall traps, were not implemented. A list of wildlife species observed was created.

2.7 Birds

Bird observations were recorded onto the Bird Survey Field Data Sheet during the site visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. During the site visit, bird observations were recorded incidental to other monitoring activities. Observations were categorized by species, activity code, and general habitat association (**Appendix B**). A comprehensive bird list was compiled using these observations. No birdhouses are currently located on the site.

2.8 Macroinvertebrates

No aquatic macroinvertebrate sample was collected from Sites 1 and 2.

2.9 Functional Assessment

A functional assessment was completed in 2006 and 2007 using the 1999 MDT Montana Wetland Assessment Method (Berglund 1999). In 2008 and 2009 the 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was applied. Field data necessary for this assessment were collected during the mid-season site visit with the remainder of the functional assessment completed in the office. A Functional Assessment Form was completed for each wetland or groups of wetlands at Site 2 (**Appendix B)**.

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transect. One photograph point was established (**Figure 2** in **Appendix A**). A panoramic photo was taken at this established point. A 2009 post-construction aerial photograph of Site 2 was taken by MDT and used to map features and community boundaries. All photographs pertaining to the project are provided in **Appendix C**.

2.11 GPS Data

During the 2009 site visit, a global positioning system (GPS) along with hand-mapping was used to mark each photograph point, transect start and end, community boundaries, soil pits, and other features.

2.12 Maintenance Needs

The boundaries of Site 2 were inspected for obvious signs of problems. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented.

3.0 RESULTS

3.1 Hydrology

Hydrology at the Meriwether-East Mitigation Site was designed to be supplied by groundwater seepage from the adjacent wetland, surface runoff from snow melt, and direct precipitation. About 15% of Site 2's surface was inundated during the site evaluation. The large, green algal mat of *Rhizoclomium* observed in 2007 occurred as very small patches in 2008 and 2009. Soils throughout were saturated in the upper 12 inches of the profile during the monitoring visit.

It was assumed that precipitation levels measured at the Cut Bank FAA Airport would serve as an indicator of precipitation received at the mitigation site. The total precipitation received at this station from January through July of 2009 was 4.01 in (WRCC 2009). This represented 51% of the mean precipitation (7.84 inches [in]) recorded between January and July from 1903 to July 2009. This period during 2009 was significantly drier than the same period in 2008 (9.84), 2005 (9.21 in), and 2004 (4.57 in), and wetter than the same period in 2007 (1.17 in), 2006 (2.70 in), and 2003 (2.63 in) (WRCC 2009).

3.2 Vegetation

Vegetation community types are based on topography, hydrology, and plant composition. Vegetation community data and a list of plant species observed were recorded for Site 2 (**Monitoring Forms** in **Appendix B**). A comprehensive plant list has been compiled for Site 2 since 2006 (**Table 1**).

At Site 2, four vegetation community types were documented in 2009: Type 3 – *Grassland Upland*, Type 5/6 – *Grassland Wetland*, Type 7 – *Wetland*, and Type 8 - Typha/Eleocharis *Wetland* (**Figure 3** in **Appendix A**). Type 3 is an upland grassland that borders Site 2 to the west and southwest and also occupies the upland buffer along the west and southwest sides. Type 5/6 is wetland which has been dominated since 2008 by foxtail barley (*Hordeum jubatum*) and Nuttall's alkali grass (*Puccinellia nuttalliana*). The dominant plants [Pursh seepweed (*Suaeda calceoliformis*) and oakleaf goosefoot (*Chenopodium glaucum*)] of Type 5/6 in 2006-2007 were not observed in 2009. Along the north boundary, fowl bluegrass (*Poa palustris*)

Table 1: ***Vegetation species observed from 2006 through 2009 at the Meriwether-East Wetland Mitigation Site 2.***

Scientific Name	Region 9 (Northwest) Wetland Indicator	Scientific Name	Region 9 (Northwest) Wetland Indicator
Achillea millifolium	FACU	*Kochia scoparia*	FAC
Agropyon smithii	FACU	*Lactuca serriola*	FAC-
Agropyon trachycaulum	FAC	*Liatris punctata*	---
Agrostis alba	FACW	***Melilotus alba***	**FACU**
Alisma gramineum	**OBL**	*Melilotus officinalis*	FACU
Alopecurus pratensis	FACW	*Poa juncifolia*	FACU+
Artemisia frigida	---	*Poa palustris*	FAC
***Aster* (*campestris*)**	---	*Polygonum* spp.	---
Aster pansus	FAC+	*Polypogon monspeliensis*	FACW+
Beckmannia syzigachne	OBL	*Populus tremuloides*	FAC+
Bouteloua gracilis	---	*Potentilla anserina*	OBL
Carex spp.	---	*Puccinellia nuttalliana*	OBL
Chenopodium album	---	*Ranunculus cymbalaria*	OBL
Chenopodium capitatum	---	*Ranunculus sceleratus*	OBL
Chenopodium glaucum	FAC	*Ratibida columnifera*	---
Chenopodium hybridum	---	*Rhizoclonium* spp. (a green algae)	---
Chenopodium leptophyllum	FACU	*Rosa* spp.	---
Cirsium arvense [1]	FACU+	*Salicornia rubra*	OBL
Crepis runcinata	FACU	*Salix exigua*	OBL
Distichlis spicata	FAC+	*Salix* lutea	---
Eleocharis palustris	OBL	*Salsola iberica*	---
Gaillardia aristata	---	*Scirpus acutus*	OBL
Glycyrrhiza lepidota	FAC+	*Scirpus maritimus*	OBL
Grindelia squarrosa	FACU	*Scirpus pungens* (syn. *S. americana*)	OBL
Heterotheca villosa (syn. *Chrysopsis villosa*)	---	*Spergularia marina*	OBL
Hordeum brachyantherum	FACW	*Suaeda calceoliformis* (syn. *S. depressa*)	FACW-
Hordeum jubatum	FAC+	*Triglochin maritimum*	OBL
Juncus balticus	OBL	*Typha latifolia*	OBL

Bolded species were observed for the first time in 2009.
[1] Montana State Noxious Plant.

intermixes with foxtail barley and Nuttall's alkali grass. The more-persistent emergent type plants observed in the past created a tight community in 2009 and were delineated separately as Type 8. The Type 8 community was inundated by a few inches of water and was occupied by a rich assemblage of bulrushes (*Scirpus maritimus*, *S. acutus*, and *S. pungens*), rush (*Juncus balticus*), creeping spikerush (*Eleocharis palustris*), and cattail (*Typha latifolia*). Type 7 is an undisturbed wetland that was delineated (as #11) in October of 2002 by URS-BRW, Inc. (2003); it borders Site 2 to the east (**Figure 3** in **Appendix A**). Dominant plants found in Type 7 during July 2009 included Baltic rush, alkali bluegrass (*Poa juncifolia*), and Nuttall's alkali grass.

For Site 2, 2009 transect data (**Monitoring Forms** in **Appendix B**) were summarized in tabular format (**Table 2**) and graphically illustrated (**Charts 1** and **2**). Photographs were taken at the start and end of Transect 1 at Site 2 (**Photos 2** and **3** in **Appendix C**). Transect 1 traversed

through an upland community, a large wetland community, and the existing adjacent wetland community (**Chart 1**). The amount of wetland along the transect remained the same from 2008 (**Chart 2**). The *Rhizoclonium* mat that suppressed plant growth in 2007 was present in low abundances. Vegetatively, the wetland is filling in with a diversity of species (**Photos 1-10** in **Appendix C**).

One noxious weed, Canada thistle (*Cirsium arvense*), was found at Site 2. Two polygons of Canada thistle were mapped in 2008 and appeared similar in size in 2009 (**Figure 3** in **Appendix A**).

Table 2: ***Data summary for Transect 1 at the Meriwether-East Wetland Mitigation Site 2.***

Monitoring Year	2006	2007	2008	2009
Transect Length (feet)	500	500	500	500
# Vegetation Community Transitions along Transect	7	2	2	2
# Vegetation Communities along Transect	5	3	3	3
# Hydrophytic Vegetation Communities along Transect	2	2	2	2
Total Vegetative Species	18	18	19	19
Total Hydrophytic Species	12	13	13	12
Total Upland Species	6	5	6	7
Estimated % Total Vegetative Cover	30	50	75	85
% Transect Length Comprised of Hydrophytic Vegetation Communities	48	48	97	97
% Transect Length Comprised of Upland Vegetation Communities	0	3	3	3
% Transect Length Comprised of Unvegetated Open Water / Mudflat	49	49	0	0
% Transect Length Comprised of Bare Substrate	3	0	0	0

Chart 1: ***Transect map showing vegetation types of Transect 1 from start (0 feet) to end (500 feet) for Site 2 from 2006 to 2009.***

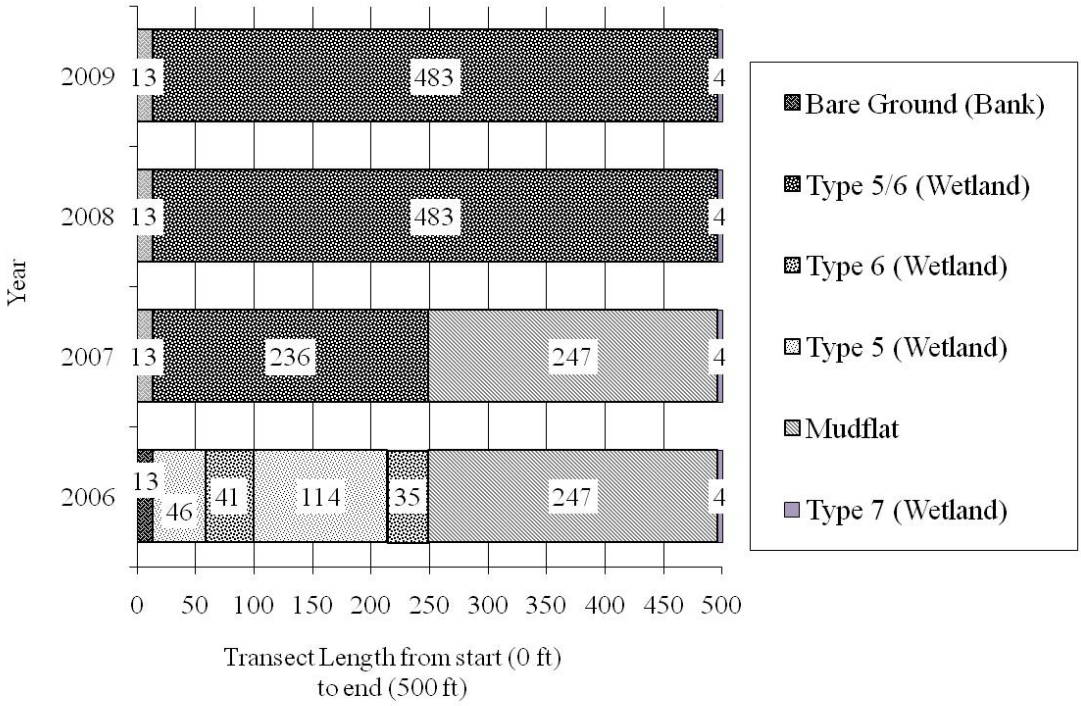
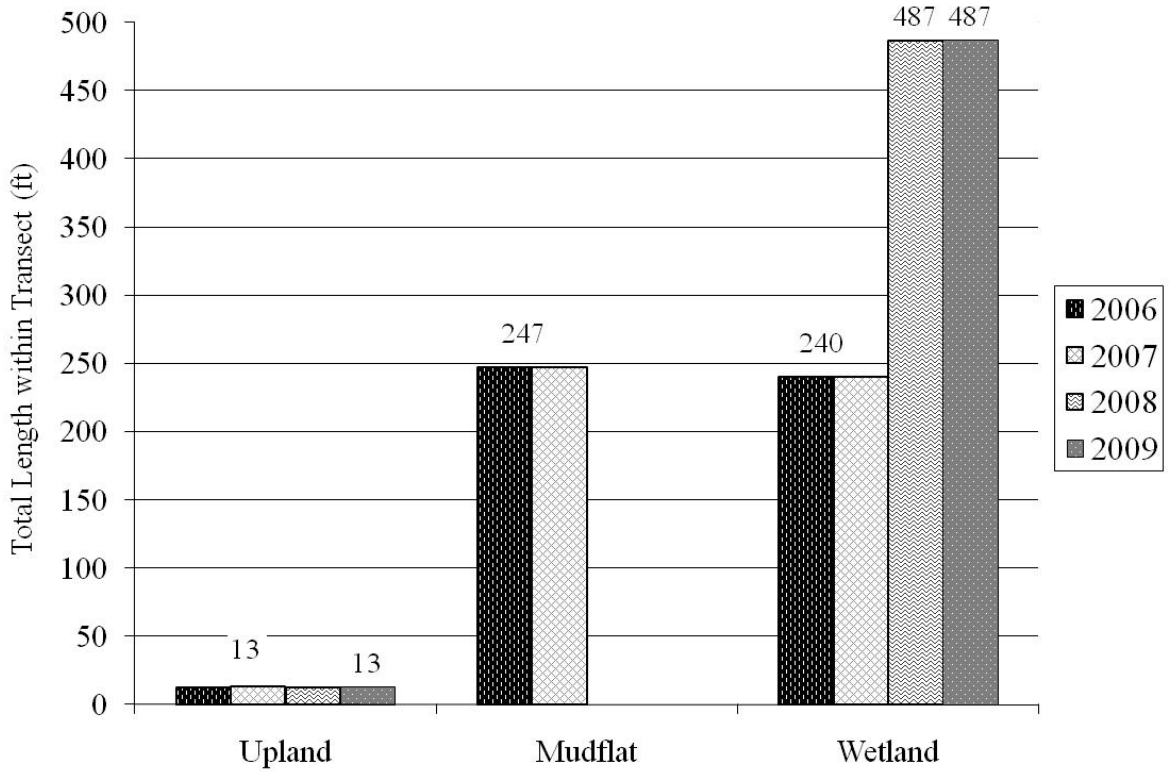


Chart 2: ***Total length of each vegetation community within Transect 1 at Site 2 from 2006 to 2009.***



3.3 Soils

At Site 2 wetland matrix colors were fairly consistent, ranging from 2.5Y 6/6 to 2.5Y 3/1 (**COE Forms** in **Appendix B**). Pockets of 10YR 4/3 to 10YR 2/1 were found in various portions of the soil profiles. Mottling was rarely observed in 2009 (**COE Forms** in **Appendix B**). Soil textures ranged from clay to silty-clay-loam with abundant cobbles and gravels.

3.4 Wetland Delineation

Wetland development throughout Site 2 was achieved this year (**Figure 3** in **Appendix A**). Wetland plant growth was not suppressed by the *Rhizoclonium* mat; rather, plants were germinating or establishing where soils were inundated or saturated. Wetland habitat covered 6.62 acres, which accounts for the entire site. However, a strip along the northern boundary (along the highway) and a mound in the center of the site was colonized by a variety of plants that indicated more marginal wetland conditions.

3.5 Wildlife

A comprehensive list of wildlife species (from site observations or their sign) was compiled for Site 2 (**Table 3**). Specific information on wildlife sightings at Site 2 can be found in the **Monitoring Forms** in **Appendix B**. In 2009 two migratory bird species that associate with water and/or wetlands were observed at the site (**Monitoring Forms** in **Appendix B**).

Table 3: ***Fish and wildlife species observed at the Meriwether-East Wetland Mitigation Site 2 from 2006 to 2009.***

FISH None	
AMPHIBIAN None	
REPTILE None	
BIRD American Avocet (*Recurvirostra americana*) Dark-eyed Junco (*Junco hyemalis*) Horned Lark (*Eremophila alpestris*) Killdeer (*Charadrius vociferous*) **Red-winged Blackbird (*Agelaius phoeniceus*)**	 **Sandpiper (unidentified species)** **Sparrow (unidentified species)** Willet (*Catoptrophorus semipalmatus*) Wilson's Phalarope (*Phalaropus tricolor*)
MAMMAL Deer (*Odocoileus* spp.) or Pronghorn (*Antilocapra americana*)	

Bolded species were observed in 2009.

3.6 Macroinvertebrates

No aquatic macroinvertebrate sample was collected at Site 2.

3.7 Functional Assessment

The revised 2008 Montana Wetland Assessment Method (MWAM) for MDT projects was used to assess the values and functions of the wetland at Site 2 (**Functional Assessment Form** in **Appendix B**). In 2007 and 2006 the 1999 version of the Montana Wetland Assessment Form was used to assess the values and functions of the wetland area at Site 2. The 1999 and 2008 MWAMs differ; however, general comparison between the 2006/2007 and 2009 years can still be made at Site 2.

Site 2 continued to rate as a Category III wetland (**Table 4**). Notable functions and values included General Wildlife Habitat, Flood Attenuation, Short and Long Term Water Storage, Sediment / Nutrient / Toxicant Removal, Production / Export Food Chain Support, and Groundwater Discharge/Recharge (**Table 4**). The functional assessment score increased by over three points from that in 2007 (and was the same score as that achieved in 2008). This is a result of changes in the MWAM and better conditions for developing wetland habitat. In 2006 the

project acreage was provided by MDT (based on design). In 2007, a combination of hand-mapping and resource grade GPS mapping was used; the resource grade GPS points were overlaid onto an unrectified 2007 aerial photograph (**Appendix D**). This was believed to have created an overestimate in acreage. For 2008 and 2009, the MDT Survey grade data were again used.

Table 4: ***Summary of 2006 to 2009 wetland function/value ratings and functional points at Site 2 of the Meriwether-East Wetland Mitigation Project.***

Function and Value Parameters from the MDT Montana Wetland Assessment Method	2006[1] Site 2	2007[1] Site 2	2008[2] Site 2	2009[2] Site 2
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
General Wildlife Habitat	Mod (0.5)	Low (0.2)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA	NA	NA
Flood Attenuation	Mod (0.5)	Mod (0.5)	High (0.9)	High (0.9)
Short and Long Term Surface Water Storage	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment / Nutrient / Toxicant Removal	Mod (0.7)	Mod (0.7)	High (1.0)	High (1.0)
Sediment / Shoreline Stabilization	NA	NA	NA	NA
Production Export / Food Chain Support	Mod (0.6)	Mod (0.6)	High (0.8)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.4)
Recreation/Education Potential	Low (0.1)	Low (0.1)	NA	NA
Actual Points/Possible Points	4.6 / 10	4.3 / 10	5.3 / 9.0	5.4 / 9.0
% of Possible Score Achieved	46%	43%	59%	60%
Overall Category	III	III	III	III
Total Acreage of Assessed Wetlands and Other Aquatic Habitats within Site Boundaries (ac)	**6.62**	**6.64**	**6.62**	**6.62**
Functional Units (acreage x actual points)	**30.45**	**28.5**	**35.1**	**35.7**

[1] Conducted using the 1999 version of the MDT Montana Wetland Assessment Method.
[2] Conducted using the 2008 version of the MDT Montana Wetland Assessment Method.

3.8 Photographs

A 2009 aerial photograph was used to create **Figures 2** and **3** in **Appendix A**. A panoramic photo was taken at Photo Point 1 (**Photo 1** in **Appendix C**). Representative single frame photographs were taken of the transect and conditions within Site 2 (**Photos 1-10** in **Appendix C**).

3.9 Maintenance Needs/Recommendations

The dikes were surveyed for erosion problems in 2009. The dikes were covered evenly with erosion control fabric and no erosion problems were found. Plants have incrementally been colonizing the erosion control fabric.

The two small sub-populations of Canada thistle should be sprayed with the appropriate herbicide before they flower in 2010.

3.10 Current Credit Summary

No wetlands were present prior to construction of the Meriwether-East Mitigation Site 2. The goal is to create 6.62 acres of wetland habitat at Site 2. No specific performance criteria were required to be met at this site in order to document its success. The goal at Site 2 has been achieved as 6.62 acres of wetland were present in 2009. Proper hydrology and a seed source from adjacent natural wetlands has been the key to driving the development and maintenance of this wetland habitat. The quality of these aquatic habitats equated to a gain of 35.7 functional units (**Table 4**).

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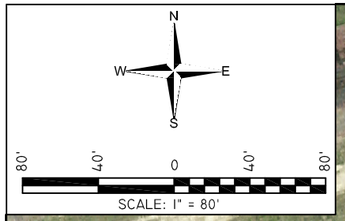
Appendix A

SITE 2 FIGURES 2 & 3

MDT Wetland Mitigation Monitoring
Meriwether-East
Glacier County, Montana

Figure 2 - 2009 Monitoring Activity Locations



Highway 2

Monitoring Limits

Soil Pit 1

T1 End

Soil Pit 4

Soil Pit 3

T1 Start

Soil Pit 2

PP

Soil Pit 5

Legend

- Monitoring Area Limits
- Vegetation Transect
- Photo Point Location
- Soil Pit Location

Base photograph July 2, 2009

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. PBS&J MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

MERIWETHER-EAST WETLAND MITIGATION SITE 2

2009 MONITORING ACTIVITY LOCATIONS

DRAWN: JR
PROJ MGR: J. BERGLUND
CHECKED: AP
APPVD: JB
PLOTTED: Oct/05/2009

PROJ NO: 0B4308802 04.04
LOCATION: CUT BANK, MT
SCALE: NOTED
FILE NAME: BASE 2009.dwg

PBSJ
801 N. Last Chance Gulch
Suite 101
Helena, MT 59601

FIGURE
2

REV -

DATE 10/06/2008

Figure 3 - 2009 Mapped Site Features

N
W E
S

80' 40' 0 40' 80'
SCALE: 1" = 80'

Highway 2

Monitoring Limits

7

5/6

3

8

H

H

Wetland Area
Project Area 6.62 acres
Wetland Area 6.62 acres

Legend
Monitoring Area Limits
Vegetation Communities
Wetland Area
Noxious Weeds
Cirsium arvense
Infestation Size
✖ = < 0.1 acre
Cover Class
H = High (25-100% cover)

Base photograph July 2, 2009

Vegetation Types
(3) Grassland Upland
(5/6) Herbaceous Emergent Wetland
(7) Pre-existing Wetland #11
(8) Persistent Emergent Wetland

MERIWETHER-EAST WETLAND MITIGATION SITE 2

2009 MAPPED SITE FEATURES

PROJ NO: 0B4308802 04.04	DRAWN: JR		
LOCATION: CUT BANK, MT	PROJ MGR: J. BERGLUND		
SCALE: NOTED	CHECKED: AP	APPVD: JB	
FILE NAME: BASE 2009.dwg	PLOTTED: Oct/02/2009		

801 N. Last Chance Gulch
Suite 101
Helena, MT 59601

PBSJ

FIGURE
3

REV -

DATE 10/06/2008

Appendix B

2009 Site 2 Wetland Mitigation Site Monitoring Form
2009 Site 2 Bird Survey Form
2009 Site 2 COE Wetland Delineation Forms
2009 Site 2 MDT Functional Assessment Form

MDT Wetland Mitigation Monitoring
Meriwether-East
Glacier County, Montana

PBS&J / MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Meriwether-East, Site 2** Project Number: **0B4308802.04.04**
Assessment Date: **July 20, 2009** Person(s) conducting the assessment: **Andrea Pipp**
Location: **Highway 2, west of Cut Bank** MDT District: **Great Falls** Milepost: _____
Legal Description: T **33N** R **8W** Section **8**
Weather Conditions: **sunny, 0-5mph winds, low 70 degrees** Time of Day: **11:40am - 5:00pm**
Initial Evaluation Date: **August 8, 2006** Monitoring Year: **4** # Visits in Year: **1**
Size of evaluation area: **6.64 acres** Land use surrounding wetland: **highway, railroad, & rangeland**

HYDROLOGY

Surface Water Source: **groundwater & precipitation**
Inundation: **Present** Average Depth: **0.1 feet** Range of Depths: **0-5 inches**
Percent of assessment area under inundation: **3%**
Depth at emergent vegetation-open water boundary: **NA feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **Yes**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Rhizoclonium, a species of green algae, present, but not dominating.

Groundwater Monitoring Wells: **Absent**
Record depth of water below ground surface (in feet):

Well Number	Depth	Well Number	Depth	Well Number	Depth

Additional Activities Checklist:
☐ Map emergent vegetation-open water boundary on aerial photograph.
☒ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)
☒ Use GPS to survey groundwater monitoring well locations, if present.

COMMENTS / PROBLEMS:

VEGETATION COMMUNITIES

Community Number: **5** Community Title (main spp): **Type 5 - Wetland**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	+ = < 1%	Hordeum jubatum	1 = 1-5%
Ranunculus	+ = < 1%		
Spergularia marina	+ = < 1%		
Chenopodium glaucum	3 = 11-20%		
Typha latifolia	2 = 6-10%		
Puccinellia nuttalliana	1 = 1-5%		

Comments / Problems: **In 2006, surface soils were saturated, light colored, and covered with salt deposition.**

Community Number: **6** Community Title (main spp): **Type 6 - Wetland**

Dominant Species	% Cover	Dominant Species	% Cover
Puccinellia nuttalliana	+ = < 1%	Agropyron	+ = < 1%
Chenopodium glaucum	3 = 11-20%		
Hordeum jubatum	+ = < 1%		
Chenopodium leptophyllum	2 = 6-10%		
Suaeda depressa	4 = 21-50%		
Kochia scoparia	4 = 21-50%		

Comments / Problems: **In 2006, surface soils were darker colored with no salt deposition.**

Community Number: **3** Community Title (main spp): **Type 3 - Grassland Upland**

Dominant Species	% Cover	Dominant Species	% Cover
Artemisia frigida	1 = 1-5%		
Kochia scoparia	4 = 21-50%		
Bouteloua gracilis	2 = 6-10%		
Chrysopsis villosa	2 = 6-10%		
Liatris punctata	2 = 6-10%		
Agropyron spp.	2 = 6-10%		

Comments / Problems: **Present in 2006-2007.**

Community Number: **7** Community Title (main spp): **Type 7 - Wetland #11**

Dominant Species	% Cover	Dominant Species	% Cover
Poa juncifolia	4 = 21-50%		
Juncus balticus	4 = 21-50%		
Puccinellia nuttalliana	+ = < 1%		
Agropyron spp.	+ = < 1%		
Aster (pansus)	+ = < 1%		

Comments / Problems: **Present in 2006-2007.**

VEGETATION COMMUNITIES (continued)

Community Number: **5/6** Community Title (main spp): **Type 5 / 6 - Hordeum/Puccinellia Wetland**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	1 = 1-5%	Hordeum jubatum	4 = 21-50%
Ranunculus cymbalaria	1 = 1-5%	Chenopodium album	0%
Spergularia marina	0%	Suaeda calceoliformis	+ = < 1%
Chenopodium glaucum	0%	Eleocharis palustris	2 = 6-10%
Typha latifolia	1 = 1-5%	Scirpus maritimus & S. pungens	1 = 1-5%
Puccinellia nuttalliana	5 = > 50%	Hordeum brachyantherum	0%
Alopecurus pratensis	1 = 1-5%	Triglochin maritimum	+ = < 1%
		Poa palustris	1 = 1-5%

Comments / Problems: **Type 5/6 from 2007 continued to be present in 2008, but shifted in species abundance and distribution.**

Community Number: **5/6** Community Title (main spp): **Type 5 / 6 - Hordeum/Puccinellia Wetland**

Dominant Species	% Cover	Dominant Species	% Cover
Puccinellia nuttalliana	4 = 21-50%	Beckmannia syzigachne	1 = 1-5%
Hordeum jubatum	4 = 21-50%	Juncus balticus	2 = 6-10%
Ranunculus cymbalaria	2 = 6-10%	Melilotus officinalis	1 = 1-5%
Ranunculus sceleratus	+ = < 1%	Crepis runcinata	1 = 1-5%
Scirpus maritimus	1 = 1-5%	Alopecurus	1 = 1-5%
Scirpus acutus	1 = 1-5%	Typha latifolia	+ = < 1%

Comments / Problems: **In 2009 this plant assemblage represented herbaceous emergent species. Hordeum & Puccinellia dominated in cover for the third year in a row in the western two-thirds of the site and was consistenly present (but not dominating) in the eastern third of the site. It's boundary with Type 8 was abrupt.**

Community Number: **8** Community Title (main spp): **Type 8 - Typha/Eleocharis Wetland**

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	4 = 21-50%	Scipus americanus	+ = < 1%
Alisma gramineum	1 = 1-5%	Ranunculus cymbalaria	1 = 1-5%
Beckmannia syzigachne	1 = 1-5%	Eleocharis palustris	4 = 21-50%
Juncus balticus	3 = 11-20%		
Scirpus acutus	1 = 1-5%		
Scirpus maritimus	1 = 1-5%		

Comments / Problems: **In 2009 this plant assemblage represented persistant emergent species which created a community with a distinct boundary.**

Community Number: ___ Community Title (main spp): _____

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

COMPREHENSIVE VEGETATION LIST

Plant Species	Vegetation Community Number (s)	Plant Species	Vegetation Community Number (s)
Achillea millifolium	7	Kochia scoparia	3, 6
Agropyron smithii	3, 7	Lactuca serriola	3
Agropyron trachycaulum	5/6	Liatris punctata	3
Agrostis alba	5/6	Melilotus officinale	3, 5/6
Alisma gramineum	8	Poa juncifolia	7
Alopecurus pratensis	5/6	Poa palustis	5/6
Artemisia frigida	3	Polygonum spp.	5/6
Aster pansus	7	Polypogon monspeliensis	5/6
Beckmannia syzigachne	5/6, 8	Populus tremuloides (1 seedling)	5/6
Bouteloua gracilis	3	Potentilla [arguta]	7
Carex spp.	5/6, 8	Puccinellia nuttalliana	5/6, 7
Chenopodium album	5/6	Ranunculus cymbalaria	5/6, 8
Chenopodium capitatum	5/6	Ranunculus sceleratus	5/6
Chenopodium glaucum	5/6	Ratabida columnifera	3
Chenopodium hybridum	5/6	Rhizoclonium spp. (green algal spp.)	mudflat, 5/6, 8
Chenopodium leptophyllum	6	Rosa spp.	3, 5/6
Chrysopsis villosa (syn. Heterotheca villosa)	3	Salicornia rubra	5/6
Cirsium arvense	3	Salix exigua	5/6, 8
Crepis runcinata (1)	3	Salix lutea	5/6, 8
Distichlis spicata	5/6	Salsola iberica	3
Eleocharis palustris	5/6, 8	Scirpus acutus	5/6, 8
Gaillardia aristata	3	Scirpus maritimus	5/6,8
Glycyrrhiza lepidota	5/6	Scirpus [americana]	5/6, 8
Grindelia squarrosa	3, 5/6, 7	Spergularia marina	5/6
Hordeum brachyantherum	5/6	Suaeda calceoliformis (syn. S. depressa)	5/6
Hordeum jubatum	5/6	Triglochin maritimum	5/6, 8
Juncus balticus	5/6, 7, 8	Typha latifolia	5/6, 8

Comments / Problems: (1) Sonchus arvensis was mis-identified in 2007; it should be Crepis runcinata. Plant names in brackets indicate an uncertainty in identification.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
NONE PLANTED			

Comments / Problems: _____

WILDLIFE

Birds

Were man-made nesting structures installed? **No**
If yes, type of structure: _____ How many? _____
Are the nesting structures being used? **NA**
Do the nesting structures need repairs? _____

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
None Observed		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: _____

PHOTOGRAPHS

Using a camera with a 50mm lens and color film take photographs of the following permanent reference points listed in the check list below. Record the direction of the photograph using a compass. When at the site for the first time, establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3 feet above ground. Survey the location with a resource grade GPS and mark the location on the aerial photograph.

Photograph Checklist:

- ☒ One photograph for each of the four cardinal directions surrounding the wetland.
- ☒ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.
- ☒ At least one photograph showing the buffer surrounding the wetland.
- ☒ One photograph from each end of the vegetation transect, showing the transect.

Location	Photograph Frame #	Photograph Description	Compass Reading (°)
		See photo sheets	

Comments / Problems: _____

GPS SURVEYING

Using a resource grade GPS survey the items on the checklist below. Collect at least 3 location points set at a 5 second recording rate. Record file numbers for site in designated GPS field notebook.

GPS Checklist:

- ☒ Jurisdictional wetland boundary.
- ☒ 4-6 landmarks that are recognizable on the aerial photograph.
- ☒ Start and End points of vegetation transect(s).
- ☒ Photograph reference points.
- ☐ Groundwater monitoring well locations.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

- ☒ Delineate wetlands according to the 1987 Army COE manual.
- ☒ Delineate wetland – upland boundary onto aerial photograph.

Yes Survey wetland – upland boundary with a resource grade GPS survey.

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

(Complete and attach full MDT Montana Wetland Assessment Method field forms.)
(Also attach any completed abbreviated field forms, if used)

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **No**
If yes, do they need to be repaired? **NA**
If yes, describe the problems below and indicate if any actions were taken to remedy the problems.

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? **No**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Meriwether-East Site 2** Date: **July 20, 2009** Examiner: **A. Pipp**
Transect Number: **T-1** Approximate Transect Length: **500 feet** Compass Direction from Start: **59˚** Note: **compass at 0 degrees decl.**

Vegetation Type A: **Bank covered with erosion control**	
Length of transect in this type: 0 - 12.5 feet	
Plant Species	**Cover**
Agropyron smithii	4 = 21-50%
Hordeum jubatum	2 = 6-10%
Gaillardia aristata	1 = 1-5%
Suaeda calceoliformis (not seen in 2009)	
Ratitbida columnifera	1 = 1-5%
Salsola iberica (not seen in 2008, 2009)	
Puccinellia nuttalliana (base of slope)	+ = < 1%
Grindelia squarrosa	+ = < 1%
Crepis runcinata	1 = 1-5%
Aster pansus	1 = 1-5%
bare ground/ litter (20%)	
Total Vegetative Cover:	70%

Vegetation Type B: **Type 5/6 - Wetland**	
Length of transect in this type: 12.5 - 496 feet	
Plant Species	**Cover**
Puccinellia nuttalliana	4 = 21-50%
Hordeum jubatum	4 = 21-50%
Ranunculus cymbalaria & Eleocharis palustris (EACH)	2 = 6-10%
Triglochin maritimum & Poa juncifolia (EACH)	+ = < 1%
Juncus balticus	2 = 6-10%
Agrostis alba & Carex spp. (EACH)	+ = < 1%
Polygonum spp. (seedlings)	1 = 1-5%
Beckmannia syzigachne (EACH)	1 = 1-5%
Alopecurus pratensis	1 = 1-5%
CHEGLA, DISSTR, HORBRA, POLMON (not seen in 2008, 2009)	
Total Vegetative Cover:	90%

Vegetation Type C: **Type 7 - Wetland 17**	
Length of transect in this type: 494 - 500 feet	
Plant Species	**Cover**
Poa juncifolia	4 = 21-50%
Juncus balticus	3 = 11-20%
Puccinellia nuttalliana	1 = 1-5%
Agropyron smithii	+ = < 1%
Aster pansus	+ = < 1%
Hordeum jubatum	+ = < 1%
Crepis runcinata	+ = < 1%
Suaeda calceoliformis (not seen in 2008)	
Grindelia squarrosa (not seen in 2008)	
Potentilla (arguta)	+ = < 1%
Total Vegetative Cover:	95%

Vegetation Type D:	
Length of transect in this type: feet	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		**Indicator Class**	**Source**
+ = < 1%	3 = 11-20%	+ = Obligate	P = Planted
1 = 1-5%	4 = 21-50%	- = Facultative/Wet	V = Volunteer
2 = 6-10%	5 = > 50%	0 = Facultative	

Percent of perimeter developing wetland vegetation (excluding dam/berm structures): **100%**

Establish transects perpendicular to the shoreline (or saturated perimeter). The transect should begin in the upland area. Permanently mark this location with a standard metal fencepost. Extend the imaginary transect line towards the center of the wetland, ending at the 3 foot depth (in open water), or at the point where water depths or saturation are maximized. Mark this location with another metal fencepost.

Estimate cover within a 10 foot wide "belt" along the transect length. At a minimum, establish a transect at the windward and leeward sides of the wetland. Remember that the purpose of this sampling is to monitor, not inventory, representative portions of the wetland site.

Comments: **In the western central area of the site, the ground surface forms a hump. The hump is still dominated by wetland vegetation and exhibits cracked soils; however, it is being colonized by upland plants (Melilotus officinale, Rosa spp., and Grindelia squarrosa).**

BIRD SURVEY – FIELD DATA SHEET

Site: **Meriwether-East, Site 2** Date: **7/20/09**
Survey Time: **1140 am** to **1700 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Red-wing Blackbird	4	F N L	MA				
Sandpiper spp. (*)	4	FO F L	MA UP				
Sparrow spp.	3	FO	UP				

BEHAVIOR CODES
BP = One of a breeding pair
BD = Breeding display
F = Foraging
FO = Flyover
L = Loafing
N = Nesting

HABITAT CODES
AB = Aquatic bed
FO = Forested
I = Island
MA = Marsh
MF = Mud Flat
OW = Open Water
SS = Scrub/Shrub
UP = Upland buffer
WM = Wet meadow
US = Unconsolidated shore

Weather: **sunny, 0-5 mph winds, high 70 degrees**

Notes: **The sandpipers may have been the 'White-rumped Sandpiper'. They were large and seemed to exhibit a distinct white rump patch and a moderately long, straight bill.**

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 1	

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Central within western half.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Hordeum jubatum	Herb	FAC+	*Puccinellia nuttalliana*	Herb	OBL
Barley,Fox-Tail			Grass,Nuttall's Alkali		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 2/2 = 100.00%

FAC Neutral: 1/1 = 100.00%

Numeric Index: 4/2 = 2.00

Remarks:
Also present, but not dominant: Crepis runcinata (1%) and Poa palustris (5%).

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 4.0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009	
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier	
Investigators: andrea pipp		**State:** Montana	
		Plot ID: Soil Pit 1	

SOILS

Map Unit Name (Series and Phase): Saline land
Map Symbol: SA **Drainage Class:** Poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Montmorillonitic, frigid Ustic Torriorth **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-4	A	10YR3/2	N/A	N/A	N/A	Clay, gravels
0-4	A	10YR4/2	N/A	N/A	N/A	Clay, gravels
4-14	B	2.5YR5/3	N/A	N/A	N/A	Silty clay, gravels

Hydric Soil Indicators:

NO **Histosol**	NO **Concretions**
NO **Histic Epipedon**	NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Sulfidic Odor**	NO **Organic Streaking in Sandy Soils**
NO **Aquic Moisture Regime**	NO **Listed on Local Hydric Soils List**
NO **Reducing Conditions**	NO **Listed on National Hydric Soils List**
NO **Gleyed or Low Chroma Colors**	YES **Other (Explain in Remarks)**

Remarks:
From 0-14 inches, soils were very gravelly. At 4 inches, gravels and soil were glistening (saturated). Site was inundated in May 2009. Soils meet NRCS Hydric Soils criteria #4, "Soils that are frequently flooded for long duration or very long duration during the growing season."

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland?	(Yes) No
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	(Yes) No		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 2

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Near T-1 Start in Type 8.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Ranunculus cymbalaria	Herb	OBL	*Typha latifolia*	Herb	OBL
Butter-Cup,Seaside			Cattail,Broad-Leaf		
Juncus balticus	Herb	OBL	*Puccinellia nuttalliana*	Herb	OBL
Rush,Baltic			Grass,Nuttall's Alkali		
Scirpus maritimus	Herb	OBL			
Bulrush,Saltmarsh					

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/5 = 100.00%
FAC Neutral: 5/5 = 100.00%
Numeric Index: 5/5 = 1.00

Remarks:
Also present but not dominant (less than or equal to 1%): Salix exigua, Hordeum jubatum, triglochin maritimum, Scirpus americanus.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	= 7.5 *(in.)*
Depth to Saturated Soil:	= 0.0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 2

SOILS

Map Unit Name (Series and Phase): Saline land
Map Symbol: SA **Drainage Class:** Poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Montmorillonitic, frigid Ustic Torriorth **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-0.5	A	10YR2/1	N/A	N/A	N/A	Mucky mineral
0.5-3.0	A	10YR4/3	N/A	N/A	N/A	Clay loam
3.0-10	B	2.5Y4/3	N/A	N/A	N/A	Clay

Hydric Soil Indicators:

NO **Histosol**
NO **Histic Epipedon**
NO **Sulfidic Odor**
NO **Aquic Moisture Regime**
NO **Reducing Conditions**
NO **Gleyed or Low Chroma Colors**
NO **Concretions**
NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Organic Streaking in Sandy Soils**
NO **Listed on Local Hydric Soils List**
NO **Listed on National Hydric Soils List**
YES **Other (Explain in Remarks)**

Remarks:
Soils at 10 inches were of 2 inch cobbles and difficult to dig. Site was inundated in May 2009. Soils meet NRCS Hydric Soils criteria #4, "Soils that are frequently flooded for long duration or very long duration during the growing season."

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner:	-Montana Department of Transportation-		**County:** Glacier
Investigators:	andrea pipp		**State:** Montana
			Plot ID: Soil Pit 3

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(if needed, explain on the reverse side)		Near T-1 Start in Type 5/6.

VEGETATION (USFWS Region No. 9)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Puccinellia nuttalliana	Herb	OBL	*Alopecurus arundinaceus*	Herb	NI
Grass,Nuttall's Alkali			Foxtail,Creeping		
Hordeum jubatum	Herb	FAC+	*Juncus balticus*	Herb	OBL
Barley,Fox-Tail			Rush,Baltic		
Ranunculus cymbalaria	Herb	OBL	*Triglochin maritimum*	Herb	OBL
Butter-Cup,Seaside			Arrow-Grass,Seaside		

Percent of Dominant Species that are OBL, FACW or FAC:	**FAC Neutral:** 4/4 = 100.00%
(excluding FAC-) 5/5 = 100.00%	**Numeric Index:** 7/5 = 1.40

Remarks:
Confirm identification of Alopecurus and Carex.

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 1.0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner:	-Montana Department of Transportation-		**County:** Glacier
Investigators:	andrea pipp		**State:** Montana
			Plot ID: Soil Pit 3

SOILS

Map Unit Name (Series and Phase): Saline land
Map Symbol: SA **Drainage Class:** Poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Montmorillonitic, frigid Ustic Torrierth **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-6	A	10YR3/2	7.5YR4/6	Common	Distinct	Clay loam, small cobbles
6-11	B	10YR4/2	2.5YR6/6	N/A	N/A	Silty clay, small cobbles

Hydric Soil Indicators:

NO **Histosol**	NO **Concretions**
NO **Histic Epipedon**	NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Sulfidic Odor**	NO **Organic Streaking in Sandy Soils**
NO **Aquic Moisture Regime**	NO **Listed on Local Hydric Soils List**
NO **Reducing Conditions**	NO **Listed on National Hydric Soils List**
NO **Gleyed or Low Chroma Colors**	YES **Other (Explain in Remarks)**

Remarks:
From 0-6 inches, matrix colors are 10YR 3/1 (10%), 10YR 3/2 (85), and 10YR 5/3 (5%) with mottles of 7.5 YR 4/6 (20%). From 6-11 inches, matrix colors are 10YR 4/2 (50%) and 2.5 Y (4/3) with mottles of 2.5 Y 6/6 (5%). Site was inundated in May 2009. Soils meet NRCS Hydric Soils criteria #4, "Soils that are frequently flooded for long duration or very long duration during the growing season."

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland?	(Yes) No
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	(Yes) No		

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner:	-Montana Department of Transportation-		**County:** Glacier
Investigators:	andrea pipp		**State:** Montana
			Plot ID: Soil Pit 4

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Near T-1 End.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Hordeum jubatum	Herb	FAC+	*Eleocharis palustris*	Herb	OBL
Barley,Fox-Tail			Spikerush,Creeping		
Beckmannia syzigachne	Herb	OBL	*Scirpus maritimus*	Herb	OBL
Sloughgrass,American			Bulrush,Saltmarsh		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 4/4 = 100.00%
FAC Neutral: 3/3 = 100.00%
Numeric Index: 6/4 = 1.50

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	= 12 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
From 0-12 inches, soil was very moist.

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site:	Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner:	-Montana Department of Transportation-		**County:** Glacier
Investigators:	andrea pipp		**State:** Montana
			Plot ID: Soil Pit 4

SOILS

Map Unit Name (Series and Phase): Saline land
Map Symbol: SA **Drainage Class:** Poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Montmorillonitic, frigid Ustic Torriorth **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-5	A	2.5Y3/1	N/A	N/A	N/A	Clay loam, gravels
5-12	B	2.5Y4/1	10YR4/6	Common	Distinct	Clay, small cobbles

Hydric Soil Indicators:
- NO **Histosol**
- NO **Histic Epipedon**
- NO **Sulfidic Odor**
- NO **Aquic Moisture Regime**
- NO **Reducing Conditions**
- YES **Gleyed or Low Chroma Colors**
- NO **Concretions**
- NO **High Organic Content in Surface Layer in Sandy Soils**
- NO **Organic Streaking in Sandy Soils**
- NO **Listed on Local Hydric Soils List**
- NO **Listed on National Hydric Soils List**
- YES **Other (Explain in Remarks)**

Remarks:
From 0-5 inches matrix colors are 2.5Y 3/1 (80%) and 2.5Y 4/1 (20%).
From 5-12 inches matrix colors are 10YR 2/1 (30%) and 2.5Y 4/1 (50%) with mottles of 10YR 4/6 (20%). Site was inundated in May 2009. Soils meet NRCS Hydric Soils criteria #4, "Soils that are frequently flooded for long duration or very long duration during the growing season."

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 5

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:**
Is the area a potential Problem Area?	Yes (No)	**Field Location:**
(If needed, explain on the reverse side)		Southern boundary in Type 8.

VEGETATION **(USFWS Region No. 9)**

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Typha latifolia	Herb	OBL	*Juncus balticus*	Herb	OBL
Cattail,Broad-Leaf			Rush,Baltic		
Eleocharis palustris	Herb	OBL	*Beckmannia syzigachne*	Herb	OBL
Spikerush,Creeping			Sloughgrass,American		
Alisma gramineum	Herb	OBL	*Hordeum jubatum*	Herb	FAC+
Water-Plantain,Narrow-Leaf			Barley,Fox-Tail		
Ranunculus cymbalaria	Herb	OBL	*Puccinellia nuttalliana*	Herb	OBL
Butter-Cup,Seaside			Grass,Nuttall's Alkali		

Percent of Dominant Species that are OBL, FACW or FAC: **FAC Neutral:** 7/7 = 100.00%
(excluding FAC-) 8/8 = 100.00% **Numeric Index:** 10/8 = 1.25

Remarks:

HYDROLOGY

NO **Recorded Data(Describe in Remarks):**
- N/A **Stream, Lake or Tide Gauge**
- N/A **Aerial Photographs**
- N/A **Other**

YES **No Recorded Data**

Field Observations

Depth of Surface Water:	N/A *(in.)*
Depth to Free Water in Pit:	= 7.0 *(in.)*
Depth to Saturated Soil:	= 0.0 *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- NO **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- NO **Drift Lines**
- NO **Sediment Deposits**
- NO **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:

DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: Meriwether-East Site 2: 2009	**Project No:** 0B4308802	**Date:** 20-Jul-2009
Applicant/Owner: -Montana Department of Transportation-		**County:** Glacier
Investigators: andrea pipp		**State:** Montana
		Plot ID: Soil Pit 5

SOILS

Map Unit Name (Series and Phase): Saline land
Map Symbol: SA **Drainage Class:** Poorly drained **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Montmorillonitic, frigid Ustic Torriorth **Field Observations Confirm Mapped Type?** Yes (No)
Profile Description

Depth (inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast		Texture, Concretions, Structure, etc
0-0.5	Oi	10YR2/1	N/A	N/A	N/A	Mucky mineral
0.5-7	A	2.5Y4/1	N/A	N/A	N/A	Silty clay loam
7-11	B	2.5Y4/2	N/A	N/A	N/A	Silty clay loam, small cobbles

Hydric Soil Indicators:

NO **Histosol**	NO **Concretions**
NO **Histic Epipedon**	NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Sulfidic Odor**	NO **Organic Streaking in Sandy Soils**
NO **Aquic Moisture Regime**	NO **Listed on Local Hydric Soils List**
NO **Reducing Conditions**	NO **Listed on National Hydric Soils List**
NO **Gleyed or Low Chroma Colors**	YES **Other (Explain in Remarks)**

Remarks:
From 0.5 to 11 inches soil contained 1-3 inch cobbles and was difficult to dig. Site was inundated in May 2009. Soils meet NRCS Hydric Soils criteria #4, "Soils that are frequently flooded for long duration or very long duration during the growing season."

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland?	(Yes) No
Wetland Hydrology Present?	(Yes) No		
Hydric Soils Present?	(Yes) No		

Remarks:

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: _____ **2. MDT Project #:** STPX-NH 0037(26) **3. Control #:** 5000

3. Evaluation Date: July 20, 2009 **4. Evaluator(s):** Andrea Pipp **5. Wetland/Site #(s):** Site 2

6. Wetland Location(s): Township 33 N, Range 8 W, Section 17; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: ST 284+40 to ST 287+50 (R); Approximately at MP 239.

Watershed: 8 - Marias **County:** Glacier _ _ _____

7. Evaluating Agency: MDT

Purpose of Evaluation:

- ☐ **Wetland potentially affected by MDT project**
- ☐ **Mitigation wetlands; pre-construction**
- ☒ **Mitigation wetlands; post-construction**
- ☐ **Other** _____

8. Wetland Size (acre): _____ (visually estimated)
6.62 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 6.62 (measured, e.g. GPS)

10. CLASSIFICATION OF WETLAND AND AQUATIC HABITATS IN AA (See manual for definitions.)

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	100

Comments: In 2009 two emergent community types were delineated: Type 8 (persistent emergent species) and Type 5/6 (herbaceous emergent species.)

11. ESTIMATED RELATIVE ABUNDANCE (of similarly classified sites within the same Major Montana Watershed Basin; see manual.)
common

12. GENERAL CONDITION OF AA

i. Disturbance: Use matrix below to select the appropriate response; see manual for Montana listed noxious weed and aquatic nuisance vegetation species lists.

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) 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	---
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 ≤30%.	---	---	---
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%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** Livestock grazing was present prior to construction of mitigation site.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense present in the upland.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA is an excavated are bordering an existing wetland. Highway 2 occurs on the immediate north boundary. Rangeland occurs on all boundaries though livestcok is excluded by fences.

13. STRUCTURAL DIVERSITY (Based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes]; see #10 above.)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
≥3 (or 2 if one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	mod	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Salix shrubs are increasing in abundance (though still sparse).

Wetland/Site #(s): Site 2

14A. HABITAT FOR FEDERALLY LISTED OR PROPOSED THREATENED OR ENDANGERED PLANTS OR ANIMALS

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
Functional Point/Rating	---	---	---	---	---	---	0L

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

14B. HABITAT FOR PLANTS OR ANIMALS RATED S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM
Do not include species listed in 14A above.

i. AA is Documented (D) or Suspected (S) to contain: Check box based on definitions in manual.

Primary or critical habitat (**list species**) ☐ D ☐ S _____
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☒ S

ii. Rating: Based on the strongest habitat chosen in 14A(i) above, select the corresponding functional point and rating.

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	.0L
S2 and S3 Species Functional Point/Rating	---	---	---	---	---	---	.0L

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

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of Overall Wildlife Use in the AA: Check substantial, moderate, or low based on supporting evidence.

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

☐ ***Minimal:*** Based on any of the following [check].
- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interview with local biologist with knowledge of 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
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their 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 manual for further definitions of these terms].

Structural Diversity (see #13)	☐ **High**								☒ **Moderate**								☐ **Low**			
Class Cover Distribution (all vegetated classes)	☐ **Even**				☐ **Uneven**				☒ **Even**				☐ **Uneven**				☐ **Even**			
Duration of Surface Water in ≥ 10% of AA	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**	**P/P**	**S/I**	**T/E**	**A**
☒ **Low Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	H	---	---	---	---	---	---	---	---	---	---
☐ **Moderate Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (see #12i)	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

iii. Rating: Use the conclusions from i and ii above and the matrix below to select the functional point and rating.

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☐ **Exceptional**	☒ **High**	☐ **Moderate**	☐ **Low**
☐ **Substantial**	---	---	---	---
☒ **Moderate**	---	.7M	---	---
☐ **Minimal**	---	---	---	---

Comments: Several pairs of Red-winged Blackbirds, several sandpipers, and many dragonflies were observed.

Wetland/Site #(s): Site 2

14D. GENERAL FISH HABITAT ☒ **NA** (proceed to 14E)

If the AA is not used by fish, fish use is not restorable due to habitat constraints, or is not desired from a management perspective [such as fish entrapped in a canal], then check the NA box and proceed to 14E.

Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier].

Type of Fishery: ☐ Cold Water (**CW**) ☐ Warm Water (**WW**) **Use the CW or WW guidelines in the manual to complete the matrix.**

i. Habitat Quality and Known / Suspected Fish Species in AA: Use matrix to select the functional point and rating.

Duration of Surface Water in AA	☐ **Permanent / Perennial**						☐ **Seasonal / Intermittent**						☐ **Temporary / Ephemeral**					
Aquatic Hiding / Resting / Escape Cover	☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**		☐ **Optimal**		☐ **Adequate**		☐ **Poor**	
Thermal Cover: optimal / suboptimal	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**	**O**	**S**
FWP Tier I fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier II or **Native Game** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Tier III or **Introduced Game** fish	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
FWP Non-Game Tier IV or **No** fish species	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Sources used for identifying fish spp. potentially found in AA: _____

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 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?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☐ **N0**

b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area; specify in comments) for native fish or introduced game fish? ☐ **YES**, add to score in **i** or **iia** 0.1 = __ or ☐ **N0**

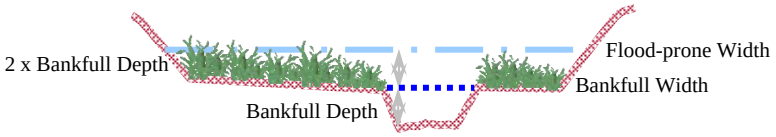
iii. Final Score and Rating: _ **Comments:** _____

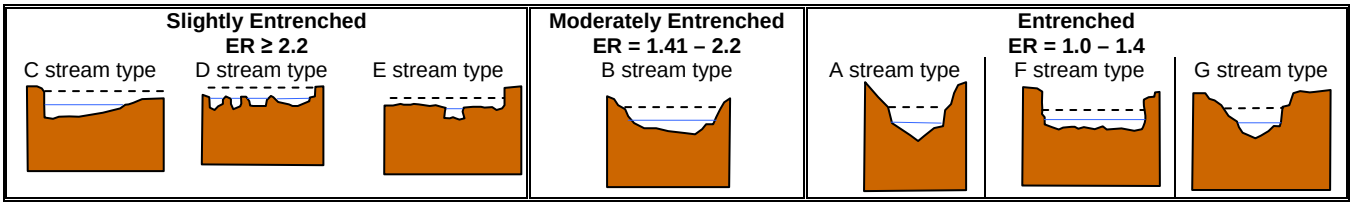
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

Applies only to wetlands that are subject to flooding via in-channel or overbank flow.
If wetlands in AA are not flooded from in-channel or overbank flow, check the NA box and proceed to 14F.

Entrenchment Ratio (ER) Estimation (see 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





i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	☒ Slightly Entrenched C, D, E stream types			☐ Moderately Entrenched B stream type			☐ Entrenched A, F, G stream types		
Percent of Flooded Wetland Classified as Forested and/or Scrub/Shrub	☐ 75%	☒ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%	☐ 75%	☐ 25-75%	☐ <25%
AA contains **no outlet or restricted outlet**	---	.9H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---	---

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** Site connects to a wetland which borders a drainage. When the drainage floods, water can back-up into this site.

Wetland/Site #(s): Site 2

14F. SHORT AND LONG TERM SURFACE WATER STORAGE ☐ **NA** (proceed to 14G)

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.
If no wetlands in the AA are subject to flooding or ponding, then check the NA box and proceed to 14G.

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

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☒ **>5 acre feet**			☐ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
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**	---	.9H	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Site may flood every year. Flooding of the site was documented on May 19, 2009 and June 14, 2006.

14G. SEDIMENT / NUTRIENT / TOXICANT / RETENTION AND REMOVAL ☐ **NA** (proceed to 14H)

Applies to wetland with potential to receive sediments, nutrients, or toxicants through influx of surface or ground water or direct input.
If no wetlands in the AA are subject to such input, check the NA box and proceed to 14H.

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	1H	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	---	---	---

Comments: _____

14H. SEDIMENT / SHORELINE STABILIZATION ☒ **NA** (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action.
If 14H does not apply, check the NA box and proceed to 14I.

% Cover of Wetland Streambank or Shoreline by Species with Stability Ratings of ≥6 (see Appendix F).	**Duration of Surface Water Adjacent to Rooted Vegetation**		
	☐ **Permanent / Perennial**	☐ **Seasonal / Intermittent**	☐ **Temporary / Ephemeral**
☐ **≥ 65%**	---	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: _____

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. Level of Biological Activity: Synthesis of wildlife and fish habitat rates (select).

General Fish Habitat Rating (14Diii)	**General Wildlife Habitat Rating (14Ciii)**		
	☐ **E/H**	☒ **M**	☐ **L**
☐ **E/H**	---	---	---
☐ **M**	---	---	---
☐ **L**	---	---	---
☒ **NA**	---	M	---

ii. Rating: Working from top to bottom, use the matrix below to select the functional point and rating. Factor A = acreage of vegetated wetland component in the AA; Factor B = level of biological activity rating from above (14Ii); Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to the duration of surface water in the AA, where P/P, S/I, and T/E were previously defined, and A = "absent" [see manual for further definitions of these terms].

A	☒ **Vegetated Component >5 acres**						☐ **Vegetated Component 1-5 acres**						☐ **Vegetated Component <1 acre**					
B	☐ **High**		☒ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**		☐ **High**		☐ **Moderate**		☐ **Low**	
C	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
P/P	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	.7M	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): Site 2

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT (continued)

iii. Modified Rating: Note: Modified score cannot exceed 1.0 or be less than 0.1.

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = 0.80 ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** _____

14J. GROUNDWATER DISCHARGE / RECHARGE
Check the appropriate indicators in i and ii below.

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☐ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ 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: _____

ii. Recharge Indicators
- ☐ Permeable substrate present without underlying impeding layer.
- ☐ Wetland contains inlet but no outlet.
- ☐ Stream is a known 'losing' stream. Discharge volume decreases.
- ☐ Other: _____

iii. Rating: Use the information from i and ii above and the table below to select the functional point and rating.

Criteria	Duration of Saturation at AA Wetlands ***FROM GROUNDWATER DISCHARGE*** or ***WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*** ☐ P/P	☒ S/I	☐ T	☐ None
☒ **Groundwater Discharge or Recharge**	---	.7M	---	---
☐ **Insufficient Data/Information**	---			

Comments: _____

14K. UNIQUENESS

i. Rating: Working from top to bottom, use the matrix below to select the functional point and rating.

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland OR plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types AND structural diversity (#13) is high OR contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types OR associations AND structural diversity (#13) is low-moderate		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☒ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.4M	---
☐ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL ☒ NA (proceed to Overall Summary and Rating page)
Affords 'bonus' points if AA provides a recreational or educational opportunity.

i. Is the AA a known or potential recreational or educational site? ☐ **YES**, go to ii. ☒ **NO**, check the NA box.

ii. Check categories that apply to the AA: ☐ Educational/Scientific Study ☐ Consumptive Recreational ☐ Non-consumptive recreational
☐ Other: _____

iii. Rating: Use the matrix below to select the functional point and rating.

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	---	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: _____

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): Site 2

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	low 0.00	1.00		
B. MT Natural Heritage Program Species Habitat	low 0.00	1.00		
C. General Wildlife Habitat	mod 0.70	1.00		
D. General Fish Habitat	NA	NA		
E. Flood Attenuation	high 0.90	1.00		*
F. Short and Long Term Surface Water Storage	high 0.90	1.00		
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00		*
H. Sediment / Shoreline Stabilization	NA	NA		
I. Production Export / Food Chain Support	high 0.80	1.00		
J. Groundwater Discharge / Recharge	mod 0.70	1.00		
K. Uniqueness	mod 0.40	1.00		*
L. Recreation / Education Potential (bonus point)	NA			
Total Points	**5.4**	**9.0**	**Total Functional Units**	
Percent of Possible Score 60% (round to nearest whole number)				

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 Category IV)
- ☐ 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; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

OVERALL ANALYSIS AREA (AA) RATING: Check the appropriate category based on the criteria outlined above.

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

Appendix C

2009 SITE 2 REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Meriwether-East
Glacier County, Montana

MERIWETHER-EAST WETLAND MITIGATION SITE 2 – 2009

Photo 1: Photo-Point 1. Panoramic view facing northwest from the east end of Site 2.

Photo 2: View is northeast from the start of Transect 1.

Photo 3: View is southwest from the end of Transect 1.

Photo 4: View is northwest at Soil Pit 1 in Type 5/6 wetland habitat from

MERIWETHER-EAST WETLAND MITIGATION SITE 2 – 2009

Photo 5: View is east at Soil Pit 2 in Type 8 wetland.

Photo 6: View is east at Soil Pit 3 in Type 5/6 wetland.

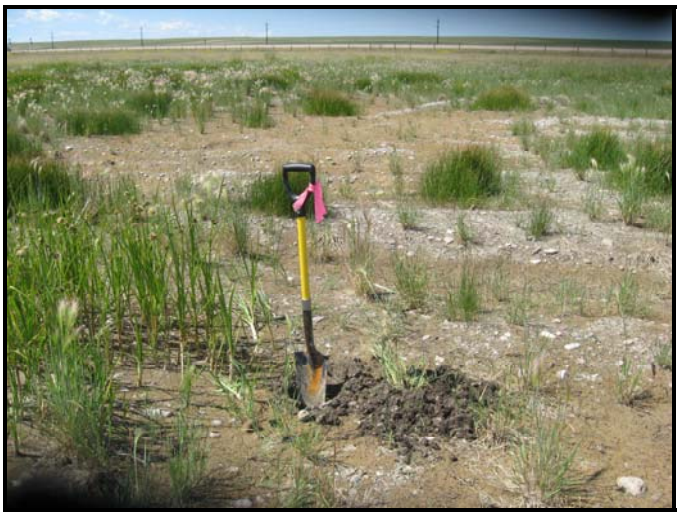


Photo 7: View is northwest at Soil Pit 4 in Type 5/6 wetland.

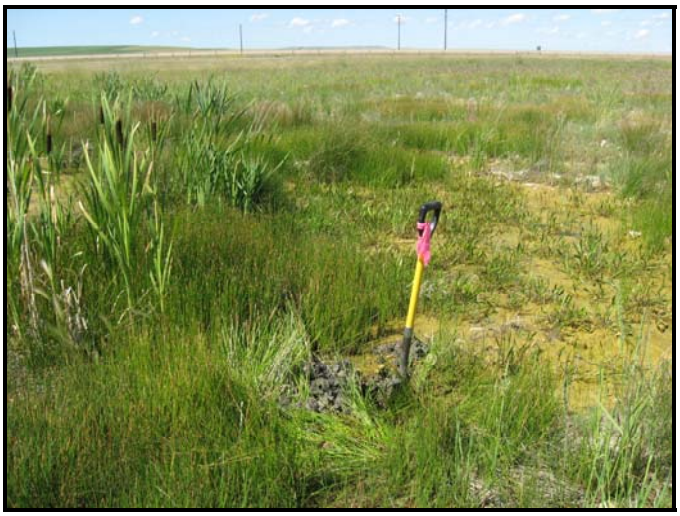


Photo 8: View is north at Soil Pit 5 in Type 8 wetland. Photo shows *Typha*, *Eleocharis*, and *Alisma*.

Photo 9: A Red-winged Blackbird perched on *Typha* in the Type 8 wetland.

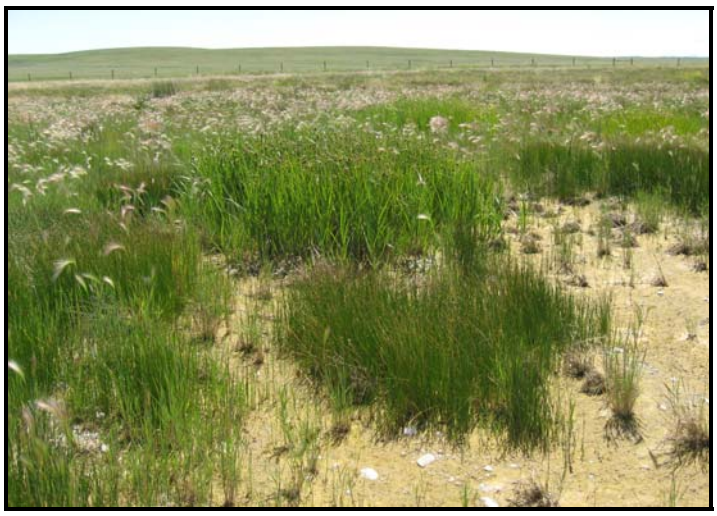
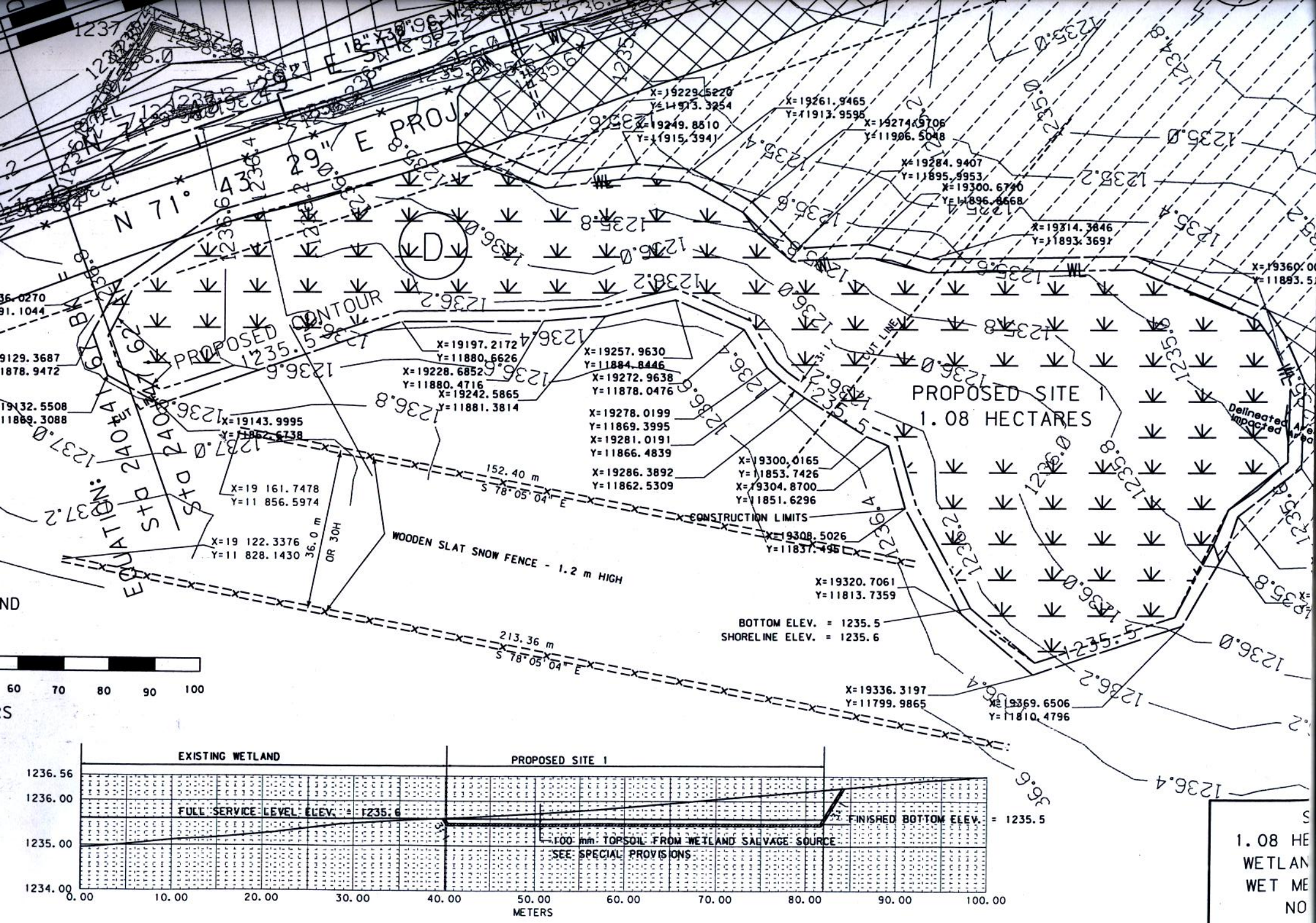


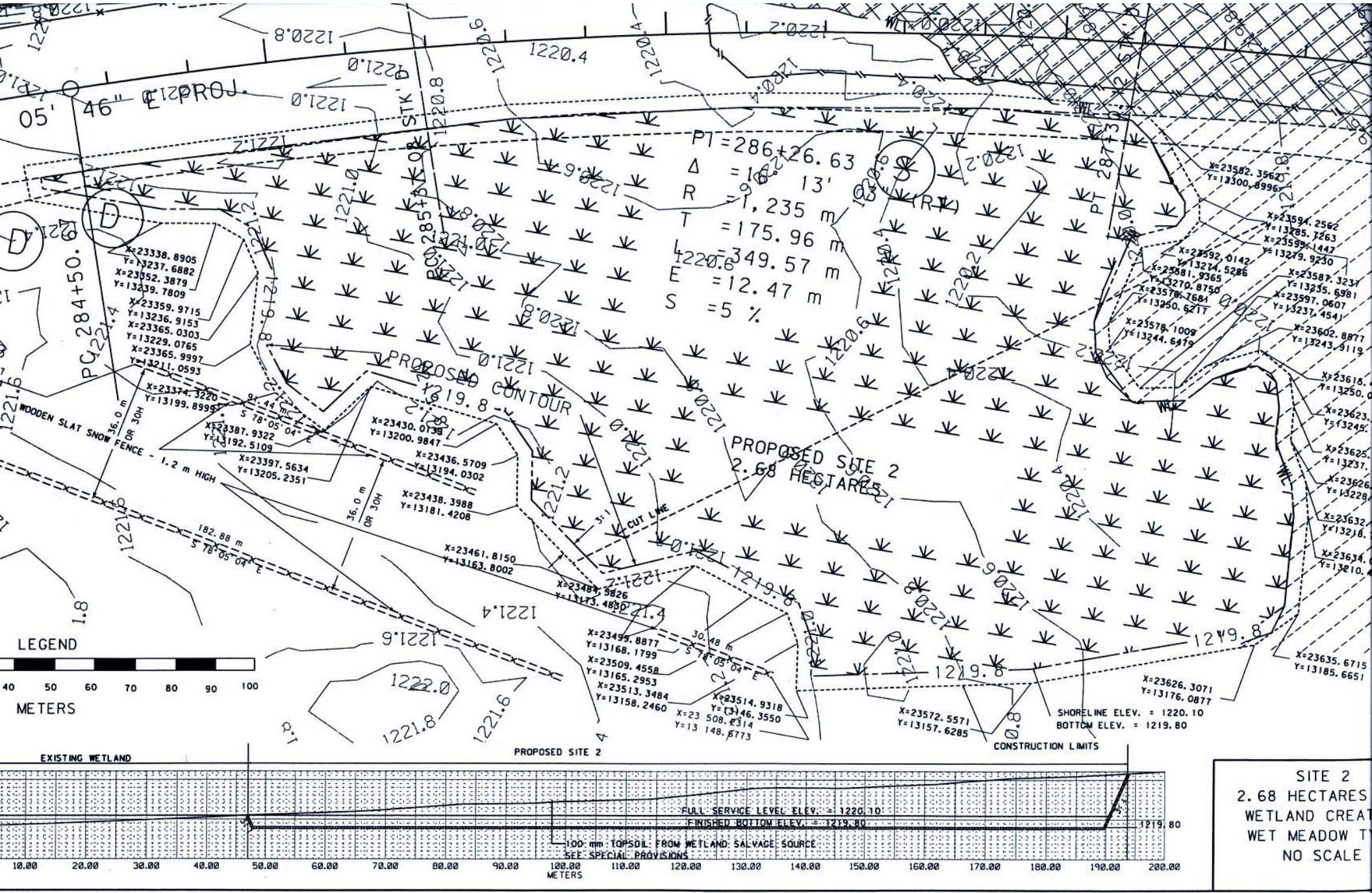
Photo 10: View is southeast at *Eleocharis*, *Scirpus*, and *Hordeum*, in Type 5/6 wetland.

Appendix D

SITE 1 PLAN
SITE 2 PLAN

MDT Wetland Mitigation Monitoring
Meriwether-East
Glacier County, Montana


N 71° 43' 29" E PROJ.
PROPOSED CONTOUR
1235.5
PROPOSED SITE 1
1.08 HECTARES
CUT LINE
3:1
WL
D
X=19229.5220
Y=11913.3254
X=19249.8510
Y=11915.3941
X=19261.9465
Y=11913.9595
X=19274.9706
Y=11906.5048
X=19284.9407
Y=11895.9953
X=19300.6740
Y=11896.8668
X=19314.3846
Y=11893.3691
X=19197.2172
Y=11880.6626
X=19228.6852
Y=11880.4716
X=19242.5865
Y=11881.3814
X=19257.9630
Y=11884.8446
X=19272.9638
Y=11878.0476
X=19278.0199
Y=11869.3995
X=19281.0191
Y=11866.4839
X=19286.3892
Y=11862.5309
X=19143.9995
Y=11862.6738
X=19 161.7478
Y=11 856.5974
X=19 122.3376
Y=11 828.1430
X=19300.0165
Y=11853.7426
X=19304.8700
Y=11851.6296
X=19308.5026
Y=11837.495
X=19320.7061
Y=11813.7359
X=19336.3197
Y=11799.9865
X=19369.6506
Y=11810.4796
152.40 m
S 78° 05' 04" E
213.36 m
S 78° 05' 04" E
36.0 m
OR 30H
WOODEN SLAT SNOW FENCE - 1.2 m HIGH
CONSTRUCTION LIMITS
BOTTOM ELEV. = 1235.5
SHORELINE ELEV. = 1235.6
Delineated Impacted
EXISTING WETLAND
PROPOSED SITE 1
FULL SERVICE LEVEL ELEV. = 1235.6
FINISHED BOTTOM ELEV. = 1235.5
100 mm TOPSOIL FROM WETLAND SALVAGE SOURCE
SEE SPECIAL PROVISIONS
1236.56
1236.00
1235.00
1234.00
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
80.00
90.00
100.00
METERS


PROPOSED CONTOUR
PROPOSED SITE 2
2.68 HECTARES
PI=286+26.63
Δ =16° 13'
R =1,235 m
T =175.96 m
L =349.57 m
E =12.47 m
S =5 %
PC 284+50.
PC 285+00.
WOODEN SLAT SNOW FENCE - 1.2 m HIGH
36.0 m OR 30H
182.88 m
S 78° 05' 04" E
30.48 m
CUT LINE
3:1
LEGEND
40 50 60 70 80 90 100
METERS
EXISTING WETLAND
PROPOSED SITE 2
CONSTRUCTION LIMITS
SHORELINE ELEV. = 1220.10
BOTTOM ELEV. = 1219.80
FULL SERVICE LEVEL ELEV. = 1220.10
FINISHED BOTTOM ELEV. = 1219.80
100 mm TOPSOIL FROM WETLAND SALVAGE SOURCE
SEE SPECIAL PROVISIONS
10.00 20.00 30.00 40.00 50.00 60.00 70.00 80.00 90.00 100.00 110.00 120.00 130.00 140.00 150.00 160.00 170.00 180.00 190.00 200.00
METERS
SITE 2
2.68 HECTARES
WETLAND CREAT
WET MEADOW T
NO SCALE