MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT

BIG MUDDY CREEK MITIGATION SITE
ROOSEVELT COUNTY, MONTANA

PROJECT CONSTRUCTED: 2011/2012

MONITORING REPORT #7: DECEMBER 2017



Prepared for:

VISION ZERO
zero deaths · zero serious injuries
MONTANA DEPARTMENT OF TRANSPORTATION

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MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2017

BIG MUDDY CREEK MITIGATION SITE ROOSEVELT COUNTY, MONTANA

MDT Project Number NH-1- (46) 633
Big Muddy Creek – West
Control Number 4058-001

MDT Project Number NH-1- (46) 626
Brockton – East
Control Number 4058

USACE: NWO-2009-01515-MTB

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December 2017

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TABLE OF CONTENTS

1.0 INTRODUCTION **1**

2.0 METHODS **3**

2.1 HYDROLOGY 3
2.2 VEGETATION 4
2.3 SOIL 5
2.4 WETLAND DELINEATION 5
2.5 WILDLIFE 5
2.6 FUNCTIONAL ASSESSMENT 6
2.7 PHOTOGRAPHIC DOCUMENTATION 6
2.8 GLOBAL POSITIONING SYSTEM DATA 6
2.9 MAINTENANCE NEEDS 6

3.0 RESULTS **6**

3.1 HYDROLOGY 6
3.2 VEGETATION 7
3.3 SOIL 15
3.4 WETLAND DELINEATION 16
3.5 WILDLIFE 16
3.6 FUNCTIONAL ASSESSMENT 16
3.7 PHOTOGRAPHIC DOCUMENTATION 21
3.8 MAINTENANCE NEEDS 21
3.9 CURRENT CREDIT SUMMARY 21

4.0 REFERENCES **27**

LIST OF TABLES

TABLE PAGE

3-1 Vegetation Species Observed From 2011 Through 2017 at the Big Muddy Site 8
3-2 Data Summary for T-1 (North Parcel) From 2012 Through 2017 at the Big Muddy Site 12
3-3 Data Summary for T-2 (South Parcel) From 2012 Through 2017 at the Big Muddy Site 13
3-4 Total Wetland Acres Delineated From 2011 Through 2017 at the Big Muddy Site 16
3-5 Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2017 17
3-6 Functions and Values of the Big Muddy Site From 2011 Through 2012 and 2014 Through 2017 19
3-7 Wetland Crediting and Performance Standard Summary for the Original Big Muddy Creek Site 22
3-8 Summary of Performance Standards for Big Muddy Credit Areas 24
3-9 Summary of Wetland Credits From 2011 Through 2017 at the Big Muddy Site 25

LIST OF FIGURES

FIGURE PAGE

1-1 Project Location of the Big Muddy Creek Site 2

LIST OF CHARTS

CHART PAGE

3-1 Transect Map Showing Community Types on T-1 (North Parcel) From 2012 Through 2017..... 12
3-2 Length of Habitat Types Within T-1 (North Parcel) From 2012 Through 2017 at the Big Muddy Site..... 13
3-3 Transect Map Showing Community Types on T-2 (South Parcel) From 2012 Through 2017 From Start to Finish at the Big Muddy Site..... 14
3-4 Length of Habitat Types Within T-2 (South Parcel) From 2012 Through 2017 at the Big Muddy Site..... 14

LIST OF APPENDICES

APPENDIX A. PROJECT AREA MAPS A-1
APPENDIX B. MONITORING FORMS..... B-1
APPENDIX C. PROJECT AREA PHOTOGRAPHS C-1
APPENDIX D. PROJECT PLAN SHEETS..... D-1

Cover: View looking northwest from Photo-Point 1.

1.0 INTRODUCTION

The north parcel of the Big Muddy Creek Wetland Mitigation Site was completed in spring 2011 and the south parcel was completed in 2012. This report presents the results of the seventh year of post-construction monitoring at the north parcel and the sixth year at the south parcel. Because the site has met all performance and acreage goals, 2017 is the final year of monitoring at this site. This Montana Department of Transportation (MDT) wetland mitigation project is located 4 miles west of Culbertson, on US Highway 2, in Section 21, Township 28 North, Range 55 East, Roosevelt County, Montana, as illustrated in Figure 1-1. The overall size of the site was modified in 2012 to provide compensatory mitigation for unavoidable impacts associated with the MDT Brockton – East project. The original mitigation area consisted of 10.62 acres located on the north side of US Highway 2. An additional 7.25 acres located south of US Highway 2 were added in 2012. The total mitigation area monitored since 2012 has been approximately 17.9 acres. The monitoring criteria and protocols contained in the wetland mitigation and monitoring plan submitted on April 12, 2010, remain as originally submitted and are discussed below.

Figures A-2 and A-3 in Appendix A show the 2017 monitoring activity locations and mapped site features, respectively. The MDT Mitigation Site Monitoring form [Berglund and McEldowney, 2008], US Army Corps of Engineers (USACE) Wetland Determination Data forms for the Great Plains (GP) Region [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] are included in Appendix B. Project site photographs are included in Appendix C, and the project plan sheets are provided in Appendix D.

The site is situated within Watershed #12 – the Lower Missouri River Basin. MDT completed an initial feasibility study in August 2009. MDT staff completed a baseline delineation and MWAM in June 2010.

Approximately 0.73 acre of wetlands was delineated within the project boundary as part of the baseline assessment completed in June 2010. The wetlands encompassed an inundated, emergent marsh that extended from the banks of an unnamed tributary to Big Muddy Creek, as well as a narrow emergent wet meadow that extended from the marsh into upland habitat.

The original mitigation goals were to create and preserve wetland habitat functions associated with riverine and emergent wetlands on the Big Muddy Creek tributary floodplain. The project objectives for the north parcel include the following:

- Maximize the development of emergent and aquatic bed wetlands, general wildlife habitat, short- and long-term surface-water storage, sediment/nutrient/toxicant removal, and production export/food chain support
- Create up to approximately 9.32 acres of wetland
- Preserve approximately 0.73 acre of wetland through permanent protection and weed management
- Preserve a protected, managed 0.43-acre upland buffer adjacent to site wetlands
- Minimize site operation and maintenance requirements.

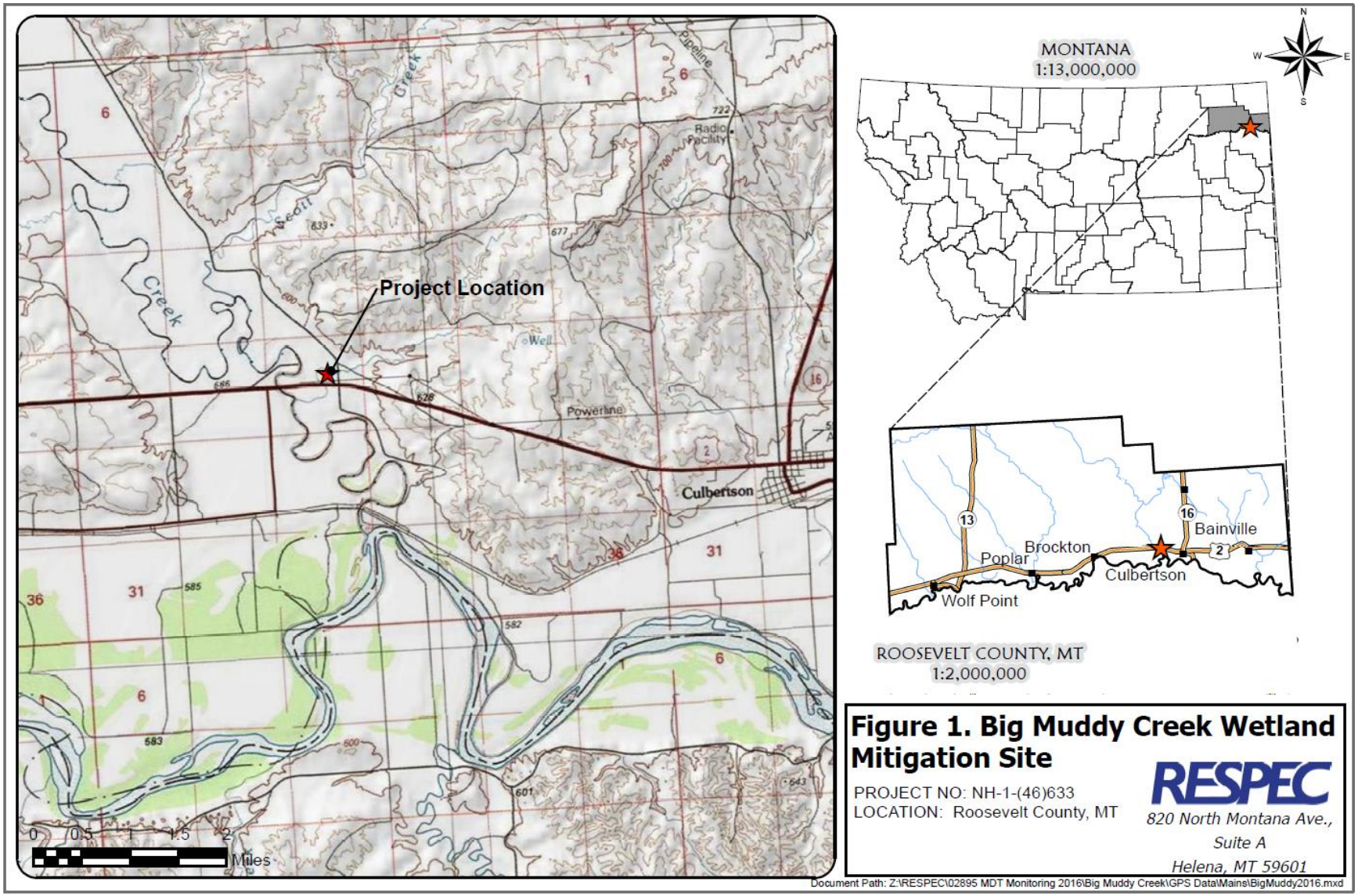


Figure 1-1. Project Location of the Big Muddy Creek Site.

The original mitigation plan proposed creating 6.53 acres of emergent/aquatic bed shallow marsh within three wetland cells. The cells were to be excavated to intersect groundwater and provide water depths that ranged from 0.5 to 2 feet. Additional hydrology was to be provided by direct precipitation and snowmelt. Up to 1.76 additional acres of emergent wetland were expected to form in the excavated areas between the three cells. The excavation was expected to facilitate saturation of the root zone via capillary action during the spring and early summer of most years. The potential passive development of approximately 1.03 acres of emergent wet meadow that is located at the north boundary and adjacent to the existing wet meadow was to be facilitated by increasing and augmenting hydrology to the south within the excavated cells.

The monitoring area was increased in 2012 to include an additional 7.25-acre parcel located to the south of US Highway 2. This revised mitigation area was incorporated into the original mitigation plan to include the unavoidable wetland impacts associated with the MDT Brockton – East project. This revision included constructing a 5.47-acre wetland depression within the south parcel in 2011 along the floodplain of an unnamed tributary to Big Muddy Creek in an area that was delineated as upland in April 2010. According to an MDT letter to Mr. Todd Tillinger of the USACE dated June 14, 2010 [Tillinger, 2010], this revision was a clerical and mathematical revision based on MDT's decision to let the MDT Brockton – East and Big Muddy Creek – West projects proceed at the same time and to construct them concurrently. A 1.83-acre preexisting wetland was located in the south parcel monitoring area and was included in the preservation credit category in 2012.

The performance standards for each mitigation feature are included in Section 3.9 of this report. The project credit ratios that were approved by the USACE and presented in the *Big Muddy Creek Wetland Mitigation Plan* [Atkins and Post, Buckley, Schuh, & Jernigan, 2011] are also shown in Section 3.9. The construction of the Big Muddy mitigation project was authorized under the authority of Section 404 of the Clean Water Act via permit NWO-2009-01515-MTB.

2.0 METHODS

The 2017 monitoring event was completed on July 12, 2017. Information for the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and are illustrated on Figure A-2 (Appendix A). Data-collection activities included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird- and wildlife-use documentation, photographic documentation, functional assessment, and a nonengineering examination of the infrastructure established within the mitigation project area.

2.1 HYDROLOGY

The presence of hydrological indicators as outlined on the Wetland Determination Data form was assessed at four data points established within the project area. The hydrologic indicators were evaluated according to features observed in situ during the site visit. The data were recorded on the Wetland Determination Data forms (Appendix B). Hydrologic assessments allow mitigation goals that address inundation and saturation requirements to be evaluated.

Technical criteria for wetland hydrology guidelines have been established as “permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season” [USACE, 2010]. Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is defined for purposes of this report as the number of days when a 50 percent probability exists that the minimum daily temperature is greater than or equal to 28.5 degrees Fahrenheit [USACE, 2010]. The growing season that was recorded for the predominant soil map units (Havrelon loam and Lohler silty clay) averages 113 days [US Department of Agriculture, 2011]. Areas that are defined as wetlands would require 14 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits that were excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded on the Wetland Determination Data forms (Appendix B). A pair of groundwater monitoring wells are located within the monitoring area, one each on the north and south parcels (Figure A-2, Appendix A). These wells have not been monitored regularly by MDT and were not monitored in 2017.

2.2 VEGETATION

The boundaries of general dominant-species-based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2017 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (< 1 percent), 1 (1–5 percent), 2 (6–10 percent), 3 (11–20 percent), 4 (21–50 percent), and 5 (> 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure A-3, Appendix A).

Temporal changes in vegetation were evaluated through annual assessments of a static belt transect established in August 2011 and an additional transect established in 2012 (Figure A-2, Appendix A). Vegetation composition was assessed and recorded along two approximately 10-foot-wide belt transects (T-1 and T-2) that were 647 feet long and 366 feet long, respectively (Figure A-2, Appendix A). The transect endpoints were recorded with a resource-grade GPS unit.

Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges that were used for the vegetation community polygon data (Appendix B). Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The *Montana Noxious Weed List* (February 2017), prepared by the Montana Department of Agriculture [2015], was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photograph with noxious weed species color-coded (Figure A-3, Appendix A). Cover classes are represented by a T, L, M, or H, which represent less than 1 percent, 1–5 percent, 6–25 percent, and 26–100 percent, respectively. Before the 2017 field season, monitoring crews attended a 1-day training hosted by MDT to ensure that field staff are adequately trained in judging total percent cover of noxious weeds both at the individual infestation level and

across entire sites. The total cover by noxious weeds overall across the site was estimated based on the noxious weed cover classes and project acreage.

2.3 SOIL

Soil information was obtained from the *Web Soil Survey for Roosevelt County, Montana* [US Department of Agriculture, 2011] and in situ soil descriptions. Soil cores were excavated by using a Montana sharpshooter shovel and evaluated according to procedures outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and the 2010 *Regional Supplement to the Corps of Engineers Manual: Great Plains Region* (2010 GP Regional Supplement) [USACE, 2010]. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data form for each profile (Appendix B).

2.4 WETLAND DELINEATION

Waters of the US, including special aquatic sites and jurisdictional wetlands, were delineated throughout the project area according to criteria established in the 1987 Wetland Manual and the 2010 GP Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology that were described in the 2010 *Regional Supplement to the Corps of Engineers Manual: Great Plains Region* (2010 GP Regional Supplement) [USACE, 2010] must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2016 National Wetland Plant List (NWPL) [Lichvar et al., 2016]. A routine level-2 on-site determination method [Environmental Laboratory, 1987] was used to delineate jurisdictional areas within the project boundaries. The information was recorded onto Wetland Determination Data forms (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site (i.e., mudflat). The wetland boundary was surveyed and identified on the 2017 aerial photographs. Wetland areas were calculated using GIS methods.

2.5 WILDLIFE

Observations and other positive indicators of use by mammal, reptile, amphibian, and bird species were recorded on the Wetland Mitigation Site Monitoring forms during each of the site visits. Indirect-use indicators, including tracks, scat, burrows, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list of animals observed from 2011 through 2017 was compiled for this report.

2.6 FUNCTIONAL ASSESSMENT

The MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate functions and values on the sites. This method provides an objective means of assigning an overall rating to wetlands and provides regulators with a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values [Berglund and McEldowney, 2008]. Field data for this assessment were collected during the site visit. MWAM forms were completed for four assessment areas (AAs), the created wetlands (north/south) and the existing wetlands (Appendix B).

2.7 PHOTOGRAPHIC DOCUMENTATION

Monitoring at photo points provided supplemental information that documented wetland, upland, and transect conditions; site trends; and current land uses that surround the site. Photographs were taken at established photo points throughout the site during the site visit (Appendix C). Photo-point locations were recorded with a resource-grade GPS unit (Figure A-2, Appendix A).

2.8 GLOBAL POSITIONING SYSTEM DATA

Site features and survey points were collected using a resource-grade (± 1 meter) Trimble R1 GNSS GPS receiver and companion Android tablet during the 2017 monitoring season. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included wetland boundaries, fence boundaries, photo points, transect endpoints, noxious weed infestations, and wetland data points.

2.9 MAINTENANCE NEEDS

Channels, engineered structures, fencing, and other man-made features were examined during the site visit for obvious signs of breaching, damage, or other problems. This examination was cursory and did not constitute an engineering-level structural inspection.

3.0 RESULTS

3.1 HYDROLOGY

Climate data from the meteorological station at Culbertson Coop, Montana (242122), recorded an average annual precipitation rate of 13.6 inches from December 1900 to August 2017 [Western Regional Climate Center, 2017]. The annual precipitation recorded in the years 2010, 2011, 2012, 2013, 2014, 2015, and 2016 was 20.53, 17.43, 12.44, 19.82, 12.51, 13.18, and 17.75 inches, respectively. The historic precipitation average from January to August 31 was 10.63 inches. Precipitation in recent years for the same period was 16.77 (2010), 15.39 (2011), 8.98 (2012), 11.25 (2013), 10.73 (2014), 10.46 (2015), 11.28 inches (2016), and 5.13 (2017). These data suggest that the region received above-average precipitation in 2010 and 2011, below-average precipitation in 2012 and 2017, and near-average precipitation from 2013 through 2016. Precipitation at this location in 2017 through August (5.13 inches) was 5.5 inches below the long-term average of 10.63 inches.

Precipitation and infrequent flooding of the unnamed tributary of Big Muddy Creek drive hydrology at the Big Muddy site.

Less than 1 percent of the entire site was inundated during the 2016 and 2017 field surveys, which is a significant reduction from previous monitoring years (15 percent in 2015). The excavated cells in the north parcel had no standing water during the 2017 monitoring for the second time since monitoring began in 2010. Many areas defined as wetlands across both sides of the mitigation area were not inundated but exhibited periodic saturation within 12 inches (1.0 foot) of the ground. Other signs of hydrology included water marks, salt crust, geomorphic position, positive FAC-neutral test, inundation and saturation visible on aerial imagery, and surface soil cracks. Both the north and south parcels receive periodic overbank flow from the unnamed tributary during spring flows. Evidence of this happening in 2017 was lacking from both sites during monitoring. The constructed wetlands and adjacent stream are hydrologically connected via groundwater. Nearby, Big Muddy Creek appeared to be running at well-below-average levels during the July site visit, which is likely a result of well-below-average precipitation in the region between December and July in the watershed. In coordination with the Montana Governor's Drought and Water Supply Advisory Committee, the Montana State Library publishes monthly maps of moisture by county. The July 2017 map shows Roosevelt County to be Extremely Dry. Additionally, the governor of Montana issued Executive Order 5-2017 on June 23, 2017, declaring a drought emergency to exist in northeast Montana. Later, under Executive Order No. 6-2017, the governor declared a drought disaster in Roosevelt County and 13 other counties in NE Montana [DNRC, 2017].

Four data points (DP-1W, DP-1U, DP-2U, and DP-2W) were sampled to determine the wetland and upland boundaries. DP-1W and DP-2W are located in areas that met the wetland criteria. DP-1W is located in the excavated basin south of the highway, and DP-2W is located in a concave, depressional salt flat in the north parcel. Evidence of positive wetland hydrology at DP-1W included a salt crust, surface soil cracks, geomorphic position, and a positive FAC-neutral test. Wetland hydrology indicators at DP-2W included saturation to near the ground surface, water marks, salt crust, surface soil cracks, saturation visible on aerial imagery, geomorphic position, and a positive FAC-neutral test. No primary or secondary indicators of wetland hydrology were observed at DP-1U or DP-2U, which are located upslope of DP-1W and DP-2W, respectively.

3.2 VEGETATION

Monitoring year 2017 marked the seventh year of post-construction monitoring at the north parcel and the sixth year at the south parcel of the Big Muddy Creek site. A total of 75 plant species were observed site wide from 2011 through 2017, as provided in Table 3-1. Vegetation plant communities were mapped and named by plant composition and dominance. The nine communities that were identified in 2017 and complete lists of the associated species are included on the Wetland Mitigation Site Monitoring form (Appendix B) and the mapped communities shown on Figure A-3 (Appendix A).

Table 3-1. Vegetation Species Observed From 2011 Through 2017 at the Big Muddy Site (Page 1 of 2)

Scientific Names	Common Names	GP Indicator Status[a]
Achillea millefolium	Common Yarrow	FACU
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FACW
Apocynum cannabinum	Indian Hemp	FAC
Aquatic macrophytes	Aquatic macrophytes	NL
Artemisia cana	Coaltown Sagebrush	FACU
Artemisia frigida	Fringed Sage	NL
Artemisia tridentata	Big Sagebrush	NL
Aster sp.	Aster	NL
Astragalus sp.	Milkvetch	NL
Atriplex suckleyi	Suckley's Saltbush	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bouteloua dactyloides	Buffalo Grass	FACU
Bouteloua gracilis	Blue Gramma	NL
Bromus inermis	Smooth Brome	UPL
Carex aquatilis	Leafy Tussock Sedge	OBL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	NL
Distichlis spicata	Coastal Salt Grass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Equisetum arvense	Field Horsetail	FAC
Fraxinus pennsylvanica	Green Ash	FAC
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Iva axillaris	Deer-Root	FAC
Juncus balticus	Baltic Rush	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lactuca tatarica	Russian Blue Lettuce	UPL
Lemna minor	Common Duckweed	OBL
Lepidium densiflorum	Miner's Pepperwort	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	Prairie Flax	NL
Lupinus argenteus	Silvery Lupine	NL
Lycopus americanus	Cut-Leaf Water-Horehound	OBL

Table 3-1. Vegetation Species Observed From 2011 Through 2017 at the Big Muddy Site (Page 2 of 2)

Scientific Names	Common Names	GP Indicator Status[(a)]
Medicago sativa	Alfalfa	UPL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Nassella viridula	Green Needlegrass	NL
Opuntia polyacantha	Plains Pricklypear	NL
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa arida	Prairie Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FACU
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus deltoides	Eastern Cottonwood	FAC
Populus tremuloides	Quaking Aspen	FAC
Potentilla anserina	Silverweed	FACW
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rosa woodsii	Woods' Rose	FACU
Rumex crispus	Curly Dock	FAC
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus americanus	Chairmaker's Club-Rush	OBL
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Scutellaria galericulata	Hooded Skullcap	OBL
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	Freshwater Cord Grass	FACW
Suaeda calceoliformis	Paiuteweed	FACW
Symphoricarpos albus	Common Snowberry	UPL
Symphyotrichum laeve	Smooth Blue American-Aster	FACU
Taraxacum officinale	Common Dandelion	FACU
Teucrium canadense	American Germander	FACW
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-Beard	NL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Vicia americana	American Purple Vetch	FACU

(a) 2016 NWPL [Lichvar et al., 2016].
New species that were identified in 2017 are **bolded.**

Five vegetation communities were observed on the north parcel in 2017 and included four wetland types and one upland type. Wetland types that have (N) or (S) after the name indicates that the community type is specific to the north or south parcels, respectively.

- Wetland Type 3 – *Schoenoplectus* spp.
- Wetland Type 4 – *Spartina pectinata/ Schoenoplectus* spp.

- Wetland Type 9 – *Puccinellia nuttalliana*/*Iva axillaris*
- Wetland Type 15 – Bare Ground/*Schoenoplectus* meritimus
- Upland Type 16 – *Bromus inermis*/*Pascopyrum smithii*.

Type 16 represented the drier areas that border the excavated depressions. All of the cells on the north parcel lacked standing water in 2017, so community Type 18 – Open Water/*Schoenoplectus* spp. was absent from the site. Aerial photos from June 26, 2017 show standing water and inundation in the western and eastern cells and the ground surface was cracked during the July field survey, indicating that surface water and inundation was present earlier in the growing season.

Three vegetation communities were observed on the south parcel in 2017: two wetland types and one upland type.

- Wetland Type 12 – *Puccinellia nuttalliana/Iva axillaris*
- Wetland Type 17 – *Teucrium canadense/Chenopodium album*
- Upland Type 14 – *Agropyron cristatum/Bromus inermis*.

The excavated depression in the south parcel was dry during the July 2017 monitoring event but had surface soil cracks in some areas, indicating that inundation was likely present towards the ground surface earlier in the growing season. Extreme drought conditions prevented this site from retaining water into the summer and fall periods. Communities in the north and south parcels are discussed below.

Wetland community Type 3 – *Schoenoplectus* spp. replaced upland community Type 1 – *Elymus* spp. and upland Type 2 – *Chenopodium album* in 2013. The community was identified on 1.81 acres of the north parcel in 2017 and generally included the emergent vegetation found along the margins of the constructed cells. This community type expanded in 2017 because of 2 consecutive years of low water levels in the excavated cells. Dominant species included saltmarsh club-rush (*Schoenoplectus maritimus*), hard-stem club-rush (*Schoenoplectus acutus*), Chairmaker's club-rush (*Schoenoplectus americanus*), coastal saltgrass (*Distichlis spicata*), freshwater cordgrass (*Spartina pectinata*), and broad-leaf cat-tail (*Typha latifolia*). The cover class for bare ground was estimated at 6–10 percent. A natural recruitment area that consisted of Eastern cottonwood (*Populus deltoides*) and willow (*Salix* spp.) seedlings and saplings was identified along the eastern boundary of this community.

Wetland community Type 4 – *Spartina pectinata/Schoenoplectus* spp. characterized 0.78 acre of the preexisting wetland community, adjacent to the unnamed tributary to Big Muddy Creek that parallels the western and northern boundaries of the north parcel. The vegetation was dominated by freshwater cordgrass, saltmarsh club-rush, hard-stem club-rush, field sow-thistle (*Sonchus arvensis*), creeping meadow-foxtail (*Alopecurus arundinaceus*), fox-tail barley (*Hordeum jubatum*), and six other species observed at less than 5 percent cover. Inundated areas were observed in this community during the 2016 site visit, with water levels that ranged from 0 to 1.0 foot deep.

Wetland community Type 9 – *Puccinellia nutalliana/Iva axillaris* (N) was identified on 3.80 acres of wetland located within the excavated areas between the constructed cells on the northern side of US Highway 2. This community replaced wetland Type 5 – *Puccinellia nutalliana/Chenopodium album*

in 2013 because of the shift in dominance from lamb's quarters (*Chenopodium album*) to deer-root (*Iva axillaris*). The vegetation cover was dominated by Nuttall's alkali grass (*Puccinellia nutalliana*), deer-root, western-wheat grass (*Pascopyrum smithii*), and coastal salt grass (*Distichlis spicata*), and 16 other species. This community increased in 2016 into the northernmost excavated cell on the north parcel, which is experiencing a gradual drying out.

Wetland community Type 12 – *Puccinellia nutalliana/Iva axillaris* (S) now represents 5.7 acres of the south parcel, which includes the excavated wetland depression and areas north and northeast of the constructed cell. Dominant species included Nuttall's alkali grass, deer-root, fox-tail barley, and seven other species.

Wetland community Type 15 – Bare Ground/*Schoenoplectus* meritimus was observed on 1.75 acres in 2017 and is located in the two southern cells of the north parcel. The community was not inundated during the July 2017 monitoring event, although several indicators of wetland hydrology provided evidence that the extent of inundation was greater earlier in the growing season. Bare ground represented more than 50 percent of the excavated depression. Dominant species included saltmarsh club-rush and Nuttall's alkali grass, with lesser cover from coastal saltgrass, fox-tail barley, and paiuteweed (*Suaeda caleoliformis*). Areas that were identified as Type 15 in 2017 had been identified as Type 18 – Open Water/*Schoenoplectus* spp. in previous years.

Wetland community Type 17 – *Teucrium canadense/Chenopodium album* was identified on 0.3 acre along the existing wetland fringe, west of the excavated depression on the south parcel. The vegetation was dominated by American germander (*Teucrium canadense*), lamb's quarters, freshwater cordgrass, Russian blue lettuce (*Lactuca tatarica*), common spike-rush (*Eleocharis palustris*), and 14 other species.

Upland community Type 14 – *Agropyron cristatum/Bromus inermis* characterized the 1.25-acre upland located south and east of the constructed cell on the south parcel. Dominant species included crested wheatgrass (*Agropyron cristatum*), smooth brome (*Bromus inermis*), deer-root, and 16 other species.

Upland community Type 16 – *Bromus inermis/Pascopyrum smithii* was identified on 2.49 acres, which is an increase of 0.14 acre since 2014 and represents the drier areas that border the excavated depressions in the north parcel. This community replaced upland Type 8 – *Bromus inermis/Agropyron cristatum* because species composition and their associated cover classes had shifted during the 2015 survey. The vegetation was dominated by smooth brome, western wheatgrass, crested wheatgrass, deer-root, curly-cup gumweed (*Grindelia squarrosa*), and 21 other species.

Vegetation community transitions were measured along a 647-foot transect (T-1) for the northern half of the site and a 366-foot transect (T-2) for the southern half of the site (Figure A-2, Appendix A). T-1 intersected three vegetation communities, including wetland Types 3 – *Schoenoplectus* spp. and 9 – *Puccinellia nuttalliana/Iva axillaris*, and upland Type 16 – *Bromus inermis/Pascopyrum smithii*. The data recorded on T-1 are summarized in tabular and graphical formats in Table 3-2 and Charts 3-1 and 3-2, respectively. Because of low groundwater levels during the 2017 monitoring event, vegetation community changes occurred along T-1 with community Type 3 increasing from 4 percent in 2016 to

23 percent in 2017. Wetland Type 15 – Bare Ground/*Schoenoplectus* maritimus decreased from 19 percent in 2016 to 0 percent in 2017. The percent of upland community that was identified along the transect decreased from 30.1 percent in 2012 to 19.6 percent in 2017, which reflects the transition from upland to wetland vegetation cover.

Table 3-2. Data Summary for T-1 (North Parcel) From 2012 Through 2017 at the Big Muddy Site

Monitoring Year	2012	2013	2014	2015	2016	2017
Transect Length (feet)	**647**	**647**	**647**	**647**	**647**	**647**
Vegetation Community Transitions Along Transect	11	11	11	11	8	6
Vegetation Communities Along Transect	4	3	4	5	4	3
Hydrophytic Vegetation Communities Along Transect	2	2	2	4	3	2
Total Vegetative Species	24	20	25	29	21	18
Total Hydrophytic Species	11	9	10	12	10	10
Total Upland Species	13	11	15	17	11	8
Estimated % Total Vegetative Cover	50	70	70	70	70	85
Estimated % Unvegetated	50	30	30	30	30	15
% Transect Length Comprising Hydrophytic Vegetation Communities	32.1	49.8	51.6	83.0	80	80
% Transect Length Comprising Upland Vegetation Communities	30.1	18.1	18.1	17.0	20	20
% Transect Length Comprising Unvegetated Open Water	37.7	32.1	20.1	0	0	0
% Transect Length Comprising Mudflat	0.0	0.0	10.2	0	0	0

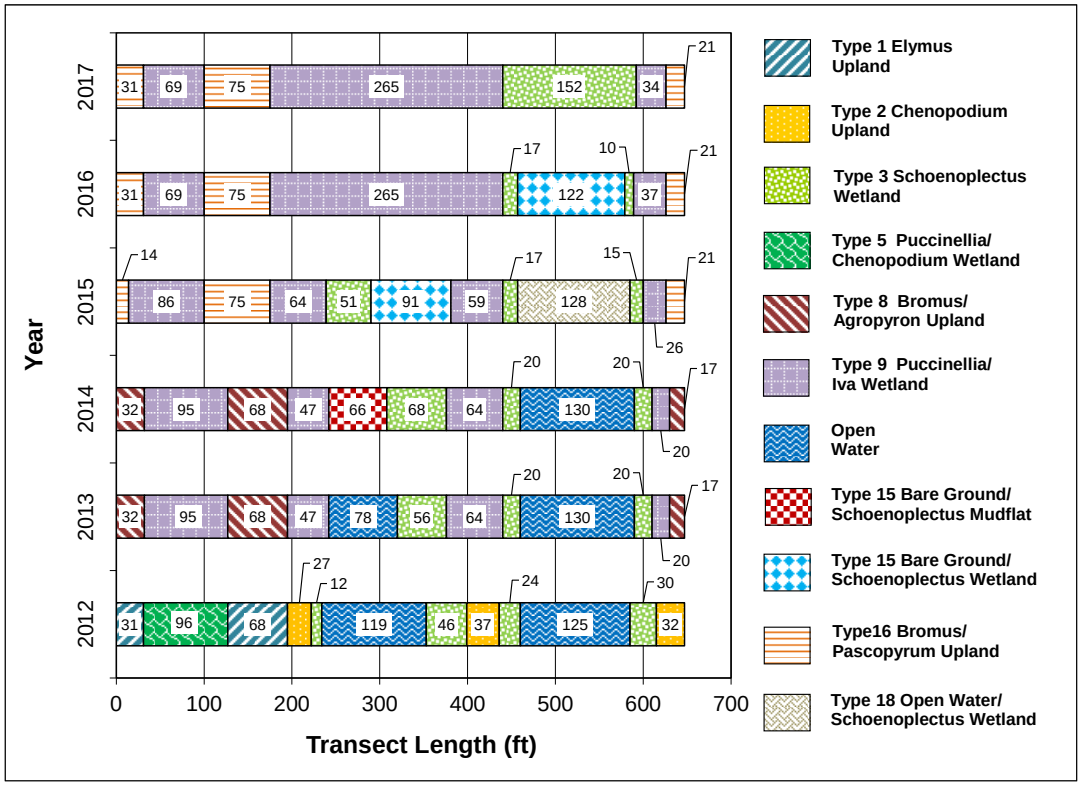


Chart 3-1. Transect Map Showing Community Types on T-1 (North Parcel) From 2012 Through 2017.

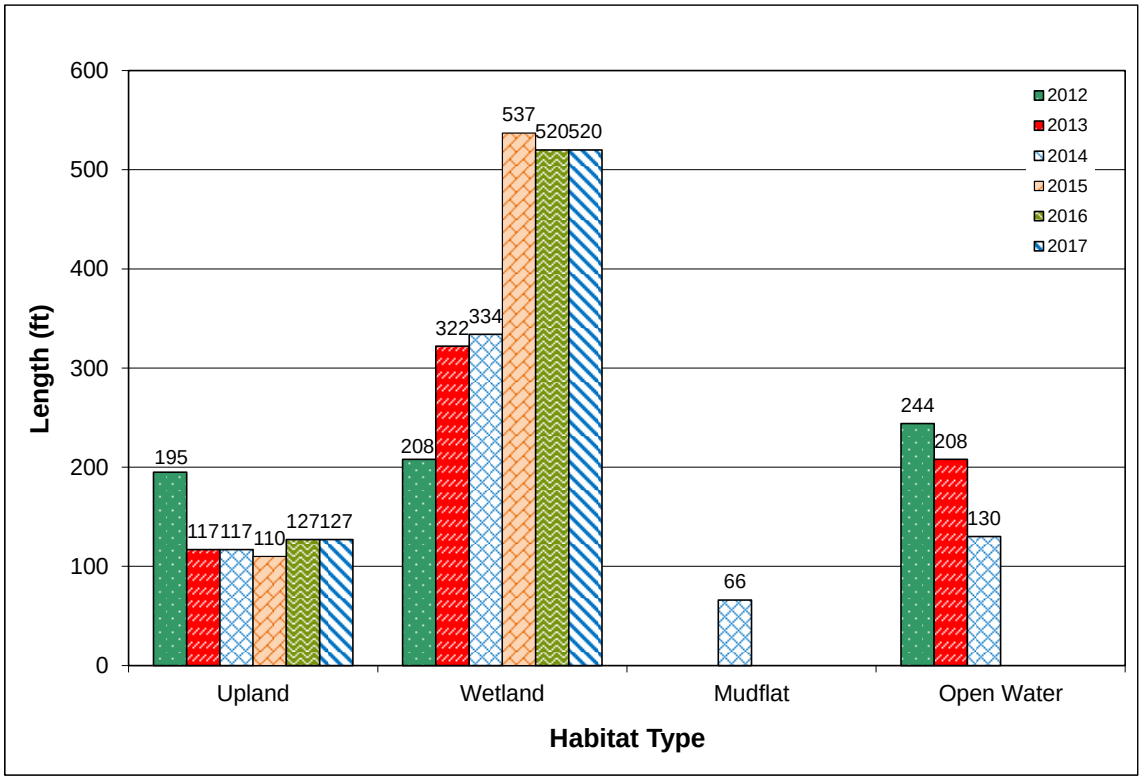


Chart 3-2. Length of Habitat Types Within T-1 (North Parcel) From 2012 Through 2017 at the Big Muddy Site.

Table 3-3. Data Summary for T-2 (South Parcel) From 2012 Through 2017 at the Big Muddy Site

Monitoring Year	2012	2013	2014	2015	2016	2017
Transect Length (feet)	**366**	**366**	**366**	**366**	**366**	**366**
Vegetation Community Transitions Along Transect	2	2	2	2	2	2
Vegetation Communities Along Transect	3	3	3	3	3	3
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	21	18	17	15	16	16
Total Hydrophytic Species	11	10	7	4	4	4
Total Upland Species	10	8	10	11	12	12
Estimated % Total Vegetative Cover	90	95	95	95	95	95
Estimated % Unvegetated	10	5	5	5	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	91.3	91.8	91.8	91.8	91.8	91.8
% Transect Length Comprising Upland Vegetation Communities	8.7	8.2	8.2	8.2	8.2	8.2
% Transect Length Comprising Unvegetated Open Water	0.0	0.0	0	0	0	0
% Transect Length Comprising Mudflat	0.0	0.0	0	0	0	0

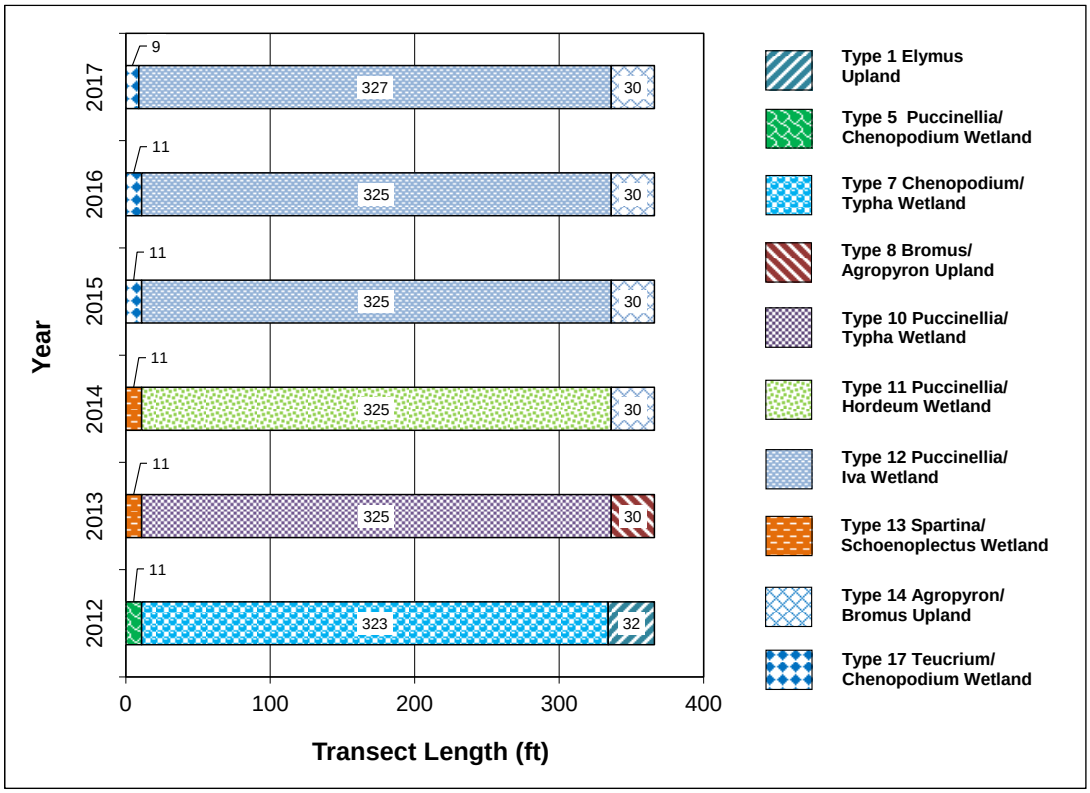


Chart 3-3. Transect Map Showing Community Types on T-2 (South Parcel) From 2012 Through 2017 From Start to Finish at the Big Muddy Site.

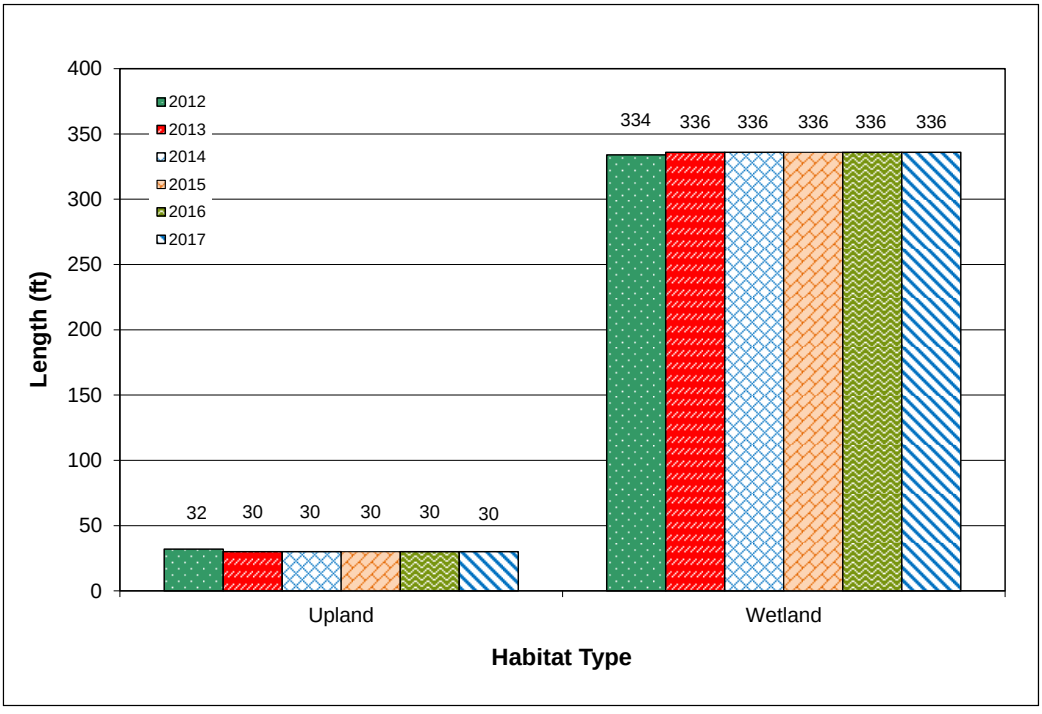


Chart 3-4. Length of Habitat Types Within T-2 (South Parcel) From 2012 Through 2017 at the Big Muddy Site.

Two infestations of Canada thistle (*Cirsium arvense*), which is a Priority 2B noxious weed, were observed at the northeast edge of the unnamed tributary on the north parcel. The infestations included trace and moderate cover classes. The Canada thistle and field bindweed infestations previously noted on the south parcel were not identified during the 2017 field survey. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds at each site. No woody species were installed at either location within this site. A natural recruitment area that consists of Eastern cottonwood (*Populus deltoides*) and willow (*Salix* spp.) seedlings and saplings was identified within wetland Type 3 in the north parcel from 2013 through 2017. In 2017, the seedlings appeared to be healthy and showed little signs of herbivory, although growth has been slow.

3.3 SOIL

The project site was mapped in the *Web Soil Survey for Roosevelt County, Montana* [US Department of Agriculture, 2011]. Three soil series were mapped within the monitoring area and include the Havrelon loam, Lallie silty clay, and Lohler silty clay. The Havrelon loam was mapped primarily in the preexisting wetland areas in the north parcel. This series is a moderately well-drained loam that is taxonomically classified as a frigid Typic Ustifluvents. The Havrelon series is found on floodplains of major streams and tributaries. The Lohler silty clay is a slowly permeable soil that is taxonomically classified as a frigid Vertic Ustifluvents and mapped across the majority of both monitoring parcels. This soil is mainly found on floodplains. The Lallie series consist of very deep, poorly drained, slowly permeable soils formed in lake basins and old oxbows. This series was mapped along the west boundary of the site that surrounds the unnamed tributary of Big Muddy Creek. The three soil map units are included on the *Montana Hydric Soils List* [US Department of Agriculture, 2014].

Soil test pits were excavated at four locations, all of which were within what was originally mapped as the Lohler silty clay soil series (DP-1W, DP-1U, DP-2U, and DP-2W; Figure A-2, Appendix A). The presence of the Lohler silty clay soil series was confirmed through observations at all four data points during the 2017 monitoring event. DP-1W and DP-2W are located in areas that met the wetland criteria. The upper horizon of the soil profile at DP-1W revealed 8 inches of dark (10YR 3/1) silty clay with 5 percent yellowish-red (5 YR 4/6) redox concentrations in the matrix. The lower horizon consisted of an olive brown (2.5Y 4/3) silty clay with 30 percent very dark gray (Gley 1 3/N) gleyed concentrations in the matrix. This soil met the criteria for redox dark surface and classification as a hydric soil. The soil profile at DP-2W revealed a dark grayish-brown (10YR 4/2) silty clay with 5 percent brown (7.5 YR 4/6) redox concentrations in the matrix. During previous surveys, this soil did not meet the criteria for any hydric soil indicators, likely because of its location in a recently constructed wetland where soils may have been too young to have formed hydric indicators [USACE, 2010]; however, in 2017 the percentage of redox concentrations had increased to 5 percent. This soil meets the National Technical Committee for Hydric Soils (NTCHS). The soil profile at DP-1U, which is located in the adjacent upland approximately 20 feet upslope of DP-1W, was a dark (10YR 3/1) silty clay loam. No hydric soil indicators were observed in this soil profile. The soil profile at DP-2U, which is located in the adjacent upland approximately 30 feet upslope of DP-2U, was a dark grayish-brown (10YR 4/2) silty clay. No hydric soil indicators were observed in this soil profile.

3.4 WETLAND DELINEATION

Two data points (DP-2U and DP-2W) located within the north parcel and two data points (DP-1W and DP-1U) in the south parcel were evaluated to confirm the wetland boundary determinations (Figure A-2, Appendix A; Wetland Determination Data forms, Appendix B). The 2017 wetland delineation identified a combined total of 14.12 acres of wetland/aquatic habitat at the north and south parcels, which is the same as 2016, and a decrease of 0.13 acre since 2014; this data is presented in Table 3-4. A total of 8.12 acres of wetland habitat was identified in the north parcel in 2017. The 6.0-acre extent of overall wetland and aquatic habitat in the south parcel remained constant from 2013 through 2017.

Table 3-4. Total Wetland Acres Delineated From 2011 Through 2017 at the Big Muddy Site

Wetland and Aquatic Habitat	2012 (acres)	2013 (acres)	2014 (acres)	2015 (acres)	2016 (acres)	2017 (acres)
Created Wetland – North Parcel	1.14	3.65	4.61	7.39	7.39	7.39
Preexisting Wetland – North Parcel	0.73	0.73	0.73	0.73	0.73	0.73
Open Water – North Parcel	5.05	3.87	2.91	0.00	0.00	0.00
Subtotal for North Parcel	**6.92**	**8.25**	**8.25**	**8.12**	**8.12**	**8.12**
Created Wetland – South Parcel	4.11	4.17	4.17	4.17	4.17	4.17
Preexisting Wetland – South Parcel	1.83	1.83	1.83	1.83	1.83	1.83
Open Water – South Parcel	0.00	0.00	0.00	0.00	0.00	0.00
Subtotal for South Parcel	**5.94**	**6.00**	**6.00**	**6.00**	**6.00**	**6.00**
Total	**12.87**	**14.25**	**14.25**	**14.12**	**14.12**	**14.12**

3.5 WILDLIFE

A comprehensive list of birds and other wildlife species that were observed directly or indirectly from 2011 through 2017 is presented in Table 3-5 and the site Wetland Mitigation Site Monitoring form (Appendix B). Twelve bird species as well as rabbit scat, deer tracks, and two plains garter snakes (*Thamnophis radix*) were observed in 2017. Wildlife observations in 2017 are bolded in Table 3-5.

3.6 FUNCTIONAL ASSESSMENT

The 2008 MWAM was used in the *Big Muddy Creek Wetland Mitigation Plan* [Atkins and Post, Buckley, Schuh, & Jernigan, 2011] to evaluate 8 acres of the existing riverine wetland associated with the tributary to Big Muddy Creek and 2 acres of the remnant wet meadow located north and south of the site. Both AAs extended outside the current project boundaries. The 2008 MWAM has also been used to evaluate the functional values of the mitigation wetlands from 2011 through 2017. These values are provided in Table 3-6. Four AAs were assessed in 2017 that included the created wetlands within the north parcel, preserved wetlands within the north parcel, created wetlands within the south parcel, and preserved wetlands within the south parcel. The created and preserved wetland AAs within the Big Muddy site were not separated by parcel (north/south) in 2012. The MWAM forms for the Big Muddy area that were completed in 2017 are located in Appendix B.

Table 3-5. Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2017 (Page 1 of 2)

Common Name	Scientific Name
Amphibian	
Boreal Chorus Frog	*Pseudacris maculata*
Northern Leopard Frog	*Rana pipiens*
Woodhouse's Toad	*Bufo woodhousii*
Mammal	
White-tailed Deer	*Odocoileus virginianus*
Deer sp.	***Odocoileus* sp.**
Muskrat	*Ondatra zibethicus*
Rabbit sp.	***unknown species***
Raccoon	*Procyon lotor*
Red Fox	*Vulpes vulpes*
Reptile	
Plains Garter Snake	***Thamnophis radix***
Prairie Rattlesnake	*Crotalus viridis*
Unknown Snake	
Bird	
American Avocet	*Recurvirostra americana*
American Coot	*Fulica americana*
American Goldfinch	*Spinus tristus*
American Pigeon	*Anas americana*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Blue-winged Teal	*Anas discors*
Brewer's Blackbird	***Euphagus cyanocephalus***
Cinnamon Teal	*Anas cyanoptera*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Yellowthroat	***Geothlypis trichas***
Eastern Kingbird	*Tyrannus tyrannus*
Franklin's Gull	*Leucophaeus pipixcan*
Gadwall	*Anas strepera*
Killdeer	***Charadrius vociferus***
Loggerhead Shrike	*Lanius ludovicianus*
Mallard	*Anas platyrhynchos*
Mourning Dove	***Zenaida macroura***
Northern Pintail	*Anas acuta*
Northern Shoveler	*Anas clypeata*
Red-tailed hawk	***Buteo jamaicensis***
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-necked Pheasant	***Phasianus colchicus***
Sparrow	*unknown species*
Spotted Sandpiper	***Actitis macularius***

Table 3-5. Wildlife Species Observed Within the Big Muddy Site From 2011 Through 2017 (Page 2 of 2)

Common Name	Scientific Name
Bird	
Swainson's Hawk	*Buteo swainsoni*
Tree Swallow	***Tachycineta bicolor***
Upland Sandpiper	***Bartramia longicauda***
Western Meadowlark	***Sturnella neglecta***
Western Sandpiper	*Calidris mauri*
Wilson's Phalarope	***Phalaropus tricolor***
Wilson's Snipe	*Gallinago delicata*
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*

Species that were identified in 2017 are **bolded.**

The north parcel Creation AA encompassed 7.39 acres and included the constructed wetland cells and excavated areas between the cells, which were characterized by wetland community Types 3 – *Schoenoplectus* spp., 9 – *Puccinellia nuttalliana/Iva axillaris*, 15 – Bare Ground/*Schoenoplectus* spp., and 18 – Open Water/*Schoenoplectus* spp. This AA was rated as a Category II wetland with 72 percent of the total possible points. Overall, the AA rates high for several wetland functions including production export/food chain support, short- and long-term surface-water storage, sediment/shoreline stabilization, and recreation/education potential. This AA achieved 53.21 total functional units in 2017.

The north parcel Preservation AA included 0.73 acre located within the floodway fringe of the existing tributary to Big Muddy Creek (wetland community Type 4 – *Spartina pectinate/Schoenoplectus* spp.). This AA was rated as a Category III wetland with 56 percent of the total possible points and 4.09 functional units in 2017. The AA received high ratings in 2017 for sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and recreation/education potential. The north parcel Creation and Preservation AAs scored 53.21 and 4.09 functional units, respectively. Combined, the north parcel Creation and Preservation AAs scored 57.30 functional units in 2017.

The south parcel Creation AA encompassed 4.17 acres within the footprint of the excavated wetland cell and was dominated by wetland community Type 12 – *Puccinellia nuttalliana/Iva axillaris*. The AA was rated as a Category III wetland with 61 percent of the total possible points and 25.44 functional units in 2017, the same as 2016. The AA received high ratings for short- and long-term surface-water storage, sediment/nutrient/toxicant removal, sediment/shoreline stabilization, and recreation/ education potential.

The south parcel Preservation AA identified in 2017 included 1.83 acres of existing wetland and 10.61 functional units. The AA was rated as a Category III wetland with 58 percent of the total possible points from 2013 through 2017. The seasonal/intermittent nature of the wetland hydrology within this AA was the primary factor that limited overall functional ratings. The AA received high ratings for sediment/shoreline stabilization, sediment/nutrient/toxicant removal, and recreation/education potential. The south parcel Creation and Preservation AAs scored 25.44 and 10.61 functional units, respectively. Combined, the south parcel Creation and Preservation AAs attained 36.05 functional units in 2017.

Table 3-6. Functions and Values of the Big Muddy Site From 2011 Through 2012 and 2014 Through 2017 (Page 1 of 2)

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2011 (Creation) AA-1	2011 (Preservation) AA-2	2012[a] (Creation) AA-1	2012[a] (Preservation) AA-2	2014 Creation North Parcel	2014 Preservation North Parcel	2014 Creation South Parcel	2014 Preservation South Parcel	2015 Creation North Parcel	2015 Preservation North Parcel
Listed/Proposed Threatened and Endangered (T&E) Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
Montana Natural Heritage Program (MTNHP) Species Habitat	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
General Wildlife Habitat	Mod (0.5)	High (0.9)	Mod (0.7)	High (0.9)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)
Short- and Long-Term Surface-Water Storage	High (1.0)	Mod (0.4)	High (1.0)	High (0.8)	High (1.0)	Low (0.3)	High (0.9)	Low (0.3)	High (1.0)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (0.9)	High (1.0)	High (0.9)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.3)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (0.9)	High (1.0)	High (1.0)	High (0.9)
Production Export/Food Chain Support	Mod (0.5)	High (0.9)	Mod (0.6)	High (1.0)	Mod (0.7)	Mod (0.4)	Mod (0.4)	Mod (0.7)	High (0.8)	Mod (0.4)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	High (1.0)	High (1.0)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (1.0)	Mod (0.7)
Uniqueness	Low (0.2)	Mod (0.4)	Low (0.2)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)	High (0.15)	High (0.15)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	**5.35/10**	**6.55/10**	**6.65/10**	**7.05/10**	**7.1/10**	**5.6/10**	**6.1/10**	**5.8/10**	**7.2/10**	**5.6/10**
% of Possible Score Achieved	**53.5%**	**65.5%**	**66.5%**	**70.5%**	**71.0%**	**56.0%**	**61.0%**	**58.0%**	**72.0%**	**56.0%**
Overall Category	**III**	**II**	**II**	**II**	**II**	**III**	**III**	**III**	**II**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**6.19**	**0.73**	**10.31**	**2.56**	**7.52**	**0.73**	**4.17**	**1.83**	**7.39**	**0.73**
Functional Units (acreage × actual points)	**33.12**	**4.78**	**68.56**	**18.05**	**53.39**	**4.09**	**25.44**	**10.61**	**53.21**	**4.09**

Table 3-6. Functions and Values of the Big Muddy Site From 2011 Through 2012 and 2014 Through 2017 (Page 2 of 2)

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	2015 Creation South Parcel	2015 Preservation South Parcel	2016 Creation North Parcel	2016 Preservation North Parcel	2016 Creation South Parcel	2016 Preservation South Parcel	2017 Creation North Parcel	2017 Preservation North Parcel	2017 Creation South Parcel	2017 Preservation South Parcel
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
General Wildlife Habitat	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (0.9)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)
Short- and Long-Term Surface-Water Storage	High (0.9)	Low (0.3)	High (1.0)	Low (0.3)	High (0.9)	Low (0.3)	High (1.0)	Low (0.3)	High (0.9)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (0.9)	High (1.0)	High (1.0)	High (1.0)	High (0.9)	High (1.0)	High (1.0)	High (1.0)	High (0.9)
Sediment/Shoreline Stabilization	High (0.9)	High (1.0)	High (0.9)	High (0.9)	High (0.9)	High (1.0)	High (1.0)	High (0.9)	High (0.9)	High (1.0)
Production Export/Food Chain Support	Mod (0.4)	Mod (0.7)	High (0.8)	Mod (0.4)	Mod (0.4)	Mod (0.7)	Mod (0.8)	Mod (0.4)	Mod (0.4)	Mod (0.7)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)	Low (0.3)	Mod (0.4)
Recreation/Education Potential (bonus points)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	**6.1/10**	**5.8/10**	**7.2/10**	**5.6/10**	**6.1/10**	**5.8/10**	**7.2/10**	**5.6/10**	**6.1/10**	**5.8/10**
% of Possible Score Achieved	**61.0%**	**58.0%**	**72.0%**	**56.0%**	**61.0%**	**58.0%**	**72.0%**	**56.0%**	**61.0%**	**58.0%**
Overall Category	**III**	**III**	**II**	**III**	**III**	**III**	**II**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**4.17**	**1.83**	**7.39**	**0.73**	**4.17**	**1.83**	**7.39**	**0.73**	**4.17**	**1.83**
Functional Units (acreage × actual points)	**25.44**	**10.61**	**53.21**	**4.09**	**25.44**	**10.61**	**53.21**	**4.10**	**25.44**	**10.62**

(a) 2012 AAs included wetland areas on both sides (north/south) of US Highway 2.

3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken at photo points 1 through 7 (PP1 through PP7), transect endpoints, and wetland determination data points are shown in Appendix C.

3.8 MAINTENANCE NEEDS

No diversion structures or nesting structures are currently installed at the site. Two infestations of Canada thistle, which is a Priority 2B noxious weed, were observed at the edge of the unnamed tributary in the northeast quadrant of the north site (Figure A-3, Appendix A). Weed coverage at both portions of the mitigation site is less than 1 percent. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds that were identified at each location and treatment to contain and control identified populations.

3.9 CURRENT CREDIT SUMMARY

Table 3-7 summarizes the originally proposed mitigation acreages, credit ratios, and scaled performance standards from the *Big Muddy Creek Wetland Mitigation Plan* [Atkins and Post, Buckley, Schuh, & Jernigan, 2011]. This table was modified in 2012 to include the additional acreages monitored within the south parcel. Table 3-8 presents a summary of the site's progress in relation to the established performance standards. Table 3-9 provides a breakdown of the credit acreages (based on the 2017 delineation) listed for each category scaled according to the credit criteria listed in Table 3-7. Each mitigation category has been divided into the respective parcels (north or south). The total credit acres accrued at the Big Muddy site in 2017 was 12.95 acres.

Table 3-7. Wetland Crediting and Performance Standard Summary for the Original Big Muddy Creek Site (Page 1 of 2)

	Compensatory Mitigation Type	USACE Mitigation Credit Ratio[a]	Proposed Acres	Preliminary Credit Estimate (acres)	Performance Standard 1	Performance Standard 2	Performance Standard 3	Scaled % Credit Criteria[b]
North Parcel	**Creation: Establishment[c] (area between cells [1.76 acres] and passive creation in northern tip of site [1.03 acres])**	1:1	1.03–2.79	1.03–2.79	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	Achieve 70% Absolute Cover of FAC or Wetter Plants	Noxious Weed Absolute Cover < 5%	Features constructed/implemented and: All standards met = 100% Standard 1 met and demonstrable progress on 2–3 = 70% Standard 1 not met but demonstrable progress on 1–3 = 50% Standard 1 met but lack of progress/ corrective action on 2–3 = 30% Standard 1 not met and no demonstrable progress/corrective Action = 0%
	Creation: Establishment (emergent marsh and open water in north parcel)	1:1	6.53	6.53	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Features constructed/implemented and: All standards met = 100% Standard 1 met and demonstrable progress on 2–3 = 70% Standard 1 not met but demonstrable progress on 1–3 = 50% Standard 1 met but lack of progress/ corrective action on 2–3 = 30% Standard 1 not met and no demonstrable progress/corrective Action = 0%
	Preservation (north parcel)	4:1	0.73	0.18	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	All standards met = 100% Standard 1 met and demonstrable progress on 3 = 75% Standard 1 not met but demonstrable progress on 1 and 3 = 50% Standard 1 met but lack of progress on 3 = 30% Standard 1 not met = 0%
	Upland Buffer (north parcel)	5:1	0.43	0.09	N/A	N/A	Noxious Weed Absolute Cover < 5%	Standard 3 met = 100% Standard 3 not met but with demonstrable progress = 30% Standard 3 not met with no demonstrable progress = 0%

Table 3-7. Wetland Crediting and Performance Standard Summary for the Original Big Muddy Creek Site (Page 2 of 2)

	Compensatory Mitigation Type	USACE Mitigation Credit Ratio[a]	Proposed Acres	Preliminary Credit Estimate (acres)	Performance Standard 1	Performance Standard 2	Performance Standard 3	Scaled % Credit Criteria[b]
South Parcel	**Creation: Establishment (emergent marsh and open water in south parcel)[d]**	1:1	5.47	5.47	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Features constructed/implemented and: All standards met = 100% Standard 1 met and demonstrable progress on 2–3 = 70% Standard 1 not met but demonstrable progress on 1–3 = 50% Standard 1 met but lack of progress/ corrective action on 2–3 = 30% Standard 1 not met and no demonstrable progress/corrective Action = 0%
	Preservation (south parcel)[d]	4:1	1.83	0.46	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	All standards met = 100% Standard 1 met and demonstrable progress on 3 = 75% Standard 1 not met but demonstrable progress on 1 and 3 = 50% Standard 1 met but lack of progress on 3 = 30% Standard 1 not met = 0%
	Upland Buffer (south parcel)	5:1	NA	NA	N/A	N/A	Noxious Weed Absolute Cover < 5%	Standard 3 met = 100% Standard 3 not met but with demonstrable progress = 30% Standard 3 not met with no demonstrable progress = 0%
	Total			**13.76–15.52 acres**				

(a) USACE, 2005.
(b) Percentages to be applied to credit estimate acres in Column 5.
(c) Incidentally created wetlands will be credited according to parameters listed under "Creation: Establishment."
(d) Areas added in 2012 have been included in preliminary wetland crediting and performance standard summary approved by the USACE for the Big Muddy wetland mitigation project.

Table 3-8. Summary of Performance Standards for Big Muddy Credit Areas

	Compensatory Mitigation Type	Performance Standard 1	Performance Standard 2	Performance Standard 3	Discussion
North Parcel	**Creation: Establishment[(a)] (area between cells [1.76 acres] and passive creation in northern tip of site [1.03 acres])**	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	Achieve 70% Absolute Cover of FAC or Wetter Plants	Noxious Weed Absolute Cover < 5%	Performance Standards 1, 2 and 3 met. Full credit allocated.
	Creation: Establishment (emergent marsh and open water in north parcel)	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Performance Standards 1, 2 and 3 met. Full credit allocated.
	Preservation (north parcel)	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	Performance Standards 1 and 3 met. Full credit allocated.
	Upland Buffer (north parcel)	N/A	N/A	Noxious Weed Absolute Cover < 5%	Performance Standard 3 met. Full credit allocated.
South Parcel	***Creation: Establishment[(b)] (emergent marsh and open water in south parcel)**	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria (excluding open water areas)	Achieve 70% Absolute Cover of FAC or Wetter Plants (excluding open water areas)	Noxious Weed Absolute Cover < 5%	Performance Standards 1, 2 and 3 met. Full credit allocated.
	***Preservation (south parcel)**	Satisfy 1987 Wetland Manual and 2010 GP Regional Supplement Wetland Hydrology Wetland Soils Hydrophytic Vegetation Criteria	N/A	Noxious Weed Absolute Cover < 5%	Performance Standards 1 and 3 met. Full credit allocated.
	Upland Buffer (south parcel)	N/A	N/A	Noxious Weed Absolute Cover < 5%	Performance Standard 3 met. Full credit allocated.

(a) Incidentally created wetlands will be credited according to parameters listed under "Creation: Establishment."
(b) Areas added in 2012 have been included in preliminary wetland crediting and performance standard summary approved by the USACE for the Big Muddy wetland mitigation project.

Table 3-9. Summary of Wetland Credits From 2011 Through 2017 at the Big Muddy Site (Page 1 of 2)

	Compensatory Mitigation Type	USACE Mitigation Credit Ratio	2011 Delineated Acres	Scaled % Credit Standards	2011 Credit Acres	2012 Delineated Acres	Scaled % Credit Standards	2012 Credit Acres	2013 Delineated Acres	Scaled % Credit Standards	2013 Credit Acres	2014 Delineated Acres
North Parcel	Wetland Creation: Establishment (area between constructed cells in north parcel)	1:1	0.44	70%	0.31	0.00	0%	0.00	1.76	70%	1.23	1.76
	Wetland Creation: Establishment (wetland cells in north parcel)	1:1	5.75	70%	4.03	5.76	70%	4.03	5.76	70%	4.03	5.76
	Wetland Preservation (north parcel)	4:1	0.73	100%	0.18	0.73	100%	0.18	0.73	100%	0.18	0.73
	Upland Buffer (north parcel)	5:1	3.70	100%	0.74	3.69	100%	0.74	2.37	100%	0.47	2.37
	North Subtotal		**10.62**	**–**	**5.26**	**10.18**		**4.95**	**10.62**		**5.92**	**10.62**
South Parcel	Wetland Creation: Establishment (wetland cell in south parcel)	1:1	–			4.55	70%	3.19	4.17	70%	2.92	4.17
	Wetland Preservation (south parcel)	4:1	–			1.83	100%	0.46	1.83	100%	0.46	1.83
	Upland Buffer (south parcel)	5:1	–			1.31	100%	0.26	1.25	100%	0.25	1.25
	South Subtotal					7.69		**3.90**	**7.25**		**3.63**	**7.25**
	Total		**10.62**		**5.26**	**17.87**		**8.86**	**17.87**		**9.55**	**17.87**

Table 3-9. Summary of Wetland Credits From 2011 Through 2017 at the Big Muddy Site (Page 2 of 2)

	Compensatory Mitigation Type	Scaled % Credit Standards	2014 Credit Acres	2015 Delineated Acres	Scaled % Credit Standards	2015 Credit Acres	2016 Delineated Acres	Scaled % Credit Standards	2016 Credit Acres	2017 Delineated Acres	Scaled % Credit Standards	2017 Credit Acres
North Parcel	**Wetland Creation: Establishment (area between constructed cells in north parcel)**	100%	1.76	1.63	100%	1.63	1.63	100%	1.63	1.63	100%	1.63
	Wetland Creation: Establishment (wetland cells in north parcel)	70%	4.03	5.76	100%	5.76	5.76	100%	5.76	5.76	100%	5.76
	Wetland Preservation (north parcel)	100%	0.18	0.73	100%	0.18	0.73	100%	0.18	0.73	100%	0.18
	Upland Buffer (north parcel)	100%	0.47	2.50	100%	0.50	2.50	100%	0.50	2.50	100%	0.50
	North Subtotal		**6.45**	**10.62**		**8.07**	**10.62**		**8.07**	**10.62**		**8.07**
South Parcel	**Wetland Creation: Establishment (wetland cell in south parcel)**	100%	4.17	4.17	100%	4.17	4.17	100%	4.17	4.17	100%	4.17
	Wetland Preservation (south parcel)	100%	0.46	1.83	100%	0.46	1.83	100%	0.46	1.83	100%	0.46
	Upland Buffer (south parcel)	100%	0.25	1.25	100%	0.25	1.25	100%	0.25	1.25	100%	0.25
	South Subtotal		**4.88**	**7.25**		**4.88**	**7.25**		**4.88**	**7.25**		**4.88**
	Total		**11.33**	**17.87**		**12.95**	**17.87**		**12.95**	**17.87**		**12.95**

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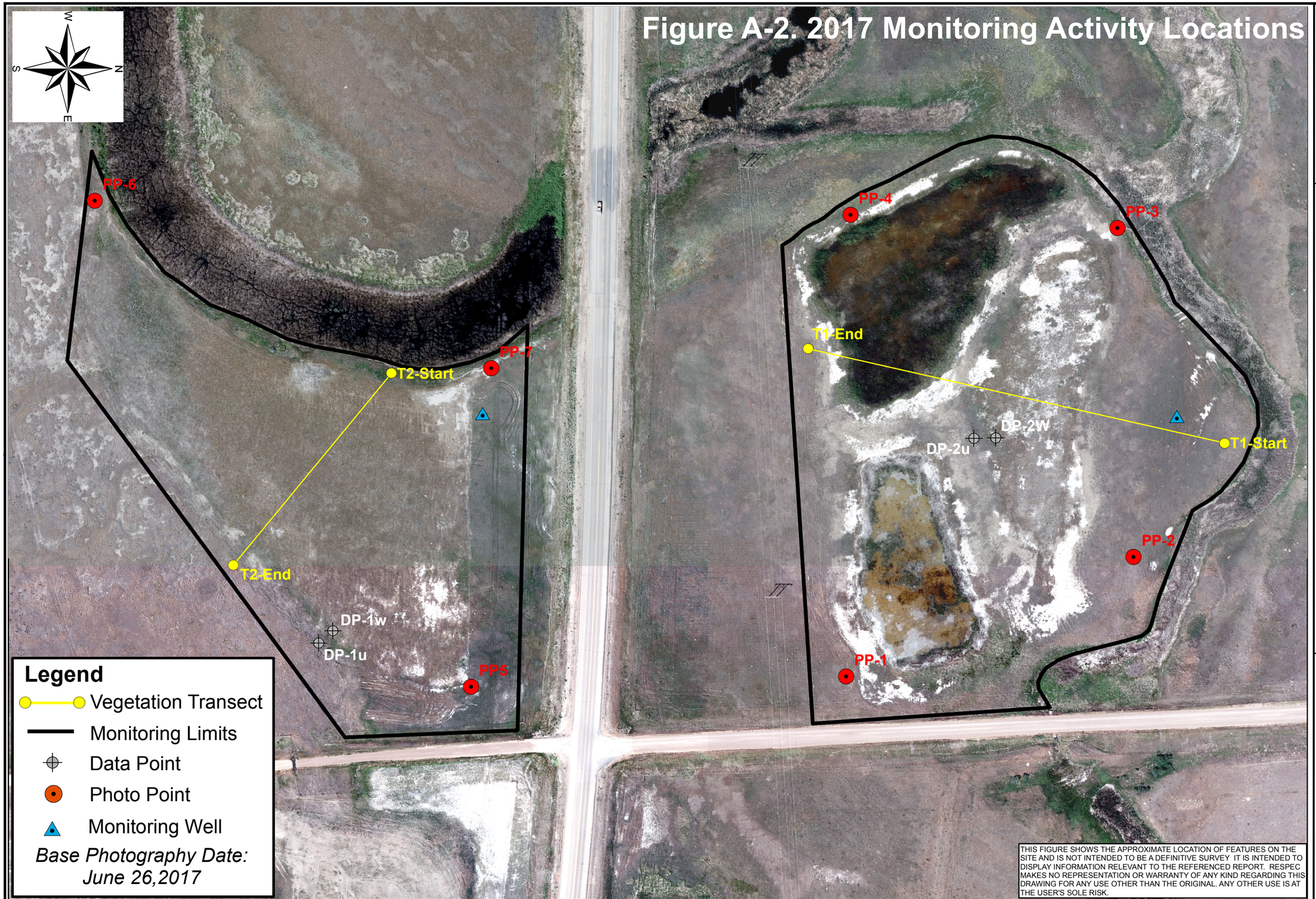
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APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Big Muddy Creek Mitigation Site
Roosevelt County, Montana

Figure A-2. 2017 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Data Point
- Photo Point
- Monitoring Well

Base Photography Date: June 26,2017

RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

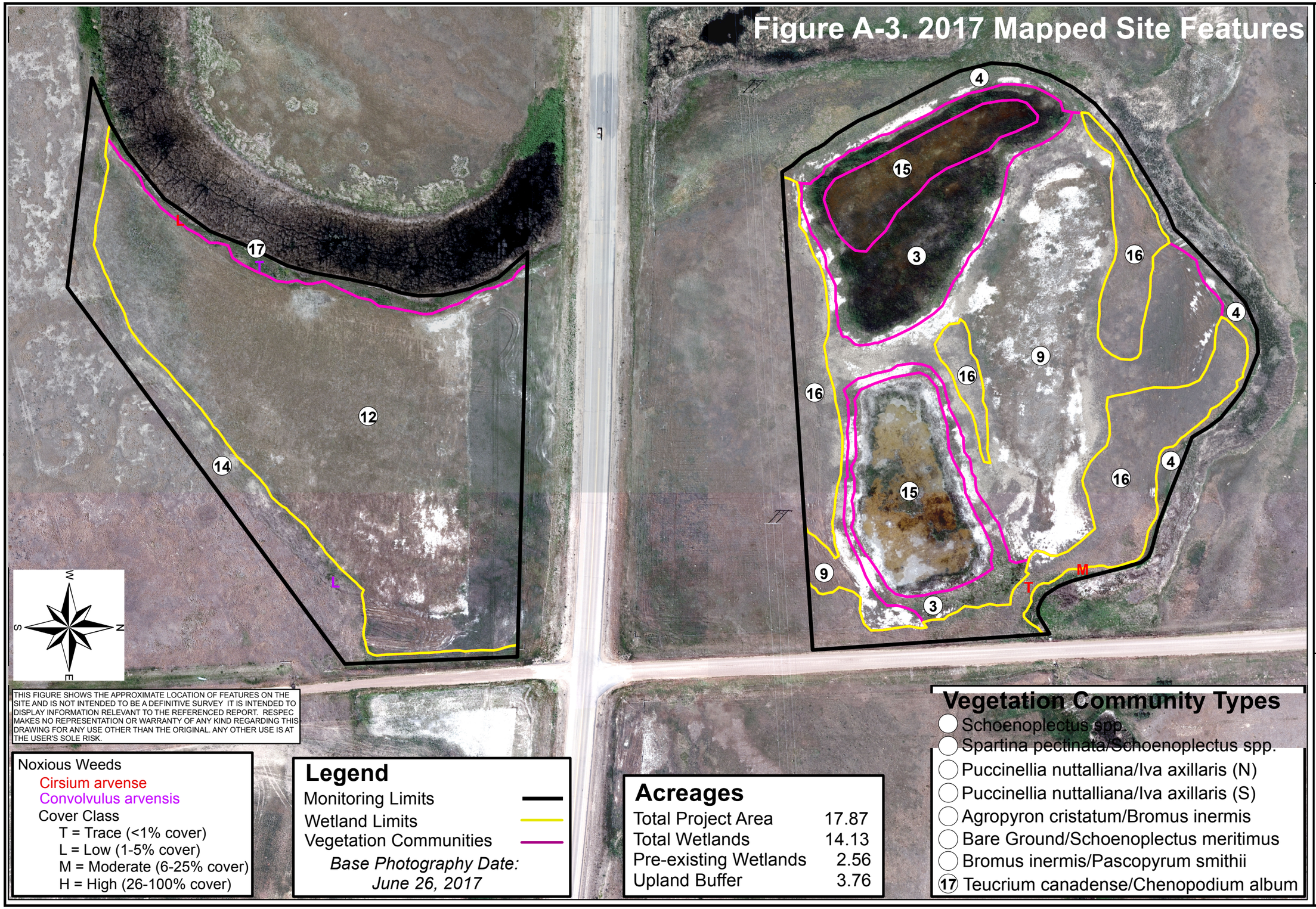
Big Muddy Creek Wetland Mitigation Site
2017 Monitoring Activity Locations

0 60 120 240 360 480 600 Feet

Project:	NH-1-(46)633
Location:	Roosevelt Co., Montana
Date:	December 2017
Project Manager:	M. Traxler
Drawn By:	J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Big Muddy Creek\GPS Data\Wains\Monitor2017.mxd

Figure A-3. 2017 Mapped Site Features



THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC 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.

Noxious Weeds
- Cirsium arvense
- Convolvulus arvensis

Cover Class
- T = Trace (<1% cover)
- L = Low (1-5% cover)
- M = Moderate (6-25% cover)
- H = High (26-100% cover)

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: June 26, 2017

Acreages

Total Project Area	17.87
Total Wetlands	14.13
Pre-existing Wetlands	2.56
Upland Buffer	3.76

Vegetation Community Types

- Schoenoplectus spp.
- Spartina pectinata/Schoenoplectus spp.
- Puccinellia nuttalliana/Iva axillaris (N)
- Puccinellia nuttalliana/Iva axillaris (S)
- Agropyron cristatum/Bromus inermis
- Bare Ground/Schoenoplectus meritimus
- Bromus inermis/Pascopyrum smithii
- (17) Teucrium canadense/Chenopodium album

RESPEC
820 North Montana Ave.,
Suite A
Helena, MT 59601

Big Muddy Creek Wetland Mitigation Site
2017 Mapped Site Features

0 60 120 240 360 480 600 Feet

Project: NH-1-(46)633
Location: Roosevelt Co., Montana
Date: December 2017
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Big Muddy Creek\GPS Data\Mains\Veg2017.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Big Muddy Creek Mitigation Site
Roosevelt County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Big Muddy** Project Number: _____
Assessment Date: **July 12, 2017** Person(s) conducting the assessment: **M. Traxler**
Location: **4 miles west of Culbertson** MDT District: **Glendive**
Milepost: **~639.75 on Highway 2**
Legal Description: T **28N** R **55E** Section **21**
Weather Conditions: **mostly cloudy, 70 degrees** Time of Day: **9:30 AM**
Initial Evaluation Date: **August 20, 2011** Monitoring Year: **7** # Visits in Year: **1**
Size of evaluation area: **17.87 acres** Land use surrounding wetland: **Agriculture, pasture, US Hwy 2**

HYDROLOGY

Surface Water Source: **Unnamed tributary to Big Muddy Creek, precipitation, groundwater**
Inundation: **Absent** Average Depth: **0 feet** Range of Depths: **0**
Percent of assessment area under inundation: **0%**
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.):
Surface soil cracks, salt crust, geomorphic position, inundation and saturation visible on aerial, FAC-neutral test, water marks.

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

Well Number	Depth	Well Number	Depth	Well Number	Depth
Well 1					
Well 2					

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:
Area receives periodic overbank flow from the unnamed tributary during spring flows and large storm events. Groundwater connection between stream and constructed wetlands on both north and south side of Hwy 2. Constructed depressions with periodic to permanent inundation. 2017 was the second consecutive year with no surface water present during monitoring visit due to extended extreme drought in area.Well 1 located in northern tract, Well 2 located in southern tract. Unable to open either well to measure water depth, as the wells appeared to be locked.

VEGETATION COMMUNITIES

Community Number: **3** Community Title (main spp): **Schoenoplectus spp. /**

Dominant Species	% Cover	Dominant Species	% Cover
Schoenoplectus maritimus	3 = 11-20%	Hordeum jubatum	1 = 1-5%
Distichlis spicata	2 = 6-10%	Juncus balticus	1 = 1-5%
Spartina pectinata	2 = 6-10%	Puccinellia nuttalliana	1 = 1-5%
Typha latifolia	2 = 6-10%	Eleocharis palustris	1 = 1-5%
Bare Ground	2 = 6-10%	Schoenoplectus acutus	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Schoenoplectus americanus	1 = 1-5%

Comments / Problems: _____

Community Number: **4** Community Title (main spp): **Spartina pectinata / Schoenoplectus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Schoenoplectus maritimus	4 = 21-50%	Elymus trachycaulus	1 = 1-5%
Spartina pectinata	4 = 21-50%	Schoenoplectus acutus	1 = 1-5%
Sonchus arvensis	3 = 11-20%	Typha latifolia	1 = 1-5%
Alopecurus arundinaceus	2 = 6-10%		
Hordeum jubatum	2 = 6-10%		
Puccinellia nuttalliana	1 = 1-5%		

Comments / Problems: _____

Community Number: **9** Community Title (main spp): **Puccinellia nuttalliana / Iva axillaris**

Dominant Species	% Cover	Dominant Species	% Cover
Puccinellia nuttalliana	5 = > 50%	Agropyron cristatum	1 = 1-5%
Distichlis spicata	4 = 21-50%	Bassia scoparia	1 = 1-5%
Iva axillaris	4 = 21-50%	Chenopodium album	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Schoenoplectus maritimus	1 = 1-5%
Grindelia squarrosa	2 = 6-10%	Spartina pectinata	1 = 1-5%
Bare Ground	2 = 6-10%	Bromus inermis	1 = 1-5%

Comments / Problems: **Community located in northern tract.**

Community Number: **12** Community Title (main spp): **Puccinellia nuttalliana / Iva axillaris**

Dominant Species	% Cover	Dominant Species	% Cover
Puccinellia nuttalliana	5 = > 50%	Bassia scoparia	1 = 1-5%
Hordeum jubatum	4 = 21-50%	Distichlis spicata	1 = 1-5%
Iva axillaris	4 = 21-50%	Spartina pectinata	1 = 1-5%
Chenopodium album	2 = 6-10%		
Bare Ground	1 = 1-5%		
Suaeda calceoliformis	1 = 1-5%		

Comments / Problems: **Community located in southern tract.**

VEGETATION COMMUNITIES (continued)

Community Number: **14** Community Title (main spp): **Agropyron cristatum / Bromus inermis**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	5 = > 50%		
Agropyron cristatum	4 = 21-50%		
Iva axillaris	2 = 6-10%		
Hordeum jubatum	1 = 1-5%		
Grindelia squarrosa	1 = 1-5%		
Poa pratensis	1 = 1-5%		

Comments / Problems: _____

Community Number: **15** Community Title (main spp): **Bare Ground / Schoenoplectus maritimus**

Dominant Species	% Cover	Dominant Species	% Cover
Bare Ground	5 = > 50%		
Schoenoplectus maritimus	3 = 11-20%		
Puccinellia nuttalliana	2 = 6-10%		
Hordeum jubatum	1 = 1-5%		
Distichlis spicata	1 = 1-5%		
Suaeda calceoliformis	+ = < 1%		

Comments / Problems: _____

Community Number: **16** Community Title (main spp): **Bromus inermis / Pascopyrum smithii**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	4 = 21-50%	Spartina pectinata	1 = 1-5%
Pascopyrum smithii	3 = 11-20%	Chenopodium sp.	1 = 1-5%
Grindelia squarrosa	2 = 6-10%	Distichlis spicata	1 = 1-5%
Iva axillaris	2 = 6-10%	Elymus trachycaulus	1 = 1-5%
Agropyron cristatum	2 = 6-10%	Hordeum jubatum	1 = 1-5%
Poa pratensis	1 = 1-5%	Puccinellia nuttalliana	1 = 1-5%

Comments / Problems: _____

Community Number: **17** Community Title (main spp): **Teucrium canadense / Chenopodium album**

Dominant Species	% Cover	Dominant Species	% Cover
Teucrium canadense	4 = 21-50%	Distichlis spicata	1 = 1-5%
Chenopodium album	3 = 11-20%	Iva axillaris	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Lepidium densiflorum	1 = 1-5%
Lactuca tatarica	2 = 6-10%	Symphoricarpos albus	1 = 1-5%
Spartina pectinata	2 = 6-10%	Convolvulus arvensis	1 = 1-5%
Apocynum cannabinum	1 = 1-5%	Puccinellia nuttalliana	1 = 1-5%

Comments / Problems: _____

VEGETATION COMMUNITIES (continued)

Community Number: **18** Community Title (main spp): **Open Water / Schoenoplectus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Schoenoplectus maritimus	5 = > 50%		
Open Water	1 = 1-5%		
Aquatic macrophytes	3 = 11-20%		
Algae, green	2 = 6-10%		
Schoenoplectus acutus	1 = 1-5%		
Spartina pectinata	+ = < 1%		

Comments / Problems: **This vegetation type was very limited in 2016 and 2017 due to lack of surface water.**

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

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

Dominant Species	% Cover	Dominant Species	% Cover

Comments / Problems: _____

Additional Activities Checklist:

☐ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes

Comments / Problems: **No woody species were installed on this site. The wetlands were revegetated with seed and salvaged material. Numerous volunteer seedlings and saplings (less than 1-inch diameter) were observed within the eastern portion of the site in 2017, including cottonwoods, aspen, and willows.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Big Muddy** Date: **July 12, 2017** Examiner: **M. Traxler**
Transect Number: **1** Approximate Transect Length: **647 feet** Compass Direction from Start: **220˚** Note: **North Side**

Transect Interval Length: **31 feet (station 0-31)**	
Vegetation Community Type: Bromus inermis / Pascopyrum smithii	
Plant Species	**Cover**
Distichlis spicata	4 = 21-50%
Pascopyrum smithii	3 = 11-20%
Agropyron cristatum	3 = 11-20%
Artemisia cana	2 = 6-10%
Bromus inermis	2 = 6-10%
Chenopodium sp.	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **69 feet (station 31-100)**	
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris	
Plant Species	**Cover**
Distichlis spicata	5 = > 50%
Puccinellia nuttalliana	5 = > 50%
Iva axillaris	3 = 11-20%
Suaeda calceoliformis	2 = 6-10%
Chenopodium sp.	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **75 feet (station 100-175)**	
Vegetation Community Type: Bromus inermis / Pascopyrum smithii	
Plant Species	**Cover**
Bromus inermis	4 = 21-50%
Distichlis spicata	4 = 21-50%
Iva axillaris	3 = 11-20%
Pascopyrum smithii	3 = 11-20%
Agropyron cristatum	2 = 6-10%
Puccinellia nuttalliana	1 = 1-5%
Chenopodium sp.	1 = 1-5%
Grindelia squarrosa	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length: **265 feet (station 175-440)**	
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris	
Plant Species	**Cover**
Puccinellia nuttalliana	4 = 21-50%
Bare Ground	3 = 11-20%
Hordeum jubatum	2 = 6-10%
Distichlis spicata	1 = 1-5%
Grindelia squarrosa	1 = 1-5%
Chenopodium sp.	1 = 1-5%
Pascopyrum smithii	1 = 1-5%
Bassia scoparia	1 = 1-5%
Total Vegetative Cover:	75%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Big Muddy** Date: **July 12, 2017** Examiner: **M. Traxler**
Transect Number: **1** Approximate Transect Length: **647 feet** Compass Direction from Start: **220˚** Note: **North Side**

Transect Interval Length: **152 feet (station 440-592)**	
Vegetation Community Type: Schoenoplectus spp. /	
Plant Species	**Cover**
Schoenoplectus acutus	4 = 21-50%
Schoenoplectus maritimus	4 = 21-50%
Spartina pectinata	2 = 6-10%
Bare Ground	2 = 6-10%
Alopecurus arundinaceus	1 = 1-5%
Eleocharis palustris	1 = 1-5%
Puccinellia nuttalliana	1 = 1-5%
Sonchus arvensis	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Total Vegetative Cover:	75%

Transect Interval Length: **34 feet (station 592-626)**	
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris	
Plant Species	**Cover**
Bare Ground	4 = 21-50%
Distichlis spicata	3 = 11-20%
Puccinellia nuttalliana	2 = 6-10%
Grindelia squarrosa	+ = < 1%
Hordeum jubatum	+ = < 1%
Total Vegetative Cover:	75%

Transect Interval Length: **21 feet (station 626-647)**	
Vegetation Community Type: Bromus inermis / Pascopyrum smithii	
Plant Species	**Cover**
Bromus inermis	4 = 21-50%
Grindelia squarrosa	1 = 1-5%
Iva axillaris	1 = 1-5%
Agropyron cristatum	1 = 1-5%
Pascopyrum smithii	1 = 1-5%
Total Vegetative Cover:	90%

Transect Interval Length:	
Vegetation Community Type:	
Plant Species	**Cover**
Total Vegetative Cover:	%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Big Muddy** Date: **July 12, 2017** Examiner: **M. Traxler**
Transect Number: **2** Approximate Transect Length: **366 feet** Compass Direction from Start: **130˚** Note: **South Side**

Transect Interval Length: **9 feet (station 0-9)**
Vegetation Community Type: Teucrium canadense / Chenopodium album

Plant Species	Cover
Symphoricarpos albus	3 = 11-20%
Iva axillaris	2 = 6-10%
Spartina pectinata	2 = 6-10%
Chenopodium album	1 = 1-5%
Teucrium canadense	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **327 feet (station 9-336)**
Vegetation Community Type: Puccinellia nuttalliana / Iva axillaris

Plant Species	Cover
Puccinellia nuttalliana	5 = > 50%
Hordeum jubatum	3 = 11-20%
Chenopodium album	2 = 6-10%
Bare Ground	1 = 1-5%
Iva axillaris	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **30 feet (station 336-366)**
Vegetation Community Type: Agropyron cristatum / Bromus inermis

Plant Species	Cover
Bromus inermis	5 = > 50%
Agropyron cristatum	2 = 6-10%
Iva axillaris	1 = 1-5%
Vicia americana	+ = < 1%
Grindelia squarrosa	+ = < 1%
Symphoricarpos albus	+ = < 1%
Total Vegetative Cover:	95%

Transect Interval Length:
Vegetation Community Type:

Plant Species	Cover
Total Vegetative Cover:	

%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Cover Estimate		**Indicator Class**	**Source**
+ = < 1%	3 = 11-10%	+ = 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): ___ **%**

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: _____

PHOTOGRAPHS

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 & Lat/Long	Compass Reading (°)
PP-1		Photo Point 1, Photo 1: 48.165836 / -104.617004	N
PP-1		Photo Point 1, Photo 2: 48.165836 / -104.617004	NW
PP-1		Photo Point 1, Photo 3: 48.165836 / -104.617004	SW
PP-2		Photo Point 2, Photo 1: 48.167038 / -104.617645	N
PP-2		Photo Point 2, Photo 2: 48.167038 / -104.617645	E
PP-2		Photo Point 2, Photo 3: 48.167038 / -104.617645	S
PP-2		Photo Point 2, Photo 4: 48.167038 / -104.617645	W
PP-3		Photo Point 3, Photo 1: 48.16716 / -104.619606	E
PP-3		Photo Point 3, Photo 2: 48.16716 / -104.619606	S
PP-3		Photo Point 3, Photo 3: 48.16716 / -104.619606	W
PP-3		Photo Point 3, Photo 4: 48.16716 / -104.619606	N
PP-4		Photo Point 4, Photo 1: 48.166012 / -104.619835	N
PP-4		Photo Point 4, Photo 2: 48.166012 / -104.619835	NE
PP-4		Photo Point 4, Photo 3: 48.166012 / -104.619835	NW
PP-5		Photo Point 5 (Pano): 48.164421 / -104.616943	221
PP-6		Photo Point 6 (Pano): 48.162872 / -104.620232	0
PP-7		Photo Point 7 (Pano): 48.164448 / -104.618835	180
T-1 start		Transect 1 start: 48.167465 / -104.618301	220
T-1 end		Transect 1 end: 48.165768 / -104.619057	30
T-2 start		Transect 2 start: 48.164039 / -104.619043	130
T-2 end		Transect 2 end: 48.163334 / -104.618011	310
DP-1U		Upland soil pit #1: 48.163729 / -104.617384	
DP-1W		Wetland soil pit #1: 48.163785 / -104.61745	
DP-2U		Upland soil pit #2: 48.166432 / -104.618452	
DP-2W		Wetland soil pit #2: 48.166514 / -104.618436	

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:

- ☒ Upland/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.
- ☐ Bird nest boxes.

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

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

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

- ☒ Complete and attach full MDT Montana Wetland Assessment Method field forms.

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: _____

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
Garter snake	2	☐	☐	☐	
Deer sp.		☒	☐	☐	
Rabbit sp.		☐	☒	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: Site contained no standing water during 2017 site visit which might be limiting wildlife use - especially waterfowl species and mammals that would routinely come to the site to drink.

BIRD SURVEY – FIELD DATA SHEET

Site: **Big Muddy** Date: **7/12/17**
Survey Time: _____ to _____

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
Western Meadowlark	4	L F FO	UP				
Mourning Dove	2	N F FO	UP				
Ring-necked Pheasant	1	L	MA				
Upland Sandpiper	2	L	UP				
Brewer's Blackbird	1	FO	UP				
Common Yellowthroat	1	L	MA				
Red-tailed Hawk	1	FO	UP				
Red-winged Blackbird	2	L FO	MA MF				
Spotted Sandpiper	1	FO	UP				
Killdeer	4	L F FO	MF UP				
Tree Swallow	20	FO	MA				
Wilson's Phalarope	1	FO	MA				

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: _____

Notes: **Ducks could be heard on adjacent property but not seen due to height of vegetation.**

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy **City/County:** Roosevelt **Sampling Date:** 12-Jul-17

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1U**

Investigator(s): M. Traxler **Section, Township, Range:** S 21 T 28N R 55E

Landform (hillslope, terrace, etc.): Shoulder slope **Local relief (concave, convex, none):** flat **Slope:** 10.0% 5.7 °

Subregion (LRR): LRR F **Lat.:** 48.163729 **Long.:** -104.617384 **Datum:** WGS84

Soil Map Unit Name: Lohler silty clay **NWI classification:** Not Mapped

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

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:
Data point in upland, vegetation community 14.

VEGETATION - Use scientific names of plants

FWS Region: -?-

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Agropyron cristatum	10	☐	13.9%	UPL
2. Bromus inermis	30	☑	41.7%	UPL
3. Iva axillaris	5	☐	6.9%	FAC
4. Lactuca tatarica	1	☐	1.4%	UPL
5. Pascopyrum smithii	25	☑	34.7%	FACU
6. Symphoricarpos albus	1	☐	1.4%	UPL
7.		☐	0.0%	
8.		☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	72	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

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

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

Percent of dominant Species That Are OBL, FACW, or FAC: 0.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	5	x 3 =	15
FACU species	25	x 4 =	100
UPL species	42	x 5 =	210
Column Totals:	72 (A)		325 (B)

Prevalence Index = B/A = 4.514

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Upland vegetation in this plot is dominated by smooth brome and western wheat grass.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 3/1	100					Silty Clay Loam	

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators observed during field survey. Soil not moist to 16".

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No evidence of hydrologic indicators observed during field survey. Very dry.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy **City/County:** Roosevelt **Sampling Date:** 12-Jul-17

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-1W**

Investigator(s): M. Traxler **Section, Township, Range:** S 21 T 28N R 55E

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** flat **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR F **Lat.:** 48.163785 **Long.:** -104.61745 **Datum:** WGS84

Soil Map Unit Name: Lohler silty clay **NWI classification:** Not Mapped

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

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Data point in excavated basin south of highway, on southeastern edge of wetland cell.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Hordeum jubatum	25	☑	25.0%	FACW
2. Iva axillaris	25	☑	25.0%	FAC
3. Puccinellia nuttalliana	50	☑	50.0%	OBL
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	50	x 1 =	50	
FACW species	25	x 2 =	50	
FAC species	25	x 3 =	75	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	100	(A)	175	(B)

Prevalence Index = B/A = 1.75

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:
Vegetation at data point unchanged from 2016.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-1W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	3/1	95	5YR	4/6	5	C	M	Silty Clay	
8-16	2.5Y	4/3	70			30	C	M	Silty Clay	Redox color: (Gley 1) 3/N

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil moist to within 2" of surface.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☑ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soil moist to within 2" of surface, but no saturation or water in pit.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy **City/County:** Roosevelt **Sampling Date:** 12-Jul-17

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-2U**

Investigator(s): M. Traxler **Section, Township, Range:** **S** 21 **T** 28N **R** 55E

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** flat **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR F **Lat.:** 48.166432 **Long.:** -104.618452 **Datum:** WGS84

Soil Map Unit Name: Lohler silty clay **NWI classification:** Not Mapped

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

Are Vegetation ☐ **, Soil** ☐ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ◉ No ○

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ○ No ◉

Hydric Soil Present? Yes ○ No ◉

Wetland Hydrology Present? Yes ○ No ◉

Is the Sampled Area within a Wetland? Yes ○ No ◉

Remarks:
Data point located in upland area between wetland depressions.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Bromus inermis	5	☐ 8.1%	UPL
2. Distichlis spicata	30	☑ 48.4%	FACW
3. Grindelia squarrosa	10	☐ 16.1%	UPL
4. Pascopyrum smithii	15	☑ 24.2%	FACU
5. Melilotus officinalis	2	☐ 3.2%	FACU
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	62	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐	
2.	0	☐	
	0	= Total Cover	

% Bare Ground in Herb Stratum 40

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	30	x 2 =	60
FAC species	0	x 3 =	0
FACU species	17	x 4 =	68
UPL species	15	x 5 =	75
Column Totals:	62 (A)		203 (B)

Prevalence Index = B/A = 3.274

Hydrophytic Vegetation Indicators:

- ☐ **1 - Rapid Test for Hydrophytic Vegetation**
- ☐ **2 - Dominance Test is > 50%**
- ☐ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Dominance test is not greater than 50% and prevalence index is above 3.0.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-2U

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-16	10YR 4/2	100					Silty Clay	Soil moist at 12"

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

No hydric soil indicators observed during field survey.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☐ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

No primary or secondary hydrology indicators observed during field survey.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Big Muddy **City/County:** Roosevelt **Sampling Date:** 29-Jun-16

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-2W

Investigator(s): M. and T. Traxler **Section, Township, Range:** S 21 T 28N R 55E

Landform (hillslope, terrace, etc.): Lowland **Local relief (concave, convex, none):** flat **Slope:** 0.0% 0.0 °

Subregion (LRR): LRR F **Lat.:** 48.166514 **Long.:** -104.618436 **Datum:** WGS84

Soil Map Unit Name: Lohler silty clay **NWI classification:** Not Mapped

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

Are Vegetation ☐ **, Soil** ☑ **, or Hydrology** ☐ **significantly disturbed?** **Are "Normal Circumstances" present?** Yes ○ No ◉

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

Summary of Findings - Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present? Yes ◉ No ○

Hydric Soil Present? Yes ◉ No ○

Wetland Hydrology Present? Yes ◉ No ○

Is the Sampled Area within a Wetland? Yes ◉ No ○

Remarks:
Data point located on concave, depressional salt flat.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Distichlis spicata	20	☑	26.7%	FACW
2. Puccinellia nuttalliana	25	☑	33.3%	OBL
3. Suaeda calceoliformis	5	☐	6.7%	FACW
4. Hordeum jubatum	5	☐	6.7%	FACW
5. Sonchus arvensis	20	☑	26.7%	FAC
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	75	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	25	x 1 =	25	
FACW species	30	x 2 =	60	
FAC species	20	x 3 =	60	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	75	(A)	145	(B)

Prevalence Index = B/A = 1.933

Hydrophytic Vegetation Indicators:

- ☑ **1 - Rapid Test for Hydrophytic Vegetation**
- ☑ **2 - Dominance Test is > 50%**
- ☑ **3 - Prevalence Index is ≤3.0**[1]
- ☐ **4 - Morphological Adaptations**[1] **(Provide supporting data in Remarks or on a separate sheet)**
- ☐ **Problematic Hydrophytic Vegetation**[1] **(Explain)**

[1] **Indicators of hydric soil and wetland hydrology must be present.**

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

100% of dominant species are OBL, FACW, or FAC. Prevalence index < 3.0.

*Indicator suffix = National status or professional decision assigned because Regional status not defined by FWS.

Soil

Sampling Point: DP-2W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-15	10YR	4/2	95	7.5YR	4/6	5	C	M	Silty Clay	Soil is as moist as DP-2U.

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Stratified Layers (A5) (LRR F)
- ☐ 1 cm Muck (A9) (LRR F,G,H)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Muck Mineral (S1)
- ☐ 2.5 cm Mucky Peat or Peat (S2) (LRR G, H)
- ☐ 5 cm Mucky Peat or Peat (S3) (LRR F)
- ☐ Sandy Gleyed Matrix S4
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☑ Depleted Dark Surface (F7)
- ☐ Redox depressions (F8)
- ☐ High Plains Depressions (F16) **(MLRA 72 and 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) (LRR I, J)
- ☐ Coastal Prairie Redox (A16) (LRR F, G, H)
- ☐ Dark Surface (S7) (LRR G)
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 and 73)**
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Soil meets NTCHS technical standard for hydric soil and had been inundated earlier in the spring.

Hydrology

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☑ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Water-Stained Leaves (B9)
- ☑ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Dry Season Water Table (C2)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where not tilled)**
- ☐ Presence of Reduced Iron (C4)
- ☐ Thin Muck Surface (C7)
- ☐ Other (Explain in Remarks)

Secondary Indicators (minimum of two required)

- ☑ Surface Soil Cracks (B6)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Drainage Patterns (B10)
- ☐ Oxidized Rhizospheres on Living Roots (C3) **(where tilled)**
- ☐ Crayfish Burrows (C8)
- ☑ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☑ FAC-neutral Test (D5)
- ☐ Frost Heave Hummocks (D7) (LRR F)

Field Observations:

Surface Water Present? Yes ○ No ◉ Depth (inches): _____

Water Table Present? Yes ○ No ◉ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ○ No ◉ Depth (inches): _____

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soil moist at 6".

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy **2. MDT Project #:** NH 1-10(626) **3. Control #:** 4058-001

3. Evaluation Date: July 12, 2017 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** North Cell - Created

6. Wetland Location(s): Township 28 N, Range 55 E, Section 21; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: ~639.75 on Hwy 2

Watershed: 12 - Lower Missouri **County:** _ Roosevelt _ _____

7. Evaluating Agency: Respec for 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)
7.39 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 7.39 (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	Unconsolidated Bottom	Excavated	Permanent / Perennial	40
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	59
Riverine	Emergent Wetland		Permanent / Perennial	1

Comments: _____

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

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.)**:** Constructed wetland cells continue to exhibit vegetation development. Grazing eliminated within project boundaries. Adjacent land used for agriculture (grazing). Hwy 2 bisects the mitigation site. Big Muddy Creek borders boundary of constructed wetlands.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA includes the constructed cells north of Hwy 2. Constructed cells have had only seasonal saturation the last two years allowing for some emergent vegetation to establish. Area between constructed wetland cells and riverine wetland has gradually converted to wetland since construction.

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: Vegetation is predominantly emergent. No woody overstory associated with creek.

Wetland/Site #(s): North Cell - Created

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): USFWS database for Roosevelt County

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 Blue Heron (S3), Loggerhead Shrike (S3B)
Incidental habitat (**list species**) ☐ D ☒ S Greater Sage-Grouse (S2)
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	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

Sources for documented use (e.g. observations, records): Suspected species identified by MTNHP for Roosevelt County. Loggerhead Shrike observed onsite.

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)	---	---	---	---	---	---	---	---	E	---	---	---	---	---	---	---	---	---	---	---
☐ **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**	.9H	---	---	---
☐ **Minimal**	---	---	---	---

Comments: Several bird species and animal tracks observed during site visits. No surface water in excavated cells in 2017 - limiting factor in providing habitat for waterfowl and other wildlife.

Wetland/Site #(s): North Cell - Created

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**

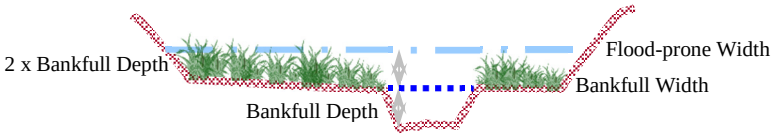
iii. Final Score and Rating: _ **Comments:** Closed wetland cells with no direct surface water inlet or outlet.

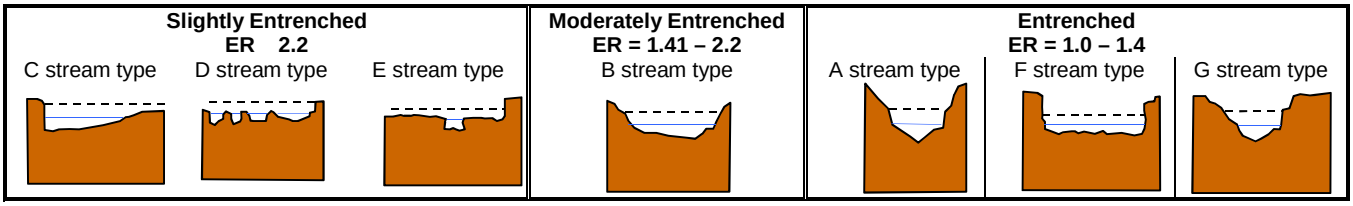
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

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**	---	---	---	---	---	.5M	---	---	---
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:** AA is adjacent to unnamed tributary of Big Muddy Creek and contains no outlet. Unnamed tributary is within MDT conservation area. Floodprone and bankfull widths not measured, visual estimation of B stream type.

Wetland/Site #(s): North Cell - Created

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**	1H	---	---	---	---	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Constructed cells were either inundated at time of site visit or showed sufficient signs of inundation during early growing season. Cells with greater than 5 ac ft of storage potential.

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: Vegetation cover along shoreline around constructed cells has developed to greater than 70%.

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%	1H	---	---
☐ 35-64%	---	---	---
☐ < 35%	---	---	---

Comments: Shoreline vegetation consists of Schoenoplectus, Distichlis, and Typha.

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	H	---	---

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	---	.7M	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
S/I	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): North Cell - Created

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** = .8H ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** Vegetated wetland area ~5.93-ac., average 50-foot upland buffer surrounding mitigation site.

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**	1H	---	---	---
☐ **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)	---	---	---	---	---	---	---	---	.3L
☐ **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)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: MDT-owned site with known hunting.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): North Cell - Created

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	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	3.70	
C. General Wildlife Habitat	high 0.90	1.00	6.65	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.50	1.00	3.70	
F. Short and Long Term Surface Water Storage	high 1.00	1.00	7.39	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	7.39	
H. Sediment / Shoreline Stabilization	high 1.00	1.00	7.39	*
I. Production Export / Food Chain Support	high 0.80	1.00	5.91	
J. Groundwater Discharge / Recharge	high 1.00	1.00	7.39	*
K. Uniqueness	low 0.30	1.00	2.22	
L. Recreation / Education Potential (bonus point)	high 0.20		1.48	
Total Points	**7.2**	**10**	**53.21 Total Functional Units**	
Percent of Possible Score 72% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy **2. MDT Project #:** NH 1-10(626) **3. Control #:** 4058-001

3. Evaluation Date: July 12, 2017 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** North Cell - Preservation

6. Wetland Location(s): Township 28 N, Range 55 E, Section 21; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: ~639.75 on Hwy 2

Watershed: 12 - Lower Missouri **County:** _ Roosevelt _ _____

7. Evaluating Agency: RESPEC for 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)
0.73 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 0.73 (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
Riverine	Emergent Wetland		Seasonal / Intermittent	100

Comments: _____

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.)**:** Grazing eliminated within project area. Grazing still occurs on the pastures located north of the project site. Existing wetland associated with Big Muddy Creek.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA encompasses existing emergent wetland associated with an abandoned oxbow of Big Muddy Creek that borders mitigation site on west and north boundaries. The wetland within the mitigation site is currently managed in natural state. The preservation AA was not disturbed during construction.

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: Emergent vegetation class but is comprised of various species so not considered a monoculture.

Wetland/Site #(s): North Cell - Preservation

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): USFWS database for Roosevelt County

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 Blue Heron (S3), Loggerhead Shrike (S3B)
Incidental habitat (**list species**) ☐ D ☒ S Greater Sage-Grouse (S2)
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	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

Sources for documented use (e.g. observations, records): MTNHP tracker for Roosevelt County. Loggerhead Shrike observed onsite.

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: Seasonal waterfowl habitat, abundant amphibian breeding areas.

Wetland/Site #(s): North Cell - Preservation

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**

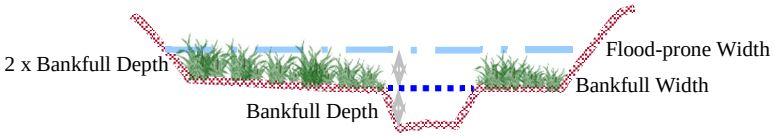
iii. Final Score and Rating: _ **Comments:** _____

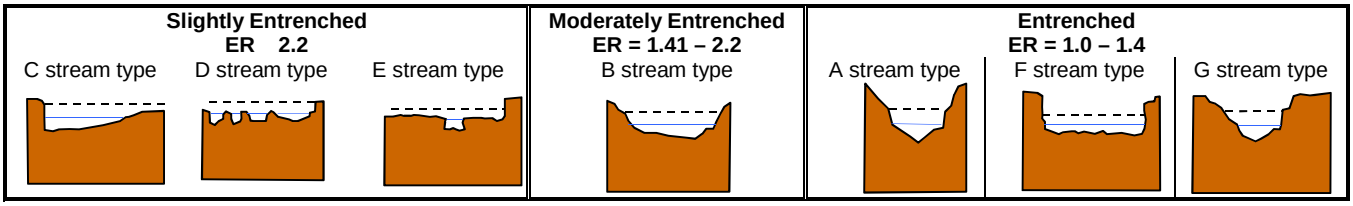
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

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**	---	---	---	---	---	.5M	---	---	---
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:** Unnamed tributary of Big Muddy Creek not physically measured, but the channel cross-section most resembles "Moderately entrenched/B stream type", which has an entrenchment ratio ranging from 1.41 to 2.2.

Wetland/Site #(s): North Cell - Preservation

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**	---	---	---	---	---	---	---	.3L	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: AA is 0.73 acres, without potential to support greater than 1 ft of surface water.

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: Cover of veg in existing riverine wetland >70%. Wetland converges with unnamed tributary of Big Muddy Creek, culvert under highway considered restricted outlet.

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%**	---	.9H	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: Existing wetland forms shoreline on west side of constructed cells and eventually converges with Big Muddy Creek. Bulrush, sedge, cattail, and rush species provide stability

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	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	.3L	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): North Cell - Preservation

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** = 0.40 ☐ **NO**

iv. Final Score and Rating: .4M **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: Surface water not present perennially, but saturation is present year round along tributary.

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)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: MDT-owned site, signs of hunting.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): North Cell - Preservation

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	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	0.37	
C. General Wildlife Habitat	mod 0.70	1.00	0.51	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.50	1.00	0.37	
F. Short and Long Term Surface Water Storage	low 0.30	1.00	0.22	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	0.73	*
H. Sediment / Shoreline Stabilization	high 0.90	1.00	0.66	
I. Production Export / Food Chain Support	mod 0.40	1.00	0.29	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	0.51	*
K. Uniqueness	mod 0.40	1.00	0.29	
L. Recreation / Education Potential (bonus point)	high 0.20		0.15	
Total Points	**5.6**	**10**	**4.10 Total Functional Units**	
Percent of Possible Score 56% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy **2. MDT Project #:** NH 1-10(626) **3. Control #:** 4058-001

3. Evaluation Date: July 12, 2017 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** South Cell - Created

6. Wetland Location(s): Township 28 N, Range 55 E, Section 21; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: ~639.75 on Hwy 2

Watershed: 12 - Lower Missouri **County:** _ Roosevelt _ _____

7. Evaluating Agency: RESPEC for 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)
4.17 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 4.17 (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: _____

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

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.)**:** Constructed wetland cell with continued vegetation development. AA adjacent to Hwy 2.
_____

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA includes the constructed cell south of Hwy 2. Hwy 2 and an unnamed tributary of Big Muddy borders this AA.

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: Vegetation class only includes emergent wetland but is comprised of various species so not considered a monoculture.

Wetland/Site #(s): South Cell - Created

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): USFWS database for Roosevelt County

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 Blue Heron (S3), Loggerhead Shrike (S3B)
Incidental habitat (**list species**) ☐ D ☒ S Greater Sage-Grouse (S2)
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	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

Sources for documented use (e.g. observations, records): Suspected species identified by MTNHP for Roosevelt County. Loggerhead Shrike observed onsite.

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 bird species and signs of wildlife observed during site visits.

Wetland/Site #(s): South Cell - Created

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**

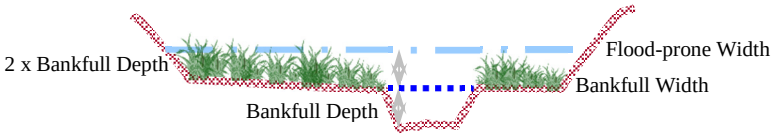
iii. Final Score and Rating: _ **Comments:** Closed wetland cell with no direct surface water inlet or outlet.

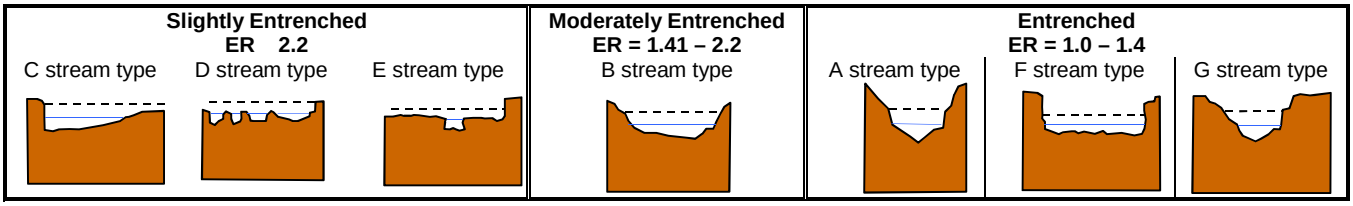
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

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**	---	---	---	---	---	.5M	---	---	---
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:** Unnamed tributary of Big Muddy Creek not physically measured, but the channel cross-section most resembles "Moderately entrenched/B stream type", which has an entrenchment ratio ranging from 1.41 to 2.2.

Wetland/Site #(s): South Cell - Created

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: Constructed cell showed signs of inundation during early growing season. Cell is 4.17-ac with storage potential >1.5 ft deep.

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: Vegetation cover within constructed cell estimated to be >70%.

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%**	---	.9H	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: Shoreline vegetation consists of Schoenoplectus, Distichlis, and Puccinellia.

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	---	---	---	---	---	---	---	---	---	.3L	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): South Cell - Created

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** = 0.40 ☐ **NO**

iv. Final Score and Rating: .4M **Comments:** Average 50-foot upland buffer surrounding mitigation site.

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)	---	---	---	---	---	---	---	---	.3L
☐ **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)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: MDT-owned site with known hunting.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): South Celll - Created

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	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	2.09	
C. General Wildlife Habitat	mod 0.70	1.00	2.92	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.50	1.00	2.09	
F. Short and Long Term Surface Water Storage	high 0.90	1.00	3.75	*
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	4.17	
H. Sediment / Shoreline Stabilization	high 0.90	1.00	3.75	*
I. Production Export / Food Chain Support	mod 0.40	1.00	1.67	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	2.92	*
K. Uniqueness	low 0.30	1.00	1.25	
L. Recreation / Education Potential (bonus point)	high 0.20		0.83	
Total Points	**6.1**	**10**	**25.44 Total Functional Units**	
Percent of Possible Score 61% (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**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Big Muddy **2. MDT Project #:** NH 1-10(626) **3. Control #:** 4058-001

3. Evaluation Date: July 12, 2017 **4. Evaluator(s):** Mark Traxler **5. Wetland/Site #(s):** South Cell - Preservation

6. Wetland Location(s): Township 28 N, Range 55 E, Section 21; Township ___ N, Range ___ E, Section _____

Approximate Stationing or Roadposts: ~639.75 on Hwy 2

Watershed: 12 - Lower Missouri **County:** _ Roosevelt _ _____

7. Evaluating Agency: RESPEC for 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)
1.83 (measured, e.g. GPS)

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 1.83 (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
Riverine	Emergent Wetland		Seasonal / Intermittent	30
Depressional	Emergent Wetland		Seasonal / Intermittent	70

Comments: _____

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.)**:** Grazing eliminated within AA. AA not disturbed during construction.

ii. Prominent noxious, aquatic nuisance, and other exotic vegetation species: Cirsium arvense, Convolvulus arvensis

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: AA encompasses existing emergent wetland associated with an abandoned oxbow of Big Muddy Creek and adjacent lowland located in the southern parcel.

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: Emergent vegetation class comprised of various obligate species including Typha and Schoenoplectus

Wetland/Site #(s): South Cell - Preservation

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): USFWS database for Roosevelt County

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 Blue Heron (S3), Loggerhead Shrike (S3B)
Incidental habitat (**list species**) ☐ D ☒ S Greater Sage-Grouse (S2)
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	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	---	---	---	.5M	---	---	---

Sources for documented use (e.g. observations, records): MTNHP tracker for Roosevelt County. Loggerhead Shrike observed onsite.

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: _____

Wetland/Site #(s): South Cell - Preservation

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**

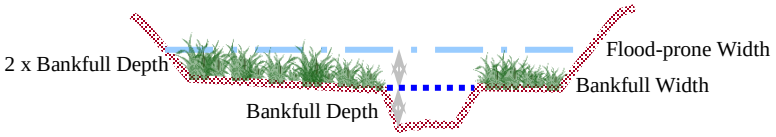
iii. Final Score and Rating: _ **Comments:**

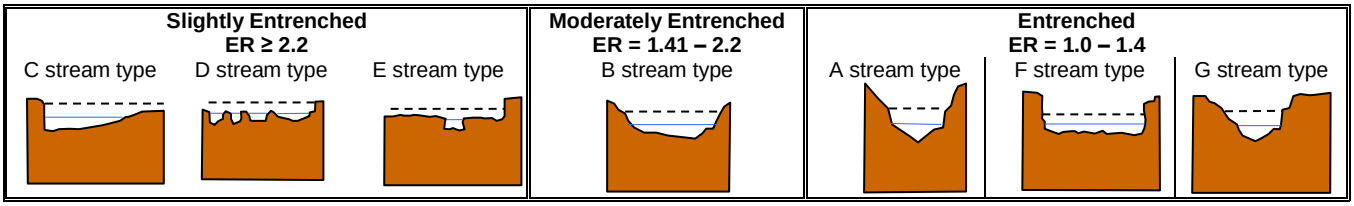
14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14F)

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**	---	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	---	---	---	---	---	.4M	---	---	---

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:** Unnamed tributary of Big Muddy Creek not physically measured, but the channel cross-section most resembles "Moderately entrenched/B stream type", which has an entrenchment ratio ranging from 1.41 to 2.2.

Wetland/Site #(s): South Cell - Preservation

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**	---	---	---	---	---	---	---	.3L	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: AA is 0.3 acres without potential to support greater than 0.5 feet of surface water.

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**	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	.9H	---	---	---	---	---	---	---

Comments: Cover greater than 70%, undisturbed during construction.

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%**	1H	---	---
☐ **35-64%**	---	---	---
☐ **< 35%**	---	---	---

Comments: AA includes shoreline of unnamed tributary of Big Muddy Creek.

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	---	---	---	---	---	---	---	---	.6M	---	---	---	---	---	---	---	---	---
T/E/A	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Wetland/Site #(s): South Cell - Preservation

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** = .7M ☐ **NO**

iv. Final Score and Rating: .7M **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)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: MDT-owned site with known hunting.

15. GENERAL SITE NOTES: _____

Wetland/Site #(s): South Celll - Preservation

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	0	
B. MT Natural Heritage Program Species Habitat	mod 0.50	1.00	0.92	
C. General Wildlife Habitat	mod 0.70	1.00	1.28	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	mod 0.40	1.00	0.73	
F. Short and Long Term Surface Water Storage	low 0.30	1.00	0.55	
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	1.65	*
H. Sediment / Shoreline Stabilization	high 1.00	1.00	1.83	*
I. Production Export / Food Chain Support	mod 0.70	1.00	1.28	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	1.28	*
K. Uniqueness	mod 0.40	1.00	0.73	
L. Recreation / Education Potential (bonus point)	high 0.20		0.37	
Total Points	**5.8**	**10**	**10.62 Total Functional Units**	
Percent of Possible Score 58% (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
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Big Muddy Creek Mitigation Site
Roosevelt County, Montana

Big Muddy: Northern Property Photographs



Photo Point: 1 Location: SE Property Corner
Bearing: North Year: 2011



Photo Point: 1 Location: SE Property Corner
Bearing: North Year: 2013



Photo Point: 1 Location: SE Property Corner
Bearing: North Year: 2014



Photo Point: 1 Location: SE Property Corner
Bearing: North Year: 2015



Photo Point: 1 Location: SE Property Corner
Bearing: North Year: 2016



Photo Point: 1 Location: SE Property Corner
Bearing: North Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 1 Location: SE Property Corner
Bearing: Northwest Year: 2011



Photo Point: 1 Location: SE Property Corner
Bearing: Northwest Year: 2013



Photo Point: 1 Location: SE Property Corner
Bearing: Northwest Year: 2014



Photo Point: 1 Location: SE Property Corner
Bearing: Northwest Year: 2015



Photo Point: 1 Location: SE Property Corner
Bearing: Northwest Year: 2016



Photo Point: 1 Location: SE Property Corner
Bearing: Northwest Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 1 Location: SE Property Corner
Bearing: Southwest Year: 2011



Photo Point: 1 Location: SE Property Corner
Bearing: Southwest Year: 2013



Photo Point: 1 Location: SE Property Corner
Bearing: Southwest Year: 2014



Photo Point: 1 Location: SE Property Corner
Bearing: Southwest Year: 2015



Photo Point: 1 Location: SE Property Corner
Bearing: Southwest Year: 2016



Photo Point: 1 Location: SE Property Corner
Bearing: Southwest Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 2 Location: NE Property Corner
Bearing: North Year: 2011



Photo Point: 2 Location: NE Property Corner
Bearing: North Year: 2013



Photo Point: 2 Location: NE Property Corner
Bearing: North Year: 2014



Photo Point: 2 Location: NE Property Corner
Bearing: North Year: 2015



Photo Point: 2 Location: NE Property Corner
Bearing: North Year: 2016



Photo Point: 2 Location: NE Property Corner
Bearing: North Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 2 Location: NE Property Corner
Bearing: East Year: 2011



Photo Point: 2 Location: NE Property Corner
Bearing: East Year: 2013



Photo Point: 2 Location: NE Property Corner
Bearing: East Year: 2014



Photo Point: 2 Location: NE Property Corner
Bearing: East Year: 2015



Photo Point: 2 Location: NE Property Corner
Bearing: East Year: 2016



Photo Point: 2 Location: NE Property Corner
Bearing: East Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 2 Location: NE Property Corner
Bearing: South Year: 2011



Photo Point: 2 Location: NE Property Corner
Bearing: South Year: 2013



Photo Point: 2 Location: NE Property Corner
Bearing: South Year: 2014



Photo Point: 2 Location: NE Property Corner
Bearing: South Year: 2015



Photo Point: 2 Location: NE Property Corner
Bearing: South Year: 2016



Photo Point: 2 Location: NE Property Corner
Bearing: South Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 2 Location: NE Property Corner
Bearing: West Year: 2011



Photo Point: 2 Location: NE Property Corner
Bearing: West Year: 2013



Photo Point: 2 Location: NE Property Corner
Bearing: West Year: 2014



Photo Point: 2 Location: NE Property Corner
Bearing: West Year: 2015



Photo Point: 2 Location: NE Property Corner
Bearing: West Year: 2016



Photo Point: 2 Location: NE Property Corner
Bearing: West Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 3 Location: NW Property Corner
Bearing: East Year: 2011



Photo Point: 3 Location: NW Property Corner
Bearing: East Year: 2013



Photo Point: 3 Location: NW Property Corner
Bearing: East Year: 2014



Photo Point: 3 Location: NW Property Corner
Bearing: East Year: 2015



Photo Point: 3 Location: NW Property Corner
Bearing: East Year: 2016



Photo Point: 3 Location: NW Property Corner
Bearing: East Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 3 Location: NW Property Corner
Bearing: South Year: 2011



Photo Point: 3 Location: NW Property Corner
Bearing: South Year: 2013



Photo Point: 3 Location: NW Property Corner
Bearing: South Year: 2014



Photo Point: 3 Location: NW Property Corner
Bearing: South Year: 2015



Photo Point: 3 Location: NW Property Corner
Bearing: South Year: 2016



Photo Point: 3 Location: NW Property Corner
Bearing: South Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 3 Location: NW Property Corner
Bearing: West Year: 2011



Photo Point: 3 Location: NW Property Corner
Bearing: West Year: 2013



Photo Point: 3 Location: NW Property Corner
Bearing: West Year: 2014



Photo Point: 3 Location: NW Property Corner
Bearing: West Year: 2015



Photo Point: 3 Location: NW Property Corner
Bearing: West Year: 2016



Photo Point: 3 Location: NW Property Corner
Bearing: West Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 3 Location: NW Property Corner
Bearing: North Year: 2011



Photo Point: 3 Location: NW Property Corner
Bearing: North Year: 2013



Photo Point: 3 Location: NW Property Corner
Bearing: North Year: 2014



Photo Point: 3 Location: NW Property Corner
Bearing: North Year: 2015



Photo Point: 3 Location: NW Property Corner
Bearing: North Year: 2016



Photo Point: 3 Location: NW Property Corner
Bearing: North Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 4 Location: SW Property Corner
Bearing: North Year: 2011



Photo Point: 4 Location: SW Property Corner
Bearing: North Year: 2013



Photo Point: 4 Location: SW Property Corner
Bearing: North Year: 2014



Photo Point: 4 Location: SW Property Corner
Bearing: North Year: 2015



Photo Point: 4 Location: SW Property Corner
Bearing: North Year: 2016



Photo Point: 4 Location: SW Property Corner
Bearing: North Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 4 Location: SW Property Corner
Bearing: Northeast Year: 2011



Photo Point: 4 Location: SW Property Corner
Bearing: Northeast Year: 2013



Photo Point: 4 Location: SW Property Corner
Bearing: Northeast Year: 2014



Photo Point: 4 Location: SW Property Corner
Bearing: Northeast Year: 2015



Photo Point: 4 Location: SW Property Corner
Bearing: Northeast Year: 2016



Photo Point: 4 Location: SW Property Corner
Bearing: Northeast Year: 2017

Big Muddy: Northern Property Photographs



Photo Point: 4 Location: SW Property Corner
Bearing: Northwest Year: 2011



Photo Point: 4 Location: SW Property Corner
Bearing: Northwest Year: 2013



Photo Point: 4 Location: SW Property Corner
Bearing: Northwest Year: 2014



Photo Point: 4 Location: SW Property Corner
Bearing: Northwest Year: 2015



Photo Point: 4 Location: SW Property Corner
Bearing: Northwest Year: 2016



Photo Point: 4 Location: SW Property Corner
Bearing: Northwest Year: 2017

Big Muddy: Southern Property Photographs



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2014



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2015



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2016



Photo Point 5; Location: NE Property Corner; Bearing 221 degrees; Year 2017

Big Muddy: Southern Property Photographs



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2014



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2015



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2016



Photo Point 6; Location: SW Property Corner; Bearing 0 degrees; Year 2017

Big Muddy: Southern Property Photographs



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2014



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2015



Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2016

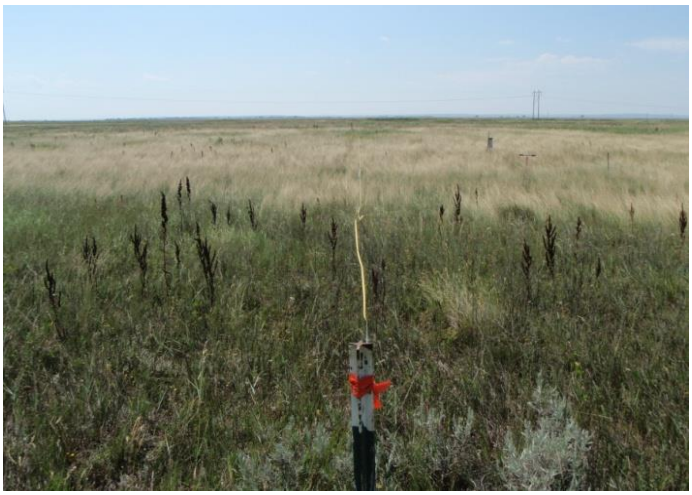


Photo Point 7; Location: NW Property Corner; Bearing 180 degrees; Year 2017

Big Muddy: Transect Photographs



Transect 1: Start Location: North Parcel
Bearing: 220 degrees Year: 2011



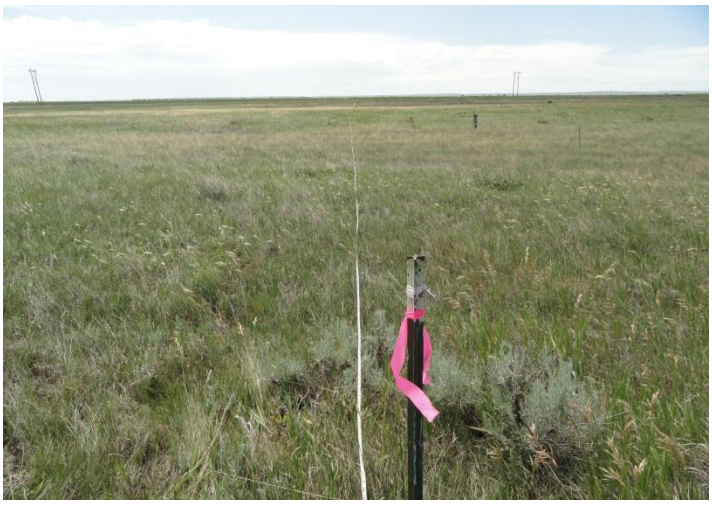
Transect 1: Start Location: North Parcel
Bearing: 220 degrees Year: 2013



Transect 1: Start Location: North Parcel
Bearing: 220 degrees Year: 2014



Transect 1: Start Location: North Parcel
Bearing: 220 degrees Year: 2015



Transect 1: Start Location: North Parcel
Bearing: 220 degrees Year: 2016

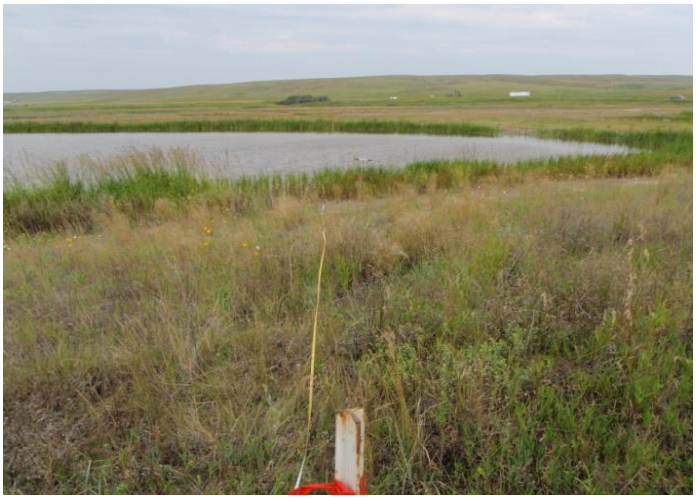


Transect 1: Start Location: North Parcel
Bearing: 220 degrees Year: 2017

Big Muddy: Transect Photographs



Transect 1: Finish
Location: North Parcel
Bearing: 40 degrees
Year: 2011



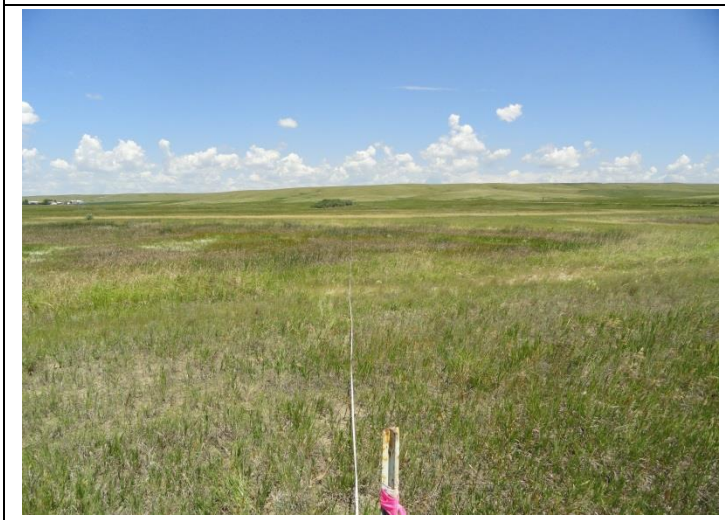
Transect 1: Finish
Location: North Parcel
Bearing: 40 degrees
Year: 2013



Transect 1: Finish
Location: North Parcel
Bearing: 40 degrees
Year: 2014



Transect 1: Finish
Location: North Parcel
Bearing: 40 degrees
Year: 2015

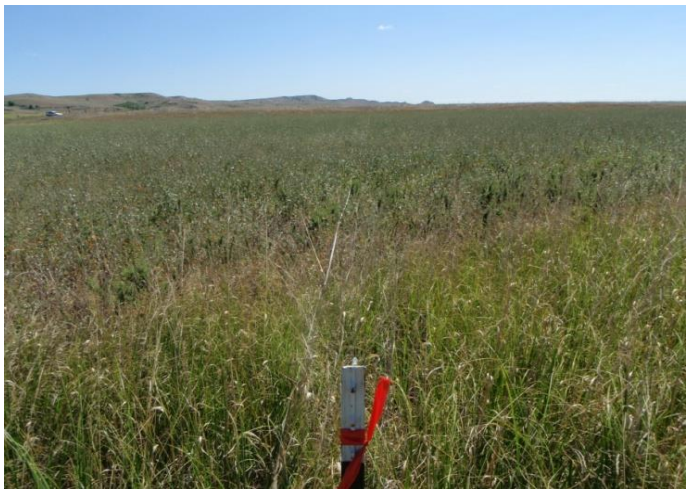


Transect 1: Finish
Location: North Parcel
Bearing: 40 degrees
Year: 2016



Transect 1: Finish
Location: North Parcel
Bearing: 40 degrees
Year: 2017

Big Muddy: Transect Photographs



Transect 2: Start Location: South Parcel
Bearing: 130 degrees Year: 2011



Transect 2: Start Location: South Parcel
Bearing: 130 degrees Year: 2013



Transect 2: Start Location: South Parcel
Bearing: 130 degrees Year: 2014



Transect 2: Start Location: South Parcel
Bearing: 130 degrees Year: 2015



Transect 2: Start Location: South Parcel
Bearing: 130 degrees Year: 2016



Transect 2: Start Location: South Parcel
Bearing: 130 degrees Year: 2017

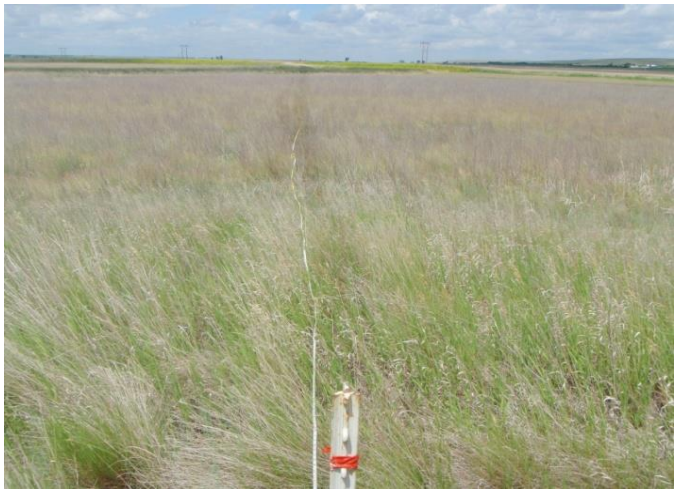
Big Muddy: Transect Photographs



Transect 2: Finish Location: South Parcel
Bearing: 310 degrees Year: 2011



Transect 2: Finish Location: South Parcel
Bearing: 310 degrees Year: 2013



Transect 2: Finish Location: South Parcel
Bearing: 310 degrees Year: 2014



Transect 2: Finish Location: South Parcel
Bearing: 310 degrees Year: 2015



Transect 2: Finish Location: South Parcel
Bearing: 310 degrees Year: 2016



Transect 2: Finish Location: South Parcel
Bearing: 310 degrees Year: 2017

Big Muddy: Transect Photographs



Data Point: DP1W Location: South Parcel
Year: 2017



Data Point: DP1U Location: South Parcel
Year: 2017



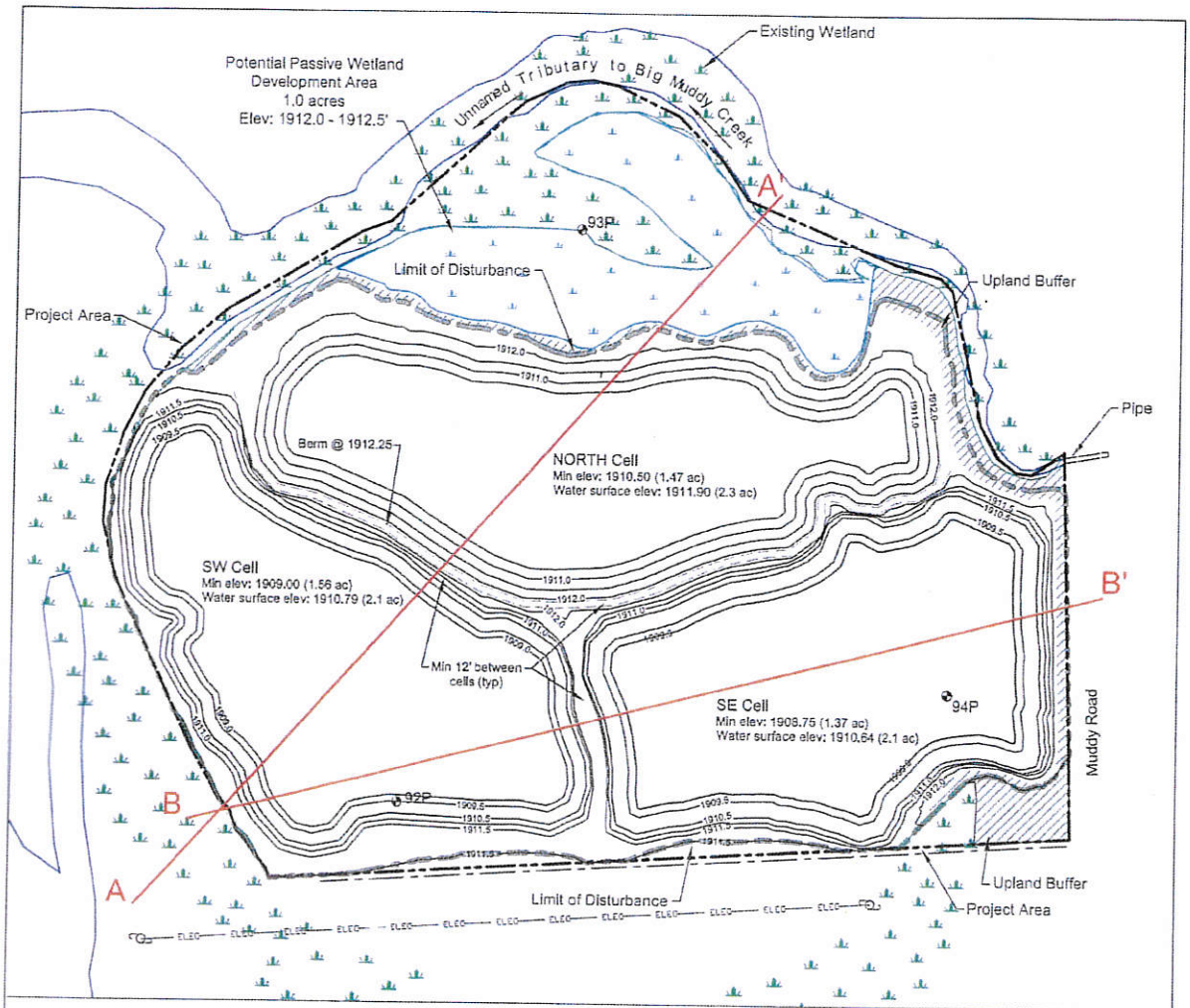
Data Point: DP2W Location: North Parcel
Year: 2017



Data Point: DP2U Location: North Parcel
Year: 2017

APPENDIX D
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Big Muddy Creek Mitigation Site
Roosevelt County, Montana



Legend

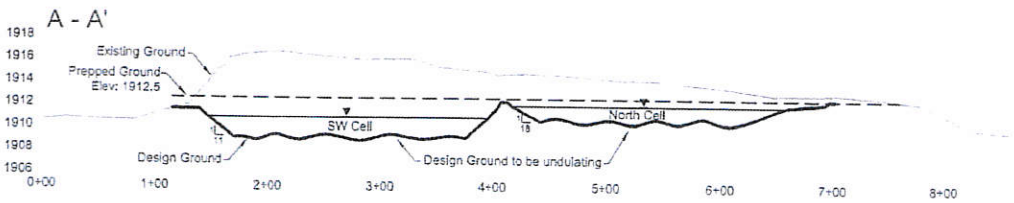
- Approximate Site Border
- Limits of Disturbance
- Existing Wetland
- Potential Passive Wetland
- Upland Buffer
- Extents of Cell Surface Water
- Cross Section Location
- Well Location
- Northerly Extents of Utility Easement

Note: All elevations are final. Will require over-excavation for topsoil replacement.

N W E S

100' 50' 0 50' 100'

SCALE: 1" = 100'



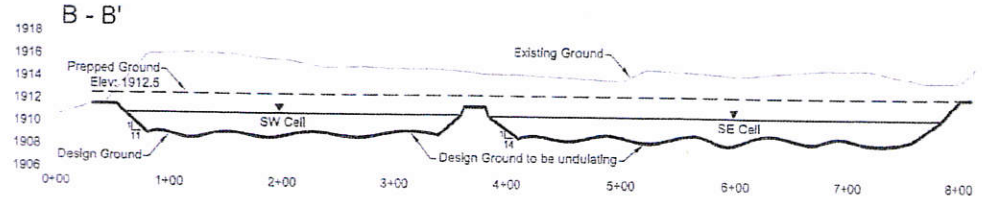


FIGURE 4	PBSJ 1120 Cedar Missoula, MT 59802	PROJ NO: 100015542	DRAWN: JR	PROJECT NAME: BIG MUDDY CREEK WETLAND MITIGATION SITE
REV - 03/23/2010		LOCATION: ROOSEVELT CO., MT	PROJ MGR: J. BERGLUND	DRAWING TITLE: FIGURE 4. PRELIMINARY DESIGN - PLAN & PROFILE
		SCALE: NOTED	CHECKED: LL APPVD: DM	
		FILE NAME: design_prelim_R02_1.dwg		