MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2014

Forsyth – Northwest
West Site (Site 1); Middle Site (Site 2);
East Site (Site 3); Treasure County Line Site (Site 4)
Rosebud County, Montana

Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION

2701 Prospect Ave
Helena, MT 59620-1001

December 2014

Prepared by:

CONFLUENCE

PO Box 1133
Bozeman, MT 59771-1133

MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

WETLAND MITIGATION MONITORING REPORT:

YEAR 2014

Forsyth - Northwest:
West Site (Site 1), Middle Site (Site 2),
East Site (Site 3), Treasure County Line Site (Site 4)
Treasure County Line Constructed: 1999
Forsyth East, Middle, West Constructed: 2012

MDT Project Number:
STPP 14-6 (9) 259 CN 4059 (Forsyth Northwest)

USACE Number:
NWO-2002-90-599 Control Number 1514 (Forsyth – NW)
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Prepared for:

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

Prepared by:

Confluence Consulting, Inc.
P.O. Box 1133
Bozeman, MT 59771

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1. INTRODUCTION

The 2014 Forsyth-Northwest (FNW) wetland monitoring report documents the second year of monitoring at the four FNW sites: West Site (1), Middle Site (2), East Site (3), and Treasure County Line Site (4). The FNW Wetland Mitigation Sites were developed to mitigate for a cumulative total of 8.98 acres of wetland impacts associated with two Montana Department of Transportation (MDT) highway construction projects; 1) Volborg – North and South project constructed in 2004, and 2) the Forsyth – Northwest project constructed in 2012. The 2014 Forsyth-Northwest Wetland Mitigation Monitoring Report includes monitoring results for each of the four sites and a discussion of the mitigation credits developed for the FNW project.

The four wetland mitigation sites are located in Rosebud County in the Sagebrush Steppe ecoregion of the Northwest Great Plains. The sites are within Watershed 14 (Middle Yellowstone). Three sites are located northwest of Forsyth along Montana Highway 12 at mile markers 262.3 (East-3), 261.9 (Middle-2), and 260 (West-1) within the Big Porcupine Creek sub-basin (Figure 1). Treasure County Line (Site 4), located approximately 12 miles west of Forsyth at Interstate 94 mile marker 81.75 (Figure 2), is situated southwest of the intersection of Interstate 94 and Reservation Road in the Lower Yellowstone River-Sunday Creek sub-basin. Figures 3 through 10 (Appendix A) show the monitoring activity locations and mapped site features for each site, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring Forms, the USACE Great Plains Regional Supplement Wetland Determination Data Forms (USACE 2010), and the 2008 MDT Montana Wetland Assessment Forms (Berglund and McEldowney. 2008) for each site. Appendix C contains photographs of the project areas and Appendix D includes the project plan sheets.

1.1. Impacts and Mitigation

Wetland impacts for the Forsyth-Northwest project were identified in the US Army Corps of Engineers (USACE) permit #NWO-2006-90676-MTB and a wetland mitigation monitoring plan prepared by MDT and dated February 15, 2012. The wetland mitigation sites are intended to provide credits for impacts caused by the Volborg-N & S project, constructed in 2004, and the FNW project, completed in 2012. The Treasure County Line mitigation site was constructed in 1999, prior to the 2.18 acres of impact resulting from the FNW project. The 2012 mitigation plan outlined that this site had produced 1.78 acres of wetland credit, awarded at a 1:1 credit ratio. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the total area of required mitigation presented in the approved wetland mitigation plan was 11 acres. Table 1 provides a summary of the impacts, appropriate ratios, and anticipated mitigation requirements. The anticipated wetland mitigation acreages produced by the FNW project are listed by site and mitigation type in Table 2. Mitigation requirements and estimated credit development are discussed in more detail in the Comprehensive Credit Summary section of this report.

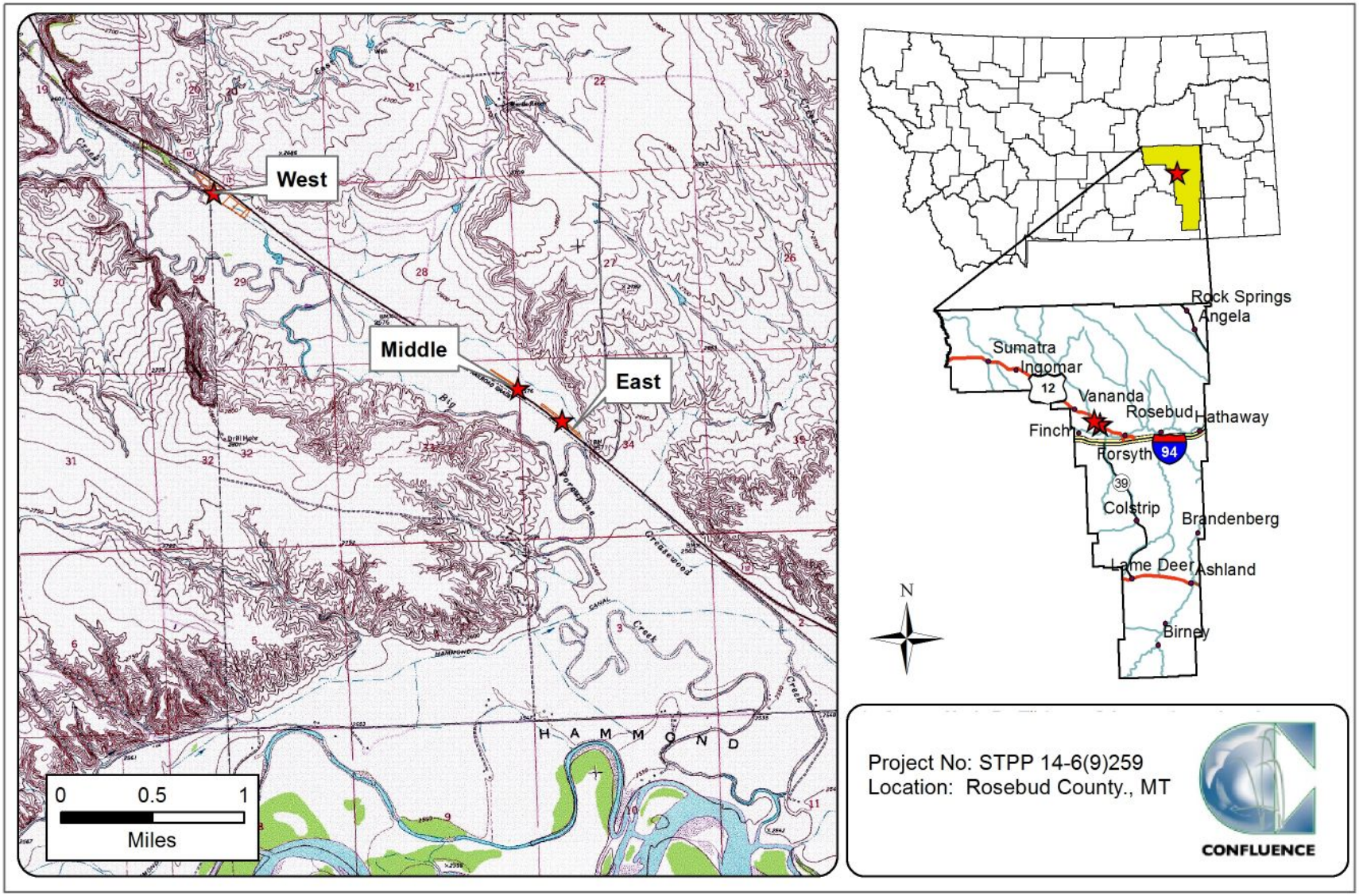

Figure 1. Project locations of Forsyth Northwest (FNW) Mitigation Sites: West (Site 1), Middle (Site 2), and East (Site 3).

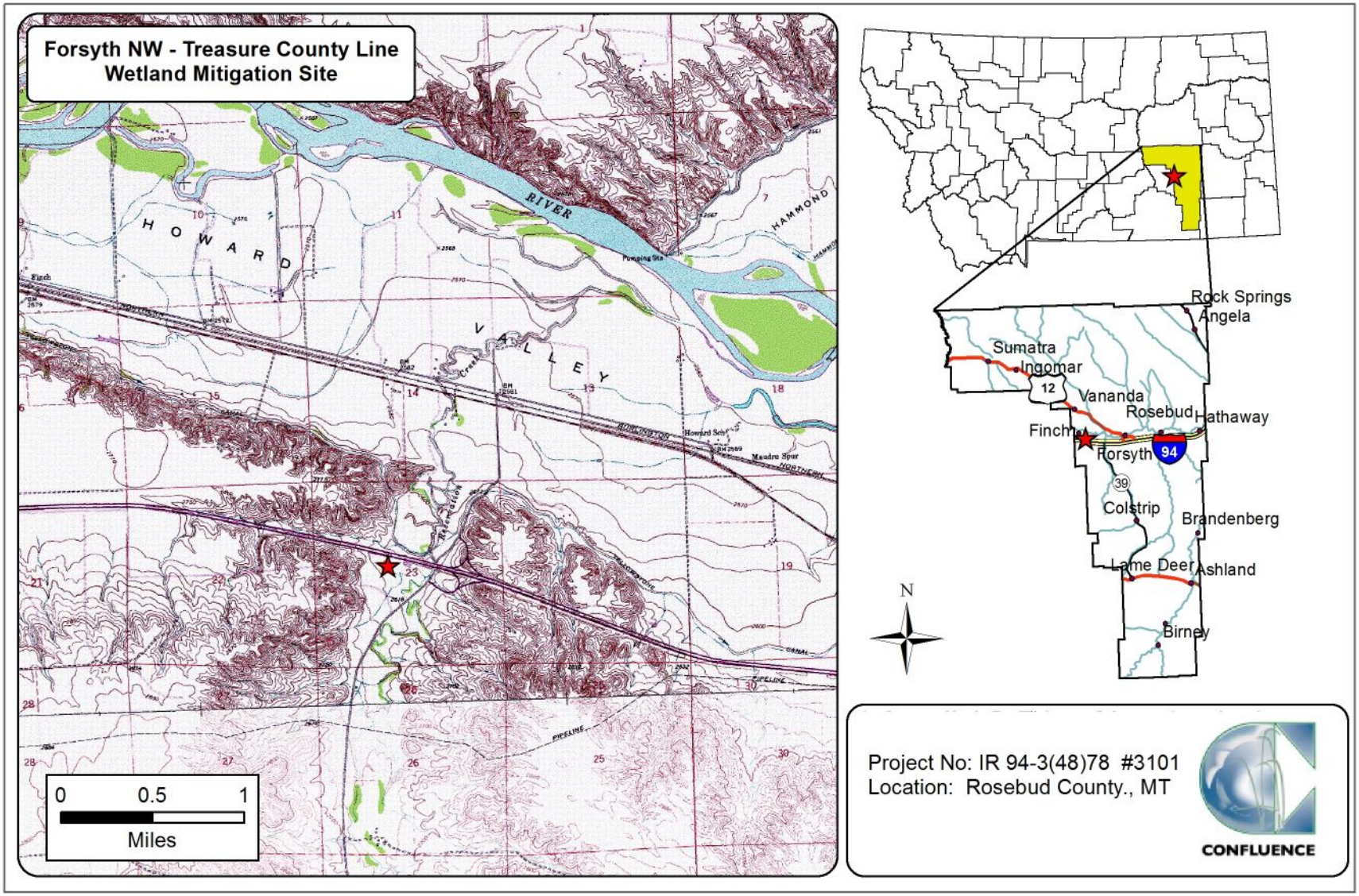

Figure 2. Project location of FNW - Treasure County Line (Site 4).

Table 1. Wetland impacts to be mitigated at FNW sites 1, 2, 3, and 4.

MDT PROJECT	IMPACTS (acres)	CREDITS (acres)	BALANCE REMAINING (acres)	RATIO	MITIGATION (acres)
Volborg - North & South	6.80	0.00	6.80	1.5:1	10.20
Forsyth - Northwest	2.18	1.78	0.40	2:1	0.80
TOTAL	**8.98**	**1.78**	**--**	**--**	**11.00**

Table 2. Anticipated wetland mitigation acreages for FNW sites 1, 2, 3, and 4.

WETLAND MITIGATION SITE	EXPECTED CREDITS*	
	Mitigation Type	Acre
West Site (Site 1)	Creation	9.09
	Preservation	1.29
	Sub-Total Site 1	**10.38**
Middle Site (Site 2)	Creation	0.34
East Site (Site 3)	Creation	1.07
	Total Sites 1, 2, and 3	**11.79**
Treasure County Line Site (Site 4)	Previous Creation (Credit)	1.78
	Total for all FNW sites (1-4)	**13.57**

1.2. General Mitigation Objectives

The MDT-developed performance standards and monitoring requirements (as presented in the approved mitigation plan) for the FNW sites are listed below. Aside from monitoring requirements, there are no quantitative metrics or criteria associated with the success of these mitigation sites.

1. **Vegetation community:**
   a. Establish permanent photo points
   b. Establish vegetation transects to monitor the development of each vegetative community and its diversity.
   c. Develop a plant species list during each monitoring visit.
   d. Plot vegetative communities on as-built plans.
   e. Determine areal coverage of vegetative community from as-built plans, aerial photographs, or by conventional or GPS survey every other year, starting in 2013.
   f. Monitor for, and control invasive weed species.
2. **Soils**
   a. Establish monitoring points for hydric soil development.
   b. Monitor and document the development of hydric soils utilizing a Munsell Soil Chart.
   c. Document the progression of reducing soil conditions as the soil transitions from an aerobic state, to an anaerobic (hydric) state.

3. **Hydrology:**
   a. Delineate area of inundation no earlier than the second weekend of June every other year, starting in 2013.
   b. Survey and document the hydrology within the new wetland area no earlier than the second weekend of June every other year, starting in 2013.
   c. Measure the horizontal and vertical extent of the soil saturation zone at the margins of the wetlands.
4. **Wildlife Community:**
   a. Birds:
      i. Create and maintain a cumulative bird list of species observed.
   b. Mammals:
      i. Create and maintain a list of mammalian species observed either directly or indirectly, i.e., tracks, scat, etc., during the biennial monitoring visits.
   c. Herpetiles:
      i. Create and maintain a list of the amphibian and reptile species observed either directly or indirectly, i.e., tracks, nests, etc., during the biennial monitoring visits.
5. **MDT Functional Assessment**
   a. A formal MDT Functional Assessment will be completed during each monitoring period.
6. **Routine Wetland Determination**
   a. A Routine Wetland Determination form will be completed during each monitoring period according to the 1987 Corps of Engineers Wetland Delineation Manual and to the terms most applicable "Regional Supplement", most likely the Western Great Plains (LRR G) supplement.

1.3. Mitigation Sites

The following sections provide a general discussion of the four wetland mitigation sites: West Site (1), Middle Site (2), East Site (3), and Treasure County Line (4). The discussion includes location, site topography, mitigation objectives, and targeted wetland community goals.

1.3.1. West Site – Site 1

The West mitigation site (1) is a 13.71-acre site owned by MDT and located at the mouth of East Spring Coulee in the floodplain of Big Porcupine Creek. The site is intended to provide 10.38 acres of compensatory wetland mitigation. Approximately 1.29 acres of pre-existing wetlands will be preserved at this site. The monitoring area boundary is shown on Figures 3 and 4: West Site – Site 1 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.

- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.
- Constructing a water retention dike on the east end of the project site.

The targeted wetland community types included emergent, scrub-shrub, and forested classes dominated by herbaceous hydrophytes, willows, and cottonwoods. Site construction was completed in summer 2012 and the revegetation was completed from August through October 2012.

1.3.2. Middle Site – Site 2

The Middle mitigation site (2) is a 1.80-acre site owned by MDT. The site is adjacent to US Highway 21, situated among old meander scars across the Big Porcupine Creek floodplain. This area is intended to provide 0.34 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures 5 and 6: Middle Site – Site 2 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.
- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is anticipated to be a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in summer 2012 and the revegetation was completed from August through October 2012.

1.3.3. East Site – Site 3

The East mitigation site (3) is a 2.74-acre site owned by MDT. The site is located approximately 1,000 feet from the Middle site (2) and is also directly adjacent to US Highway 21. The East site is intended to provide 1.07 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figures 7 and 8: East Site – Site 3 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.
- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated wetlands and seeding with wetland grass mix.

The proposed wetland community for this site is anticipated to be a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in summer 2012 and the revegetation was completed from August through October 2012.

1.3.4. Treasure County Line Site – Site 4

The Treasure County Line mitigation site (4) is a 5.89-acre site owned by MDT. The site is located adjacent to an existing wetland complex along Reservation Creek and is intended to provide 1.78 acres of compensatory wetland mitigation. The monitoring area boundary is shown on Figure 9 and 10: Treasure County Line Site – Site 4 (Appendix A). Mitigation plan sheets are presented in Appendix D. Proposed mitigation actions included the following:

- Excavation of new wetland areas with undulating bottoms.
- Create emergent wetlands by placing salvaged wetland sod and hydrophytic vegetation within the excavated areas and seeding with wetland grass mix.

The proposed wetland community for this site is anticipated to be a palustrine emergent system dominated by herbaceous hydrophytes. Site construction was completed in 1999.

2. METHODS

The Forsyth NW – West site was monitored on June 19, 2014; the Middle and East Sites were monitored the next day on June 20, 2014. The Treasure County Line site was monitored on July 10, 2014. Information contained on the Mitigation Monitoring Forms and Wetland Data Forms was entered directly into an electronic tablet during the field investigation (Appendix B). Monitoring activity locations for West, Middle, East, and Treasure County Line Sites were mapped with a global positioning system (GPS) as illustrated on Figures 3, 5, 7 and 9, respectively (Appendix A). Information collected included wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird and wildlife use documentation, photographic documentation, functional assessments, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

The presence of hydrological indicators as outlined on the Wetland Data Forms was documented at four data points within the West Site, two data points within the Middle Site, two points within the East Site, and two data points within Treasure County Line. Hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Data Forms (Appendix B). Hydrologic assessments allow evaluation of mitigation goals addressing inundation and saturation requirements.

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 classified as jurisdictional wetlands. The growing season is defined for purposes of this

report as the number of days when there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit (Environmental Laboratory 1987). Temperature data recorded for the meteorological station at Forsythe, Montana (243098), have a median (5 years in 10) growing season length of 156 days. Areas defined as wetlands would require 19.5 days of inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria. Soil pits 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 Form (Appendix B).

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 2014 aerial photographs. The percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to 10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Appendix B). Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figures 4, 6, 8, and 10, Appendix).

Temporal changes in vegetation were evaluated through annual assessments of static belt transects (Figures 3, 5, 7 and 9, Appendix A). Vegetation composition was assessed and recorded along vegetation belt transects established at all sites during the 2014 reconnaissance visits for each of site. The transects replaced any previously located transects to better represent and capture future vegetative changes at each of the remaining sites. Transects are 10 feet wide and vary in length at each site. The transect endpoints were recorded with a GPS unit.

Spatial changes in the dominant vegetation communities were documented along the stationed transect. The percent cover of each vegetation species within transects was estimated using the same values and cover ranges listed for the community polygon data (Appendix B). Photographs were taken at the endpoints of each transect during the monitoring event (Appendix C). The number of live individuals observed for each woody species planted was recorded during the monitoring event.

The Montana State Noxious Weed List (September 2010), prepared by the Montana Department of Agriculture, was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field during the investigation and mapped on the 2014 aerial photos (Figures 4, 6, 8 and 10, Appendix A). The noxious weed species identified are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■" representing 0.0 to 0.1 acres, 0.1 to 1.0 acres, or greater than 1.0 acre in extent, respectively. The letters T, L, M, or H, represent the cover classes, standing for less than 1 percent, 1 to 5 percent, 6 to 25 percent, and 26 to 100 percent, respectively.

2.3. Soil

Soil information was obtained from the *Soil Survey for Rosebud County* and *in situ* soil descriptions (NRCS 2010). Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the USACE 1987 Wetland Manual. A description of the soil profile, including hydric indicators when present, was recorded on the Wetland Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the U.S. including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Manual and the 2010 Great Plains Regional Supplement (USACE 2010). The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 2010 Regional Supplement must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2014 National Wetland Plant List (NWPL) (Lichvar *et al.*, 2014). 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 electronically on the Wetland Determination Data Form (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 2014 aerial photographs. Wetland areas were estimated using geographic information system (GIS) methods.

2.5. Wildlife

Observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the wetland monitoring form during each of the site visits. Indirect use indicators, including tracks, scat, burrow, 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 list of wildlife species observed on the sites each year is compiled and updated annually in each report.

2.6. Functional Assessment

The MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was used to evaluate functions and values on the sites. This method provides an objective means of assigning wetlands an overall rating and provides regulators 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. One Wetland Assessment Form was completed at each mitigation site (assessment area (AA) (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland and upland conditions, site trends, current land uses surrounding the site, and the status of the vegetation transects. Photographs were taken at established photo points and at transect endpoints throughout each of the mitigation sites during the field survey (Appendix C). Photo point locations were recorded with a resource-grade GPS unit (Figures 3, 5, 7 and 9, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS (Global Positioning System) unit during the 2014 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, subsequently exported into GIS, and drawn in Montana State Plane Single Zone NAD 83 meters. In addition to GPS, some site features within the site were hand-mapped onto the 2014 aerial photographs and digitized. Site features and survey points that were mapped included fence boundaries, photographic points, transect endpoints, wetland boundaries, vegetation community boundaries, and soil sample locations.

2.9. Maintenance Needs

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

3. RESULTS

3.1. West Site – Site 1

3.1.1. Hydrology

The average total annual precipitation recorded at the Forsythe, Montana weather station (243098), from January 1975 to September 2014 was 14.48 inches (WRCC 2014). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station exceeding the average by five inches. The precipitation between January and August totaled 13.85 inches in 2013 and 15.63 in 2014, both of which exceeded the long-term average of 10.52 inches for this same period. The main source of hydrology at the FNW - West site is a seasonal high water table and occasional overbank flooding from East Spring Coulee and Big Porcupine Creek. Additional hydrology is provided by surface water from precipitation events.

Mitigation activities included excavation to lower the ground surface of uplands to match adjacent existing wetlands and the construction of a dike across two wetland/ephemeral swales along the lower end of the site (east side) to impound periodic surface water. High surface water flows at the site in 2013 breached a portion of the dike. MDT completed repairs on the structure in July 2013. This failure was repeated in 2014 when the fill placed across the swale was eroded to native elevation, exposing the gravel/cobble substrate along the ephemeral channel bed (PP 2, page C-2, Appendix C). Water was flowing through the breached berm at time of the June 20, 2014 site visit.

Inundation was observed across a majority of the excavated areas during the 2014 field survey. Additional evidence of site hydrology included saturation within 12 inches, sediment deposition, drainage patterns, surface soil cracks, iron deposits, water-stained leaves, drift deposits, and algal mat/crust. Some of the lower-lying depressions were inundated during the 2014 field visit. Approximately 60 percent of the wetlands on site were inundated to an average depth of 0.5 feet during the 2014 field survey, a notable increase since 2013.

Four data points were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data point We-1w was located in an excavated area near the creek that met the wetland criteria. Positive indicators of wetland hydrology at We-1w included two inches of surface water, saturation to the ground surface, water marks, drift deposits, and drainage patterns. The remaining data points, We-1u, We-2u, and We-3u, were located in upland areas at the edge of the wetland limits. Test pit We-1u was located near the failed dike, in an area classified as upland based on the lack of sufficient duration of wetland hydrology. The wetland boundary may extend into this area once the dike is functioning as designed. Surface soil cracks provided a single secondary indicator of wetland hydrology. Data point We-2u met the hydrology criteria with two secondary indicators, surface soil cracks and drainage patterns. The data

point did not meet the criteria for plants or soil. Test pit We-3u appeared to be flooded infrequently. The groundwater table appeared to be over three feet below the ground surface during the 2014 survey based on the level of surface water observed within the nearby swale. The sparsely vegetated concave surface was a single secondary indicator of wetland hydrology.

3.1.2. Vegetation

Fifty-seven plant species were identified during the 2013 and 2014 monitoring seasons (Table 3). The mitigation area contains several mature eastern cottonwoods (*Populus deltoides*) near the center of the site and a few large peach-leaf willows (*Salix amygdaloides*) along the undisturbed existing wetland swales. Several hundred cottonwood seedlings had germinated along the apparent edge of inundation in 2013. Greasewood (*Sarcobatus vermiculatus*) was present within the undisturbed uplands on the site. Four vegetation communities were mapped across the site in 2013 and 2014. In general, the communities can be classified as undisturbed wetland, disturbed (recently constructed) wetland, undisturbed upland, and disturbed upland. The four community types were upland Type 1 – *Bromus tectorum/Sarcobatus vermiculatus*, upland Type 2 – *Helianthus annuus/Bassia scoparia*, wetland Type 3 – *Spartina pectinata/Eleocharis palustris*, and wetland Type 4 – *Eleocharis palustris/Chenopodium album*. The species composition for each community is included on the Monitoring Form (Appendix B) and discussed below. Vegetation community boundaries are shown in Figure 4 of Appendix A.

Upland community Type 1 – *Bromus tectorum/Sarcobatus vermiculatus* was located on 5.34 acres of undisturbed upland that surrounds the site. In general, the community was located beside the road grade along the northeast border of the site and the side slope of the railroad grade along the southwest boundary. Thirty-eight species were identified within the community. Dominant components within this community included cheatgrass (*Bromus tectorum*), greasewood (*Sarcobatus vermiculatus)*, lamb's quarters (*Chenopodium album*), intermediate wheatgrass (*Elymus hispidus*), field penny-cress (*Thlaspi arvense*), crested wheatgrass (*Agropyron cristatum*), false meadow rye (*Schedonrus pratensis*), common sunflower (*Helianthus annuus*), prickly lettuce (*Lactuca serriola*), and western wheatgrass (*Pascopyrum smithii*).

Upland community Type 2 – *Helianthus annuus/Bassia scoparia* was identified across 2.52 acres of upland disturbed during construction of the mitigation site. Although these areas were excavated to lower the elevation of the ground surface, positive wetland indicators within the community were not observed in 2014. The community was dominated by common sunflower and Mexican-fireweed (*Bassia scoparia*), lamb's quarters, and creeping wild rye (*Elymus repens*), with less percent cover of western wheatgrass, greasewood, American licorice (*Glycyrrhiza lepidota*), and fox-tail barley (*Hordeum jubatum*). The percentage of bare ground within this community decreased between 2013 and 2014 yet remained relatively high with a cover class of 21-50 percent.

Table 3. Vegetation species observed in 2013 and 2014 for the FNW-West site.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Alisma triviale	Northern Water-Plantain	OBL
Amaranthus retroflexus	Red-Root	FACU
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Asclepias speciosa	Showy Milkweed	FAC
Atriplex argentea	Silverscale	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	**California Brome**	**NL**
Bromus inermis	**Smooth Brome**	**UPL**
Bromus tectorum	Cheatgrass	NL
Carex sp.	**Sedge**	**NL**
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	NL
Descurainia sophia	Herb Sophia	NL
Echinochloa crus-galli	Large Barnyard Grass	FAC
Elaeagnus angustifolia	Russian-Olive	FACU
Eleocharis palustris	Common Spike-Rush	OBL
Elymus hispidus	Intermediate Wheatgrass	NL
Elymus repens	Creeping Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Euphorbia esula	Leafy Spurge	NL
Glyceria elata	**Tall Manna Grass**	**OBL**
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum brachyantherum	**Meadow Barley**	**FAC**
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	**Prairie Flax**	**NL**
Melilotus officinalis	**Yellow Sweet-Clover**	**FACU**
Pascopyrum smithii	Western-Wheat Grass	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Polygonum aviculare	**Yard Knotweed**	**FACU**
Populus deltoides	Eastern Cottonwood	FAC
Rosa arkansana	Prairie Rose	FACU
Rumex crispus	Curly Dock	FAC

[1] 2014 NWPL (Lichvar *et al*., 2014)

New species identified in 2014 are **bolded**.

Table 3 (continued). Vegetation species observed in 2013 and 2014 for the FNW-West Site.

Scientific Names	Common Names	GP Indicator Status[1]
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix sp.	**Willow**	**NL**
Sarcobatus vermiculatus	Greasewood	FAC
Schedonrus pratensis	False Meadow Rye Grass	FACU
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus maritimus	**Saltmarsh Club-Rush**	**OBL**
Setaria pumila	Yellow Bristle Grass	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Spartina pectinata	Freshwater Cord Grass	FACW
Symphoricarpos albus	Common Snowberry	UPL
Tamarix ramosissima	Salt-cedar	NL
Thlaspi arvense	Field Pennycress	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

[1] 2014 NWPL (Lichvar *et al*., 2014)

New species identified in 2014 are **bolded**.

Wetland Type 3 – *Spartina pectinata/Eleocharis palustris* generally represent the undisturbed pre-existing wetlands within the monitoring area that cover approximately 1.08 acres. Two low-lying swales through the lower half of the site and a small area near the outlet of East Spring Coulee were mapped in this community type. Freshwater cord grass (*Spartina pectinata*), common spike-rush (*Eleocharis palustris*), broad-leaf cat-tail (*Typha latifolia*), American licorice, reed canary grass (*Phalaris arundinacea*), fox-tail barley, peach-leaf willow, Eastern cottonwood, curly dock (*Rumex crispus*), field sow-thistle (*Sonchus arvenis*), and seven other species were documented within community Type 3. Open water and bare ground each covered approximately 6 to 10 percent of the community in 2014.

Wetland Type 4 – *Eleocharis palustris/Chenopodium album* covers approximately 4.76 acres of the site that was recently disturbed during excavation. The community exhibited positive wetland indicators in 2013 and 2014. The extent of the wetland community increased by approximately 0.4 acre in 2014, corresponding to the decrease in the extent of upland Type 2 as wetland habitat continued to develop. Open water was noted on over 50 percent of the community in 2014 owing to seasonal high water level and recent precipitation. Bare ground was recorded at between 21 and 50 percent cover within this community. Only common spike-rush and lamb's quarters were documented at 1 to 5 percent cover with twenty-two species, predominately hydrophytes, noted at trace levels throughout this community. Grand redstem (*Ammannia robusta*), an S2 species of concern (MTNHP) was recorded in community Type 4 in 2013. It

was not observed in 2014, possibly attributed to its occurrence in exposed mudflats as water draws down and may appear later in the growing season.

Two vegetation transect results are detailed on the Forsythe Northwest - West Monitoring Form (Appendix B) and summarized in tabular and graphic formats on Tables 4 and 5 and Charts 1 through 4, respectively. Photographs of the FNW - West transect end points are shown on pages C-4 through C-6 in Appendix C.

Vegetation Transect 1 is located in the east half of the site and is 282 feet in length. This transect began in the undisturbed uplands (Type 1) along the railroad grade, traversed across the two undisturbed existing wetland swales (Type 3) and disturbed upland areas (Type 2), and ended in upland Type 1 near Highway 12. Ten hydrophytic and 25 upland species were identified along the transect. Approximately 18.8 percent of this transect was located within wetland with the remaining 81.2 percent located in upland. The extent of wetlands on the transect increased by 3.2 percent in 2014. Wetland habitat is expected to continue to develop along this transect once the dike has been repaired and seasonal wetland hydrology can be established.

Table 4. Transect 1 data summary for FNW-West Site in 2013 and 2014.

Monitoring Year	**2013**	**2014**
Transect Length (feet)	**282**	**282**
Vegetation Community Transitions along Transect	6	6
Vegetation Communities along Transect	3	3
Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	27	35
Total Hydrophytic Species	10	10
Total Upland Species	17	25
Estimated % Total Vegetative Cover	75	80
Estimated % Unvegetated	25	20
% Transect Length Comprising Hydrophytic Vegetation Communities	15.6	18.8
% Transect Length Comprising Upland Vegetation Communities	84.4	81.2
% Transect Length Comprising Unvegetated Open Water	0.0	0
% Transect Length Comprising Mudflat	0	0

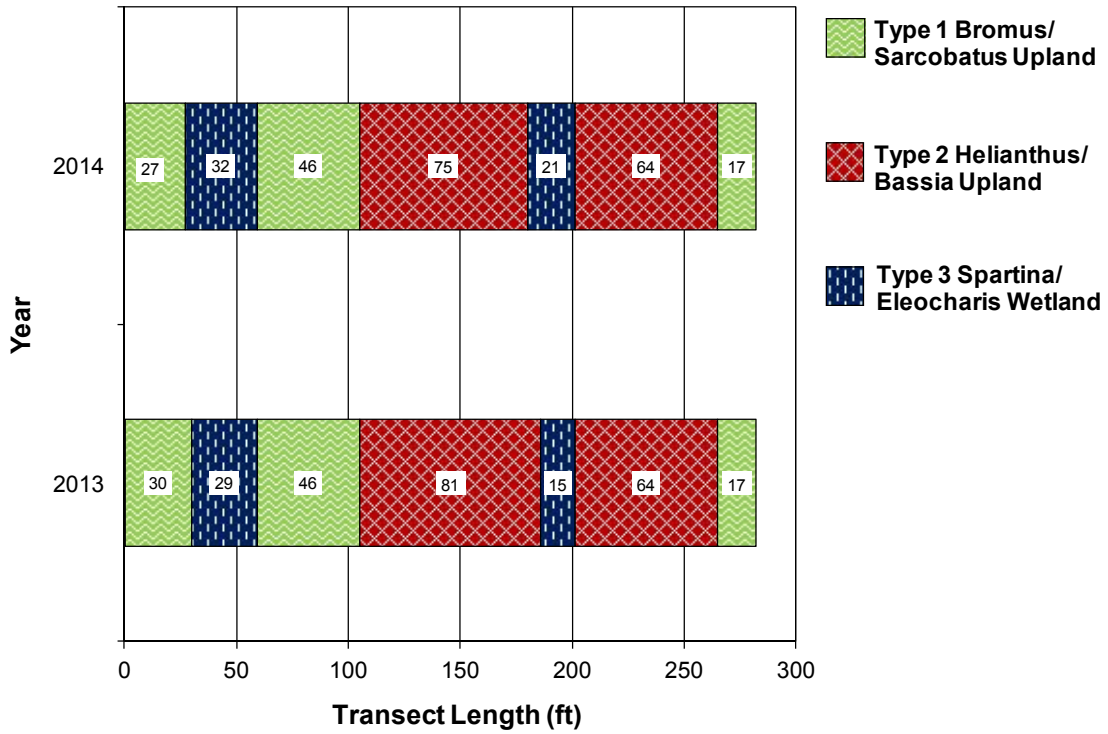

Chart 1. Transect 1 map for FNW-West Site showing vegetation types from transect start (0 feet) to finish (282 feet) for 2013 and 2014.

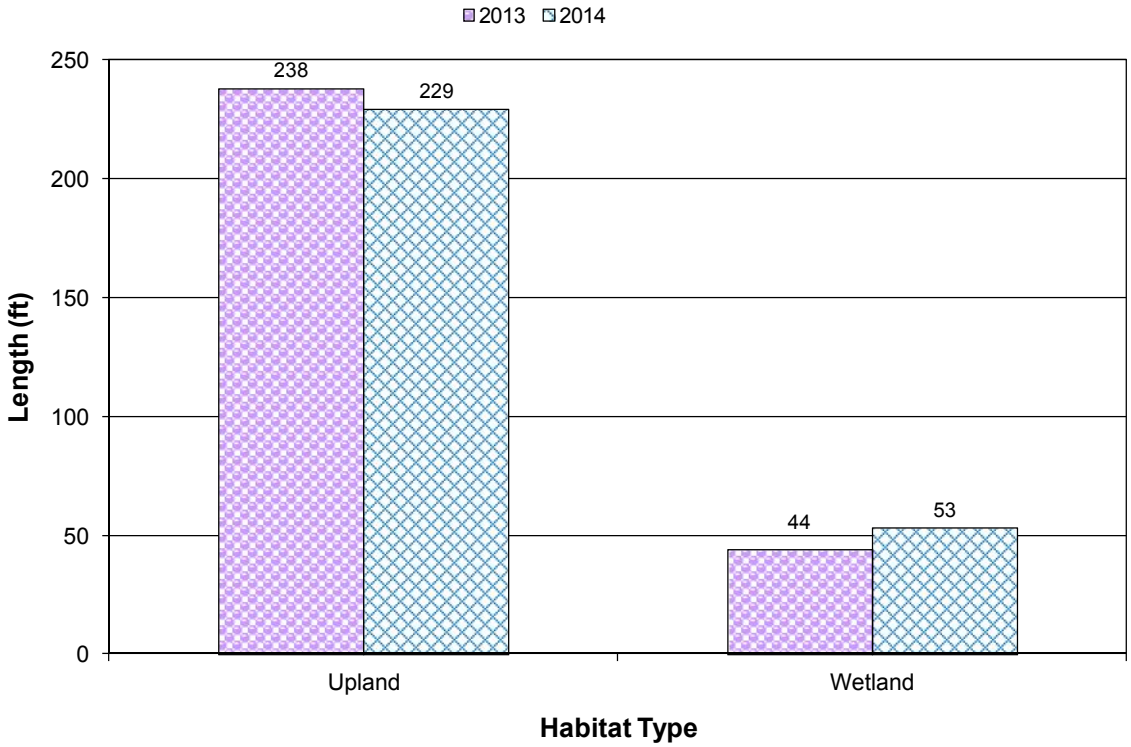

Chart 2. Length of vegetation communities within Transect 1 at FNW-West Site for 2013 and 2014.

Similar to Transect 1, Transect 2 began in undisturbed upland community Type 1 near the RR grade and finished in community Type 1 along Highway 12. The majority of this transect crossed the disturbed wetland community Type 4. Although mapped as Type 4 – *Eleocharis/Chenopodium* wetland based on the presence of greater than 5 percent vegetation cover, approximately 80 percent of the 261-foot transect consisted of bare ground due to the recent excavation of the site. A total of 26 species, including 11 hydrophytes, were identified along Transect 2.

Table 5. Transect 2 data summary for FNW-West Site for 2013 and 2014.

Monitoring Year	2013	2014
Transect Length (feet)	**261**	**261**
Vegetation Community Transitions along Transect	2	2
Vegetation Communities along Transect	2	2
Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	21	26
Total Hydrophytic Species	8	11
Total Upland Species	13	15
Estimated % Total Vegetative Cover	10	20
Estimated % Unvegetated	90	80
% Transect Length Comprising Hydrophytic Vegetation Communities	87.0	87.0
% Transect Length Comprising Upland Vegetation Communities	13.0	13.0
% Transect Length Comprising Unvegetated Open Water	0.0	0
% Transect Length Comprising Mudflat	0	0

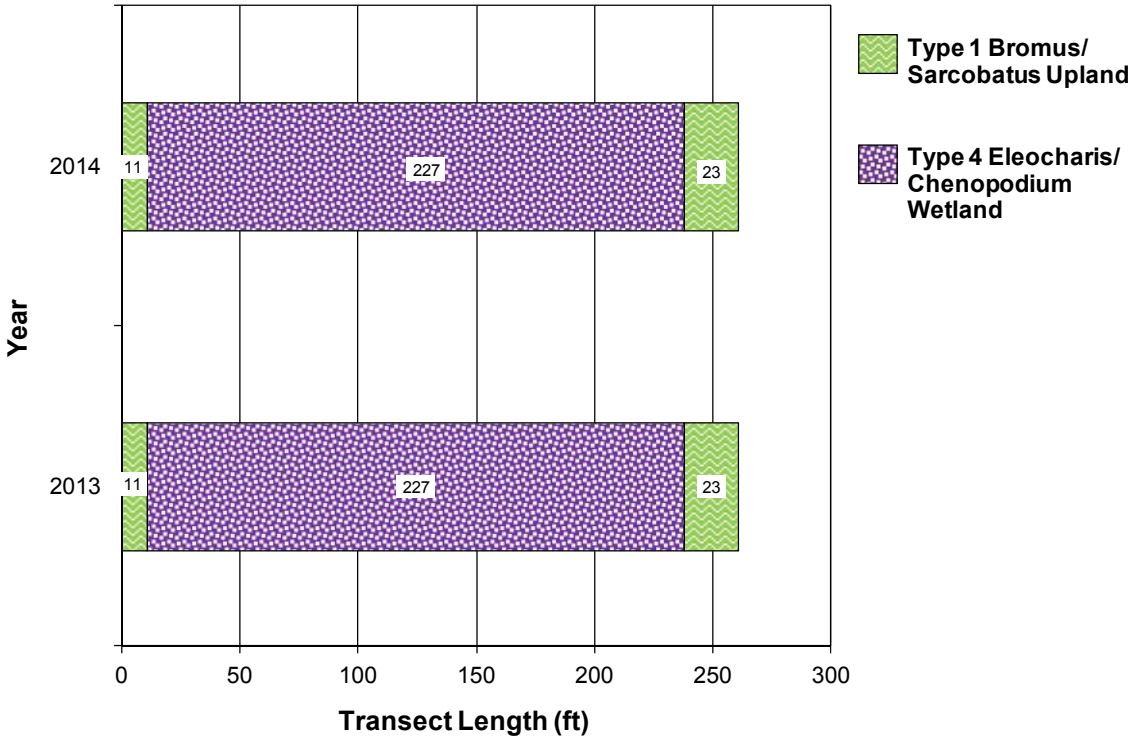

Chart 3. Transect 2 map for FNW-West Site showing vegetation types from transect start (0 feet) to finish (261 feet) for 2013 and 2014.

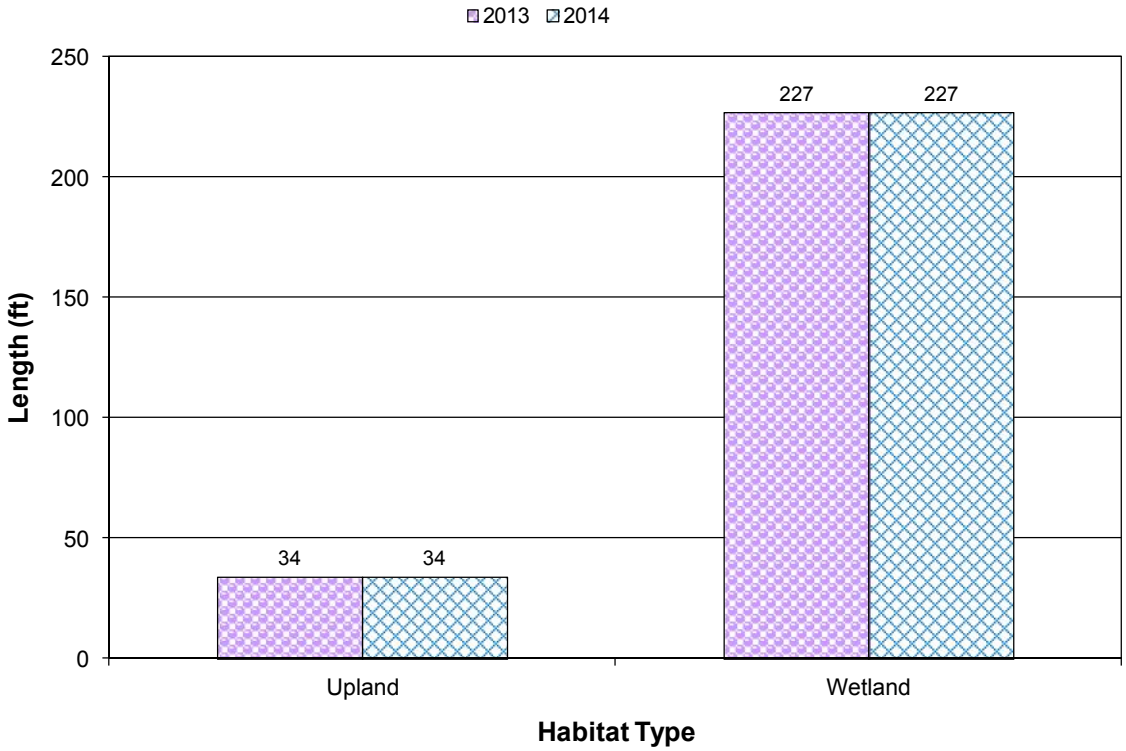

Chart 4. Length of vegetation communities within Transect 2 for FNW-West Site in 2013 and 2014.

Infestations of four Priority 2B noxious weeds, including Canadian thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), field bindweed (*Convulvulus arvensis*), and saltcedar (*Tamarix* sp.), were mapped in five locations on Figure 4 (Appendix A). Canadian thistle was identified in one location in community Type 1 near the mature cottonwoods. The size of the infestation was less than 0.1 acre and the cover class was moderate (6 to 25 percent). Field bindweed was identified along the RR grade with a cover class of low (1 to 5 percent) and at an infestation size of less than 0.1 acre. The RR grade contained two infestations of leafy spurge that ranged from 0.1 to 1.0 acre in size with cover classes of low to moderate. A few sprigs of saltcedar were present at the mouth of East Spring Coulee at an infestation size of less than 0.1 acre and at 1 to 5 percent cover.

No containerized shrubs or trees were installed at this site. Revegetation efforts included a combination of wetland sod placement and seeding following construction disturbance. The seeding mixture included Dacotah switchgrass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and Nuttall's alkaligrass (*Puccinellia nuttalliana*). Woody species are regenerating naturally within the site. Several hundred cottonwood seedlings were observed within the recently excavated wetland areas in 2013. Although only moderate survival of these seedlings were noted (<25 percent), the living seedlings exhibited increased growth in both height and thickness.

3.1.3. Soil

Soils on the site were mapped in the *Rosebud County Soil Survey* as Borollic Camborthids-Ustic Torrifluvents complex (0 to 8 percent slope) in the northwest corner of the site and Marvan silty clay. (0 to 2 percent slope) throughout the majority of the mitigation area. The Borollic Camborthids-Ustic Torrifluvents complex and Marvan sitly clay map units are located on the National Hydric Soil List (2012) and also on the Montana Hydric Soil list (USDA 2010). The Marvin series consist of very deep well drained light brownish gray clay mapped on alluvial fans, stream terraces, and drainageways.

Test pit We-1w was located at the margin of a recently excavated wetland in an area that met the hydric soil criteria. The soil profile revealed a gray (10YR 5/1) silty clay, with 3 percent, strong brown (7.5YR 5/6) concentrations in the matrix. The soil met the criteria for a depleted matrix (F3). The remaining three test pits were located in upland areas at the wetland margins. Test pit We-1u, located in an excavated area, exhibited a dark grayish brown (10YR 4/2) clay loam without redox features. Test pit We-2u was located in disturbed upland. The profile revealed a dark grayish brown (10YR 4/2) clay soil without redox features. Test pit We-3u was situated near the dike in an excavated area targeted for wetland expansion. The soil profile was brown (10 YR 5/3) clay with no redoximorphic characteristics. The units mapped for the site were generally confirmed by the test pit soils.

3.1.4. Wetland Delineation

Four data points were used to determine the wetland and upland boundaries in 2014 (FNW-West Figures 3 and 4, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Wetland Determination Data Forms (Appendix B). The total acreage of aquatic habitat at the West site (1) in 2014 was 5.85 acres, an increase of 0.41 wetland acres since 2013. This included approximately 1.29 acres of pre-existing wetland and 4.56 acres of created wetland within the recently excavated areas that have developed wetland characteristics in response to the decreased ground surface elevation. Water levels in the created wetlands support an establishing emergent plant community, although a majority of the disturbed area remains bare. Hydrophytic plants include common spike-rush, cottonwood, hard-stem club-rush (*Schoenoplectus acutus*), arum-leaf arrowhead (*Sagittaria cuneata*), and early-succession species like lamb's quarters and fox-tail barley. The existing wetlands included the low-lying swales dominated by cordgrass, spike-rush, and cattail.

Table 6. Wetland habitat acreages delineated at the FNW-West Site.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)
Existing Wetland	1.29	1.29
Created Wetland	4.15	4.56
Total	5.44	5.85

3.1.5. Wildlife

A list of wildlife species observed directly or indirectly during the 2013 and 2014 field surveys is presented in Table 7 and the monitoring form (Appendix B). Twenty-two bird species were identified in 2014. The presence of large trees and mature sunflowers provide habitat for the diversity of birds observed at the site. Two white-tailed deer (*Odocoileus virginianus*) including a bedded fawn were observed near the cottonwood groves. The tracks of a porcupine (*Erethizon dorsatum*) and raccoon (*Procyon lotor*) were also noted in 2014. No nesting structures have been installed at the site.

Table 7. Wildlife species observed at the FNW-West Site in 2013 and 2014.

COMMON NAME	SCIENTIFIC NAME
BIRDS	
American Goldfinch	*Spinus tristus*
Bald Eagle	***Haliaeetus leucocephalus***
Bank Swallow	*Riparia riparia*
Barn Swallow	***Hirundo rustica***
Belted Kingfisher	***Megaceryle alcyon***
Blue-winged Teal	***Anas discors***
Brown Thrasher	***Toxostoma rufum***
Cedar Waxwing	*Bombycilla cedrorum*
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Nighthawk	***Chordeiles minor***
Eastern Kingbird	***Tyrannus tyrannus***
Grasshopper Sparrow	*Ammodramus savannarum*
Great Blue Heron	***Ardea herodias***
Killdeer	***Charadrius vociferus***
Lark Bunting	*Calamospiza melanocorys*
Mallard	***Anas platyrhynchos***
Mourning Dove	***Zenaida macroura***
Northern Harrier	***Circus cyaneus***

COMMON NAME	SCIENTIFIC NAME
BIRDS	
Orchard Oriole	***Icterus spurius***
Red-winged Blackbird	***Agelaius phoeniceus***
Rock Wren	*Salpinctes obsoletus*
Song Sparrow	***Melospiza melodia***
Swainson's Hawk	***Buteo swainsoni***
Turkey Vulture	***Cathartes aura***
Western Kingbird	***Tyrannus verticalis***
Western Meadowlark	***Sturnella neglecta***
Western Sandpiper	***Calidris mauri***
Yellow Warbler	***Dendroica petechia***
MAMMALS	
Deer Sp.	*Odocoileus sp.*
Porcupine	***Erethizon dorsatum***
Raccoon	***Procyon lotor***
White-tailed Deer	***Odocoileus virginianus***
REPTILES	
Plains Gartersnake	*Thamnophis radix*

Species identified in 2014 are **bolded**.

3.1.6. Functional Assessment

Results of the 2013 and 2014 functional assessments are summarized in Table 8. The completed FNW-West Wetland Assessment Form is included in Appendix B. The FNW-West site was evaluated as one assessment area (AA-1) that encompassed 5.85 acres in 2014. The AA was rated as a Category III wetland in 2014 with 67.5 percent of the total possible points. Ratings for general wildlife habitat, sediment/shoreline stabilization, production export/food chain support, and uniqueness increased from 2013 to 2014 as a result of less disturbance and higher vegetation cover. The site received a high rating for MTNHP Species habitat based on the presence of *Ammannia robusta* within the site. The site also received a high rating for short and long term surface water storage. The site achieved 37.7 functional units (FU) in 2014, 8.1 more than in 2013 reflecting the increase in wetland acreage and the decrease in site disturbance as vegetation cover develop. The rating and functional units are expected to continue to improve as the site recovers from the recent excavation and develops increased vegetation cover.

Table 8. MWAM summary at the FNW-West Site in 2013 and 2014.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)
General Wildlife Habitat	Mod (0.5)	Mod (0.7)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	Mod (0.5)	Mod (0.5)
Short and Long Term Surface Water Storage	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.4)	Mod (0.4)
Sediment/Shoreline Stabilization	Low (0.3)	Mod (0.7)
Production Export/Food Chain Support	Mod (0.6)	High (0.9)
Groundwater Discharge/Recharge	Mod (0.7)	High (1.0)
Uniqueness	Mod (0.4)	Mod (0.5)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)
Actual Points/Possible Points	**5.45 / 10**	**6.75 / 10**
% of Possible Score Achieved	**54.5%**	**67.5%**
Overall Category	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**5.44**	**5.85**
Functional Units (acreage x actual points)	**29.6**	**39.5**

3.1.7. Photo Documentation

Photographs from photo points PP1 to PP5 (Figure 3, Appendix A), the transect endpoints, and wetland determination data points are shown on pages C-1 to C-7 of Appendix C.

3.1.8. Maintenance Needs

Infestations of four Priority 2B noxious weeds, including Canadian thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), field bindweed (*Convulvulus arvensis*), and saltcedar (*Tamarix* sp.), were mapped in five locations on Figure 4 (Appendix A). Canadian thistle was identified in one location in community Type 1 near the mature cottonwoods. The size of the infestation was less than 0.1 acre and the cover class was moderate (6 to 25 percent). Field bindweed was identified in one location within community 1 near the RR grade with a cover class of low (1 to 5 percent) and at an infestation size of less than 0.1 acre. The RR grade contained two infestations of leafy spurge that ranged from 0.1 to 1.0 acre in size with cover classes of low to moderate. A few sprigs of saltcedar were noted at the mouth of East Spring Coulee at an infestation size of less than 0.1 acre and at 1 to 5 percent cover. The MDT will use the annual monitoring results to determine weed control measures.

The dike failure that occurred at the site during high flows in 2013 was repaired by MDT prior to the 2013 field survey and was intact when inspected in 2013. However, the structure appeared to be inadequately stabilized and susceptible to future failure. An examination of this structure in June 2014 indicated that the structure did fail again during high spring flows, eroding a channel down to the

elevation of the original ephemeral thalweg. Photo point 2, shown on page C-2 of Appendix C, shows the repaired dike in 2013 and the failed dike following 2014 spring runoff. It is recommended the structure be redesigned and the upstream and downstream ends of the dike be reinforced with rip-rap and/or fabric for protection against future washouts based on the high volume of water that flows from the coulees at the west end of the site. A dike with reinforced spillway that functions to impound surface water during the spring would result in an increase of wetland habitat throughout the eastern part of the site. The fence around the perimeter of the monitoring areas was in good condition.

3.1.9. Current Credit Summary

Approximately 5.85 aquatic habitat acres consisting of approximately 1.29 acres of pre-existing wetland habitat and 4.56 acres of recently created wetlands were delineated in 2014. Approximately 7.86 acres of upland habitat was mapped on the site in 2014. Table 9 presents the calculated credit acres for individual mitigation types with appropriate credit ratios applied using the USACE crediting system. The FNW-West mitigation types and ratios included creation (1:1), preservation (4:1), and upland buffer (5:1). The credit acres accrued at the FNW-West site in 2014 totaled 6.45, 0.33 more credit acres than in 2013.

Table 9. Credit summary for the FNW-West Site.

WETLAND	Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres
Preserved Wetland	4:1	1.29	0.32	1.29	0.32
Created Wetland	1:1	4.15	4.15	4.56	4.56
Upland Buffer	5:1	8.27	1.65	7.86	1.57
TOTAL		**13.71**	**6.13**	**13.71**	**6.45**

There were no quantitative performance measures or success criteria established for this wetland mitigation area. Monitoring requirements listed within the approved wetland mitigation plan are being satisfied. In general, the areas delineated as wetlands met the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. The overall estimated vegetation cover of hydrophytic species on the site was approximately 30 percent and was expected to increase. Noxious weed cover in 2014 was less than 10 percent site wide.

3.2. Middle Site – Site 2

3.2.1. Hydrology

The average total annual precipitation recorded at the Forsythe, Montana weather station (243098), from January 1975 to September 2014 was 14.48 inches (WRCC 2014). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station exceeding the average by five inches. The precipitation between January and August totaled 13.85 inches in 2013 and 15.63 in 2014, both of which exceeded the long-term average of 10.52 inches for this same period. The main source of hydrology at this mitigation site is precipitation, surface runoff from adjacent uplands, and shallow groundwater.

The site is situated near abandoned meander bends associated with Big Porcupine Creek that exhibit wetland characteristics and may experience occasional flooding during high flows in Big Porcupine Creek. Approximately 5 percent of the site's wetland area was inundated with a range of depths between 0 and 0.6 feet during the 2014 survey. Sediment and drift deposits, surface soil cracks, and drainage patterns in the newly excavated depression provided evidence of inundated conditions for an extended time period prior to the field survey. Additional hydrologic indicators noted site wide included inundation, saturation, and iron deposits. Only five percent of the site was inundated during the field survey.

Two data points, M-1w and M-1u, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data point M-1w was located in an area of the excavated depression that met the wetland criteria. Hydrologic indicators at the data point included sediment deposits, surface soil cracks, a sparsely vegetated concave surface, and a positive FAC-Neutral test. Although data point M-1u exhibited surface soil cracks, it did not meet the wetland hydrology criteria requiring two secondary indicators.

3.2.2. Vegetation

A comprehensive list of the forty-four species identified onsite in 2013 and 2014 is presented in Table 10. Two community types were identified in 2013 and 2014, one upland and one wetland community type. The community types are upland Type 1 – *Pascopyrum smithii/Helianthus annuus* and wetland Type 2 – *Rumex crispus/Eleocharis palustris*. The vegetation community boundaries are shown on Figure 6 of Appendix A. The species composition for each community is discussed below and included on the Monitoring Form (Appendix B).

Table 10. Vegetation species observed at the FNW-Middle Site in 2013 and 2014.

Scientific Names	Common Names	GP Indicator Status[1]
Alisma triviale	Northern Water-Plantain	OBL
Alopecurus pratensis	**Field Meadow-Foxtail**	**FACW**
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Avena fatua	Wild Oats	NL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus tectorum	**Cheatgrass**	**NL**
Chenopodium album	Lamb's-Quarters	FACU
Convolvulus arvensis	**Field Bindweed**	**NL**
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Glyceria grandis	**American Manna Grass**	**OBL**
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	**Prairie Flax**	**NL**
Melilotus officinalis	**Yellow Sweet-Clover**	**FACU**
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa palustris	Fowl Blue Grass	FACW
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Ratibida columnifera	Prairie Coneflower	NL
Rosa arkansana	Prairie Rose	FACU
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix sp.	Willow	NL
Sarcobatus vermiculatus	Greasewood	FAC
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Solanum rostratum	Buffalo Bur	NL
Symphoricarpos albus	Common Snowberry	UPL
Tamarix ramosissima	**Salt-cedar**	**NL**
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	**Meadow Goat's-beard**	**NL**
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

[1] 2014 NWPL (Lichvar *et al*., 2014)

New species identified in 2014 are **bolded**.

Upland Type 1 - *Pascopyrum smithii/Helianthus annuus* represents the cover on the upland surrounding the excavated depression and along Highway 12 within the monitoring boundary. The 1.31-acre community included a dominance of western wheatgrass (*Pascopyrum smithii*), common sunflower (*Helianthus annuus*), yellow sweet-clover (*Melilotus officinalis*), and cheatgrass (*Bromus tectorum*). Other common components of this vegetation community included creeping wild rye (*Elymus repens*) lamb's-quarters (*Chenopodium album*), Mexican-fireweed (*Bassia scoparia*), curly dock (*Rumex crispus*), and field penny-cress (*Thlaspi arvense*). Woody plants included prairie rose (*Rosa arkansana*), greasewood (*Sarcobatus vermiculatus*), common snowberry (*Symphoricarpus albus*), and Eastern cottonwood (*Populus deltoides*).

Wetland Type 2 - *Rumex crispus/Eleocharis palustris* was identified on 0.49 acres within the excavated depression. Bare ground was recorded at greater than 50 percent of total cover. Common species included curly dock, common spikerush (*Eleocharis palustris*), American manna grass (*Glyceria grandis*), common sunflower and Mexican-fireweed. Twenty species were identified in the community including hydrophytes such as northern water-plantain (*Alisma trivale*), large barnyard grass (*Echinochloa crus-galli*), Eastern cottonwood (*Populus deltoides*), peachleaf willow (*Salix amygdaloides*), saltmarsh club-rush (*Schoenoplectus maritimus*), and broad-leaf cat-tail (*Typha latifolia*).

One vegetation transect was established at the site that runs perpendicular to the linear excavated wetland. The transect began at a fence post along the northeast boundary of the site, followed an azimuth of 205 degrees for 50 feet, then ended at an existing cottonwood. The transect traversed both communities for the same distance in 2013 and 2014. A total of 20 species were identified on the transect including eight hydrophytes and 12 upland species. Fifty-two percent of the transect was located in wetland habitat. Approximately 50 percent of the transect is unvegetated bare ground, a consequence of the recent disturbance. Vegetation transect results are detailed on the FNW-Middle Monitoring Form (Appendix B) and are summarized in Table 11 and Charts 5 and 6. Photos of the transect end points are provided in Appendix C.

One Montana-listed noxious weed was identified at the site and included a small area (<0.1-acre) of field bindweed in the western end of the site. No woody vegetation was installed within the mitigation wetland. Revegetation efforts at the site included seeding a mixture of Dacotah switchgrass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and Nuttall's alkaligrass (*Puccinellia nuttalliana*) following construction disturbance. Several hundred cottonwood seedlings were observed along the margin of the wetland at the apparent edge of early-season inundation during the 2013 field survey. A relatively high percentage of these seedlings were still living during the 2014 site visit.

Table 11. Transect 1 data summary for FNW-Middle Site in 2013 and 2014.

Monitoring Year	2013	2014
Transect Length (feet)	**50**	**50**
Vegetation Community Transitions along Transect	2	2
Vegetation Communities along Transect	2	2
Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	16	20
Total Hydrophytic Species	6	8
Total Upland Species	10	12
Estimated % Total Vegetative Cover	40	50
Estimated % Unvegetated	60	50
% Transect Length Comprising Hydrophytic Vegetation Communities	52.0	52.0
% Transect Length Comprising Upland Vegetation Communities	48.0	48.0
% Transect Length Comprising Unvegetated Open Water	0.0	0
% Transect Length Comprising Mudflat	0	0

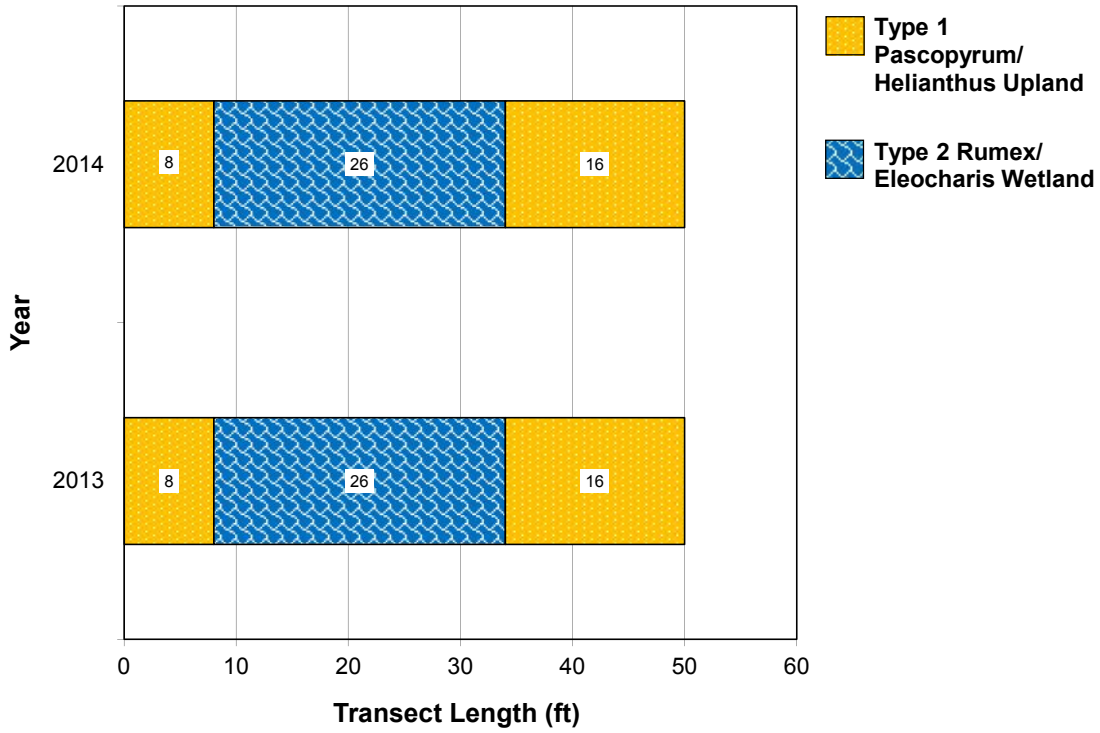

Chart 5. Transect 1 map for FNW-Middle Site showing vegetation types from transect start (0 feet) to finish (50 feet) in 2013 and 2014.

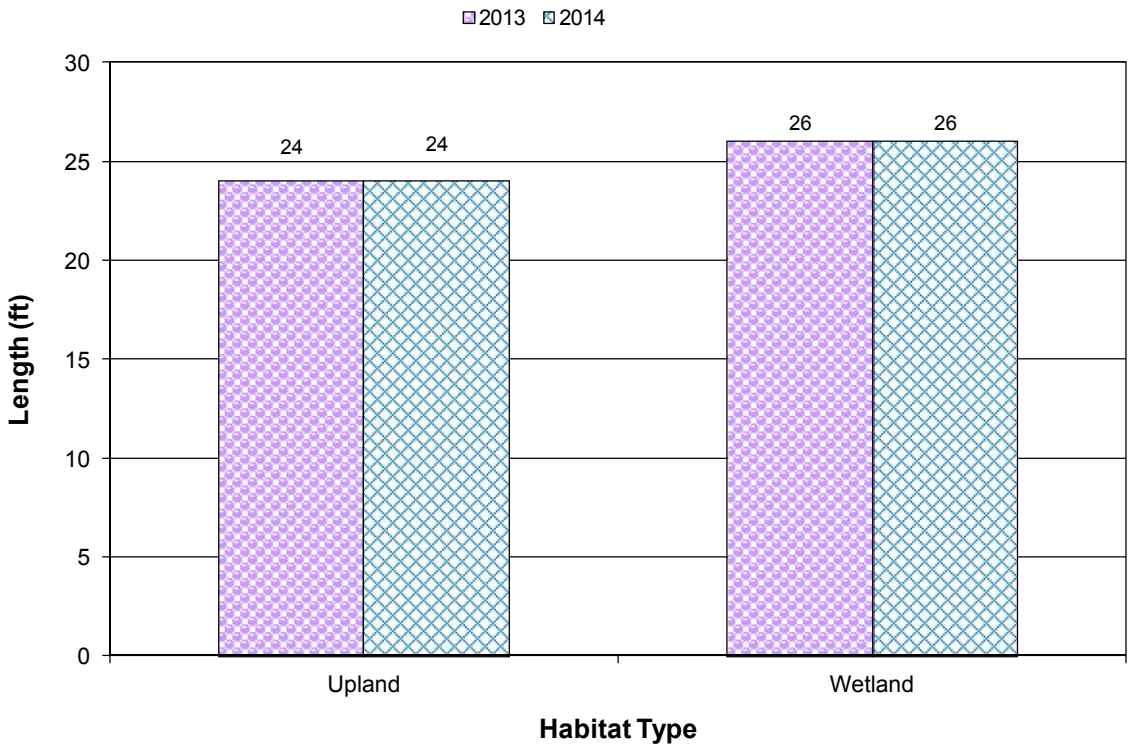

Chart 6. Length of vegetation communities within Transect 1 at FNW-Middle Site in 2013 and 2014.

3.2.3. Soil

Soils at the FNW-Middle site were mapped as Harlem silty clay found on 0 to 2 percent slopes. These very deep well-drained soils are seen on floodplains and are occasionally flooded. This map series is identified on the Montana Hydric Soils List.

Two test pits were examined to determine hydric soil parameters. Test pit M-1w was located in the excavated depression in an area that met the three wetland criteria. The soil profile revealed grayish brown (10YR 5/2) clay with dark yellowish brown (10YR 4/6) redoximorphic concentrations in the matrix. The depleted matrix within 12 inches of the soil surface was a positive indicator of hydric soils. The soil in upland test pit M-1u was brown (10YR 5/3) clay without redox concentrations within the upper 12 inches of the profile. Although the soil in the test pit was not hydric, it appeared to be near the seasonal high water table based on the presence of five percent sodic concentrations (10 YR 7/1).

3.2.4. Wetland Delineation

Two data points (Figure 6, Appendix A) were used to determine the upland and wetland boundaries. The FNW-Middle Wetland Determination Data Forms are included in Appendix B and the wetland boundaries are shown on Figure 6 (Appendix A). The total aquatic habitat developed to date within the 1.8-acre project area was 0.49 acres (Table 12). The floor of the excavated depression was identified as wetland based on the presence of positive wetland hydrology

indicators, hydric soil, and the predominance of hydrophytic species. The wetland boundary may extend slightly up the side slopes of the excavated basin in subsequent growing seasons based on the hydrological indicators (seasonal inundation) observed during the field review.

Table 12. Wetland/upland habitat acreages delineated at the FNW-Middle Site in 2013 and 2014.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)
Project Area	1.80	1.80
Created Wetland	0.49	0.49
Upland Buffer	1.31	1.31

3.2.5. Wildlife

A list of wildlife species observed directly and indirectly during the 2013 and 2014 field survey is shown in Table 13 (Monitoring Form, Appendix B). Six bird species, including an Eastern kingbird (*Tyrannus tyrannus*), common nighthawk (*Chordeiles minor*), and a turkey vulture (*Cathartes aura*) were identified within or flying over the mitigation site. The tracks of a raccoon (*Procyon lotor*) were identified in the mud.

Table 13. Wildlife species observed at the FNW-Middle Site in 2013 and 2014.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Frog sp.	
BIRDS	
American Goldfinch	*Spinus tristus*
Common Nighthawk	***Chordeiles minor***
Eastern Bluebird	*Sialia sialis*
Eastern Kingbird	***Tyrannus tyrannus***
Killdeer	*Charadrius vociferus*
Mourning Dove	***Zenaida macroura***
Turkey Vulture	***Cathartes aura***
Western Kingbird	***Tyrannus verticalis***
Western Meadowlark	***Sturnella neglecta***
MAMMALS	
Coyote	*Canis latrans*
Deer Sp.	*Odocoileus sp.*
Raccoon	***Procyon lotor***
REPTILES	
Plains Gartersnake	*Thamnophis radix*

Species identified in 2014 are **bolded**.

3.2.6. Functional Assessment

Results of the 2013 and 2014 functional assessments are summarized in Table 14. The completed FNW-Middle Wetland Assessment Form is provided in Appendix B. The FNW-West site was evaluated as one assessment area and encompassed 0.49 acres. The prominent factor adversely impacting the overall score and functional units at the site in 2013 was the general condition of the AA including high disturbance, high percentage of bare ground, low vegetation cover, and low quality of wildlife habitat. The disturbance rating went from high to moderate in 2014 based on the increased vegetation cover in disturbed areas. The S2 species of concern grand redstem was documented growing within the constructed wetland in 2013 and provided a high MTNHP rating. The flood attenuation rating was modified based on lack of connection to Big Porcupine Creek. This site achieved 47.8 percent of the possible score and a total of 2.1 functional units in 2014. The score rose 4.5 percentage points from 2013 to 2014 as a result of increases in the General Wildlife Habitat, Production Export/Food Chain Support, and Uniqueness functions. The disturbance rating is factored into the scoring of these functions. Development of the vegetation cover may result in an improved rating from a Category III wetland to a Category II wetland long term, although the small size of the AA will limit the total score.

Table 14. MWAM summary at the FNW-Middle Site for 2013 and 2014.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	High (1.0)	NA
Short and Long Term Surface Water Storage	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)
Groundwater Discharge/Recharge	NA	NA
Uniqueness	Low (0.1)	Low (0.2)
Recreation/Education Potential (bonus points)	NA	NA
Actual Points/Possible Points	**3.9 / 9**	**3.3 / 9**
% of Possible Score Achieved	**43.3%**	**36.7%**
Overall Category	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**0.49**	**0.49**
Functional Units (acreage x actual points)	**1.9**	**1.6**

3.2.7. Photo Documentation

Photographs of photo points PP1 and PP2 are shown on page C-8 in Appendix C. The vegetation transect endpoints and wetland determination data points (Figure 5, Appendix A) are shown on pages C-9 and C-10.

3.2.8. Maintenance Needs

One Montana-listed noxious weed, field bindweed (*Convolvulus arvensis*), was identified at this site in 2014 near the western boundary and should be controlled to prevent spread and colonization. The fence along the mitigation area was in good-working order. There were no man-made water control structures or bird boxes installed at this site.

3.2.9. Current Credit Summary

Table 15 shows the total delineated acres and credit acres estimated for the FNW-Middle site in 2013 and 2014. The 2014 wetland delineation identified 0.49 acres of created emergent wetlands and 1.31 acres of upland buffer, the same acreages identified in 2013. The site accrued 0.75 estimated credit acres in 2014. There are no performance standards identified for this site. One noxious weed was identified within the mitigation site boundaries yet exhibited very low percent areal cover (<1%). The percent cover of native hydrophytes was low although the overall cover increased slightly from 2013 to 2014. The cover of wetland vegetation will increase as favorable wetland conditions persist and as the site recovers from 2012 construction.

Table 15. Credit summary at the FNW-Middle Site in 2013 and 2014.

Habitat Type	Mitigation Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres
Created Wetland	1:1	0.49	0.49	0.49	0.49
Upland Buffer	5:1	1.31	0.26	1.31	0.26
Total		**1.80**	**0.75**	**1.80**	**0.75**

3.3. East Site – Site 3

3.3.1. Hydrology

The average total annual precipitation recorded at the Forsythe, Montana weather station (243098), from January 1975 to September 2014 was 14.48 inches (WRCC 2014). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station exceeding the average by five inches.

This site is very similar to the FNW-Middle site. The main sources of hydrology at this FNW-East are shallow groundwater, direct precipitation, and surface runoff from adjacent uplands. Old meander scars of Big Porcupine Creek with relic and contemporary wetland characteristics are located directly adjacent to the site. The newly excavated depression supported signs of inundation persisting for an extended period prior to the field survey. Positive hydrologic indicators observed at this site included inundation, saturation, water marks, water-stained leaves, hydrogen sulfide odor, algal mat/crust, surface soil cracks, concave surface, geomorphic position, and iron deposits. Approximately 5% of the site was inundated at the time of the 2014 field survey.

Two data points, Ea-1w and Ea-1u, were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data point Ea-1w was located within an area that met the wetland criteria. Positive indicators of wetland hydrology at this data point included drift deposits, surface soil cracks, and sparsely vegetated concave surface. No signs of wetland hydrology were observed at Ea-1u, located along the side slope of the excavated basin above the seasonal saturation zone of the impounded water.

3.3.2. Vegetation

A comprehensive list of forty-one species compiled during the 2013 and 2014 field surveys of FNW-East is presented in Table 16. Two community types were identified and mapped at this site in 2014 (Figure 8, Appendix A) and included upland Type 1 – *Helianthus annuus/Thlaspi arvense* and wetland Type 2 – *Rumex crispus/Eleocharis palustris*. The species composition is detailed by type on the FNW-East Monitoring Form (Appendix B) and discussed below.

Table 16. Vegetation species observed at the FNW-East Site in 2013 and 2014.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	**Algae, green**	**NL**
Alisma triviale	Northern Water-Plantain	OBL
Alopecurus pratensis	**Field Meadow-Foxtail**	**FACW**
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	NL
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Convolvulus arvensis	**Field Bindweed**	**NL**
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus repens	**Creeping Wild Rye**	**FACU**
Elymus sp.	Wild Rye	NL
Glyceria elata	**Tall Manna Grass**	**OBL**
Helianthus annuus	Common Sunflower	FACU
Hesperostipa comata	**Needle-and-Thread**	**NL**
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Linum lewisii	**Prairie Flax**	**NL**
Medicago sativa	**Alfalfa**	**UPL**
Melilotus officinalis	**Yellow Sweet-Clover**	**FACU**
Pascopyrum smithii	Western-Wheat Grass	FACU
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Ratibida columnifera	Prairie Coneflower	NL
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW
Salix exigua	**Narrow-Leaf Willow**	**FACW**
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Sisymbrium altissimum	**Tall Hedge-Mustard**	**FACU**
Solanum rostratum	Buffalo Bur	NL
Tamarix ramosissima	**Salt-cedar**	**NL**
Taraxacum officinale	**Common Dandelion**	**FACU**
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	**Meadow Goat's-beard**	**NL**
Typha latifolia	Broad-Leaf Cat-Tail	OBL

[1] 2014 NWPL (Lichvar *et al*., 2014)

New species identified in 2014 are **bolded**.

Upland Type 1 – *Helianthus annuus/Thlaspi arvense* represented the upland areas surrounding the excavated wetland. This 1.55-acre community is represented by upland species common to roadsides and recently disturbed sites and includes common sunflower, field penny-cress, yellow sweet-clover, crested wheatgrass (*Agropyron cristatum*), lamb's-quarters, western wheatgrass, curly dock, perennial ragweed (*Ambrosia psilostachya*), cheatgrass, fox-tail barley, and clasping pepperweed (*Lepidium perfoliatum*). Buffalobur nightshade (*Solanum rostratum*) was identified in the upland community in 2013 but was not seen during the 2014 survey.

Wetland Type 2 - *Rumex crispus/Eleocharis palustris* was mapped within the 1.19-acre excavated depression. This community was characterized by an increase of hydrophytic vegetation in 2014 from a mostly bare basin with pockets of standing water in 2013. Curly dock, an early-succession facultative plant, was recorded at a cover class of 21 to 50 percent. Common spikerush, large barnyard grass, yard knotweed (*Polygonum aviculare*), saltmarsh clubrush (*Schoenoplectus maritimus*), and broad-leaf cat-tail were identified within this community. Grand redstem (*Ammannia robusta*) was also identified at trace amounts in the wetland community at FNW-East in 2013 but not observed in 2014. Several cottonwood seedlings were observed throughout this wetland in 2013 with a modest proportion of survival noted in 2014. Seedlings of various willows (*Salix exigua* and *Salix amygdaloides*) were also present within this community in 2014.

Two vegetation transects were established, one on each end of the FNW-East site. Vegetation results for Transects 1 and 2 are detailed on the FNW-East Monitoring Form (Figure 7, Appendix B) and summarized in Tables 17 and 18 and Charts 7 through 10. Photographs of the transect end points are shown on pages C-11 to C-13 in Appendix C.

Transect 1 is located at the northwest end of the site. This transect began at the fenced boundary in upland Type 1, crossed wetland Type 2 community at a skew, and terminated in upland Type 1 (Chart 7). Twenty-four species, including seven hydrophytes and seventeen upland species, were identified along this 125-foot transect in 2014, an increase of eight species since 2013. Wetland habitat along this transect is not expected to increase considerably due to the distinct topographic break defining the wetland boundary.

Table 17. Transect 1 data summary at FNW-East Site in 2013 and 2014.

Monitoring Year	2013	2014
Transect Length (feet)	**125**	**125**
Vegetation Community Transitions along Transect	2	2
Vegetation Communities along Transect	2	2
Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	16	24
Total Hydrophytic Species	5	7
Total Upland Species	11	17
Estimated % Total Vegetative Cover	40	40
Estimated % Unvegetated	60	60
% Transect Length Comprising Hydrophytic Vegetation Communities	51.2	52
% Transect Length Comprising Upland Vegetation Communities	48.8	48
% Transect Length Comprising Unvegetated Open Water	0.0	0
% Transect Length Comprising Mudflat	0	0

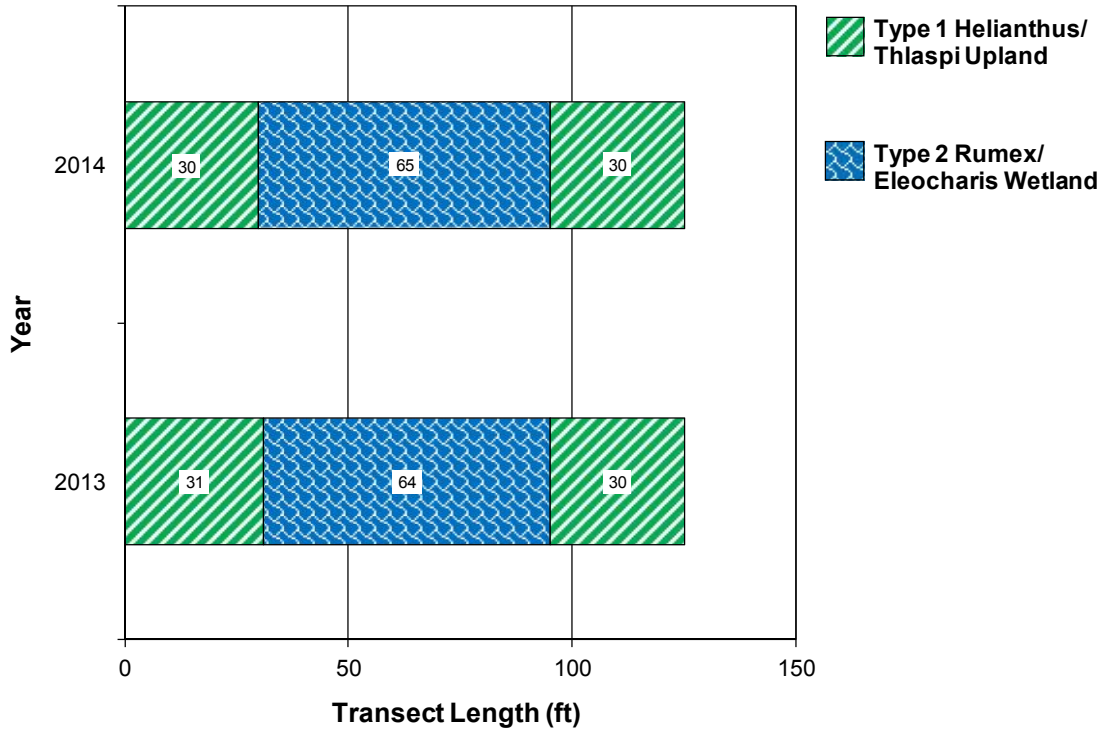

Chart 7. Transect 1 map for FNW-East Site showing vegetation types from transect start (0 feet) to finish (125 feet) in 2013 and 2014.

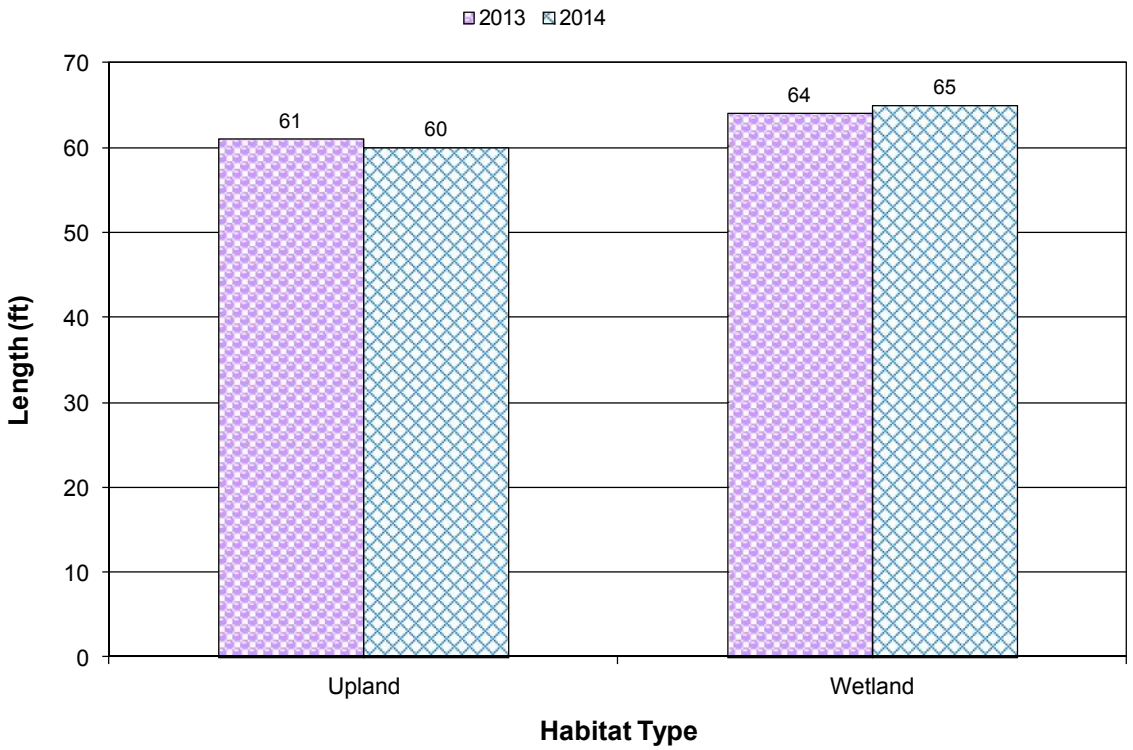

Chart 8. Length of vegetation communities within Transect 1 for FNW-East Site in 2013 and 2014.

Transect 2 is very similar to T-1. This one begins in the southeast corner of the site in upland Type 1, crosses through wetland Type 2, and terminates in upland Type 1. A total of 24 species, including nine hydrophytes and fifteen upland species, were found along this 181-foot transect. An increase of vegetative cover from 40 percent in 2013 to 55 percent in 2014 was documented along the transect and primarily included increased vegetation development within the wetland Type 2 *Rumex/Eleocharis* community following construction.

Table 18. Transect 2 data summary for FNW-East Site in 2013 and 2014.

Monitoring Year	**2013**	**2014**
Transect Length (feet)	**181**	**181**
Vegetation Community Transitions along Transect	2	2
Vegetation Communities along Transect	2	2
Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	12	24
Total Hydrophytic Species	5	9
Total Upland Species	7	15
Estimated % Total Vegetative Cover	40	55
Estimated % Unvegetated	60	45
% Transect Length Comprising Hydrophytic Vegetation Communities	63.0	63
% Transect Length Comprising Upland Vegetation Communities	37.0	37
% Transect Length Comprising Unvegetated Open Water	0.0	0
% Transect Length Comprising Mudflat	0	0

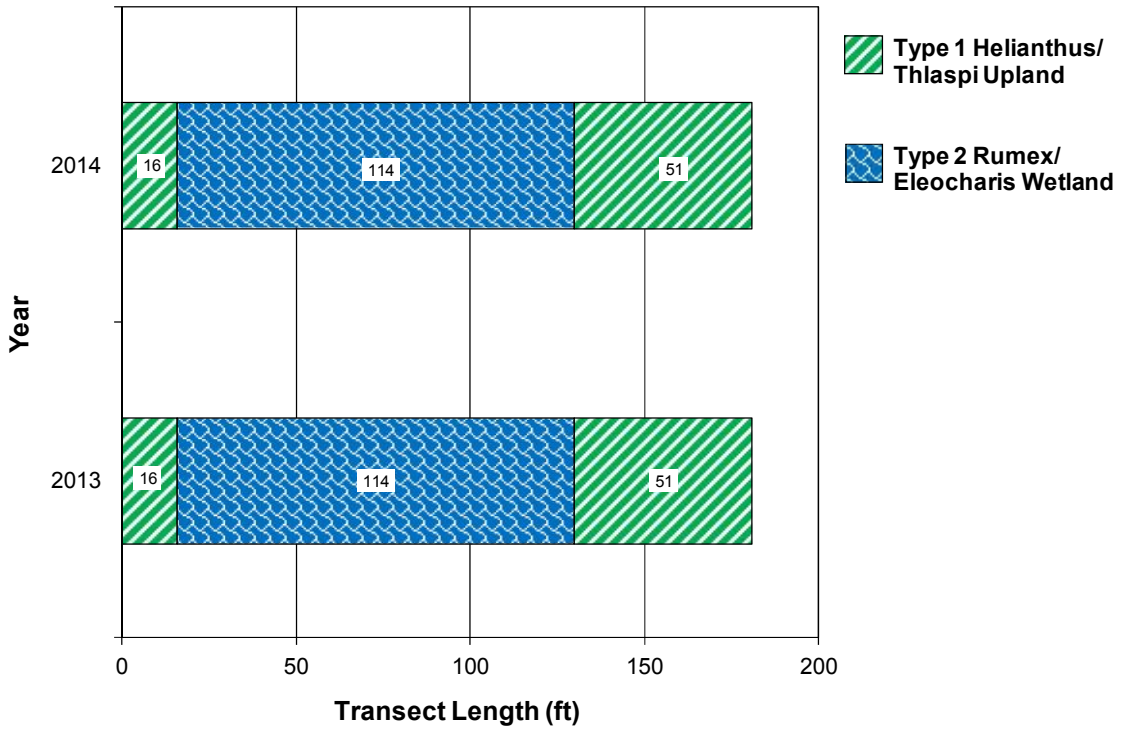

Chart 9. Transect 2 map for FNW-East Site showing vegetation types from transect start (0 feet) to finish (181 feet) in 2013 and 2014.

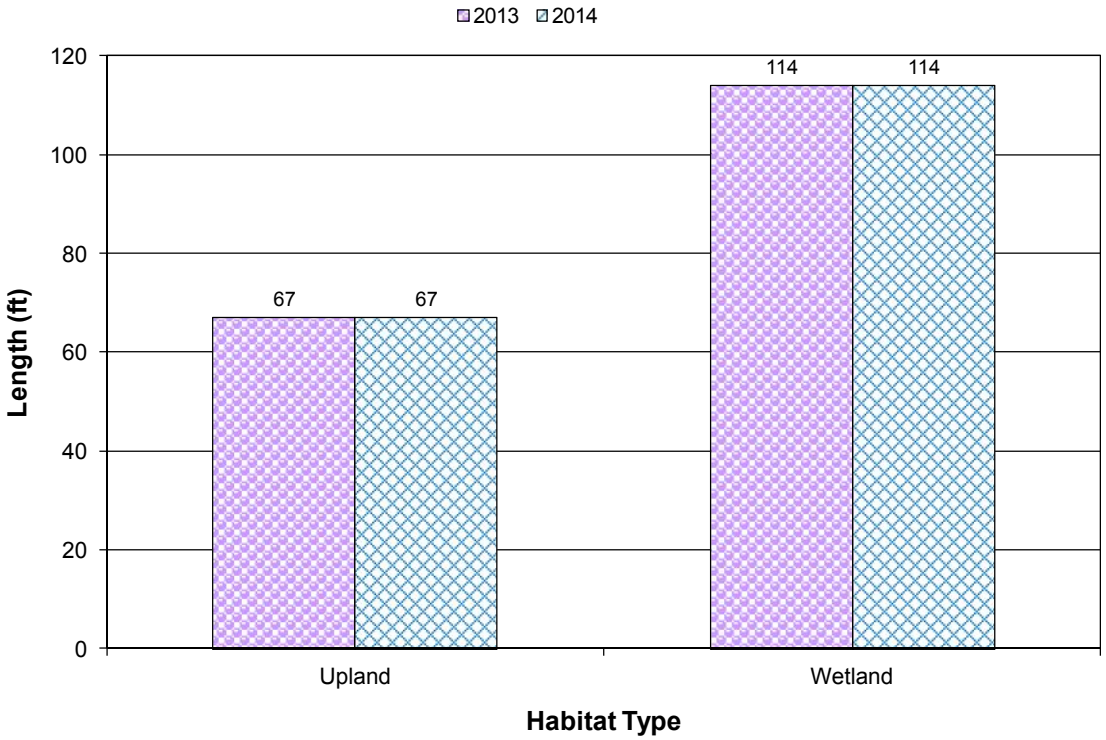

Chart 10. Length of vegetation communities within Transect 2 for FNW-East Site in 2013 and 2014.

One Montana-listed noxious weed was identified at this site and included two small locations of field bindweed. The site was seeded following construction and has displayed increased hydrophytic vegetation development within the constructed basin. No woody plants were installed at FNW-East. Mature cottonwoods and willows in the area appear to be providing natural regeneration of cottonwoods and willows as seedlings of both genera were documented within the wetland community.

3.3.3. Soil

Soils at the FNW-Middle site were mapped as Harlem silty clay, 0 to 2 percent slope. These very deep well drained soils are on floodplains and occasionally flooded. This map series is identified on the Montana Hydric Soils List.

Two test pits were examined to determine hydric soil parameters. Test pit Ea-1w was located in an area that met the three wetland criteria. The soil profile revealed a grayish browh (10YR 5/2) clay with dark yellowish brown (10YR4/4) redox concentrations in the matrix. This soil pit qualified as hydric due to the depleted matrix. Data point Ea-1u was located in the adjacent uplands. The soil profile revealed a brown (10YR 5/3) clay with light gray (10YR 7/1) mottles. This profile did not qualify as hydric. Hydric soils throughout the floor of the excavated basin are expected to continue to develop with time.

3.3.4. Wetland Delineation

Two data points were evaluated in 2014 to determine the wetland boundary at the site (Wetland Determination Data Forms, Appendix B). The surveyed boundaries are shown on Figure 8 in Appendix A. Same as in 2013, the 2014 delineation identified 1.19 acres of wetland and 1.55 acres of upland buffer (Table 19) within the project boundaries. Wetland acreage is not expected to increase much due to the abrupt topographical break at the wetland edge.

Table 19. Wetland/upland habitat acreages delineated at the FNW-East Site in 2013 and 2014.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)
Project Area	2.74	2.74
Created Wetland	1.19	1.19
Upland Buffer	1.55	1.55

3.3.5. Wildlife

A list of wildlife species observed directly and indirectly at the site during the field survey in 2013 and 2014 is presented in Table 20. Twelve bird species were observed within of directly over the mitigation site in 2014 and included cliff and barn swallows, common nighthawk, western kingbird, eastern kingbird, killdeer, lark sparrow, mourning dove, red-winged blackbird, turkey vulture, western meadowlark, and western sandpiper. Tracks of raccoon were noted at this site.

Table 20. Wildlife species observed at the FNW-East Site in 2013 and 2014.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	*Rana pipiens*
MAMMALS	
Coyote	*Canis latrans*
Deer Sp.	*Odocoileus sp.*
Raccoon	***Procyon lotor***
BIRDS	
American Goldfinch	*Spinus tristus*
Bank Swallow	*Riparia riparia*
Barn Swallow	***Hirundo rustica***
Cliff Swallow	***Petrochelidon pyrrhonota***
Common Nighthawk	***Chordeiles minor***
Eastern Kingbird	***Tyrannus tyrannus***
Killdeer	***Charadrius vociferus***
Lark Sparrow	***Chondestes grammacus***
Mourning Dove	***Zenaida macroura***
Red-winged Blackbird	***Agelaius phoeniceus***
Turkey Vulture	***Cathartes aura***
Vesper Sparrow	*Pooecetes gramineus*
Western Kingbird	***Tyrannus verticalis***
Western Meadowlark	***Sturnella neglecta***
Western Sandpiper	***Calidris mauri***

Species identified in 2014 are **bolded**.

3.3.6. Functional Assessment

Results of the 2013 and 2014 functional assessment are summarized in Table 21. The completed 2014 Wetland Assessment Form is included in Appendix B. The total aquatic habitat developed to date within the 2.74-acre project area is 1.19 acres. The site was evaluated as one assessment area.

The AA was rated as a Category III wetland with 47.8 percent of the total possible points. The presence of the grand redstem (S2) in 2013 provided the site with a high rating for MTNHP species habitat. The disturbance rating improved from high in 2013 to moderate in 2014 and was the basis for the overall higher functional rating. The site achieved 5.1 functional units, an increase of 0.8 units since 2013.

3.3.7. Photo Documentation

Photographs of photo points PP1 to PP3, the transect endpoints, and the wetland determination data points (Figure 8, Appendix A) are shown on pages C-11 through C-13 of Appendix C.

Table 21. MWAM Summary at the FNW-East Site in 2013 and 2014.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)
MTNHP Species Habitat	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.2)	Mod (0.4)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	NA	NA
Short and Long Term Surface Water Storage	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	High (1.0)
Sediment/Shoreline Stabilization	Low (0.2)	Low (0.2)
Production Export/Food Chain Support	Low (0.2)	Low (0.3)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.1)	Low (0.2)
Recreation/Education Potential (bonus points)	NA	NA
Actual Points/Possible Points	**3.6 / 9**	**4.3 / 9**
% of Possible Score Achieved	**40.0%**	**47.8%**
Overall Category	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**1.19**	**1.19**
Functional Units (acreage x actual points)	**4.3**	**5.1**

3.3.8. Maintenance Needs

One Montana-listed noxious weed was identified in two locations at this site in 2014. These locations are shown in Figure 8 (Appendix A) and should be controlled to prevent further establishment. The recently constructed fence along the site was in good-working order. There were no man-made water control structures installed at FNW-East.

3.3.9. Current Credit Summary

The wetland acreage delineated in 2014 totaled 1.19 acres. Upland buffer accounted for 1.55 acres within the FNW-East monitoring boundary. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the site attained an estimated 1.5 credit acres (Table 22). There are no established performance standards for this site.

Table 22. Credit summary at the FNW-East Site in 2013 and 2014.

Habitat Type	Mitigation Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres
Created Wetland	1:1	1.19	1.19	1.19	1.19
Upland Buffer	5:1	1.55	0.31	1.55	0.31
Total		**2.74**	**1.50**	**2.74**	**1.50**

3.4. Treasure County Line Site – Site 4

3.4.1. Hydrology

The average total annual precipitation recorded at the Forsythe, Montana weather station (243098), from January 1975 to September 2014 was 14.48 inches (WRCC 2014). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year on record at this station. Total precipitation in 2013 totaled 19.47 inches and was the third wettest year on record at this station exceeding the average by five inches. The precipitation between January and August totaled 13.85 inches in 2013 and 15.63 in 2014, both of which exceeded the long-term average of 10.52 inches for this same period.

The FNW-Treasure Co Line site was constructed in 1999 adjacent to an existing wetland along Reservation Creek. The main source of wetland hydrology is a perennial high groundwater table. Occasional overbank flooding, direct precipitation and surface water runoff provide additional hydrologic contributions. Approximately 90 percent of the wetland was inundated during the 2014 survey, with the remaining wetland area exhibiting saturation to the surface. Hydrologic indicators recorded at this site include surface water, saturation, water marks, aquatic fauna, hydrogen sulfide odor, and algal mat/crust.

Two data points, T-1u and T-1w were assessed to determine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). Data point T-1w was located within the created wetland and successfully met all three wetland criteria. Positive wetland hydrology indicators recorded at this data point included approximately three inches of surface water, high water table, saturation to the soil surface, water-stained leaves, aquatic invertebrates, and hydrogen sulfide odor. Data point T-1u was located one of the two upland islands. This upland area appeared to be at a native elevation and relatively undisturbed during excavation of the surrounding wetland. Aside from one secondary indicator (surface soil cracks) no signs of wetland hydrology were observed in this area which appeared to be approximately two to three feet above seasonal high water elevation. This area appeared to be above the influence of seasonal high water and not likely to convert to wetland habitat.

3.4.2. Vegetation

A comprehensive list of 32 species identified during the 2013 and 2014 field surveys in presented in Table 23. Two upland communities and one wetland vegetation community were identified and mapped at the FNW-Treasure Co Line site (Figure 10, Appendix A). These communities included upland Type 1 – *Artemisia tridentata/Chenopodium album*, upland Type 2 – *Elymus Canadensis/Bromus tectorum*, and wetland Type 3 – *Schoenoplectus* spp. The species composition is detailed by type on the FNW-Treasure Co Line Monitoring Form (Appendix B) and discussed below.

Table 23. Vegetation species observed at the FNW-Treasure County Line Site in 2013 and 2014.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	NL
Algae, green	Algae, green	NL
Artemisia tridentata	Big Sagebrush	NL
Asclepias speciosa	Showy Milkweed	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus tectorum	Cheatgrass	NL
Chenopodium album	Lamb's-Quarters	FACU
Cirsium arvense	Canadian Thistle	FACU
Cirsium vulgare	Bull Thistle	UPL
Elaeagnus angustifolia	Russian-Olive	FACU
Elymus canadensis	Nodding Wild Rye	FACU
Grindelia squarrosa	Curly-Cup Gumweed	UPL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Medicago sativa	**Alfalfa**	**UPL**
Melilotus officinalis	**Yellow Sweet-Clover**	**FACU**
Opuntia polyacantha	Plains Pricklypear	NL
Panicum capillare	**Common Panic Grass**	**FAC**
Poa pratensis	Kentucky Blue Grass	FACU
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rumex crispus	Curly Dock	FAC
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Sisymbrium altissimum	**Tall Hedge-Mustard**	**FACU**
Sonchus arvensis	Field Sow-Thistle	FAC
Symphoricarpos albus	Common Snowberry	UPL
Taraxacum officinale	Common Dandelion	FACU
Tragopogon dubius	**Meadow Goat's-beard**	**NL**
Typha latifolia	Broad-Leaf Cat-Tail	OBL

[1] 2014 NWPL (Lichvar *et al*., 2014)

New species identified in 2014 are **bolded**.

Upland Type 1 - *Artemisia tridentata/Chenopodium album* was mapped across 1.92 acres within the upland perimeter of the monitoring area. Big sagebrush (*Artemisia tridentata*), lamb's-quarters, Mexican-fireweed, fox-tail barley, cheatgrass, Kentucky bluegrass (*Poa pratensis*), nodding wild rye (*Elymus canadensis*) and thirteen other species were identified in this community.

Upland Type 2 – *Elymus Canadensis/Bromus tectorum* was identified across 2.47 acres in the upland areas not dominated by big sagebrush and included nodding wild rye and cheatgrass as dominant components of this community. Twenty-one other species, mostly upland species, were identified in this

community. This community was also identified on the two upland islands that remained intact during construction at this site.

Wetland Type 3 – *Schoenoplectus* spp. was mapped across 1.50 acres within the wetland cell excavated in 1999. This community supported a fully developed vegetation community and was dominated by three-square club-rush (*Schoenoplectus pungens*), with lesser amounts of saltmarsh club-rush (*S. maritimus*), fox-tail barley, broad-leaf cat-tail, and five other species. Inundation was present throughout this community.

Vegetation results for Transect 1 are detailed on the FNW-Treasure Co Line Monitoring Form (Appendix B) and summarized in Table 24 and Charts 11 and 12. Photos of the transect end points are shown on page C-18 in Appendix C.
This transect began at the fence line along the northern boundary of the mitigation area, traversed approximately 534 feet across the excavated wetland and one of the upland islands, and ended along the southern boundary of the monitoring area. Upland community Type 2 was located at both ends of the transect and across the upland island. Wetland community Type 3 was intercepted on both sides of the island. Approximately 30 percent of the transect was dominated by hydrophytic species. Twenty-two species were identified along the transect, including seven hydrophytes and 15 upland species.

Table 24. Transect 1 data summary for the FNW-Treasure County Line Site in 2013 and 2014.

Monitoring Year	**2013**	**2014**
Transect Length (feet)	**534**	**534**
Vegetation Community Transitions along Transect	4	4
Vegetation Communities along Transect	2	2
Hydrophytic Vegetation Communities along Transect	1	1
Total Vegetative Species	19	22
Total Hydrophytic Species	6	7
Total Upland Species	13	15
Estimated % Total Vegetative Cover	95	95
Estimated % Unvegetated	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	29.2	29.2
% Transect Length Comprising Upland Vegetation Communities	70.8	70.8
% Transect Length Comprising Unvegetated Open Water	0.0	0
% Transect Length Comprising Mudflat	0.0	0

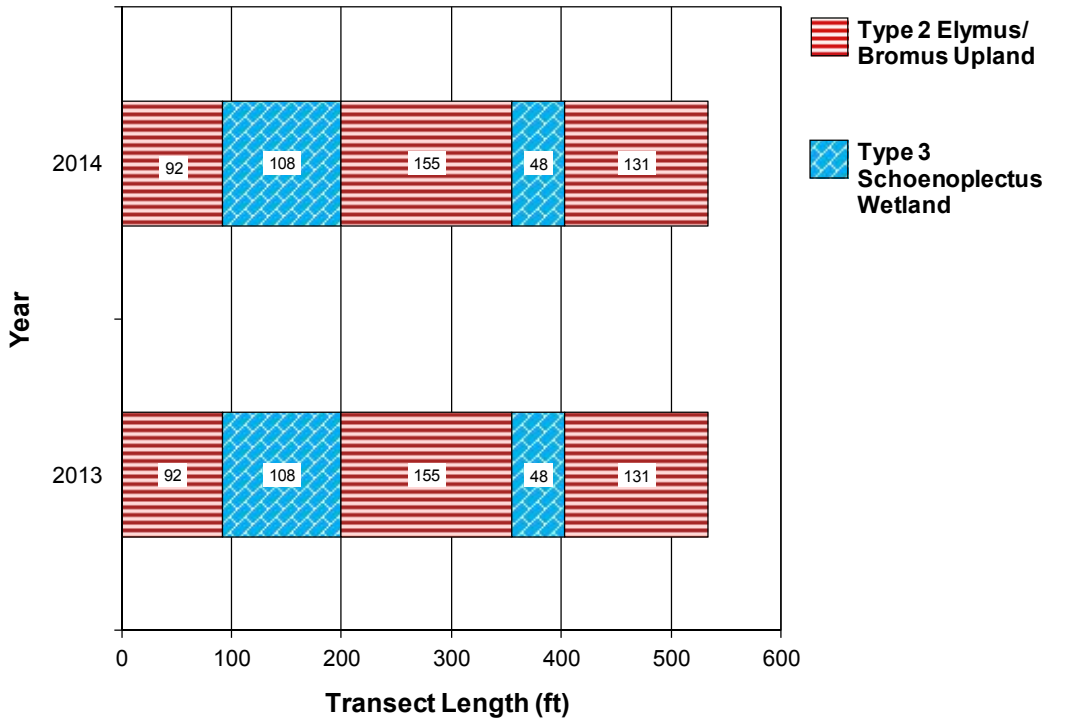

Chart 11. Transect 1 map for the FNW-Treasure County Line Site showing vegetation types from transect start (0 feet) to finish (534 feet) in 2013 and 2014.

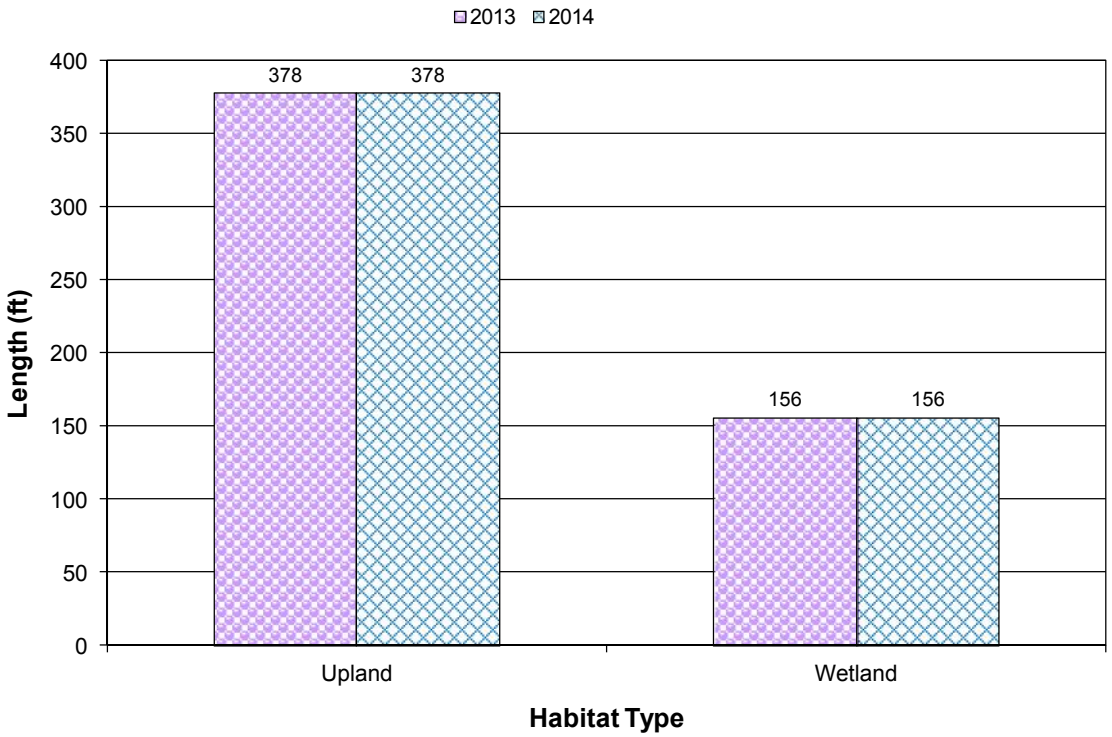

Chart 12. Length of vegetation communities within Transect 1 at the FNW-Treasure County Line Site in 2013 and 2014.

Two patches of Canadian thistle, a Priority 2B noxious weed, were identified within this site in 2014 and mapped in Figure 10 (Appendix A). Both infestations were recorded at less than 0.1-acre in size and included an area with low cover class at the edge of the wetland near the vegetation transect and another area with moderate cover (6-25%) in the northwest area of the site. No woody vegetation was installed at this site.

3.4.3. Soil

The project site was mapped as the Gerdrum-Marvan silty clays series in the Rosebud County Soil Survey Geographic (SSURGO) database. The Gerdrum and Marvan series consist of very deep well-drained fine-textured soils developed in alluvium or glacialfluvial deposits. The Marvan series is included on the Montana Hydric Soil List. The wetland data point was located in an area disturbed during construction. The upland data point was relatively undisturbed during construction and generally confirmed the mapped Gerdrum series.

Data point T-1w met the hydric soil criteria with a hydrogen sulfide odor. The soil profile displayed a gray (10 YR 5/1) clay. Redoximorphic features were difficult to distinguish due to the saturated condition of the soil. Data point T-1u exhibited a friable brown (10YR 5/3) silty clay with no redoximorphic features within the upper 12 inches.

3.4.4. Wetland Delineation

Two data points were evaluated in 2014 to determine the wetland and upland boundaries at the site (Wetland Determination Data Forms, Appendix B). The surveyed wetland boundaries are shown mapped on Figure 10 in Appendix A. The delineation identified 1.50 acres of wetland and 4.39 acres of upland buffer (Table 25). The excavated wetland basin has a fully developed hydrophytic community and appears to support perennial inundation/saturation. This wetland mitigation area is adjacent to a pre-existing natural wetland and has effectively increased the size of the overall wetland complex. The wetland boundary currently extends to the limit of excavation and appears to have developed to full potential.

Table 25. Wetland/upland habitat acreages delineated at the FNW-Treasure County Line Site in 2013 and 2014.

WETLAND AND UPLAND HABITATS	2013 (acres)	2014 (acres)
Project Area	5.89	5.89
Created Wetland	1.50	1.50
Upland Buffer	4.39	4.39

3.4.5. Wildlife

A list of wildlife species observed directly and indirectly at the site in 2013 and 2014 is presented in Table 26. Wildlife signs observed and bird activity codes were recorded on the Monitoring Form in Appendix B. Nine bird species were identified, including an American goldfinch, cliff swallow, great blue heron, mourning dove, red-winged blackbird, Sandhill crane, song sparrow, western meadowlark, and Wilson's snipe. A northern leopard from was observed during the 2014 field survey.

Table 26. Wildlife species observed at the FNW-Treasure County Line Site in 2013 and 2014.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	***Rana pipiens***
BIRDS	
American Goldfinch	***Spinus tristus***
Cliff Swallow	***Petrochelidon pyrrhonota***
Eastern Kingbird	*Tyrannus tyrannus*
Great Blue Heron	***Ardea herodias***
Mourning Dove	***Zenaida macroura***
Red-winged Blackbird	***Agelaius phoeniceus***
Sandhill Crane	***Grus canadensis***
Song Sparrow	***Melospiza melodia***
Western Meadowlark	***Sturnella neglecta***
Wilson's Snipe	***Gallinago delicata***
MAMMALS	
Coyote	*Canis latrans*
Muskrat	*Ondatra zibethicus*

Species identified in 2014 are **bolded**.

3.4.6. Functional Assessment

Results of the 2013 and 2014 functional assessments were summarized in Table 27 and the completed form is included in Appendix B. The total aquatic habitat developed to date within the 5.89-acre project area is 1.50 acres. The FNW-Treasure County Line site was evaluated as one assessment area (AA) that encompasses the full constructed wetland. The AA was rated as a Category II wetland with 73.1 percent of the total possible points and 8.8 functional units. These values improved from 2013, primarily as a function of the decreased disturbance rating from moderate to low. The site received high ratings for general wildlife habitat, short/long term surface water storage, sediment/nutrient/toxicant removal, groundwater discharge/recharge and recreation/education potential and moderate ratings for MTNHP species habitat, production export/food chain support, and uniqueness.

Table 27. MWAM Summary for the FNW-Treasure County Line Site in 2013 and 2014.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2013	2014
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Mod (0.7)	High (0.9)
General Fish/Aquatic Habitat	NA	NA
Flood Attenuation	NA	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	High (0.8)
Sediment/Nutrient/Toxicant Removal	High (1.0)	High (0.9)
Sediment/Shoreline Stabilization	NA	NA
Production Export/Food Chain Support	Mod (0.4)	Mod (0.7)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)
Uniqueness	Low (0.3)	Mod (0.4)
Recreation/Education Potential (bonus points)	High (0.15)	High (0.15)
Actual Points/Possible Points	**4.95 / 8**	**5.85 / 8**
% of Possible Score Achieved	**61.9%**	**73.1%**
Overall Category	**III**	**II**
Total Acreage of Assessed Wetlands within Site Boundaries	**1.50**	**1.50**
Functional Units (acreage x actual points)	**7.4**	**8.8**

3.4.7. Photo Documentation

Photographs of photo points PP1 to PP4, the vegetation transect endpoints, and the wetland determination data points (Figure 9, Appendix A) are shown on pages C-14 through C-18 of Appendix C.

3.4.8. Maintenance Needs

Two patches of Canadian thistle, a Priority 2B noxious weed, were identified within this site in 2014 and mapped in Figure 10 (Appendix A). Both infestations were recorded at less than 0.1-acre in size and included an area with low cover class at the edge of the wetland near the vegetation transect and another area with moderate cover (6-25%) in the northwest area of the site. No man-made water control structures were installed at this site. The fence surrounding the mitigation area was in good working order when inspected in 2014.

3.4.9. Current Credit Summary

The 5.89-acre Treasure County Line mitigation site includes 1.5 acres of created wetland and 4.39 acres of upland buffer. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the site has attained an estimated 2.38 credit acres (Table 28).

Table 28. Credit summary for the FNW-Treasure County Line Site in 2013 and 2014.

Habitat Type	Mitigation Ratio	2013 Delineated Acres	2013 Estimated Credit Acres	2014 Delineated Acres	2014 Estimated Credit Acres
Created Wetland	1:1	1.50	1.50	1.50	1.50
Upland Buffer	5:1	4.39	0.88	4.39	0.88
Total		**5.89**	**2.38**	**5.89**	**2.38**

3.5. Comprehensive Credit Summary for Forsyth NW

The wetland areas impacted during construction of the Volborg-N&S project in 2004 totaled 6.80 acres. Per the USACE requirement, the impacts were to be mitigated at a 1.5:1 ratio during the construction of the Forsyth-NW project (Corps File No.:NWO-2002-90-599; MDT control number 1514). An additional 2.18 acres of unavoidable wetland impacts that occurred during the construction of the Forsyth-NW project in 2012 has a required compensatory wetland mitigation per Corps File No.:NWO-2006-90-676, MDT control number 4059. Credits generated by the 1999 construction of the Forsyth NW-Treasure County Line mitigation site have been applied to the Forsyth-NW debits at a 1:1 ratio based on the development of this mitigation wetland site prior to impacts actually occurring.

MDT Right-of-Way agency has purchased the FNW properties resulting in MDT becoming the “fee title” landowner of the mitigation areas. As these properties are protected by legal instrument and MDT applies an active weed control management plan for the mitigation areas, upland credits have been estimated within the boundaries at each of these sites.

The credits generated at the Treasure County Line site totaled 2.38 acres in 2014 and exceeded the FNW debit requirement of 2.18 acres (Table 29). The total credits estimated for all four FNW site in 2014 was 11.08 acres. This value was 1.30 credit acres short of the required 12.38 credit acres. Continued wetland development at the FNW-West site is possible based on the installation of a functioning dike and will contribute over time to total credits generated by the FNW mitigation project. There is minimal potential for expansion of wetlands at the Middle, East, and Treasure County line sites as development has already extended to near the margins of the excavated footprint. There are no quantitative metrics or performance criteria associated with the success of these mitigation sites. The monitoring requirements identified within the approved mitigation plan are being satisfied.

Table 29. Credit/Debit summary for Forsyth-NW project.

PROJECT SITE	Actual Acres	Type	Ratio	Debit Acres
Volborg-N&S	6.80	Debit	1.5:1	10.20
Forsyth-NW	2.18	Debit	1:1*	2.18
Total	**8.98**		**Total Debits**	**12.38**
MITIGATION SITE	**Actual Acres**	**Mitigation Type**	**Ratio**	**Credit Acres**
West Site (Site 1)	4.56	Creation Credit	1:1	4.56
	1.29	Preservation Credit	4:1	0.32
	7.86	Upland Buffer Credit	5:1	1.57
Middle Site (Site 2)	0.49	Creation Credit	1:1	0.49
	1.31	Upland Buffer Credit	5:1	0.26
East Site (Site 3)	1.19	Creation Credit	1:1	1.19
	1.55	Upland Buffer Credit	5:1	0.31
Treasure County Line (Site 4)	1.50	Previous Creation (Credit)	1:1	1.50
	4.39	Upland Buffer Credit	5:1	0.88
Total	**24.14**		**Total Credits**	**11.08**
			Net Credits	**-1.30**

[1]Wetland Mitigation Monitoring Plan, Forsyth-Northwest (2012) indicates credits created at the FNW-Treasure County Line site will be applied to FNW impacts at 1:1 ratio as mitigation site was constructed prior to impacts.

4. REFERENCES

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Appendix A

Figures 3 through 10

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

Figure 3: 2014 Monitoring Activity Locations

PP4
T-2, Finish
T-2, Start
PP3
We-1w
PP5
We-1u
T-1, Finish
We-2u
We-3u
T-1, Start
PP1
PP2
Breached Dike Structure

Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 27, 2014

N

0 125 250 500

Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/West/Monitor2014.mxd

Project Name
Forsyth NW - West Site

Drawing Title
2014 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 3

REV -

Figure 4: 2014 Mapped Site Features

Vegetation Community Types

1. Bromus tectorum/Sarcobatus vermiculatus
2. Helianthus annuus/Bassia scoparia
3. Spartina pectinata/Eleocharis palustris
4. Eleocharis palustris/Chenopodium album

ACREAGES

Project Area	13.71 acres
Total Wetlands	5.85 acres
Existing Wetlands	1.08 acres
Created Wetlands	4.77 acres
Upland	7.86 acres

Noxious Weeds
- Tamarix sp.
- Euphorbia esula
- Cirsium arvense
- Convulvulus arvensis

Infestation Size
- X = <0.1 acre
- ▲ = 0.1 to 1 acre
- ■ = 1 to 5 acre

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: July 27, 2014

N

0 125 250 500

Feet

Breached Dike Structure

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/West/Veg2014.mxd

Project Name: Forsyth NW - West Site

Drawing Title: 2014 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 4

REV -

Figure 5: 2014 Monitoring Activity Locations

PP1

M-1u

T-1, Start

M-1w

T-1, Finish

PP2

Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 27, 2014

N

0 50 100 200

Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/East/Monitor2014.mxd

Project Name
Forsyth NW - Middle Site

Drawing Title
2014 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 5

REV -

Figure 6: 2014 Mapped Site Features

Noxious Weeds
Convulvulus arvensis
Infestation Size
X = <0.1 acre
▲ = 0.1 to 1 acre
■ = 1 to 5 acre
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

T
X
1
2
H

ACREAGES

Project Area	1.80 acres
Created Wetlands	0.49 acres
Upland	1.31 acres

Vegetation Community Types

1 Pascopyrum smithii/Helianthus annuus
2 Rumex crispus/Eleocharis palustris

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 27, 2014

N

0 50 100 200

Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT
PROJ NO: STPP 14-6(9)259
FILE: ForsythNW/Middle/Veg2014.mxd

Project Name
Forsyth NW - Middle Site

Drawing Title
2014 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted
Drawn: October 10, 2014
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 6

REV -

Figure 7: 2014 Monitoring Activity Locations

PP1
T-1, Start
T-1, Finish
PP2
Ea-1u
Ea-1w
T-2, Finish
T-2, Start
PP3

Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 27, 2014

N

0 50 100 200

Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/East/Monitor2014.mxd

Project Name
Forsyth NW - East Site

Drawing Title
2014 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 7

REV -

Figure 8: 2014 Mapped Site Features

Noxious Weeds
Convulvulus arvensis
Infestation Size
X = <0.1 acre
▲ = 0.1 to 1 acre
■ = 1 to 5 acre
Cover Class
T = Trace (<1% cover)
L = Low (1-5% cover)
M = Moderate (6-25% cover)
H = High (26-100% cover)

T
X

1
2

ACREAGES

Project Area	2.74 acres
Wetlands	1.19 acres
Upland	1.55 acres

Vegetation Community Types

1 Helianthus annuus/Thlaspi arvense
2 Rumex crispus/Eleocharis palustris

Legend

Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 27, 2014

N

0 50 100 200
Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT
PROJ NO: STPP 14-6(9)259
FILE: ForsythNW/East/Veg2014.mxd

Project Name
Forsyth NW - East Site

Drawing Title
2014 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted
Drawn: October 10, 2014
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 8

REV -

Figure 9: 2014 Monitoring Activity Locations

Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points

Base Photography Date: July 27, 2014

T-1, Start
PP2
PP1
T-1u
T-1w
PP3
PP4
T-2, Finish

N

0 62.5 125 250

Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/Treasure/Monitor2014.mxd

Project Name: Forsyth NW - Treasure Co. Line Site

Drawing Title: 2014 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 9

REV -

Figure 10: 2014 Mapped Site Features

ACREAGES

Project Area	5.89 acres
Wetlands	1.50 acres
Upland	4.39 acres

M

L

2

2

3

2

1

1

Legend

Monitoring Limits

Wetland Limits

Vegetation Communities

Base Photography Date: July 27, 2014

Vegetation Community Types

1. Artemisia tridentata/Chenopodium album
2. Elymus canadensis/Bromus tectorum
3. Schoenoplectus spp.

Noxious Weeds

Cirsium arvense

Infestation SIze

X = <0.1 acre

▲ = 0.1 to 1 acre

■ = 1 to 5 acre

Cover Class

T = Trace (<1% cover)

L = Low (1-5% cover)

M = Moderate (6-25% cover)

H = High (26-100% cover)

N

0 62.5 125 250

Feet

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE 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.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/TreasureCo/Veg2014.mxd

Project Name: Forsyth NW - Treasure Line Co Site

Drawing Title: 2014 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: October 10, 2014

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 10

REV -

Appendix B

2014 MDT Wetland Mitigation Site Monitoring Form
2014 USACE Routine Wetland Determination Data Form
2014 MDT Montana Wetland Assessment Form

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW - West Assessment Date/Time 6/19/2014 8:46:32 AM

Person(s) conducting the assessment: B Sandefur, E Sandefur

Weather: Partly cloudy & warm, recent rain. Location: ~15 miles NW of Forsyth

MDT District: Glendive Milepost: RP 280 on US 12

Legal Description: T 7N R 39E Section(s) 20 & 29

Initial Evaluation Date: 8/15/2013 Monitoring Year: 2 #Visits in Year: 1

Size of Evaluation Area: 13.71 (acres)

Land use surrounding wetland:

Agriculture, US 12

HYDROLOGY

Surface Water Source: Periodic flooding from Big Porcupine Creek, seasonal high groundwater

Inundation: ☑ Average Depth: 0.5 **(ft)** Range of Depths: 0-3.5 **(ft)**

Percent of assessment area under inundation: 60 %

Depth at emergent vegetation-open water boundary: 0.2 **(ft)**

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, sediment deposits, iron deposits, drain patterns, water-stained leaves, algal mat/crust, drift deposits.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
No wells	

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.

Hydrology Notes:

Mitigation area receives surface water when East Spring Creek Coulee produces surface flow and from periodic flooding of Big Porcupine Creek with potential for high water velocities through constructed wetland.

VEGETATION COMMUNITIES

Site Forsyth NW - West

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 1 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus **Acres** 5.34

Species	Cover class	Species	Cover class
Agropyron cristatum	2	Amaranthus retroflexus	0
Ambrosia psilostachya	1	Bare Ground	1
Bassia scoparia	0	Bromus carinatus	0
Bromus inermis	1	Bromus tectorum	4
Chenopodium album	3	Chenopodium sp.	0
Cirsium arvense	0	Convolvulus arvensis	0
Descurainia sophia	1	Elaeagnus angustifolia	1
Elymus hispidus	3	Elymus repens	0
Elymus sp.	0	Euphorbia esula	1
Glycyrrhiza lepidota	0	Grindelia squarrosa	1
Helianthus annuus	2	Hordeum jubatum	0
Lactuca serriola	2	Lepidium perfoliatum	1
Linum lewisii	0	Melilotus officinalis	0
Pascopyrum smithii	2	Phalaris arundinacea	1
Rosa arkansana	1	Rumex crispus	1
Salix amygdaloides	0	Sarcobatus vermiculatus	3
Schedonorus pratensis	2	Sonchus arvensis	1
Symphoricarpos albus	1	Tamarix ramosissima	0
Thlaspi arvense	3	Xanthium strumarium	1

Comments:

Community represents the undisturbed uplands within monitoring area.

Community # 2 **Community Type:** Helianthus annuus / Bassia scoparia **Acres** 2.52

Species	Cover class	Species	Cover class
Ambrosia psilostachya	1	Atriplex argentea	0
Bare Ground	4	Bassia scoparia	3
Chenopodium album	3	Cirsium arvense	0
Convolvulus arvensis	0	Elymus repens	3
Glyceria elata	0	Glycyrrhiza lepidota	2
Helianthus annuus	4	Hordeum brachyantherum	0
Hordeum jubatum	2	Lepidium perfoliatum	0
Pascopyrum smithii	2	Polygonum aviculare	0
Rosa arkansana	0	Rumex crispus	0
Sarcobatus vermiculatus	2		

Comments:

Community represents the disturbed uplands within monitoring area.

Community # 3 **Community Type:** Spartina pectinata / Eleocharis palustris **Acres** 1.08

Species	Cover class	Species	Cover class
Bare Ground	2	Carex sp.	0
Chenopodium album	0	Convolvulus arvensis	0
Eleocharis palustris	3	Elymus hispidus	0
Glycyrrhiza lepidota	1	Helianthus annuus	0
Hordeum jubatum	1	Open Water	2
Phalaris arundinacea	1	Populus deltoides	1
Rosa arkansana	0	Rumex crispus	1
Salix amygdaloides	1	Schoenoplectus maritimus	0
Sonchus arvensis	1	Spartina pectinata	1
Typha latifolia	2		

Comments:

Community represents the undisturbed wetlands within monitoring area.

Community # 4 **Community Type:** Eleocharis palustris / Chenopodium album **Acres** 4.76

Species	Cover class	Species	Cover class
Alisma triviale	0	Ambrosia psilostachya	0
Asclepias speciosa	0	Bare Ground	4
Bassia scoparia	0	Chenopodium album	1
Echinochloa crus-galli	0	Eleocharis palustris	1
Glyceria elata	0	Helianthus annuus	0
Hordeum jubatum	0	Open Water	5
Pascopyrum smithii	0	Populus deltoides	0
Rumex crispus	0	Sagittaria cuneata	0
Salix sp.	0	Schoenoplectus acutus	0
Schoenoplectus maritimus	0	Setaria pumila	0
Spartina pectinata	0	Thlaspi arvense	0
Typha latifolia	0	Xanthium strumarium	0

Comments:

Community represents the disturbed areas classified as wetlands within monitoring area.

Total Vegetation Community Acreage **13.7**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Forsyth NW - West Date: 6/19/2014 8:46:32 AM

Transect Number: 1 **Compass Direction from Start:** 25

Interval Data:

Ending Station 27 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Bromus carinatus	1	Bromus inermis	1
Bromus tectorum	3	Chenopodium album	1
Descurainia sophia	1	Elymus repens	3
Euphorbia esula	2	Lactuca serriola	0
Lepidium perfoliatum	1	Pascopyrum smithii	2
Thlaspi arvense	0		

Ending Station 59 **Community Type:** Spartina pectinata / Eleocharis palustris

Species	Cover class	Species	Cover class
Carex sp.	1	Chenopodium album	1
Eleocharis palustris	4	Hordeum jubatum	1
Hordeum jubatum	1	Rumex crispus	1

Ending Station 105 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Bromus tectorum	2	Chenopodium album	5
Elymus sp.	2	Helianthus annuus	0
Hordeum jubatum	1	Lactuca serriola	0
Lepidium perfoliatum	1	Pascopyrum smithii	2
Rumex crispus	0	Sarcobatus vermiculatus	1
Schedonorus pratensis	2	Thlaspi arvense	1

Ending Station 180 **Community Type:** Helianthus annuus / Bassia scoparia

Species	Cover class	Species	Cover class
Ambrosia psilostachya	1	Atriplex argentea	0
Bare Ground	1	Bassia scoparia	1
Chenopodium album	3	Elymus repens	1
Glyceria elata	2	Helianthus annuus	2
Hordeum brachyantherum	0	Hordeum jubatum	1
Pascopyrum smithii	0	Rumex crispus	1

Ending Station 201 **Community Type:** Spartina pectinata / Eleocharis palustris

Species	Cover class	Species	Cover class
Eleocharis palustris	5	Elymus hispidus	1
Glycyrrhiza lepidota	1	Helianthus annuus	1
Open Water	5	Phalaris arundinacea	0
Rosa arkansana	1	Rumex crispus	0
Spartina pectinata	2		

Ending Station 265 **Community Type:** Helianthus annuus / Bassia scoparia

Species	Cover class	Species	Cover class
Ambrosia psilostachya	1	Bare Ground	5
Bassia scoparia	1	Chenopodium album	1
Convolvulus arvensis	0	Glyceria elata	1
Glycyrrhiza lepidota	1	Helianthus annuus	1
Hordeum jubatum	1	Lepidium perfoliatum	0
Pascopyrum smithii	0	Polygonum aviculare	1
Rumex crispus	1		

Ending Station 282 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Ambrosia psilostachya	1	Bassia scoparia	2
Bromus inermis	2	Bromus tectorum	2
Chenopodium album	1	Elymus repens	2
Helianthus annuus	2	Lactuca serriola	1
Lepidium perfoliatum	1	Linum lewisii	1
Melilotus officinalis	2	Rumex crispus	1
Thlaspi arvense	1		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 25

Interval Data:

Ending Station 11 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Amaranthus retroflexus	0	Bromus tectorum	2
Chenopodium album	1	Cirsium arvense	2
Glycyrrhiza lepidota	2	Rosa arkansana	3
Sarcobatus vermiculatus	1	Symphoricarpos albus	2

Ending Station 238 **Community Type:** Eleocharis palustris / Chenopodium album

Species	Cover class	Species	Cover class
Alisma triviale	0	Chenopodium album	0
Eleocharis palustris	0	Open Water	5
Populus deltoides	0	Sagittaria cuneata	0
Schoenoplectus acutus	0	Schoenoplectus maritimus	0
Typha latifolia	0		

Ending Station 261 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Bare Ground	3	Bromus tectorum	2
Chenopodium album	1	Chenopodium sp.	1
Elymus sp.	1	Hordeum jubatum	2
Lactuca serriola	0	Lepidium perfoliatum	1
Melilotus officinalis	5	Pascopyrum smithii	1
Rumex crispus	1	Thlaspi arvense	1

Transect Notes:

Transect inundated from recent rains.

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW - West

Planting Type	#Planted	#Alive	Notes
None			

Comments

No woody vegetation installed at site. Natural recruitment of cottonwood and willows.

Forsyth NW - West

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Bald Eagle	1	FO	UP
Barn Swallow	8	F, FO	UP, WM
Belted Kingfisher	1	F	OW
Blue-winged Teal	1	FO	OW
Brown Thrasher	1	L	SS, UP
Cliff Swallow	13	F, N	OW, UP
Common Nighthawk	1	FO	UP
Eastern Kingbird	1		UP
Great Blue Heron	1	FO	OW, WM
Killdeer	16	F, L	MF
Mallard	1	L	OW
Mourning Dove	12	F, L	UP
Northern Harrier	1	FO	UP
Orchard Oriole	3	F, L, N	SS, WM
Red-winged Blackbird	25	FO, L	UP
Song Sparrow	2		SS, UP
Swainson's Hawk	1	FO	UP
Turkey Vulture	2	FO	UP
Western Kingbird	6	F, L, N	SS, UP
Western Meadowlark	5	F, L	UP, WM
Western Sandpiper	3	F, L	MF, OW
Yellow Warbler	4	L	SS, UP

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Porcupine		Yes	No	No	
Raccoon		Yes	No	No	
White-tailed Deer	2	Yes	No	No	bedded spotted fawn

Wildlife Comments:

Forsyth NW - West

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.

Photo #	Latitude	Longitude	Bearing	Description
1910	46.339024	-106.876183	220	We-1w
1930	46.3386	-106.875305	300	We-1u
2019	46.33773	-106.873062	300	We-3u
2720	46.337456	-106.872063	205	T-1, end
2721	46.33691	-106.872772	25	T-1, start
2724-28	46.336468	-106.871811	350	PP-2
2736-40	46.336914	-106.871132	270	PP-1
2747-54	46.337817	-106.874587	45	PP-5
2765	46.339001	-106.87645	25	T-2, start
2770	46.339561	-106.875854	205	T-2, end
2771-78	46.339554	-106.875893	205	T-2 end, pano
2779-85	46.340237	-106.877312	210	PP-4
2786-93	46.339088	-106.874611	230	PP-3
3114	46.3377766	-106.8729233	200	We-2u

Comments:

Forsyth NW - West

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

Were man-made nesting structure installed at this site? No

If yes, do they need to be repaired?

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? Yes

If yes, are the structures in need of repair? No

If yes, describe the problems below.

Dike at lower end of site repaired in 2014 and had failed again during spring runoff in 2014.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: We-1u

Investigator(s): B Sandefur Section, Township, Range: 20 7N 39E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR): LRR G Lat: 46.337668 Long: -106.872772 Datum: WGS84

Soil Map Unit Name: Marvan silty clay NWI classification: NA

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 ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks: Area likely to convert to wetland with functioning dike/outlet control structure.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Ambrosia psilostachya	10	☐	FACU
Chenopodium album	10	☐	FACU
Elymus repens	25	☑	FACU
Helianthus annuus	30	☑	FACU
Hordeum jubatum	15	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

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	15	X 2	30
FAC species	0	X 3	0
FACU species	75	X 4	300
UPL species	0	X 5	0
Column Totals	90 (A)		330 (B)

Prevalence Index = B/A = 3.67

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

Disturbed area-upland veg.

SOIL

Sampling Point: We-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
0-7	10YR 5/3	100					Silty Clay	
7-16	10YR 4/2	100					Clay Loam	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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 redox in upper 16in., Na concentration below 16in.

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area with very marginal hydrology, considered upland based on dike failure and lack of sufficient hydrologic duration. With functioning water control, wetland area would increase into this data point location.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: We-1w

Investigator(s): B Sandefur Section, Township, Range: 20 7N 39E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): undulating Slope (%): 0

Subregion (LRR): LRR G Lat: 46.338127 Long: -106.87367 Datum: WGS84

Soil Map Unit Name: Marvan silty clay NWI classification: NA

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 ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks:

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Eleocharis palustris	20	☑	OBL
Rumex crispus	5	☐	FAC
Sagittaria cuneata	10	☑	OBL
Schoenoplectus maritimus	15	☑	OBL
Typha latifolia	15	☑	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 4 (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	60	X 1	60
FACW species	0	X 2	0
FAC species	5	X 3	15
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	65 (A)		75 (B)

Prevalence Index = B/A = 1.15

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

Willow and cottonwood recruits in area just outside of plot.

SOIL

Sampling Point: We-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
0-9	10YR 5/1	97	7.5YR 5/6	3	C	M	Silty Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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: Soils flooded at time of sampling.

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): 2

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: We-2u

Investigator(s): B Sandefur Section, Township, Range: 20 7N 39E

Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR): LRR G Lat: 46.337144 Long: -106.871701 Datum: WGS84

Soil Map Unit Name: Marvan silty clay NWI classification: NA

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 ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: Area would likely respond favorably toward wetland habitat development with prolonged inundation from functioning dike.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status
Bromus tectorum	10	☐	NL
Helianthus annuus	20	☑	FACU
Lactuca serriola	30	☑	FAC
Pascopyrum smithii	25	☑	FACU
Thlaspi arvense	15	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

Dominance Test worksheet

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 33.3 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	0 X 2	0
FAC species	30 X 3	90
FACU species	60 X 4	240
UPL species	0 X 5	0
Column Totals	90 (A)	330 (B)

Prevalence Index = B/A = 3.67

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: We-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
0-5	10YR 3/2	100					Silty Clay	
5-12	10YR 4/2	100					Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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: Soils moist following rain, not saturated. No redoximorphic features identified within the upper 12in of soil profile.

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, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: We-3u

Investigator(s): B Sandefur Section, Township, Range: 20 7N 39E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): flat Slope (%): _____

Subregion (LRR): LRR G Lat: -106.871974 Long: 46.33697 Datum: WGS84

Soil Map Unit Name: Marvan silty clay NWI classification: NA

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 ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks: Data point along edge of grading between channels, no wetland habitat development.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Sarcobatus vermiculatus	15	☑	FAC

Herbaceous Stratum Plot size (5 Foot Radius)

Hordeum jubatum	20	☑	FACW
Rumex crispus	10	☑	FAC
Schedonorus pratensis	20	☑	NL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 35

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 75.0 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	20	X 2	40
FAC species	25	X 3	75
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	45 (A)		115 (B)

Prevalence Index = B/A = 2.56

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: We-3u

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
0-7	10YR 4/3	100					Clay	
7-14	10YR 5/3	100					Clay	**Soils moist following rain.**

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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 redox identified within upper 14 inches of soil profile.

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: Did not see any hydrologic indicators that indicate sufficient duration for wetland hydrology. Suspect area flooded for short duration, groundwater table over 3ft at time of sampling.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - West **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/19/2014 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Forsyth NW - West

6. Wetland Location(s): **T** 7N **R** 39E **Sec1** 20 **T** 7N **R** 39E **Sec2** 29

Approx Stationing or Mileposts RP 280 on US 12

Watershed 10100002 **Watershed/County** Big Porcupine Creek, Rosebud County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 5.85

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 5.85

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Riverine	Emergent Wetland		Permanent/Perennial	20
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	75
Depressional	Scrub-Shrub Wetland		Seasonal/Intermittent	5

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Impact to vegetation within AA from construction of mitigation area and US12 road improvements recovering with time, improved disturbance rating from 2013 (high).

ii. Prominent noxious, aquatic nuisance, other exotic species:

Euphorbia esula, Convulvulus arvensis, Cirsium arvense, Tamarix

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes existing and constructed wetlands within floodplain of an Unnamed Tributary of Big Porcupine. Surrounding land includes US12 and agriculture.

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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent wetlands with occasional trees and shrubs

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USF&WS T&E database for Rosebud County

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species)	◉ D ○ S	Ammannia robusta (S2)
Secondary habitat (list Species)	○ D ○ S	
Incidental habitat (list species)	○ D ○ S	
No usable habitat	☐ S	

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use Ammannia observed within AA

14C. General Wildlife Habitat Rating:

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

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☑ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☑ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, 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 instructions 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Several bird species and tracks of a few mammal species observed during field survey.

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

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

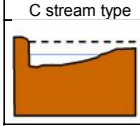
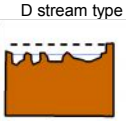
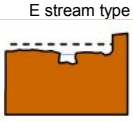
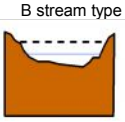
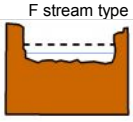
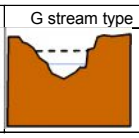
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

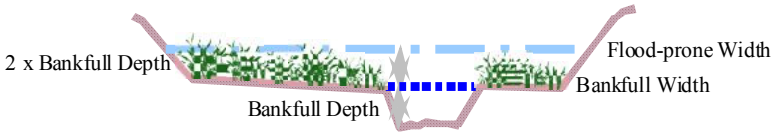
iii. Final Score and Rating: 0 NA **Comments:** No permanent fish habitat present within AA.

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width / **Bankfull width** = **Entrenchment ratio**

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 (check)? **Y** ○ **N** ◉

Comments: Surface water enters AA via box culvert and from overbank flow from Big Porcupine Creek. Dam constructed to impound water within site failed for second consecutive year, unrestricted outlet.

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic 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	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: A large area of the AA is seasonally flooded by UT-Big Porcupine Creek, approx 20% P/P.

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

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☐ **NA** here and proceed to 14I.)

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

*% 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	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: AA is subject to surface water flows during runoff in UT-Big Porcupine Creek.

14I. Production Export/Food Chain Support:

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

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

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

A	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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .9H

Comments: Upland buffer between northern boundary of AA and highway greater than 50ft.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & 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 arrive at [check] the functional points and rating)

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

Comments: Approximately 20% of AA with perennial hydrology.

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: AA with several mature trees.

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

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

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

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

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

Comments:

MDT-owned property.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Forsyth NW - West

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	5.265	☑
C. General Wildlife Habitat	M	.7	1	4.095	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.5	1	2.925	☑
F. Short and Long Term Surface Water Storage	H	1	1	5.85	☑
G. Sediment/Nutrient/Toxicant Removal	M	.4	1	2.34	☐
H. Sediment/Shoreline Stabilization	M	.7	1	4.095	☐
I. Production Export/Food Chain Support	H	.9	1	5.265	☐
J. Groundwater Discharge/Recharge	H	1	1	5.85	☑
K. Uniqueness	M	.5	1	2.925	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.8775	☐
Totals:		6.75	10	39.4875	
Percent of Possible Score			**67.5** %		

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; otherwise 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 RATING:
(check appropriate category based on the criteria outlined above)

I	II	III	IV

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW - Middle Assessment Date/Time 6/20/2014 8:46:32 AM

Person(s) conducting the assessment: B Sandefur, E Sandefur

Weather: Warm and sunny, slight breeze Location: ~8 miles NW of Forsyth

MDT District: Glendive Milepost: ~262 on US 12

Legal Description: T 7N R 39E Section(s) 33

Initial Evaluation Date: 8/15/2013 Monitoring Year: 2 #Visits in Year: 1

Size of Evaluation Area: 1.8 (acres)

Land use surrounding wetland:

Undeveloped ag land, Hwy 12

HYDROLOGY

Surface Water Source: Precipitation, runoff, shallow groundwater

Inundation: ☑ Average Depth: 0.2 **(ft)** Range of Depths: 0-0.6 **(ft)**

Percent of assessment area under inundation: 5 %

Depth at emergent vegetation-open water boundary: 0.1 **(ft)**

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, saturation, sediment and drift deposits, iron deposits, drain patterns.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
No Wells	

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.

Hydrology Notes:

Seasonal inundation from surface water/precipitation.

VEGETATION COMMUNITIES

Site Forsyth NW - Middle

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 1 **Community Type:** Pascopyrum smithii / Helianthus annuus **Acres** 1.31

Species	Cover class	Species	Cover class
Alopecurus pratensis	0	Ambrosia psilostachya	1
Avena fatua	0	Bare Ground	0
Bassia scoparia	2	Bromus carinatus	1
Bromus tectorum	5	Chenopodium album	3
Convolvulus arvensis	0	Elymus repens	3
Elymus sp.	0	Grindelia squarrosa	1
Helianthus annuus	2	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	0
Linum lewisii	0	Melilotus officinalis	5
Pascopyrum smithii	4	Polygonum aviculare	0
Populus deltoides	0	Ratibida columnifera	0
Rosa arkansana	1	Rumex crispus	2
Sarcobatus vermiculatus	1	Schedonorus pratensis	0
Symphoricarpos albus	1	Thlaspi arvense	2
Tragopogon dubius	0		

Comments:

Community # 2 **Community Type:** Rumex crispus / Eleocharis palustris **Acres** 0.49

Species	Cover class	Species	Cover class
Alisma triviale	0	Alopecurus pratensis	0
Bare Ground	5	Bassia scoparia	2
Chenopodium album	1	Convolvulus arvensis	0
Echinochloa crus-galli	1	Eleocharis palustris	1
Glyceria grandis	2	Helianthus annuus	3
Hordeum jubatum	1	Populus deltoides	1
Ratibida columnifera	0	Rumex acetosella	0
Rumex crispus	2	Salix amygdaloides	0
Schoenoplectus maritimus	1	Setaria pumila	0
Tamarix ramosissima	0	Tragopogon dubius	0
Typha latifolia	0	Xanthium strumarium	1

Comments:

Total Vegetation Community Acreage **1.8**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Forsyth NW - Middle Date: 6/20/2014 8:46:32 AM

Transect Number: 1 **Compass Direction from Start:** 205

Interval Data:

Ending Station 8 **Community Type:** Pascopyrum smithii / Helianthus annuus

Species	Cover class	Species	Cover class
Bassia scoparia	1	Bromus tectorum	3
Chenopodium album	1	Helianthus annuus	0
Lepidium perfoliatum	1	Pascopyrum smithii	1
Schedonorus pratensis	1		

Ending Station 34 **Community Type:** Rumex crispus / Eleocharis palustris

Species	Cover class	Species	Cover class
Bare Ground	4	Echinochloa crus-galli	0
Eleocharis palustris	0	Glyceria grandis	2
Hordeum jubatum	0	Populus deltoides	1
Rumex crispus	1	Salix amygdaloides	0

Ending Station 50 **Community Type:** Pascopyrum smithii / Helianthus annuus

Species	Cover class	Species	Cover class
Bare Ground	1	Elymus sp.	3
Helianthus annuus	0	Lactuca serriola	0
Linum lewisii	0	Melilotus officinalis	4
Pascopyrum smithii	2	Ratibida columnifera	0

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW - Middle

Planting Type	#Planted	#Alive	Notes
None			

Comments

No woody plants installed at site.

Forsyth NW - Middle

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Common Nighthawk	1	FO	UP
Eastern Kingbird	1	FO	UP
Mourning Dove	2	F, FO, L	UP
Turkey Vulture	1	FO	UP
Western Kingbird	5	F, FO	UP
Western Meadowlark	3	L	UP

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Raccoon		Yes	No	No	

Wildlife Comments:

Forsyth NW - Middle

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.

Photo #	Latitude	Longitude	Bearing	Description
1634	46.322174	-106.840996	300	PP-1
1642	46.322948	-106.842323	205	T-1, start
1645(4)-1646(3)	46.322868	-106.842506	25	T1 end, pano
1645(6)	46.322754	-106.842438	25	T-1, end
1706	46.322868	-106.842278	180	M-1w
1716	46.3228	-106.842323	180	M-1u
1740	46.323803	-106.844337	120	PP-2

Comments:

Forsyth NW - Middle

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

Were man-made nesting structure installed at this site? No

If yes, do they need to be repaired?

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 in need of repair?

If yes, describe the problems below.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Middle City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: M-1u

Investigator(s): B Sandefur Section, Township, Range: 33 7N 39E

Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): flat Slope (%): _____

Subregion (LRR): LRR G Lat: 46.322939 Long: -106.842437 Datum: WGS84

Soil Map Unit Name: Harlem silty clay NWI classification: NA

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 along slope of excavated basin above influence of seasonal wetland hydrology. Duration of saturation/inundation very dependant on periodic precipitation during wet season.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bassia scoparia	30	☑	FACU
Bromus carinatus	15	☑	NL
Chenopodium album	15	☑	FACU
Lepidium perfoliatum	15	☑	FAC
Populus deltoides	5	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 25.0 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	0	X 1	0
FACW species	0	X 2	0
FAC species	20	X 3	60
FACU species	45	X 4	180
UPL species	0	X 5	0
Column Totals	65 (A)		240 (B)

Prevalence Index = B/A = 3.69

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: M-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
0-12	10YR 5/3	95					Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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: Not hydric, appears to be situated near seasonal high water level based on soil characteristics (5% sodic conc 10YR 7/1).

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: Data point above influence of normal saturation/inundation levels within excavated depression.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Middle City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: M-1w

Investigator(s): B Sandefur Section, Township, Range: 33 7N 39E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRR G Lat: 46.322913 Long: -106.842465 Datum: WGS84

Soil Map Unit Name: Harlem silty clay NWI classification: NA

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 ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: Excavated basin with marginal wetland hydrology.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Eleocharis palustris	10	☑	OBL
Glyceria grandis	15	☑	OBL
Rumex crispus	10	☑	FAC
Schoenoplectus maritimus	15	☑	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 50

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 4 (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	40	X 1	40
FACW species	0	X 2	0
FAC species	10	X 3	30
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	50 (A)		70 (B)

Prevalence Index = B/A = 1.40

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: M-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
0-12	10YR 5/2	97	10YR 4/6	3	C	M	Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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:

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: Dry during early season evaluation, wetland hydrology likely not present during every year.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - Middle **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/20/2014 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Forsyth NW - Middle

6. Wetland Location(s): **T** 7N **R** 39E **Sec1** 33 **T** 7N **R** 39E **Sec2** 34

Approx Stationing or Mileposts ~262 on US 12

Watershed 10100001 **Watershed/County** Big Porcupine Creek, Rosebud Co.

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 0.49

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 0.49

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Abundant

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

AA vegetation recovering from construction disturbance.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Field bindweed.

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA very similar to Forsyth NW - East only smaller. AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent veg class present with approx 80% bare ground. Several cottonwood seedlings present in herbaceous layer.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USF&WS T&E list for Rosebud County

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species) ◉ D ○ S Scarlet Ammannia - Ammannia robusta (S2)

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ○ D ◉ S Great Blue Heron (S3)

No usable habitat ☐ S

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use MTNHP SOC report for T7N R39E, direct observation of Ammannia

14C. General Wildlife Habitat Rating:

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

Low

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, 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 instructions 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Very few signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

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

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

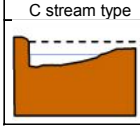
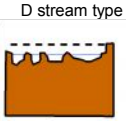
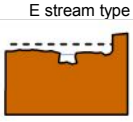
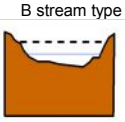
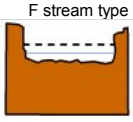
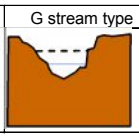
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

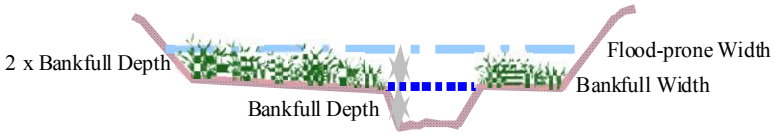
iii. Final Score and Rating: 0 NA **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☑ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width / **Bankfull width** = **Entrenchment ratio**

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 (check)? **Y** ○ **N** ◉

Comments: AA not subject to flooding from Big Porcupine Creek.

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic 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	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: AA subject to pond from precipitation and upland surface flow, capacity to pond at depth >2.2ft.

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

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA less than 70% vegetated due to recent construction of mitigation site.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☐ **NA** here and proceed to 14I.)

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

*% 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	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: AA with open water potentially subject to periodic wave action.

14I. Production Export/Food Chain Support:

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

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

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

A	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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ○ **N** ◉ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .3L

Comments:

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & 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 arrive at [check] the functional points and rating)

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

Comments: AA w/out permeable substrate, holds surface water eventually lost to evaporation.

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: Habitat within AA typical of roadside ditch.

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

i. Is the AA a known or potential rec./ed. site: (check) **Y** ○ **N** ◉ (if 'Yes' continue with the evaluation; if 'No' then click ☑ **NA** here and proceed to the overall summary and rating page)

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

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

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

Comments:

AA small, adjacent to highway, and with little to no recreation or education potential.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Forsyth NW - Middle

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	0.441	☑
C. General Wildlife Habitat	M	.4	1	0.196	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	1	0	☑
F. Short and Long Term Surface Water Storage	M	.6	1	0.294	☑
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	0.343	☑
H. Sediment/Shoreline Stabilization	L	.2	1	0.098	☐
I. Production Export/Food Chain Support	L	.3	1	0.147	☐
J. Groundwater Discharge/Recharge	NA	0	0	0	☐
K. Uniqueness	L	.2	1	0.098	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		3.3	9	1.617	
Percent of Possible Score			**36.67** %		

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; otherwise 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 RATING:
(check appropriate category based on the criteria outlined above)

I	II	III	IV

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW -East Assessment Date/Time 6/20/2014 8:46:32 AM

Person(s) conducting the assessment: B Sandefur, E Sandefur

Weather: Hot and clear Location: ~8 miles NW of Forsyth

MDT District: Glendive Milepost: ~262.3 on US 12

Legal Description: T 7N R 39E Section(s) 34

Initial Evaluation Date: 8/15/2013 Monitoring Year: 2 #Visits in Year: 1

Size of Evaluation Area: 2.74 (acres)

Land use surrounding wetland:

Undeveloped ag land, US12.

HYDROLOGY

Surface Water Source: Precipitation, runoff, shallow groundwater

Inundation: ☑ Average Depth: 0.1 **(ft)** Range of Depths: 0-0.4 **(ft)**

Percent of assessment area under inundation: 5 %

Depth at emergent vegetation-open water boundary: 0.1 **(ft)**

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 water, inundation visible on aerial imagery, saturation, water marks, water stained leaves, H2S odor, algal mat/crust, iron deposits, drift deposits, surface soil cracks, sparsely vegetated concave surface, geomorphic position.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
No Wells	

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.

Hydrology Notes:

VEGETATION COMMUNITIES

Site Forsyth NW -East

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 1 **Community Type:** Helianthus annuus / Thlaspi arvense **Acres** 1.55

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Ambrosia psilostachya	1
Bare Ground	1	Bromus carinatus	3
Bromus tectorum	1	Chenopodium album	1
Convolvulus arvensis	0	Elymus repens	1
Elymus sp.	0	Helianthus annuus	3
Hesperostipa comata	0	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	1
Linum lewisii	0	Medicago sativa	0
Melilotus officinalis	5	Pascopyrum smithii	2
Polygonum aviculare	0	Populus deltoides	0
Rumex acetosella	1	Rumex crispus	1
Sisymbrium altissimum	1	Taraxacum officinale	0
Thlaspi arvense	3	Tragopogon dubius	0

Comments:

Community # 2 **Community Type:** Rumex crispus / Eleocharis palustris **Acres** 1.19

Species	Cover class	Species	Cover class
Algae, green	1	Alopecurus pratensis	0
Ambrosia psilostachya	0	Bare Ground	2
Bassia scoparia	0	Chenopodium album	0
Convolvulus arvensis	0	Echinochloa crus-galli	1
Eleocharis palustris	2	Glyceria elata	0
Helianthus annuus	0	Hordeum jubatum	1
Open Water	2	Polygonum aviculare	1
Populus deltoides	2	Ratibida columnifera	0
Rumex crispus	4	Sagittaria cuneata	0
Salix amygdaloides	0	Salix exigua	0
Schoenoplectus maritimus	1	Tamarix ramosissima	0
Tragopogon dubius	0	Typha latifolia	1

Comments:

Total Vegetation Community Acreage **2.74**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Forsyth NW -East Date: 6/20/2014 8:46:32 AM

Transect Number: 1 **Compass Direction from Start:** 145

Interval Data:

Ending Station 30 **Community Type:** Helianthus annuus / Thlaspi arvense

Species	Cover class	Species	Cover class
Bare Ground	0	Bromus carinatus	2
Bromus tectorum	1	Elymus repens	1
Helianthus annuus	2	Hordeum jubatum	2
Lepidium perfoliatum	1	Pascopyrum smithii	1
Rumex crispus	0	Sisymbrium altissimum	1
Thlaspi arvense	1		

Ending Station 95 **Community Type:** Rumex crispus / Eleocharis palustris

Species	Cover class	Species	Cover class
Algae, green	1	Alopecurus pratensis	0
Eleocharis palustris	3	Open Water	5
Polygonum aviculare	0	Populus deltoides	1
Rumex crispus	2	Schoenoplectus maritimus	1
Typha latifolia	1		

Ending Station 125 **Community Type:** Helianthus annuus / Thlaspi arvense

Species	Cover class	Species	Cover class
Ambrosia psilostachya	2	Bromus carinatus	1
Chenopodium album	1	Elymus repens	2
Helianthus annuus	1	Lactuca serriola	1
Linum lewisii	0	Melilotus officinalis	5
Pascopyrum smithii	1	Populus deltoides	0
Rumex crispus	0	Thlaspi arvense	1

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 280

Interval Data:

Ending Station 16 **Community Type:** Helianthus annuus / Thlaspi arvense

Species	Cover class	Species	Cover class
Bare Ground	1	Convolvulus arvensis	0
Helianthus annuus	1	Hordeum jubatum	1
Medicago sativa	1	Pascopyrum smithii	2
Populus deltoides	1	Rumex crispus	3
Taraxacum officinale	1	Thlaspi arvense	1

Ending Station 130 **Community Type:** Rumex crispus / Eleocharis palustris

Species	Cover class	Species	Cover class
Ambrosia psilostachya	0	Bassia scoparia	4
Echinochloa crus-galli	3	Eleocharis palustris	1
Hordeum jubatum	1	Polygonum aviculare	1
Populus deltoides	2	Rumex crispus	3
Salix amygdaloides	0	Salix exigua	0
Schoenoplectus maritimus	0	Tragopogon dubius	0
Typha latifolia	0		

Ending Station 181 **Community Type:** Helianthus annuus / Thlaspi arvense

Species	Cover class	Species	Cover class
Bare Ground	1	Elymus repens	2
Helianthus annuus	2	Hordeum jubatum	1
Lactuca serriola	0	Linum lewisii	1
Medicago sativa	0	Melilotus officinalis	2
Pascopyrum smithii	2	Polygonum aviculare	1
Rumex crispus	1	Thlaspi arvense	1

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW -East

Planting Type	#Planted	#Alive	Notes
None planted			

Comments

No woody vegetation planted on site. Area reseeded following disturbance/construction.

Forsyth NW -East

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
Barn Swallow	5	FO	UP
Cliff Swallow	1	FO	UP
Common Nighthawk	3	FO	UP
Eastern Kingbird	1	L	UP
Killdeer	2	F	MF
Lark Sparrow	2	F, L	MF, UP
Mourning Dove	3	F, FO	UP
Red-winged Blackbird	3	L	UP
Turkey Vulture	2	FO	UP
Western Kingbird	4	L	UP
Western Meadowlark	8	F, L	UP
Western Sandpiper	1	F	MF

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Raccoon		Yes	No	No	

Wildlife Comments:

Forsyth NW -East

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.

Photo #	Latitude	Longitude	Bearing	Description
1440	46.321033	-106.838814	125	PP-1
1441	46.321045	-106.838486	145	T-1, start
1455	46.320297	-106.838493	325	T-1, end
1514	46.318336	-106.834175	280	T-2, start
1530	46.318417	-106.834923	100	T-2, end
1533	46.318233	-106.834335	305	PP-3
1546	46.320953	-106.838531	200	E-1w
1602	46.320786	-106.838676	80	E-1u
1616	46.320068	-106.837128	210	PP-2

Comments:

Forsyth NW -East

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

Were man-made nesting structure installed at this site? No

If yes, do they need to be repaired?

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 in need of repair?

If yes, describe the problems below.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: Ea-1u

Investigator(s): B Sandefur Section, Township, Range: 34 7N 39E

Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): flat Slope (%): _____

Subregion (LRR): LRR G Lat: 46.319621 Long: -106.836235 Datum: WGS84

Soil Map Unit Name: Harlem silty clay NWI classification: NA

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 ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks: Located alond slope of excavated basin above influence of seasonal surface water.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Agropyron cristatum	15	☐	NL
Bromus carinatus	40	☑	NL
Bromus tectorum	5	☐	NL
Chenopodium album	5	☐	FACU
Lepidium perfoliatum	5	☐	FAC
Melilotus officinalis	35	☑	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

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	40	X 4	160
UPL species	0	X 5	0
Column Totals	45 (A)		175 (B)

Prevalence Index = B/A = 3.89

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: Ea-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
0-12	10YR 5/3	95	10YR 7/1	5			Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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: Salt concentrations in profile.

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: No wetland hydrology at data point, above seasonal saturation zone from impounded water.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Co. Sampling Date: 6/20/2014

Applicant/Owner: MDT State: MT Sampling Point: Ea-1w

Investigator(s): B Sandefur Section, Township, Range: 34 7N 39E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRR G Lat: -106.837016 Long: 46.320046 Datum: WGS84

Soil Map Unit Name: Harlem silty clay NWI classification: NA

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 ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: Located in approximate middle of excavated swale.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Chenopodium album	5	☐	FACU
Populus deltoides	30	☑	FAC
Rumex crispus	30	☑	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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	0 X 1	0
FACW species	0 X 2	0
FAC species	60 X 3	180
FACU species	5 X 4	20
UPL species	0 X 5	0
Column Totals	65 (A)	200 (B)

Prevalence Index = B/A = 3.08

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: Ea-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
0-15	10YR 5/2	97	10YR 4/4	3	C	PL		**Very faint redox.**

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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:

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: Area seasonally inundated, saturated from surface water impounded in excavated basin.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - East **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 6/20/2014 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Forsyth NW - East

6. Wetland Location(s): **T** 7N **R** 39E **Sec1** 34 **T** **R** **Sec2**

Approx Stationing or Mileposts ~262.3 on US 12

Watershed 10100001 **Watershed/County** Big Porcupine Creek, Rosebud Co.

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 1.19

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 1.19

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Abundant

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

AA vegetation cover increased from 2013 following recent construction of wetland basin.

ii. Prominent noxious, aquatic nuisance, other exotic species:

None

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes a linear, excavated roadside depression parallel to US 12. Surrounding land includes agriculture (grazing) and highway.

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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent vegetation class present

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USF&WS T&E list for Rosebud County

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species) ◉ D ○ S Scarlet Ammannia - Ammannia robusta (S2)

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ○ D ◉ S Great Blue Heron (S3)

No usable habitat ☐ S

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use MTNHP SOC report for T7N R39E, direct observation of Ammannia

14C. General Wildlife Habitat Rating:

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

Low

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☐ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☐ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, 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 instructions 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Minimal signs of wildlife observed during field survey. This area is close to the roadway and will likely never achieve a high wildlife habitat rating.

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

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ○ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

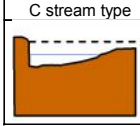
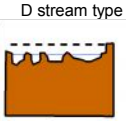
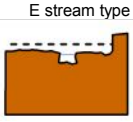
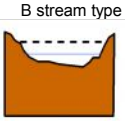
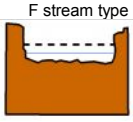
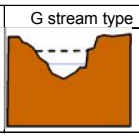
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ○ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

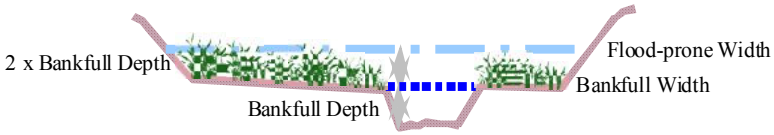
iii. Final Score and Rating: 0 NA **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☑ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width / **Bankfull width** = **Entrenchment ratio**

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 (check)? **Y** ○ **N** ◉

Comments: AA not subject to flooding from Big Porcupine Creek.

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic 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	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: AA subject to ponding from precipitation and upland surface flow.

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

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA achieved greater than 70% vegetation cover, primarily early succession annuals.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☐ **NA** here and proceed to 14I.)

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

*% 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	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: AA with seasonal/ephemeral open water potentially subject to periodic wave action. Vegetation primarily not deep-rooted.

14I. Production Export/Food Chain Support:

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

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

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

A	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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ○ **N** ◉ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .3L

Comments:

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & 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: AA hydrologically connected to an historic ox bow

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 arrive at [check] the functional points and rating)

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

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: AA resembles a roadside ditch.

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

i. Is the AA a known or potential rec./ed. site: (check) **Y** ○ **N** ◉ (if 'Yes' continue with the evaluation; if 'No' then click ☑ **NA** here and proceed to the overall summary and rating page)

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

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

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

Comments:

AA small, adjacent to highway, and with little to no recreation or education potential.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Forsyth NW - East

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	H	.9	1	1.071	☑
C. General Wildlife Habitat	M	.4	1	0.476	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	M	.6	1	0.714	☐
G. Sediment/Nutrient/Toxicant Removal	H	1	1	1.19	☑
H. Sediment/Shoreline Stabilization	L	.2	1	0.238	☐
I. Production Export/Food Chain Support	L	.3	1	0.357	☑
J. Groundwater Discharge/Recharge	M	.7	1	0.833	☑
K. Uniqueness	L	.2	1	0.238	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		4.3	9	5.117	
Percent of Possible Score			**47.78** %		

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; otherwise 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 RATING:
(check appropriate category based on the criteria outlined above)

I | II | **III** | IV

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Forsyth NW - Treasure Co. Line Assessment Date/Time 7/10/2014 2:19:12 PM
Person(s) conducting the assessment: B Sandefur, E Sandefur
Weather: Hot, breezy and mostly clear Location: ~17 miles west of Forsyth
MDT District: Glendive Milepost: ~RP 81.7 on I-94
Legal Description: T 6N R 38E Section(s) 23
Initial Evaluation Date: 8/14/2013 Monitoring Year: 2 #Visits in Year: 1
Size of Evaluation Area: 5.89 (acres)
Land use surrounding wetland:
I-94, Agriculture-grazing/pasture

HYDROLOGY

Surface Water Source: Groundwater, precipitation, surface runoff
Inundation: ☑ Average Depth: 0.4 **(ft)** Range of Depths: 0-1.2 **(ft)**
Percent of assessment area under inundation: 90 %
Depth at emergent vegetation-open water boundary: 1 **(ft)**
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 water, water marks, aquatic fauna, H2S odor, algal mat/crust.

Groundwater Monitoring Wells

Record depth of water surface below ground surface, in feet.

Well ID	Water Surface Depth (ft)
No Wells	

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.

Hydrology Notes:

Area hydrologically connected to Reservation Creek via pre-existing wetlands.

VEGETATION COMMUNITIES

Site Forsyth NW - Treasure Co. Line

(Cover Class Codes **0** = < 1%, **1** = 1-5%, **2** = 6-10%, **3** = 11-20%, **4** = 21-50% , **5** = >50%)

Community # 1 **Community Type:** Artemisia tridentata / Chenopodium album **Acres** 1.92

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Artemisia tridentata	3
Bare Ground	1	Bassia scoparia	3
Bromus tectorum	2	Chenopodium album	3
Cirsium arvense	1	Cirsium vulgare	0
Elaeagnus angustifolia	0	Elymus canadensis	2
Grindelia squarrosa	1	Helianthus annuus	1
Hordeum jubatum	3	Lactuca serriola	0
Lepidium perfoliatum	0	Opuntia polyacantha	0
Poa pratensis	2	Puccinellia nuttalliana	1
Sisymbrium altissimum	0	Sonchus arvensis	1
Symphoricarpos albus	0		

Comments:

Community # 2 **Community Type:** Elymus canadensis / Bromus tectorum **Acres** 2.47

Species	Cover class	Species	Cover class
Agropyron cristatum	0	Artemisia tridentata	1
Asclepias speciosa	0	Bare Ground	1
Bassia scoparia	0	Bromus tectorum	3
Chenopodium album	1	Cirsium arvense	0
Cirsium vulgare	1	Elymus canadensis	3
Grindelia squarrosa	1	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	1
Medicago sativa	0	Melilotus officinalis	0
Opuntia polyacantha	0	Panicum capillare	0
Poa pratensis	0	Rumex crispus	0
Schedonorus pratensis	1	Sisymbrium altissimum	0
Sonchus arvensis	0	Tragopogon dubius	0

Comments:

Community # 3 **Community Type:** Schoenoplectus spp. / **Acres** 1.5

Species	Cover class	Species	Cover class
Algae, green	1	Asclepias speciosa	0
Chenopodium album	0	Hordeum jubatum	3
Open Water	2	Rumex crispus	1
Schoenoplectus maritimus	2	Schoenoplectus pungens	5
Sonchus arvensis	2	Typha latifolia	1

Comments:

Total Vegetation Community Acreage **5.89**

(Note: some area within the project bounds may be open water or other non-vegetative ground cover.)

VEGETATION TRANSECTS

Site: Forsyth NW - Treasure Co. Line **Date:** 7/10/2014 2:19:12 PM

Transect Number: 1 **Compass Direction from Start:** 190

Interval Data:

Ending Station 92 **Community Type:** Elymus canadensis / Bromus tectorum

Species	Cover class	Species	Cover class
Agropyron cristatum	0	Bare Ground	1
Bassia scoparia	3	Bromus tectorum	1
Chenopodium album	1	Elymus canadensis	2
Grindelia squarrosa	1	Hordeum jubatum	2
Lactuca serriola	0	Panicum capillare	1
Poa pratensis	4	Sonchus arvensis	0

Ending Station 200 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Algae, green	1	Asclepias speciosa	0
Chenopodium album	1	Hordeum jubatum	0
Open Water	1	Rumex crispus	0
Schoenoplectus pungens	4	Sonchus arvensis	1

Ending Station 355 **Community Type:** Elymus canadensis / Bromus tectorum

Species	Cover class	Species	Cover class
Asclepias speciosa	0	Bromus tectorum	1
Chenopodium album	2	Elymus canadensis	2
Hordeum jubatum	1	Lactuca serriola	0
Rumex crispus	0	Tragopogon dubius	0

Ending Station 403 **Community Type:** Schoenoplectus spp. /

Species	Cover class	Species	Cover class
Chenopodium album	0	Open Water	1
Schoenoplectus maritimus	3	Schoenoplectus pungens	5
Sonchus arvensis	0		

Ending Station 534 **Community Type:** Elymus canadensis / Bromus tectorum

Species	Cover class	Species	Cover class
Artemisia tridentata	0	Bare Ground	1
Bromus tectorum	3	Chenopodium album	4
Elymus canadensis	2	Hordeum jubatum	0
Melilotus officinalis	1	Sisymbrium altissimum	0
Sonchus arvensis	1		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Forsyth NW - Treasure Co. Line

Planting Type	#Planted	#Alive	Notes
None planted			

Comments

No woody vegetation installed on site.

Forsyth NW - Treasure Co. Line

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Goldfinch	3	FO	UP
Cliff Swallow	6	FO	UP
Great Blue Heron	1	FO	OW, WM
Mourning Dove	12	FO	UP
Red-winged Blackbird	10	FO	UP, WM
Sandhill Crane	1	F	MA
Song Sparrow	1	FO	
Western Meadowlark	1	L	UP
Wilson's Snipe	1	L	MA

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

AB = Aquatic bed **SS** = Scrub/Shrub **FO** = Forested **UP** = Upland buffer **I** = Island

WM = Wet meadow **MA** = Marsh **US** = Unconsolidated shore **MF** = Mud Flat **OW** = Open Water

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Northern Leopard Frog	1	No	No	No	

Wildlife Comments:

Forsyth NW - Treasure Co. Line

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.

Photo #	Latitude	Longitude	Bearing	Description
3117	46.260921666	-106.93751833	0	T-1u
3118	46.261635	-106.937218	190	T-1, start
3119-26	46.261292	-106.937012	180	PP-1
3127-31	46.261398	-106.937569	140	PP-2
3133-38	46.260593	-106.937988	45	PP-3
3139-44	46.260349	-106.936935	315	PP-4
3145	46.26128	-106.93734	280	T-1w
3149	46.260059	-106.937912	10	T-1, end

Comments:

Forsyth NW - Treasure Co. Line

ADDITIONAL ITEMS CHECKLIST

Hydrology

☑ Map emergent vegetation/open water boundary on aerial photos.
☑ Observe extent of surface water. Look for evidence of past surface water elevations (e.g. drift lines, vegetation staining, erosion, etc).

Photos

☑ One photo from the wetland toward each of the four cardinal directions
☑ One photo showing upland use surrounding the wetland.
☑ One photo showing the buffer around the wetland
☑ One photo from each end of each vegetation transect, toward the transect

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

☑ Delineate wetlands according to applicable USACE protocol (1987 form or Supplement)
☑ Delineate wetland – upland boundary onto aerial photograph.

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

Were man-made nesting structure installed at this site? No

If yes, do they need to be repaired?

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 in need of repair?

If yes, describe the problems below.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Treasure Co. Line City/County: Rosebud Co Sampling Date: 7/10/2014

Applicant/Owner: MDT State: MT Sampling Point: T-1u

Investigator(s): B Sandefur Section, Township, Range: 23 6N 38E

Landform (hillslope, terrace, etc.): Mound Local relief (concave, convex, none): flat Slope (%): 0

Subregion (LRR): LRR G Lat: 46.260719 Long: -106.936944 Datum: WGS84

Soil Map Unit Name: Gerdrum-Marvan silty clays NWI classification: Upland

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 ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks: Data point taken on undisturbed upland island.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus japonicus	80	☑	NL
Elymus trachycaulus	10	☐	FACU
Hordeum jubatum	5	☐	FACW
Lactuca serriola	5	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

Dominance Test worksheet

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

Total Number of Dominant Species Across All Strata: 1 (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	5	X 2	10
FAC species	5	X 3	15
FACU species	10	X 4	40
UPL species	0	X 5	0
Column Totals	20 (A)		65 (B)

Prevalence Index = B/A = 3.25

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☐ 2 - Dominance Test is >50%
- ☐ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: T-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
0-12	10YR 5/3	100					Sandy Clay	
12-16	10YR 4/2	95	7.5YR 4/4	5	C	M	Silty Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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: Non-hydric soils. Very fine sand, friable in upper 12in. Redox and salt concentrations below 12in.

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, monitoring well, aerial photos, previous inspections), if available:

Remarks: Surface soil cracks from native clastic clays and not a result of periodic surface saturation. Area appears above the influence of seasonal high water and not likely to convert to wetland.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - Treasure Co. Line City/County: Rosebud Co Sampling Date: 7/10/2014

Applicant/Owner: MDT State: MT Sampling Point: T-1w

Investigator(s): B Sandefur Section, Township, Range: 23 6N 38E

Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): concave Slope (%): 0

Subregion (LRR): LRR G Lat: 46.260668 Long: -106.936959 Datum: WGS84

Soil Map Unit Name: Gerdrum-Marvan silty clays NWI classification: Upland

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 ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: Point in excavated wetland. Excellent hydrophyte development.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Schoenoplectus maritimus	30	☑	OBL
Schoenoplectus pungens	70	☑	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 2 (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	100	X 1	100
FACW species	0	X 2	0
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	100 (A)		100 (B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators

- ☐ 1 - Rapid Test for Hydrophytic Vegetation
- ☑ 2 - Dominance Test is >50%
- ☑ 3 - Prevalence Index is <= 3.0
- ☐ 4 - Morphological Adaptations (Provide supporting data in remarks or on separate sheet.
- ☐ 5 - Wetland Non-Vascular Plants
- ☐ Problematic Hydrophytic Vegetation (Explain)

Indicators of hydric sil and wetland hydrology must be present, unless disturbed or problematic for #3, 4, 5.

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: T-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
0-12	10Y 5/1	100					Clay	

[1]Type: 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 Mucky 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 & 73 of LRR H)**

Indicators for Problematic Hydric Soils[3]:

- ☐ 1 cm Muck (A9) **(LRR I, J)**
- ☐ Coast Prairie Redox (A16) **(LRR F, G, H)**
- ☐ Dark Surface (S7) **(LRR G)**
- ☐ High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 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:

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): 3

Water Table Present? Yes ☑ No ☐ Depth (inches): 0

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 0

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Area hydrologically connected to adjacent pre-existing wetland along Reservation Creek.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name Forsyth NW - Treasure Co. Line **2. MDT project#** STPP 14-6(9)259 **Control#** 4059

3. Evaluation Date 7/10/2014 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** Treasure Co. Line

6. Wetland Location(s): **T** 6N **R** 38E **Sec1** 23 **T** **R** **Sec2**

Approx Stationing or Mileposts ~RP 81.7 on I-94

Watershed 10100001 **Watershed/County** Lower Yellowstone River-Sunday Creek, Rosebud County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 1.5

How assessed: Measured e.g. by GPS

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

9. Assesssment area (AA) size (acres) 1.5

How assessed: Measured e.g. by GPS

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Permanent/Perennial	100

11. Estimated Relative Abundance Common

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) 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	low disturbance	moderate disturbance
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is <=30%.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >=30%.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc)

Constructed AA with sufficient time for vegetation to establish.

ii. Prominent noxious, aquatic nuisance, other exotic species:

Cirsium arvense

iii. Provide brief descriptive summary of AA and surrounding land use/habitat

AA includes excavated wetland constructed adjacent to a larger wetland area. Surrounding land use includes I-94 and agriculture.

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 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Emergent with scattered shrubs.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

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 (use the conclusions from i above and the matrix below to arrive at [check] the functional points and rating)

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
Functional Points and Rating	1H	.9H	.8H	.7M	.3L	.1L	0L

Sources for documented use USF&WS T&E list for Rosebud County

14B. Habitat for plant or animals rated S1, S2, or S3 by the Montana Natural Heritage Program: (not including species listed in14A above)

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◯ S Great Blue Heron (S3)

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☐ S

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

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	None
S1 Species: *Functional Points and Rating*	1H	.8H	.7M	.6M	.2L	.1L	0L
S2 and S3 Species: *Functional Points and Rating*	.9H	.7M	.6M	.5M	.2L	.1L	0L

Sources for documented use GBH observed on site.

14C. General Wildlife Habitat Rating:

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

Substantial (based on any of the following [check]):

- ☐ observations of abundant wildlife #s or high species diversity (during any period)
- ☐ abundant wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ presence of extremely limiting habitat features not available in the surrounding area
- ☐ interviews with local biologists with knowledge of the AA

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
- ☐ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):

- ☑ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☑ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☐ adequate adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

ii. Wildlife habitat features (Working from top to bottom, 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 instructions 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	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments

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

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points 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	1E	.9H	.8H	.7M	.6M	.5M	.9H	.8H	.7M	.6M	.5M	.4M	.7M	.6M	.5M	.4M	.3L	.3L
FWP Tier II or Native Game fish species	.9H	.8H	.7M	.6M	.5M	.5M	.8H	.7M	.6M	.5M	.4M	.4M	.6M	.5M	.4M	.3L	.2L	.2L
FWP Tier III or Introduced Game fish	.8H	.7M	.6M	.5M	.5M	.4M	.7M	.6M	.5M	.4M	.4M	.3L	.5M	.4M	.3L	.2L	.2L	.1L
FWP Non-Game Tier IV or No fish species	.5M	.5M	.5M	.4M	.4M	.3L	.4M	.4M	.4M	.3L	.3L	.2L	.2L	.2L	.2L	.1L	.1L	.1L

Sources used for identifying fish sp. potentially found in AA:

ii. Modified Rating (**NOTE:** Modified score cannot exceed 1 or be less than 0.1)
a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* **Y** ◯ **N** ◉ *If yes, reduce score in* ***i*** *above by 0.1:* **Modified Rating**

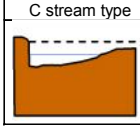
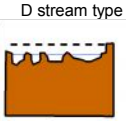
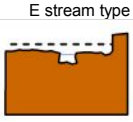
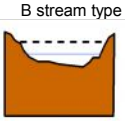
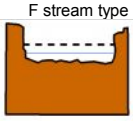
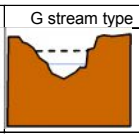
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

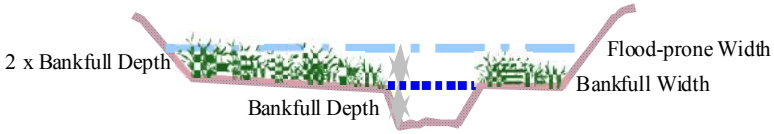
iii. Final Score and Rating: 0 NA **Comments:**

14E. Flood Attenuation: (Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA are not flooded from in-channel or overbank flow, click ☐ **NA** here and proceed to 14F.)

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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		
% 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**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

Slightly Entrenched ER = >2.2			**Moderately Entrenched ER = 1.41 – 2.2**	**Entrenched ER = 1.0 – 1.4**		
C stream type	D stream type	E stream type	B stream type	A stream type	F stream type	G stream type
						



Floodprone width / **Bankfull width** = **Entrenchment ratio**

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 (check)? **Y** ◯ **N** ◉

Comments:

14F. Short and Long Term Surface Water Storage: (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, click ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic 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	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments:

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

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of 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 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 with 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	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments:

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or 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, click ☑ **NA** here and proceed to 14I.)

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

*% 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	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments:

14I. Production Export/Food Chain Support:

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

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

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

A	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	1E	.7H	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .7M

Comments: AA bordered by I-94 to north.

14J. Groundwater Discharge/Recharge: (check the appropriate indicators in i & 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 arrive at [check] the functional points and rating)

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

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [check] the functional points 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)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments:

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

i. Is the AA a known or potential rec./ed. site: (check) **Y** ◉ **N** ○ (if 'Yes' continue with the evaluation; if 'No' then click ☐ **NA** here and proceed to the overall summary and rating page)

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

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

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

Comments:

MDT-owned site.

General Site Notes

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Treasure Co. Line

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	0.9	☐
C. General Wildlife Habitat	H	.9	1	1.35	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.4	0	0.6	☐
F. Short and Long Term Surface Water Storage	H	.8	1	1.2	☑
G. Sediment/Nutrient/Toxicant Removal	H	.9	1	1.35	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	M	.7	1	1.05	☐
J. Groundwater Discharge/Recharge	H	1	1	1.5	☑
K. Uniqueness	M	.4	1	0.6	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.225	☐
Totals:		5.85	8	8.775	
Percent of Possible Score			**73.13** %		

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; otherwise 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 RATING:
(check appropriate category based on the criteria outlined above)

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

Forsyth Northwest –West

Photo Point 1 – *Panorama* **Location:** Northeast corner of southeast end
Bearing: 270 Degrees **Taken in 2013**

Photo Point 1 – *Panorama* **Location:** Northeast corner of southeast end
Bearing: 270 Degrees **Taken in 2014**

Forsyth Northwest –West

Photo Point 2 – *Panorama* **Location:** Southwest corner of southeast end , view of repaired dike.
Bearing: 350 Degrees **Taken in 2013**

Photo Point 2 – *Panorama* **Location:** Southwest corner of southeast end , view of blown-out dike.
Bearing: 350 Degrees **Taken in 2014**

Photo Point 3 – *Panorama* **Location:** Northeast side (along road) near middle of site
Bearing: 230 Degrees **Taken in 2013**

Photo Point 3 – *Panorama* **Location:** Northeast side (along road) near middle of site
Bearing: 230 Degrees **Taken in 2014**

Forsyth Northwest –West

Photo Point 4 – *Panorama* **Location:** Northeast corner of northwest end
Bearing: 210 Degrees **Taken in 2013**

Photo Point 4 – *Panorama* **Location:** Northeast corner of northwest end
Bearing: 210 Degrees **Taken in 2014**

Photo Point 5 – *Panorama* **Location:** Southwest side near middle of site
Bearing: 45 Degrees **Taken in 2013**

Photo Point 5 – *Panorama* **Location:** Southwest side near middle of site
Bearing: 45 Degrees **Taken in 2014**

Forsyth Northwest –West

Transect 1 – *Start*
Bearing: 25 Degrees
Location: Southeast end
Taken in 2013

Transect 1 – *Start*
Bearing: 25 Degrees
Location: Southeast end
Taken in 2014

Transect 1 – *End*
Bearing: 205 Degrees
Location: Southeast end
Taken in 2013

Transect 1 – *End*
Bearing: 205 Degrees
Location: Southeast end
Taken in 2014

Forsyth Northwest –West

Transect 2 – *Start*
Bearing: 25 Degrees
Location: Northwest end
Taken in 2013

Transect 2 – *Start*
Bearing: 25 Degrees
Location: Northwest end
Taken in 2014

Transect 2 – *End*
Bearing: 205 Degrees
Location: Northwest end
Taken in 2013

Transect 2 – *End*
Bearing: 205 Degrees
Location: Northwest end
Taken in 2014

Forsyth Northwest –West

Transect 2 - *Panorama*
Bearing: 205 Degrees

Location: Transect 2 end
Taken in 2013

Transect 2 - *Panorama*
Bearing: 205 Degrees

Location: Transect 2 end
Taken in 2014

Forsyth Northwest –West

Data Point – We-1w
Bearing: 220 Degrees
Location: Veg community 4
Taken in 2014

Data Point – We-1u
Bearing: 300 Degrees
Location: Veg community 2
Taken in 2014

Data Point – We-2u
Bearing: 200 Degrees
Location: Veg community 2
Taken in 2014

Data Point – We-3w
Bearing: 300 Degrees
Location: Veg community 2
Taken in 2014

Forsyth Northwest –Middle

Photo Point 1 – *Photo 1*
Bearing: 300 Degrees
Location: Northwest end
Taken in 2013

Photo Point 1 – *Photo 1*
Bearing: 300 Degrees
Location: Northwest end
Taken in 2014

Photo Point 2 – *Photo 1*
Bearing: 120 Degrees
Location: Southeast end
Taken in 2013

Photo Point 2 – *Photo 1*
Bearing: 120 Degrees
Location: Southeast end
Taken in 2014

Forsyth Northwest –Middle

Transect 1 – *Start*
Bearing: 205 Degrees

Location: Near middle of site
Taken in 2013

Transect 1 – *Start*
Bearing: 205 Degrees

Location: Near middle of site
Taken in 2014

Transect 1 – *End*
Bearing: 25 Degrees

Location: Near middle of site
Taken in 2013

Transect 1 – *End*
Bearing: 25 Degrees

Location: Near middle of site
Taken in 2014

Forsyth Northwest –Middle

Transect 1 - *Panorama*
Bearing: 25 Degrees

Location: Transect 1 end
Taken in 2013

Transect 1 - *Panorama*
Bearing: 25 Degrees

Location: Transect 1 end
Taken in 2014

Data Point – M-1u
Bearing: 180 Degrees

Location: Veg community 1
Taken in 2014

Data Point – M-1w
Bearing: 180 Degrees

Location: Veg community 2
Taken in 2014

Photo Point 1 – *Photo 1*
Bearing: 125 Degrees
Location: Northwest end of site
Taken in 2013

Photo Point 3 – *Photo 1*
Bearing: 305 Degrees
Location: Southeast end of site
Taken in 2014

Photo Point 2 – *Panorama*
Bearing: 210 Degrees
Location: Near center of site
Taken in 2013

Photo Point 2 – *Panorama*
Bearing: 210 Degrees
Location: Near center of site
Taken in 2014

Photo Point 3 – *Photo 1*
Bearing: 305 Degrees
Location: Southeast end of site
Taken in 2013

Photo Point 3 – *Photo 1*
Bearing: 305 Degrees
Location: Southeast end of site
Taken in 2014

Transect 1 – *Beginning*
Bearing: 145 Degrees
Location: Northwest end
Taken in 2013

Transect 1 – *Beginning*
Bearing: 145 Degrees
Location: Northwest end
Taken in 2014

Transect 1 – *End*
Bearing: 325 Degrees
Location: Northwest end
Taken in 2013

Transect 1 – *End*
Bearing: 325 Degrees
Location: Northwest end
Taken in 2014

Transect 2 – *Beginning*
Bearing: 280 Degrees
Location: Southeast end
Taken in 2013

Transect 2 – *Beginning*
Bearing: 280 Degrees
Location: Southeast end
Taken in 2014

Transect 2 – *End*
Bearing: 100 Degrees
Location: Southeast end
Taken in 2013

Transect 2 – *End*
Bearing: 100 Degrees
Location: Southeast end
Taken in 2014

Data Point – E-1u
Bearing: 80 Degrees
Location: Veg community 1
Taken in 2014

Data Point – E-1w
Bearing: 200 Degrees
Location: Veg community 2
Taken in 2014

Photo Point 1 – *Panorama* **Location:** Northeast corner of wetland
Bearing: 180 Degrees **Taken in 2013**

Photo Point 1 – *Panorama* **Location:** Northeast corner of wetland
Bearing: 180 Degrees **Taken in 2014**

Photo Point 2 – *Panorama* **Location:** Northwest corner of wetland
Bearing: 140 Degrees **Taken in 2013**

Photo Point 2 – *Panorama* **Location:** Northwest corner of wetland
Bearing: 140 Degrees **Taken in 2014**

Photo Point 3 – *Panorama* **Location:** Southwest corner of wetland
Bearing: 45 Degrees **Taken in 2013**

Photo Point 3 – *Panorama* **Location:** Southwest corner of wetland
Bearing: 45 Degrees **Taken in 2014**

Photo Point 4 – *Panorama* **Location:** Southeast corner of wetland
Bearing: 315 Degrees **Taken in 2013**

Photo Point 4 – *Panorama* **Location:** Southeast corner of wetland
Bearing: 315 Degrees **Taken in 2014**

Transect 1 – *Start*
Bearing: 190 Degrees
Location: West half of wetland
Taken in 2013

Transect 1 – *Start*
Bearing: 190 Degrees
Location: West half of wetland
Taken in 2014

Transect 1 – *End*
Bearing: 10 Degrees
Location: West half of wetland
Taken in 2013

Transect 1 – *End*
Bearing: 10 Degrees
Location: West half of wetland
Taken in 2014

Data Point – T-1w
Bearing: 280 Degrees
Location: Veg community 3
Taken in 2014

Data Point – T-1u
Bearing: 0 Degrees
Location: Veg community 2
Taken in 2014

Appendix D

Original Site Plans

MDT Wetland Mitigation Monitoring
West Site (1), Middle Site (2), and East Site (3), Treasure County Line Site (4)
Rosebud County, Montana

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPP 14-6(10)259

PMS OVERLAY, RECONSTRUCTION, PULVERIZATION

FORSYTH - NORTHWEST

ROSEBUD COUNTY

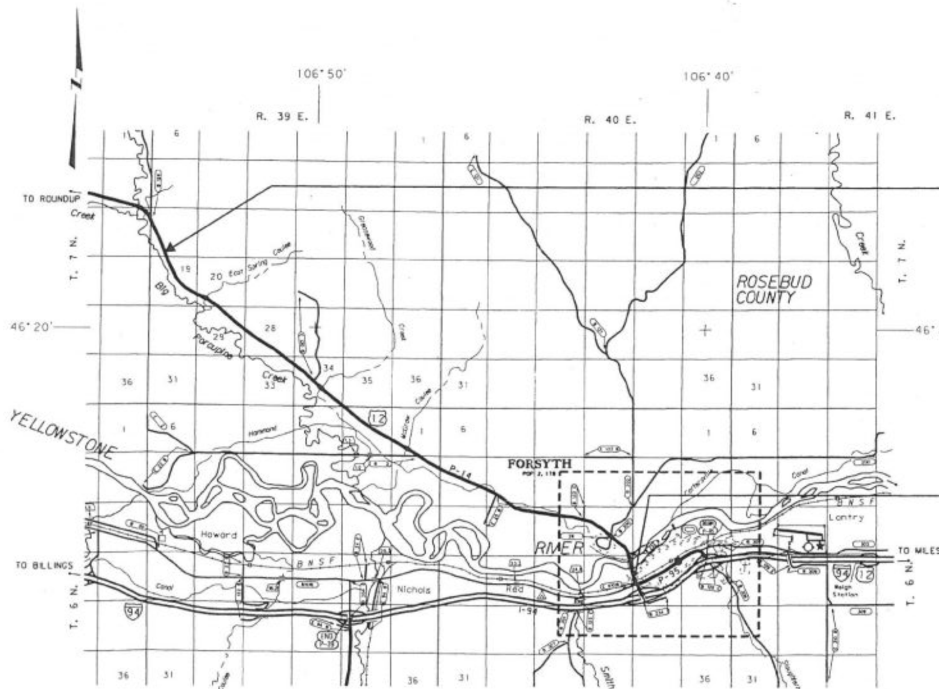
LENGTH 19.1 kilometers

DESIGN DATA
2005 A.D.T. = 240
2025 A.D.T. = 300
D.H.V. = 50
D. = 55% - 45%
T. = 19.6%
V. = 90 km/h
ALL TRUCKS = 47.0%
80 kN ESAL'S = 29.98
GROWTH RATE = 1.0%

LETTING DATE - ______

SURFACING SOURCE - CONTRACTOR FURNISHED

CSF = 0.999347553



STA. 10+00 BEG. CONNECTION
STA. 10+75 END CONNECTION
STA. 339+06.0 (ENG.) ON FAP 328-D =
STA. 10+75 BEG. STPP 14-6(10)259

THIS CONTRACT
RP 268.600 TO RP 270.509

STA. 200+97.23 END STPP 14-6(10)259 =
STA. 281+92.1 (ENG.) ON FAP F-384(2)

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	STPP 14-6(13)259
P.E.	STPP 14-6(9)259

CONTROL NO. 4059

MONTANA DEPARTMENT OF TRANSPORTATION

APPROVED : OCTOBER 27, 20 11

TIM REARDON
DIRECTOR OF TRANSPORTATION

BY [signature]
CONSULTANT DESIGN ENGINEER

MONTANA
TIMOTHY J
CONWAY
10426PE
REGISTERED PROFESSIONAL ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

DIVISION ADMINISTRATOR | DATE

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

DESIGNED BY
REVIEWED BY
CHECKED BY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	2

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

TABLE OF CONTENTS

SUMMARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	11

TOPSOIL & SEEDING

STATION		cubic meters	hectares							REMARKS
		TOPSOIL SALVAGING & PLACING	SEED			FERTILIZER		CONDITION SEEDBED	MULCH	
FROM	TO		NO. 1	NO. 2	NO. 3	NO. 1	NO. 2	AREAS 1 & 3	AREA 2	
10+00	20+00	2598	3.1	0.9	1.0	3.1	0.9	4.1	0.9	
20+00	30+00	2702	2.6	0.7	1.0	2.6	0.7	3.6	0.7	
30+00	40+00	2293	2.6	0.1	1.0	2.6	0.1	3.6	0.1	
40+00	50+00	1821	2.0		1.0	2.0		3.0		
50+00	60+00	2203	2.5	0.1	1.0	2.5	0.1	3.5	0.1	
60+00	70+00	2323	3.8	0.1	1.0	3.8	0.1	4.8	0.1	
70+00	80+00	2158	2.5	0.3	1.0	2.5	0.3	3.5	0.3	
80+00	90+00	2278	2.2	0.2	1.0	2.2	0.2	3.2	0.2	
90+00	100+00	2142	2.1	0.1	1.0	2.1	0.1	3.1	0.1	
100+00	110+00	2373	2.2	0.1	1.0	2.2	0.1	3.2	0.1	
110+00	120+00	2014	2.2		1.0	2.2		3.2		
120+00	130+00	1963	2.4	1.5	1.0	2.4	1.5	3.4	1.5	
130+00	140+00	2378	3.4	0.1	1.0	3.4	0.1	4.4	0.1	
140+00	150+00	2138	3.0	0.1	1.0	3.0	0.1	4.0	0.1	
150+00	160+00	2239	3.0		1.0	3.0		4.0		
160+00	170+00	1826	2.8		1.0	2.8		3.8		
170+00	180+00	2248	1.6		1.0	1.6		2.6		
180+00	190+00	2871	6.0	0.4	1.0	6.0	0.4	7.0	0.4	
190+00	197+00	2048	2.8	1.4	0.7	2.8	1.4	3.5	1.4	
TOTAL		42616	52.8	6.1	18.7	52.8	6.1	71.5	6.1	

FINISH GRADE CONTROL

STATION		course kilometers	REMARKS
		FINISH GRADE CONTROL	
FROM	TO		
10+00	52+00	4.2	SUBGRADE
10+00	52+00	4.2	TOP CAC
52+00	72+20	2.0	SUBGRADE MAINLINE
52+00	72+20	2.0	BASE COURSE MAINLINE
72+20	196+98	12.5	SUBGRADE
72+20	196+98	12.5	TOP BASE COURSE
TOTAL		37.4	

APPROACH PIPE (INCLUDED IN CULVERT SUMMARY RECAP)

STATION	BASIC BID ITEMS					PIPE OPTIONS mm				END SECTIONS		meters	SKEW ANGLE	REMOVE CULVERT mm x m	REMARKS
	CULVERT PIPE mm	meters			cubic meters	CONCRETE - CLASS 2	STEEL - 68 x 13 CORR. 1.63 THK.	ALUMINUM - 68 x 13 CORR. 1.52 THK.	CORRUGATED POLYETHYLENE PIPE			HEIGHT OF COVER			
		LENGTH OF PIPE	RELAY CULVERT	CLEAN CULVERT	CULVERT EXCAVATION					LEFT	RIGHT				
14+93	450	11.0			5	450				FETS	FETS	0.3		-	APP. LT.
39+38	450	11.5			20	450			450	FETS	FETS	0.6		610 x 10.5 RCP	APP. LT.
39+38	600	11.5			20	600			600	FETS	FETS	0.6		610 x 10.0 RCP	APP. RT.
49+89	-	-			15	-				-	-	-		762 x 9.3 CSP	APP. LT.
49+89					10									381 x 9.3 RCP	APP. RT.
53+35	1200	13.5			25	1200				FETS	FETS	0.4		762 x 9.0 CSP	APP. LT.
53+35	600	14.0			15	600				FETS	FETS	1.2		610 x 9.0 CSP	APP. RT.
66+36	900	11.0			15	900				FETS	FETS	0.4		610 x 8.0 CSP	APP. RT.
66+37	450	11.0			5	450				FETS	FETS	0.5			
74+18	450	11.0			10	450				FETS	FETS	0.3		-	APP. LT.
77+84	600	11.5			30	600			600	FETS	FETS	0.8		610 x 12.5 RCP	APP. LT.
77+84	600	11.5			30	600				FETS	FETS	0.5		610 x 12.5 RCP	APP. RT.
84+34	-	-			10	-				-	-	-		457 x 12.5 RCP	LT.
101+30	450	11.0			25	450	450	450	450	FETS	FETS	0.6		254 x 18.7 CSP	APP. RT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.5		610 x 7.7 RCP	APP. LT.
109+18	600	11.0			20	600	600	600		FETS	FETS	0.5		610 x 8.2 CSP	APP. RT.
114+82	600	11.0			20	600	600	600		FETS	FETS	0.5		457 x 12.5 CSP	APP. LT.
114+95	750	16.5			5	-	750	750		FETS	FETS	0.3			APP. RT.
114+95	750	2.0			5	-	750	750		FETS	FETS	0.3		762 x 1.0 CSP	APP. RT. - REMOVE 1.0 m RT.
154+40	450	11.5			15	450	450	450	450	FETS	FETS	0.8		381 x 13.6 CSP	APP. LT.
161+36	450	11.0			20	450	450	450	450	FETS	FETS	0.6		457 x 12.2 CSP	APP. LT.
162+30	450	11.5			20	450	450	450	450	FETS	FETS	0.6		457 x 12.1 CSP	APP. LT.
170+66	450	11.0			20	450	450	450	450	FETS	FETS	0.7		381 x 12.2 CSP	APP. LT.
171+95	450	11.0			10	450	450	450	450	FETS	FETS	0.6		-	APP. LT.
173+24	450	11.0			10	450	450 -	450		FETS	FETS	0.3		-	APP. LT.
183+44	600	12.5			30	600	600	600	600	FETS	FETS	1.1		610 x 11.0 CSP	APP. LT.
185+33	600	20.0			25	600	600	600	600	FETS	FETS	1.1		-	APP. LT.
TOTAL	~	~			*	~	~	~	~	~	~	~	~	211.8	

* QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY

WATER LINE

STATION	meters	REMARKS
	STEEL CASING SCH. 80	
	100 mm	MIN. 0.6 m COVER CAP ENDS
12+07	57	PLACE MARKER AT R/W LINE AT BOTH ENDS
TOTAL	57	

WETLAND SITE

STATION		LUMP SUM	REMARKS (4,2 ha)
		WETLAND MITIGATION SITE	
FROM	TO		
30+00	36+00	0.6	RT.
61+23	64+20	0.2	LT.
66+60	71+07	0.2	LT.
TOTAL		1.0	

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

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11/1/2011 REVIEWED BY
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1 2 3 CPS - U0208

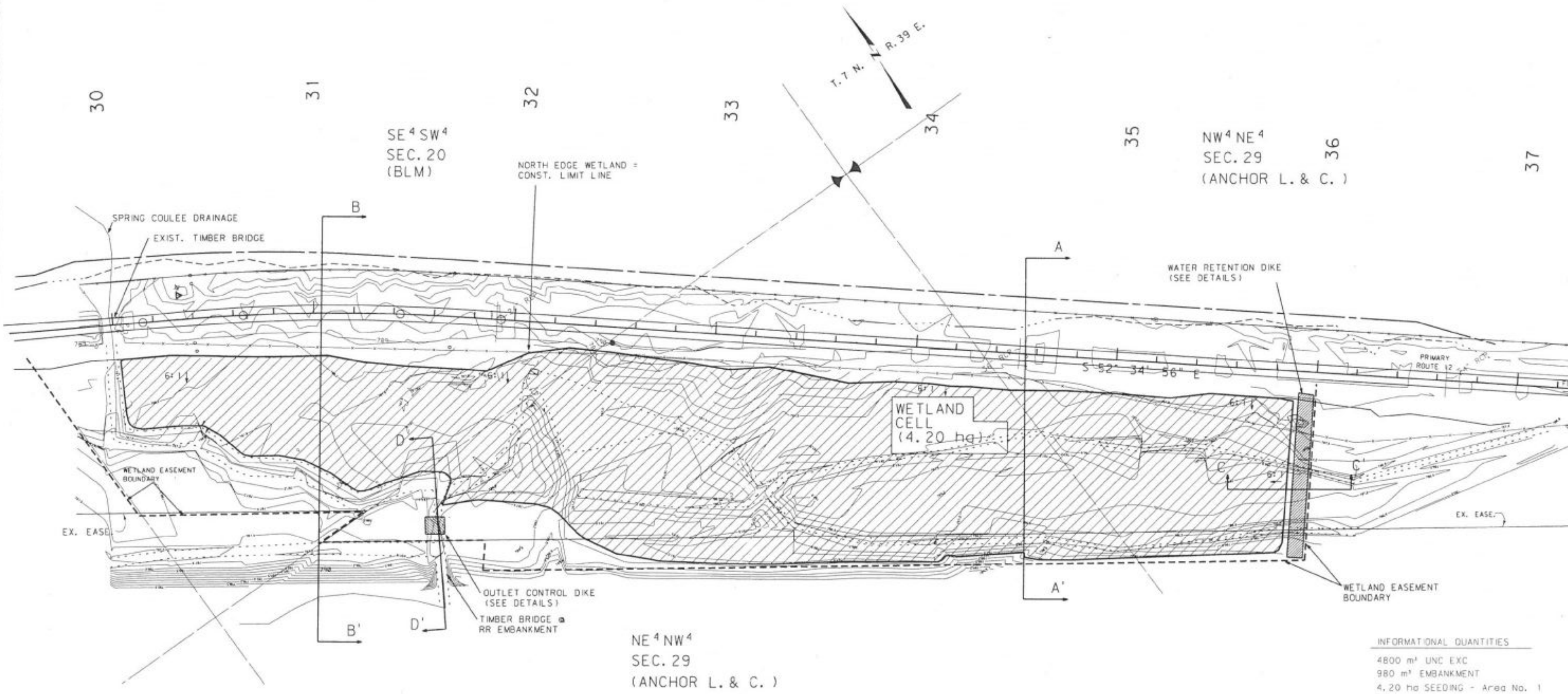
DELTA ENGINEERING P.C. CONSULTING ENGINEERS

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	26

CSF = 0.999347553

MONTANA CADD

MDT MONTANA DEPARTMENT OF TRANSPORTATION



INFORMATIONAL QUANTITIES

4800 m³ UNC EXC
980 m³ EMBANKMENT
4.20 ha SEEDING - Area No. 1

DESIGNER		
DRAWN		
APPROVED		
REVISED		
	INITIALS	DATE

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REVIEWED BY
CHECKED BY
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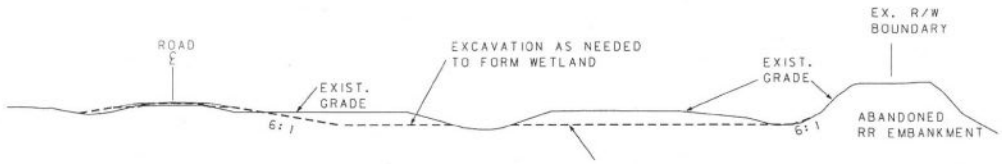
WETLAND MITIGATION SITE

STA. 30+00 TO 36+00 RT.

SCALE 1:1000

0 50M 100M

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	27

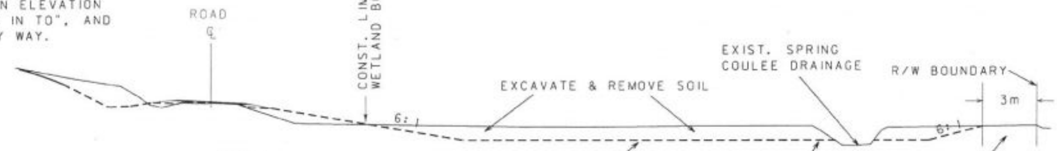


NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.

TYPICAL SECTION A-A'

NO SCALE



NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

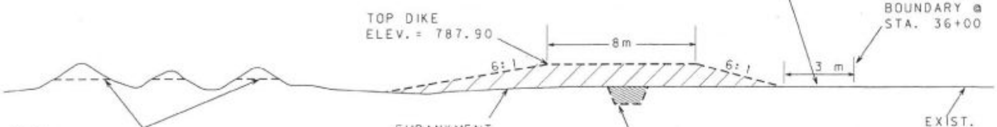
DAYLIGHT EXCAVATION INTO EXISTING DRAINAGE ON ALL AREAS ADJACENT TO THE DRAINAGE.

MAINTAIN 3 m FROM CONSTRUCTION LIMIT TO EX. R/W

TYPICAL SECTION B-B'

NO SCALE

MAINTAIN 3 m FROM CONSTRUCTION LIMIT TO R/W BOUNDARY



KEY - MIN. 2.0 m WIDE W/ 1 1/2:1 SIDE SLOPES (FULL LENGTH OF DIKE)

EXTEND AND CONNECT DIKE AND KEY TO ROADWAY EMBANKMENT ON NORTH END AND RAILROAD EMBANKMENT ON SOUTH END

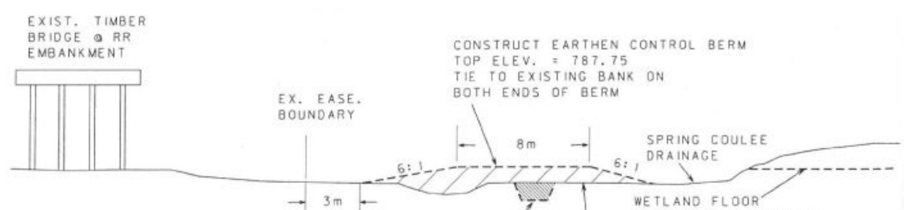
NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.

WATER RETENTION DIKE
TYPICAL SECTION C-C'

NO SCALE

NOTE: USE A-7-6 SOIL TO CONSTRUCT EMBANKMENT FOR ALL DIKES AND KEYWAYS. CONSTRUCT EMBANKMENTS AS PER SECTION 203.03.2 IN THE STANDARD SPECIFICATIONS. COMPLETE MOISTURE AND DENSITY REQUIREMENTS AS PER SECTION 203.03.3 IN THE STANDARD SPECIFICATIONS.



CONSTRUCT EARTHEN CONTROL BERM TOP ELEV. = 787.75 TIE TO EXISTING BANK ON BOTH ENDS OF BERM

KEY - MIN. 2.0 m WIDE W/ 1 1/2:1 SIDE SLOPES (FULL LENGTH OF DIKE TO LOCATIONS WHERE TOP OF DIKE CATCHES ON EXIST. GROUND)

OUTLET CONTROL DIKE
TYPICAL SECTION D-D'

NO SCALE

WETLAND MITIGATION SITE
STA. 30+00 TO 36+00 RT.
TYPICAL SECTIONS

MDT★ MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

DESIGNER		
DRAWN		
APPROVED		
REVISED		
	INITIALS	DATE

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CHECKED BY

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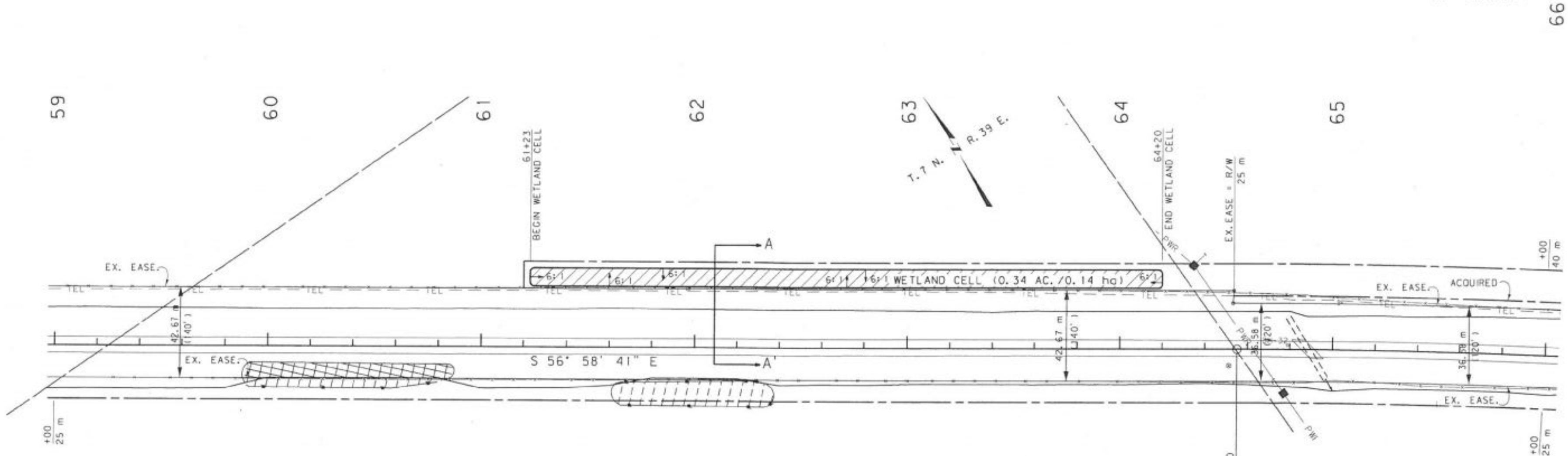
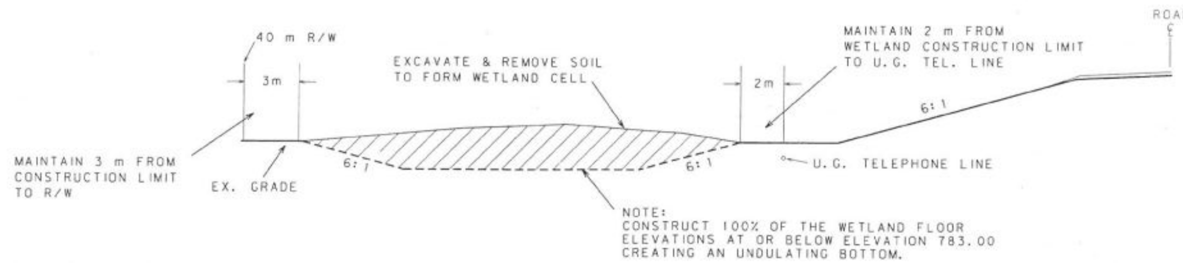
STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	28

CSF = 0.999347553



NOTE:
GRUB AND SALVAGE THE WETLAND PLANTS AND SOILS FROM STA 59+80 TO STA 60+90 RT. AND FROM STA 61+60 TO 62+40 RT THAT ARE LOCATED WITHIN THE CONSTRUCTION LIMITS.
STOCK PILE THESE MATERIALS AND USE AS A "SEED SOURCE" FOR THE NEW WETLAND AREA CREATED FROM STATION 61+23 TO STA 64+20 LT.



TYPICAL SECTION A-A'

NO SCALE

INFORMATIONAL QUANTITIES

1325 m^3 UNC EXC
0.14 ha SEEDING- AREA NO. 1

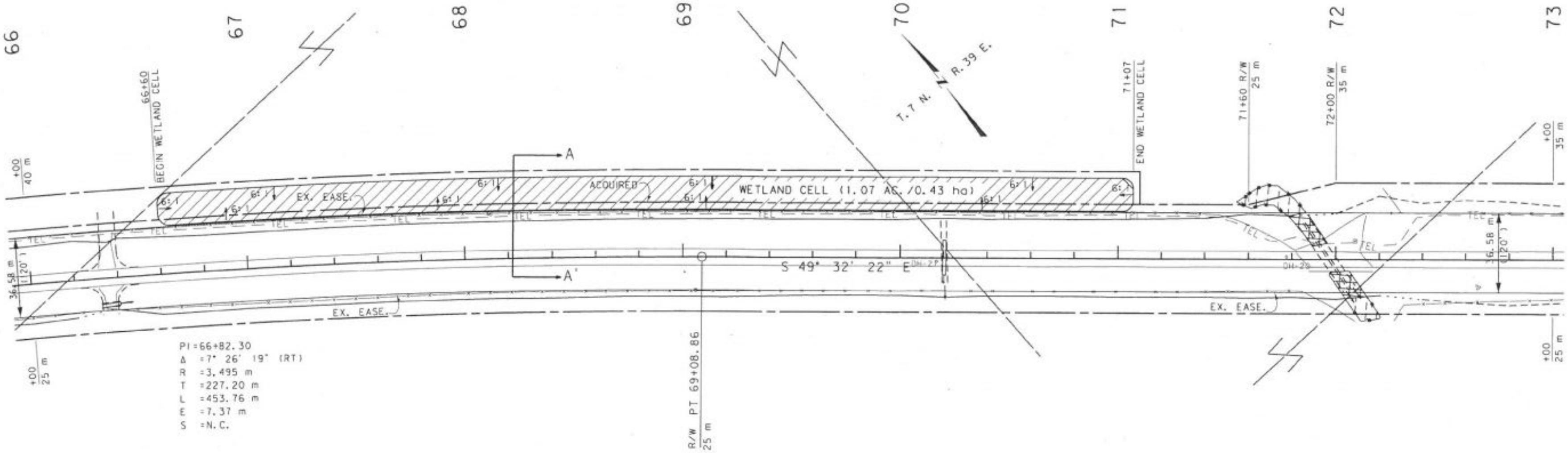
WETLAND MITIGATION SITE
STA. 61+23 TO 64+20 LT.

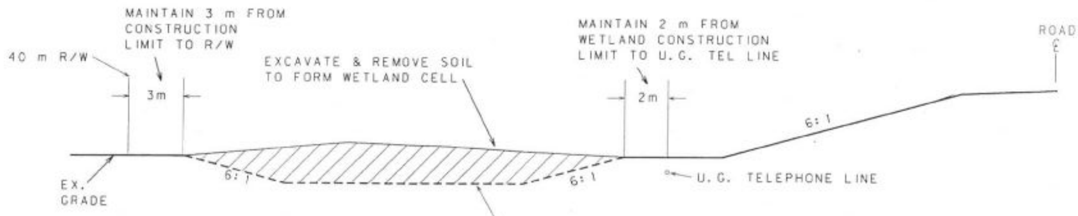
SCALE 1:1000
0 50M 100M

MDT MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
59+00 - 66+00

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	29

CSF = 0.999347553





NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 782.50 CREATING AN UNDULATING BOTTOM

TYPICAL SECTION A-A'

NO SCALE

INFORMATIONAL QUANTITIES

4778 m³ UNC EXC
0.43 ha SEEDING - Area No. 1

WETLAND MITIGATION SITE
STA. 66+60 TO 71+07 LT

SCALE 1:1000
0 50M 100M

MDT MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD

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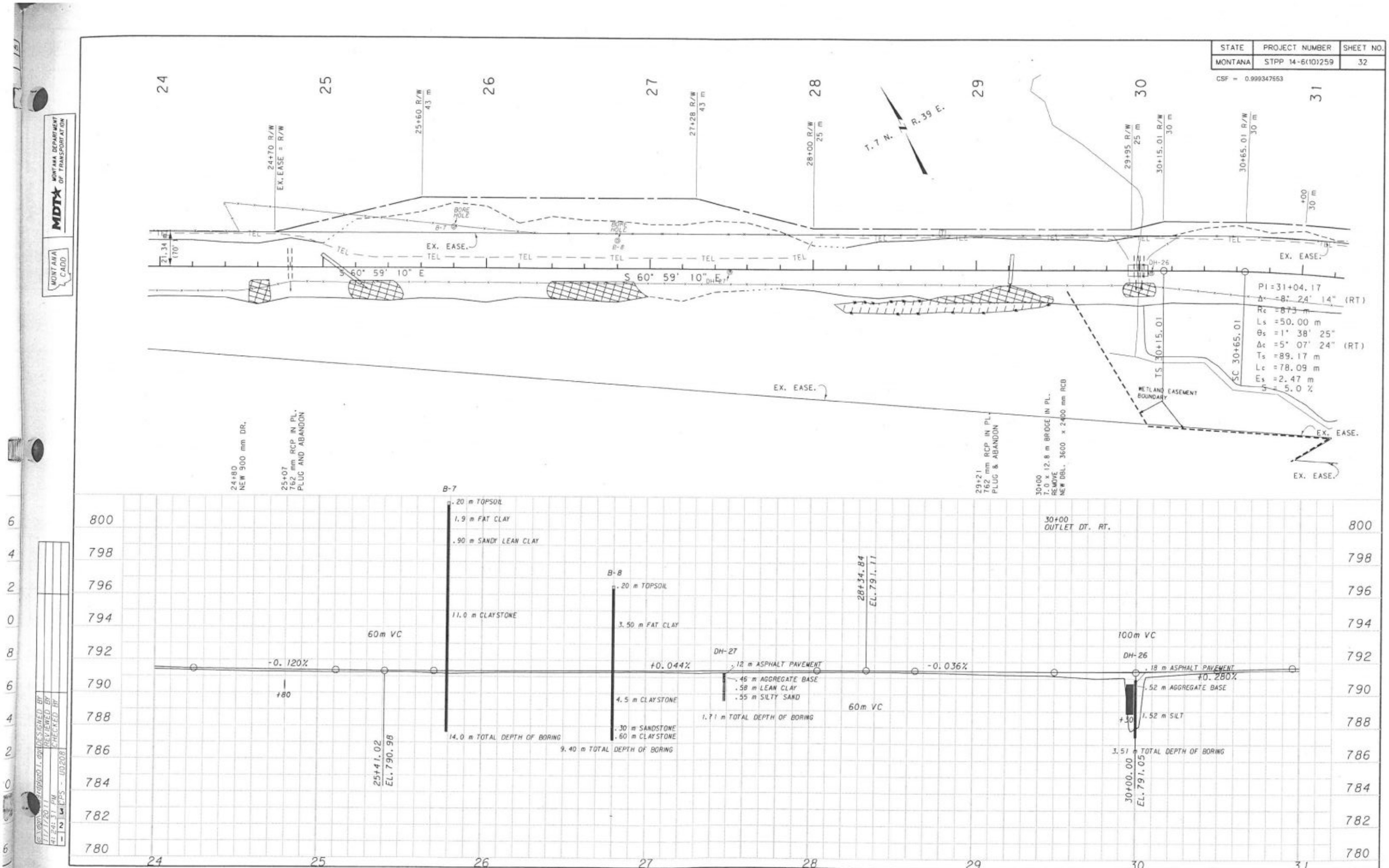
STATE | PROJECT NUMBER | SHEET NO.
MONTANA | STPP 14-6(10)259 | 32
CSF = 0.999347653
MDT MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
T.7 N. R.39 E.
24+70 R/W
EX.EASE = R/W
25+60 R/W 43 m
27+28 R/W 43 m
28+00 R/W 25 m
29+95 R/W 25 m
30+15.01 R/W 30 m
30+65.01 R/W 30 m
+00 30 m
BORE HOLE B-7
BORE HOLE B-8
EX. EASE.
TEL
S 60° 59' 10" E
DH-26
DH-27
PI=31+04.17
Δ =8° 24' 14" (RT)
Rc =873 m
Ls =50.00 m
θs =1° 38' 25"
Δc =5° 07' 24" (RT)
Ts =89.17 m
Lc =78.09 m
Es =2.47 m
S = 5.0 %
TS 30+15.01
SC 30+65.01
WETLAND EASEMENT BOUNDARY
24+80 NEW 900 mm DR.
25+07 762 mm RCP IN PL. PLUG AND ABANDON
29+21 762 mm RCP IN PL. PLUG & ABANDON
30+00 7.0 x 12.8 m BRIDGE IN PL. REMOVE NEW DBL. 3600 x 2400 mm RCB
30+00 OUTLET DT. RT.
B-7
.20 m TOPSOIL
1.9 m FAT CLAY
.90 m SANDY LEAN CLAY
11.0 m CLAYSTONE
14.0 m TOTAL DEPTH OF BORING
B-8
.20 m TOPSOIL
3.50 m FAT CLAY
4.5 m CLAYSTONE
.30 m SANDSTONE
.60 m CLAYSTONE
9.40 m TOTAL DEPTH OF BORING
DH-27
.12 m ASPHALT PAVEMENT
.46 m AGGREGATE BASE
.58 m LEAN CLAY
.55 m SILTY SAND
1.71 m TOTAL DEPTH OF BORING
DH-26
.18 m ASPHALT PAVEMENT
.52 m AGGREGATE BASE
1.52 m SILT
3.51 m TOTAL DEPTH OF BORING
60m VC
-0.120%
+80
25+41.02 EL.790.98
+0.044%
28+34.84 EL.791.11
-0.036%
60m VC
100m VC
+0.280%
+30
30+00.00 EL.791.05
800 798 796 794 792 790 788 786 784 782 780
24 25 26 27 28 29 30 31
DESIGNED BY
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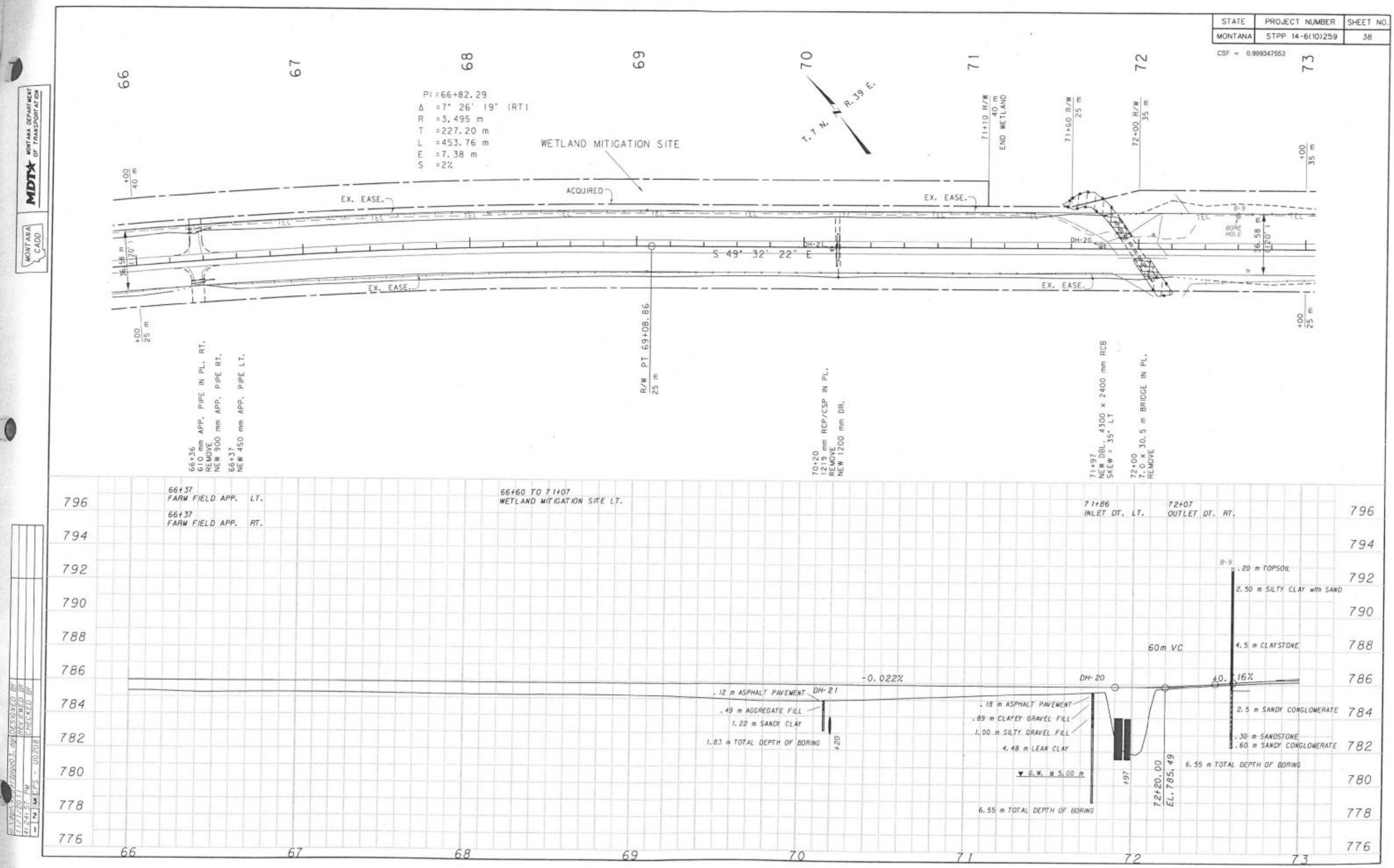
CPS - U0208

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	38

CSF = 0.999347553



MDT MONTANA DEPARTMENT OF TRANSPORTATION
MONTANA CADD
PI=66+82.29
Δ =7° 26' 19" (RT)
R =3,495 m
T =227.20 m
L =453.76 m
E =7.38 m
S =2%
WETLAND MITIGATION SITE
T. 7 N.
R. 39 E.
ACQUIRED
EX. EASE.
71+10 R/W 40 m END WETLAND
71+60 R/W 25 m
72+00 R/W 35 m
S 49° 32' 22" E
DH-21
DH-20
B-9
BORE HOLE
36.58 m (120')
R/W PT 69+08.86 25 m
66+36 610 mm APP. PIPE IN PL. RT. REMOVE NEW 900 mm APP. PIPE RT.
66+37 NEW 450 mm APP. PIPE LT.
70+20 1219 mm RCP/CSP IN PL. REMOVE NEW 1200 mm DR.
71+97 NEW DBL. 4300 x 2400 mm RCB SKEW = 35° LT
72+00 7.0 x 30.5 m BRIDGE IN PL. REMOVE
66+37 FARM FIELD APP. LT.
66+37 FARM FIELD APP. RT.
66+60 TO 71+07 WETLAND MITIGATION SITE LT.
71+86 INLET DT. LT.
72+07 OUTLET DT. RT.
-0.022%
60m VC
+0.16%
.12 m ASPHALT PAVEMENT
.49 m AGGREGATE FILL
1.22 m SANDY CLAY
1.83 m TOTAL DEPTH OF BORING
.18 m ASPHALT PAVEMENT
.89 m CLAYEY GRAVEL FILL
1.00 m SILTY GRAVEL FILL
4.48 m LEAN CLAY
G.W. @ 5.00 m
6.55 m TOTAL DEPTH OF BORING
72+20.00 EL. 785.49
.20 m TOPSOIL
2.50 m SILTY CLAY with SAND
4.5 m CLAYSTONE
2.5 m SANDY CONGLOMERATE
.30 m SANDSTONE
.60 m SANDY CONGLOMERATE
6.55 m TOTAL DEPTH OF BORING
796
794
792
790
788
786
784
782
780
778
776
66
67
68
69
70
71
72
73
DESIGNED BY
REVIEWED BY
CHECKED BY

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. IM 94-3(49)78
MILL,FILL,PL.MIX OVERLAY,SEAL & COVER
TREASURE CO. LINE -EAST
ROSEBUD COUNTY

DESIGN DATA
1996 A.D.T. = 2860
1998 A.D.T. = 2920
D.H.V. = 530
D. = 55-45
T. = 29.9
V. = 110km
ALL TRUCKS = 48.1
8165 kg ESAL'S = 658.81
GROWTH RATE = 2%

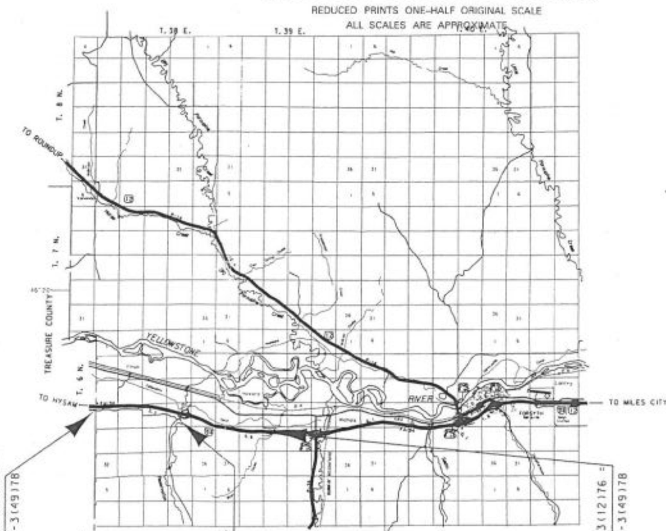
LETTING DATE - APRIL 22,1999
LETTING DATE - JULY 7,2000

AS-BUILTS

LENGTH 11.5 kilometers

SCALES
VERTICAL: 1 :
HORIZONTAL: 1 :
CROSS SECTION - HORIZONTAL & VERTICAL: 1 :
REDUCED PRINTS ONE-HALF ORIGINAL SCALE
ALL SCALES ARE APPROXIMATE

SURFACING MATERIALS - CONTRACTOR FURNISHED



STA. 1387+79.8 (ENG.) BEG. I-94-3(12)176 =
STA. 422+99.96 (MET.) BEG. IM 94-3(49)78

RESERVATION CREEK INTERCHANGE
STA. 481+99

STA. 1765+95.7 (ENG.) END I-94-3(12)176 =
STA. 538+26.48 (MET.) END IM 94-3(49)78

THIS CONTRACT

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	
P.E.	IM94-3(49)78

CONTROL NO. 3101

8-11-2000
DALE BOEHNING

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MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

3101SU.ASB

MONTANA DEPARTMENT OF TRANSPORTATION
APPROVED
____ 20 ____
TIM REARDON
DIRECTOR OF TRANSPORTATION
BY ____
PRECONSTRUCTION ENGINEER

MONTANA CARL S. PEIL 2614PE REGISTERED PROFESSIONAL ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
APPROVED
DIVISION ADMINISTRATOR DATE

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	IM 94-3(49)178	9

ADDENDUM NO. 1
ATTACHMENT NO. 12

AS-BUILTS

SUMMARY

PAVEMENT MARKINGS

ITEM	UNIT	INTERIM APPLICATION	FINAL APPLICATION	TOTAL
WHITE PAINT	LITERS	1 579		2710
YELLOW PAINT	LITERS	1 281		2273
WHITE WORDS & SYMBOLS	LITERS	124		4
TEMP. PAVEMENT MARKINGS - OVERLAY	km			730

RUMBLE STRIPS

STATION FROM	STATION TO	kilometers RUMBLE STRIP	REMARKS
422+99.84	538+26.95	11.5	WESTBOUND SHLD. - RT.
422+99.84	538+26.95	11.2	WESTBOUND SHLD. - LT.
423+00.08	538+26.40	11.5	EASTBOUND SHLD. - LT.
423+00.08	538+26.40	11.0	EASTBOUND SHLD. - RT.
TOTAL		45.1	

* WETLAND SITE (LUMP SUM)

STATION FROM	STATION TO	cubic meters UNCL. EXCAVATION #	cubic meters TOPSOIL SALVAGING AND PLACING		REMARKS
477+60.00	478+91.00	8 457			EB NEW WETLAND AREA RT
	TOTAL	1			

* SEE SPECIAL PROVISIONS
# FOR INFORMATION ONLY

CURB

STATION FROM	STATION TO	meters BITUMINOUS CURB LEFT	BITUMINOUS CURB RIGHT	REMOVE BITUMINOUS CURB * LEFT	REMOVE BITUMINOUS CURB * RIGHT	REMARKS
428+04	431+24		420.0		420.0	EASTBOUND SHLD. - RT.
480+56	481+72		116.0		116.0	EASTBOUND SHLD. - RT.
427+32	430+38	306.0		306.0		WESTBOUND SHLD. - LT.
480+28	481+72	144.0		144.0		WESTBOUND SHLD. - LT.
501+45	506+30	485.0		485.0		WESTBOUND SHLD. - LT.
SUBTOTAL		935.0	536.0	935.0	536.0	
TOTAL		1385.2		1371.0		

* SEE SPECIAL PROVISIONS FOR DISPOSAL

COLD MILLING

STATION FROM	STATION TO	square meters COLD MILLING	REMARKS
EASTBOUND			
422+60.08	423+00.08	463	FULL WIDTH - TAPER 0-45 mm
423+00.08	514+73.10	104 341	11.58 m FULL WIDTH O.G.F.C. ONLY
423+00.08	514+73.10	34 330	3.81 m WIDTH - 60 mm
514+73.10	538+26.40	27 272	FULL WIDTH - O.G.F.C. ONLY
481+21.90	481+71.90	579	FULL WIDTH - TAPER 90 - 150 mm
482+26.61 BE	482+76.61	579	FULL WIDTH - TAPER 90 - 150 mm
481+33.38	489+96.70	5 538	"R3" - FULL WIDTH - O.G.F.C. ONLY
482+19.46	485+67.36	2 101	"R4" - FULL WIDTH - O.G.F.C. ONLY
		329	"R2"-1 CAT.GRD.-FULL WIDTH-TAPER 0-45mm
538+26.40	538+66.40	463	FULL WIDTH - TAPER 0 - 45 mm
EASTBOUND	SUB-TOTAL	175995	
422+59.84	422+99.84	463	FULL WIDTH - TAPER 0 - 45 mm
422+99.84	514+73.10	104 376	7.77 m WIDTH - O.G.F.C. ONLY
422+99.84	514+73.10	34 341	3.81 m WIDTH - 60 mm
514+73.10	538+26.95	27 210	FULL WIDTH - O.G.F.C. ONLY
481+21.90	481+71.90 BE	579	FULL WIDTH - TAPER 90 - 150 mm
482+26.61 BE	482+76.61	579	FULL WIDTH - TAPER 90 - 150 mm
480+82.29	485+71.89	2 268	"R1" - FULL WIDTH - O.G.F.C. ONLY
482+30.34	487+98.58	4 258	"R2" - FULL WIDTH - O.G.F.C. ONLY
538+26.95EOP	538+66.95	463	FULL WIDTH - TAPER 0 - 45 mm
		329	"R2"-1 CAT.GRD.-FULL WIDTH-TAPER 0-45mm
WESTBOUND	SUB-TOTAL	174866	
TOTAL		285719	E.B. & W.B.

GRADING

STATION FROM	STATION TO	cubic meters UNCL. EXCAVATION *	cubic meters EMBANKMENT IN PLACE	REMARKS
428+61.00		1 217		OUTLET DITCH
469+37.00	471+09.30	99 578		EB. SLIDE AREA RT.
482+28.00	482+45.30		110	GRADE TO DRAIN MED. AH. RES. CK.
TOTAL		88272	** 110	

* CONTRACTOR TO WASTE MATERIAL
** TO BE INCLUDED IN OTHER ITEMS OF THE PROJECT FOR INFORMATION ONLY

CULVERTS

STATION	meters CSP-68 mm x 13mm		meters CSP-75 x 25 mm		meters SSPP-152 x 51 mm		END SECTIONS LEFT	END SECTIONS RIGHT	cubic meters CEMENT GROUT	cubic meters C.T.S. GRAVEL GRADE 2A	cubic meters CLASS "DD" CONCRETE	cubic meters CULVERT RIPRAP	meters CLEAN CULVERT	meters REMOVE	COATING	IN PLACE mm X m	REMARKS
		1.63 mm		2.77 mm	2.82 mm							CLASS 1					
		600 mm		2700 mm	3.980 m												
422+99		6.0					RACET	RACET								600 mm x 16.3 mm	MEDIAN CROSSOVER - B.O.P.
428+61													145.7			3.66 m x 145.7 m	USE AS IS-ADD OUTLET DITCH
469+39				61.0			21 ISTEP	21 ISTEP	65.0	73.0	6.4	13.6	61.3	6.0	@ YES	3.0 m x 61.3 m	INSERTS WITH NEW END SECTIONS
478+00		6.0					RACET	RACET								600 mm x 16.3 mm	MEDIAN CROSSOVER
503+38					74.0		21 ISTEP	21 ISTEP	260.0	211.0	9.0	19.0	74.6	9.2	@ YES	4.57 m x 74.6 m	INSERTS WITH NEW END SECTIONS
TOTAL		12.0		0.0	0.0		~	~	513.4	130.2	6.2	0.0	281.3	15.2			

@ SEE STANDARD SPEC. 709.04 FIELD COAT

8-11-2000
DALE BOEHNING

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	IM 94-3(148)178	15

DETAIL

AS-BUILTS

MONTANA DEPARTMENT OF TRANSPORTATION

MDT

MONTANA CADD

ASBUILT

T. 6N. R. 38E.

475 476 477 478 479 480 481

PI=475+58.10
Δ =2° 37' 00" (RT)
R =5,239.512 m
T =119.66 m
L =239.29 m
E =1.37 m

EQUATION:
PT Sta 476+77.72 BK =
Sta 476+76.42 AH

STA. 476+86
TIE TO EXIST. FENCE.
BEG. NEW FENCE AT 4:1 TAPER.

STA. 477+54
END 4:1 TAPER

STA. 477+30 TO 479+68
NEW FENCE BERM LT.
SEE X-SEATIONS

STA. 479+40
BEG. 4:1 TAPER.

STA. 479+68
END 4:1 TAPER.

STA. 480+54
BEG. 8:1 TAPER

POT 481+58.40

STA. 481+58
END 8:1 TAPER.

STA. 481+80
END NEW FENCE WESTBOUND
CONNECT TO NEW FENCE UNDER STRUCTURE

WESTBOUND I-94 S 74° 17' 30" E

EASTBOUND I-94 S 74° 17' 30" E

PI=475+57.46
Δ =2° 37' 00" (RT)
R =5,239.512 m
T =119.66 m
L =239.29 m
E =1.37 m

PT 476+77.08

NEW FENCE

S 62 S

POT 481+58.42

LEGEND

- NEW WETLAND AREA
- BOUNDRY OF EXIST. WETLAND AREA
- EXIST. FENCE
- NEW FENCE ALIGNMENT ON WESTBOUND WETLAND.

(1) STA. 477+96 78.3 m RT. EL. 796.90	(A) STA. 478+08 76.8 m RT. EL 795.72	(G) STA. 478+08 140.0 m RT. EL 798.46
(2) 477+96 118.3 m RT. EL. 797.35	(B) STA. 477+96 39.8 m RT. EL 797.50	(H) STA. 478+38 140.0 m RT. EL 797.43
(3) 477+76 78.3 m RT. EL. 796.90	(C) STA. 477+60 48 m RT. EL797.66	(I) STA. 478+54 140.5 m RT. EL 796.41
(4) 477+76 118.3 m RT. EL. 797.35	(D) STA. 477+60 84.5 m RT. EL 797.92	(J) **STA. 478+91 126.5 m RT. EL 796.5 EXIST.**
(5) 478+38 60.9 m RT. EL. 795.31	(E) STA. 477+60 119.8 m RT. EL 798.27	(K) STA. 478+54 126.8 m RT. EL 796.08 EXIST.
(6) 478+38 100.9 m RT. EL. 796.25	(F) STA. 477+96 141.1 m RT. EL 798.22	
(7) 478+18 60.9 m RT. EL. 795.31		
(8) 478+18 100.9 m RT. EL. 796.25		

NOTE:
EXCAVATION FOR THE WETLAND MITIGATION MUST BE AT OR ABOUVE THE ELEVATION OF THE EXISTING WETLAND.

8-11-2000
DALE BOEHNING

STA. 477+00
BEG. 4:1 FENCE TAPER

STA. 477+60
END 4:1 FENCE TAPER 15 m RT.

STA. 478+08
.609 m x 70.0 m IN PL.
USE AS IS.

STA. 477+60 TO 478+91
WETLAND MITIGATION SITE RT.
SEE X-SECTIONS

STA. 480+40
BEG. 4:1 FENCE TAPER

STA. 481+00
END 4:1 FENCE TAPER

STA. 481+71.90
EXIST. R.E.

STA 481+80
END NEW FENCE EASTBOUND
BEG. NEW FENCE UNDER STRUCTURE
TIE TO WESTBOUND FENCE.

310PL1.ASB

		DESIGNED BY	
9/19/2012		REVIEWED BY	
11:09:50 AM		CHECKED BY	
—	N	u3288	

STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(49)178	4

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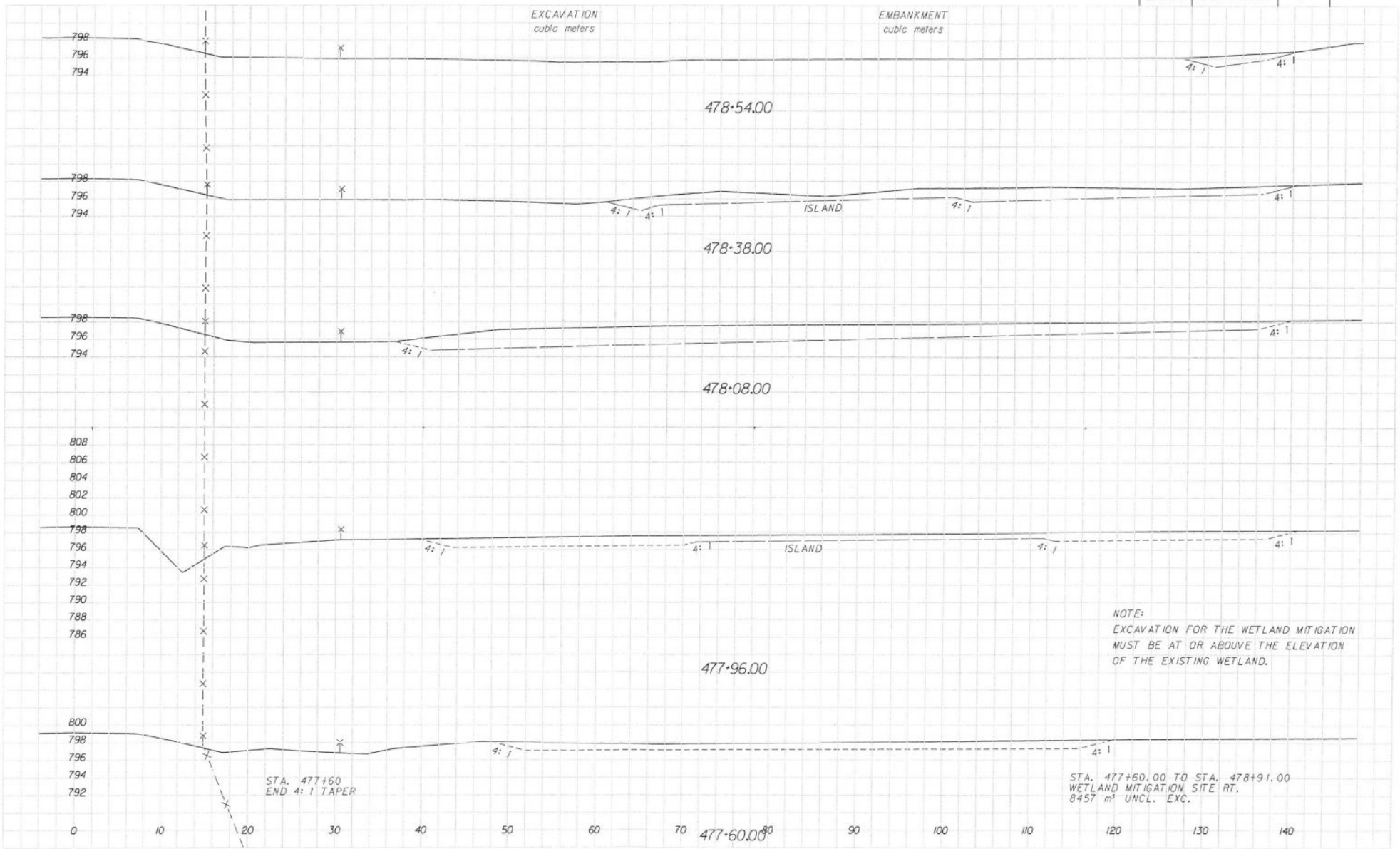

STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(49)178	5

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