MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2013

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 MDT DEPARTMENT OF TRANSPORTATION

2701 Prospect Ave
Helena, MT 59620-1001

December 2013

Prepared by:

CONFLUENCE

PO Box 1133
Bozeman, MT 59771-1133

MONTANA DEPARTMENT OF TRANSPORTATION (MDT)

WETLAND MITIGATION MONITORING REPORT:

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Forsyth - Northwest:
West Site (Site 1), Middle Site (Site 2),
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MDT Project Number:
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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

This 2013 Forsyth-Northwest (FNW) wetland monitoring report documents the first year of monitoring at the four associated 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 – N & S project constructed in 2004, and 2) the Forsyth – Northwest project constructed in 2012. The 2013 Forsyth - Northwest Wetland Mitigation Monitoring Report includes monitoring results for each of the four sites and a discussion of the mitigation credits developed by 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 4 through 11 (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 caused by the FNW project. It was identified in the 2012 mitigation plan that this site had produced 1.78 acres of wetland credit and would be credited at a 1:1 ratio. Applying standard wetland compensatory mitigation ratios (Montana Regulatory Program, April 2005), the resultant total area of required mitigation presented in the approved wetland mitigation plan is 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 in 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.

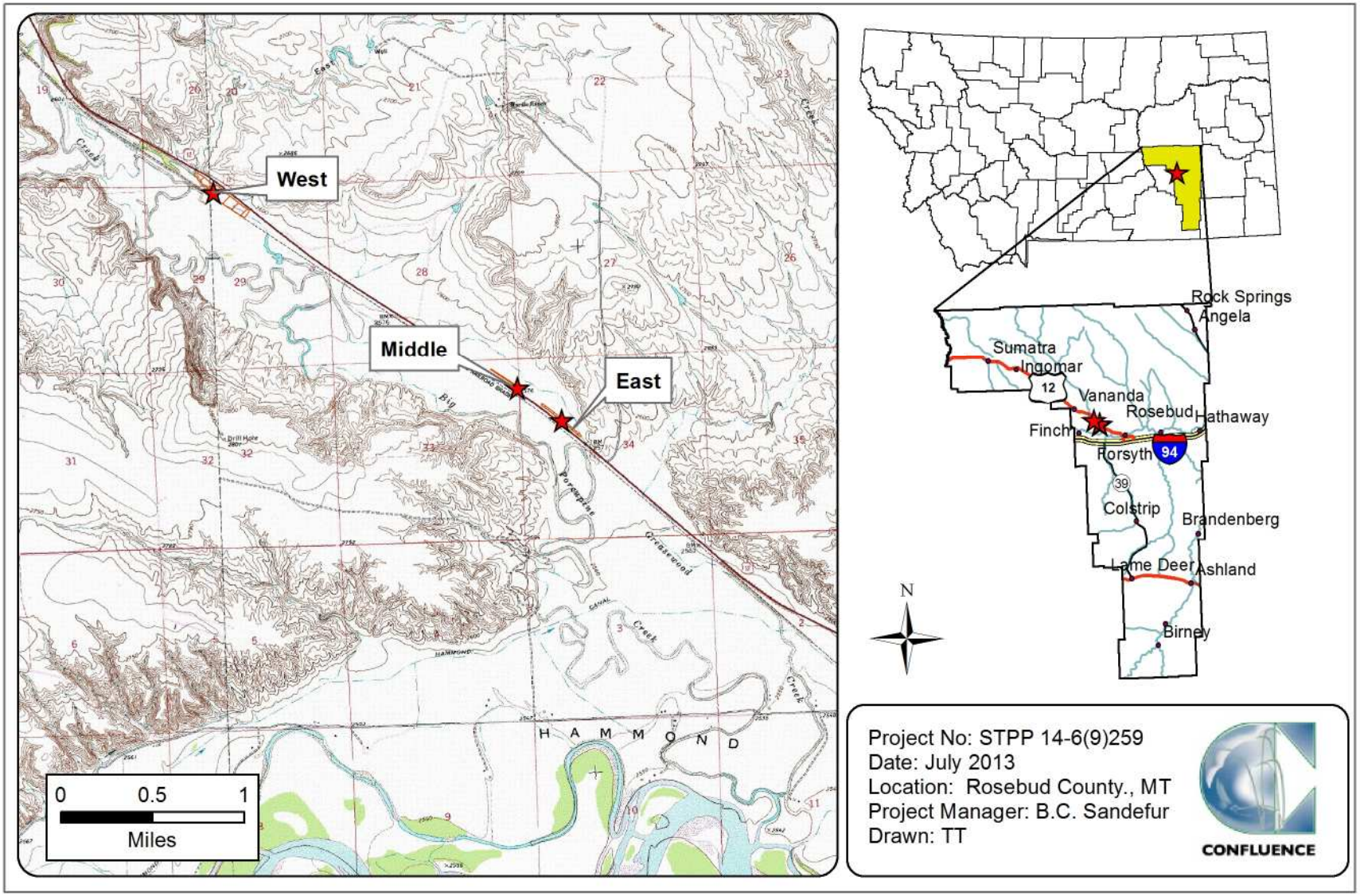


Figure 1. Project locations of Forsyth Northwest (FNW) Mitigation Sites: West (Site 1), Middle (Site 2), and East (Site 3).

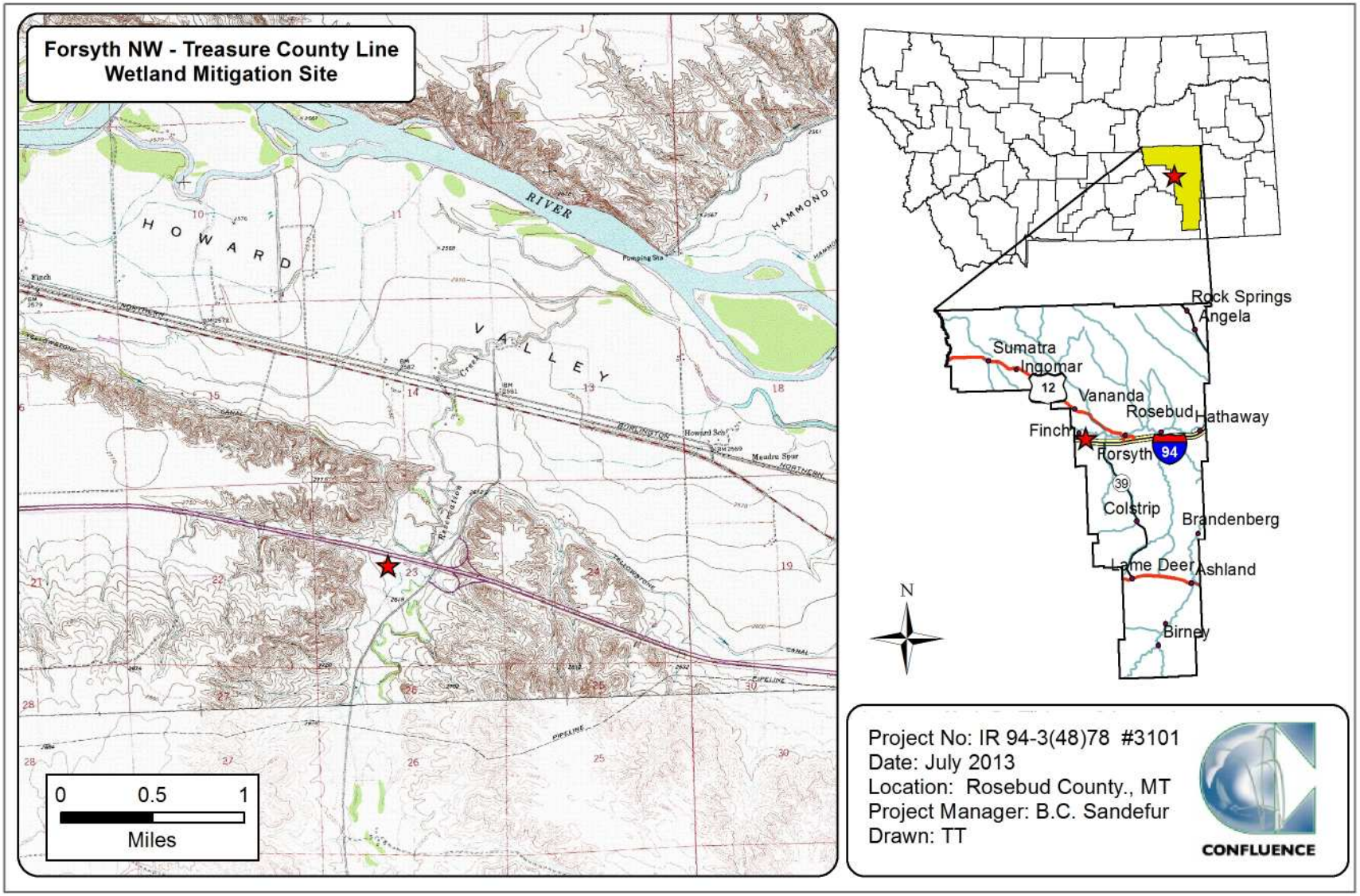


Figure 2. Project location of FNW - Treasure County Line (Site 4).

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 listed in the approved mitigation plan) for the FNW sites are listed below.

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 2nd weekend of June every other year, starting in 2013.

b. Survey and document the hydrology within the new wetland area no earlier than the 2nd 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 and 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. This site had never been monitored prior to this year's monitoring for regulatory compliance.

2. METHODS

The Treasure County Line Site was monitored on August 14, 2013; the West Site, Middle Site, and East Site were monitored the next day on August 15, 2013. Information contained on the Mitigation Monitoring Forms and Wetland Data Forms was entered electronically in the field on a personal digital assistant (PDA) palmtop computer 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 considered 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 2013 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 (Figure 4, 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 2013 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 2013 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. Cover classes are represented by a T, L, M, or H, 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 Regional Supplement. 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 Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). The 2012 NWPL scientific plant names were used in this report. Many common names used in the 2012 NWPL appear incomplete or erroneous. When used in this report, 2012 NWPL common names that appear to be incomplete or erroneous are provided with parenthetical clarification. For example, the common given name for the plant *Agrostis exarata* in the 2012 NWPL is “spiked bent”. As this is likely an error, this species’ common name would be reported here as “spiked bent (grass)”. 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 2013 aerial photograph. 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 the site visit. 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 site annually will be compiled in each report to be updated annually with each subsequent report.

2.6. Functional Assessment

The 2008 MDT Montana Wetland Assessment Method (Berglund and McEldowney 2008) was used to evaluate functions and values on the site from 2010 to 2012. 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. Wetland Assessment Forms were completed for three separate assessment areas (AA) within mitigation site (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 throughout the mitigation site during the site visit and at transect endpoints (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 2013 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 2013 aerial photograph, then 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 December 2012 was 14.25 inches (WRCC 2013). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year recorded at this station. The precipitation between January and August totaled 13.85 inches in 2013 and exceeded the long-term average of 10.52 inches between this same period. Several thunderstorms during May 2013 resulted in over 4 inches of precipitation above the long-term average for this month. This resulted in surface flow across the recently excavated site.

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 excavating to lower the ground surface of uplands to match adjacent existing wetlands and constructing a dike across two wetland/ephemeral swales along the lower end of the site (east side) to impound periodic surface water. High flows experienced at this site in 2013 breached a portion of this dike. MDT completed repairs on this structure in July 2013.

Signs of inundation were observed across much of the excavated area within this site during the 2013 field survey. These signs included sediment deposition, drainage patterns, surface soil cracks, water-stained leaves, drift deposits, and algal mat/crust. Some of the lower-lying depressions were inundated, possibly attributed to a rain event in the area the night prior to the site visit. Approximately 5 percent of the site was inundated to shallow depths (0.2ft) at the time of the 2013 field survey.

Four data points were assessed to determine the upland and wetland boundaries (Wetland Data Forms, Appendix B). Data points We-1w and We-2w were located within areas that met the wetland criteria. Positive secondary indicators of wetland hydrology at We-1w included sediment deposits, iron deposits, surface soil cracks, drainage patterns, geomorphic position. This data point was located near vegetation transect two in an area recently excavated to lower ground surface and intercept the seasonal high water table. Data point We-2w was located in an undisturbed wetland swale. This data point exhibited sediment deposits, drift deposits, algal mat/crust, inundation visible on aerial imagery, water-stained leaves, surface soil cracks, geomorphic position, and FAC-neutral test. Data points We-1u and We-2u did not exhibit any positive indicators of wetland hydrology. We-1u was located in an upland area not affected during excavation of the mitigation site. We-2u was located within the excavation area near an undisturbed wetland swale. Based on topography and hydrologic

indicators within the adjacent wetland, the area around data point We-2u may develop into wetland with an increased duration of soil saturation.

3.1.2. Vegetation

Forty-five plant species were identified during the 2013 monitoring season (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. In general, these 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 was located in the undisturbed upland areas around the site and covered approximately 5.33 acres. In general, this 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. Twenty-nine species were identified within this community with cheatgrass (*Bromus tectorum*), greasewood, lamb's quarters (*Chenopodium album*), Intermediate wheatgrass (*Elymus hispidus*), field penny-cress (*Thlaspi arvense*), crested wheatgrass (*Agropyron cristatus*), Mexican-fireweed (*Bassia scoparia*), prickly lettuce (*Lactuca serriola*), and western wheatgrass (*Pascopyrum smithii*) are dominant components within this community.

Upland community Type 2 – *Helianthus annuus/Bassia scoparia* was identified across 2.93 acres in the upland areas disturbed to construction of the mitigation site. These areas had some level of excavation to lower the elevation of the ground surface but did not display positive wetland indicators in 2013. The community was dominated by common sunflower (*Helianthus annuus*) and Mexican-fireweed with lesser components of lamb's quarters, creeping wild rye (*Elymus repens*), perennial ragweed (*Ambrosia psilostachya*), western wheatgrass, greasewood, American licorice (*Glycyrrhiza lepidota*), and fox-tail barley (*Hordeum jubatum*). Bare ground was recorded at a cover class 5 (>50%) in this community.

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

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	UPL
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 tectorum	Cheatgrass	UPL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cichorium intybus	Chicory	FACU
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	Field Bindweed	UPL
Descurainia sophia	Herb Sophia	UPL
Echinochloa crus-galli	Large Barnyard Grass	FAC
Elaeagnus angustifolia	Russian-Olive	FACU
Eleocharis palustris	Common Spike-Rush	OBL
Elymus hispidus	Intermediate Wheatgrass	UPL
Elymus repens	Creeping Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Euphorbia esula	Leafy Spurge	UPL
Festuca pratensis	Meadow Fescue	FACU
Glycyrrhiza lepidota	American Licorice	FACU
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Populus deltoides	Eastern Cottonwood	FAC
Rosa arkansana	Prairie Rose	FACU
Rumex crispus	Curly Dock	FAC
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW
Sarcobatus vermiculatus	Greasewood	FAC
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Sonchus arvensis	Field Sow-Thistle	FAC

[1]Draft NWPL (Lichvar and Kartesz, 2009).

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

Scientific Names	Common Names	GP Indicator Status[1]
Spartina pectinata	Freshwater Cord Grass	FACW
Symphoricarpos albus	Common Snowberry	FACU
Thlaspi arvense	Field Penny-cress	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

[1]Draft NWPL (Lichvar and Kartesz, 2009).

Wetland Type 3 – *Spartina pectinata/Eleocharis palustris* generally represents the undisturbed pre-existing wetlands within the monitoring area and covered 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, and peach-leaf willow were documented within community Type 3.

Wetland Type 4 – *Eleocharis palustris/Chenopodium album* covers approximately 4.36 acres and is characterized by areas recently disturbed during construction of the mitigation site that exhibited positive wetland indicators in 2013. Bare ground was recorded at greater than 50 percent cover within this community and only two species, common spike-rush and lamb's quarters, were documented at greater than a trace. Fourteen species, predominately hydrophytes, were noted at trace levels in community Type 4. Of note, grand redstem (*Ammannia robusta*), an S2 species of concern (MTNHP) was recorded in community Type 4.

Vegetation transect results were 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. Photographs of the FNW - West transect end points are shown on pages C-2 and C-3 in Appendix C.

Vegetation transect 1 is located in the eastern portion 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 undisturbed upland (Type 1) near Highway 12. Six vegetation community transitions and 3 community types were documented along transect 1. Ten hydrophytic and 17 upland species were identified along this transect. Approximately 15.6 percent of this transect was located within wetland communities with the remaining 84.4 percent in areas identified as uplands. Wetland habitat will likely increase along this transect if seasonal hydrology is successfully retained by the constructed dike.

Table 4. Transect 1 data summary for FNW-West Site.

Vegetation Community Transitions along Transect	6
Vegetation Communities along Transect	3
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	27
Total Hydrophytic Species	10
Total Upland Species	17
Estimated % Total Vegetative Cover	75
% Transect Length Comprising Hydrophytic Vegetation Communities	15.6
% Transect Length Comprising Upland Vegetation Communities	84.4
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	25.0

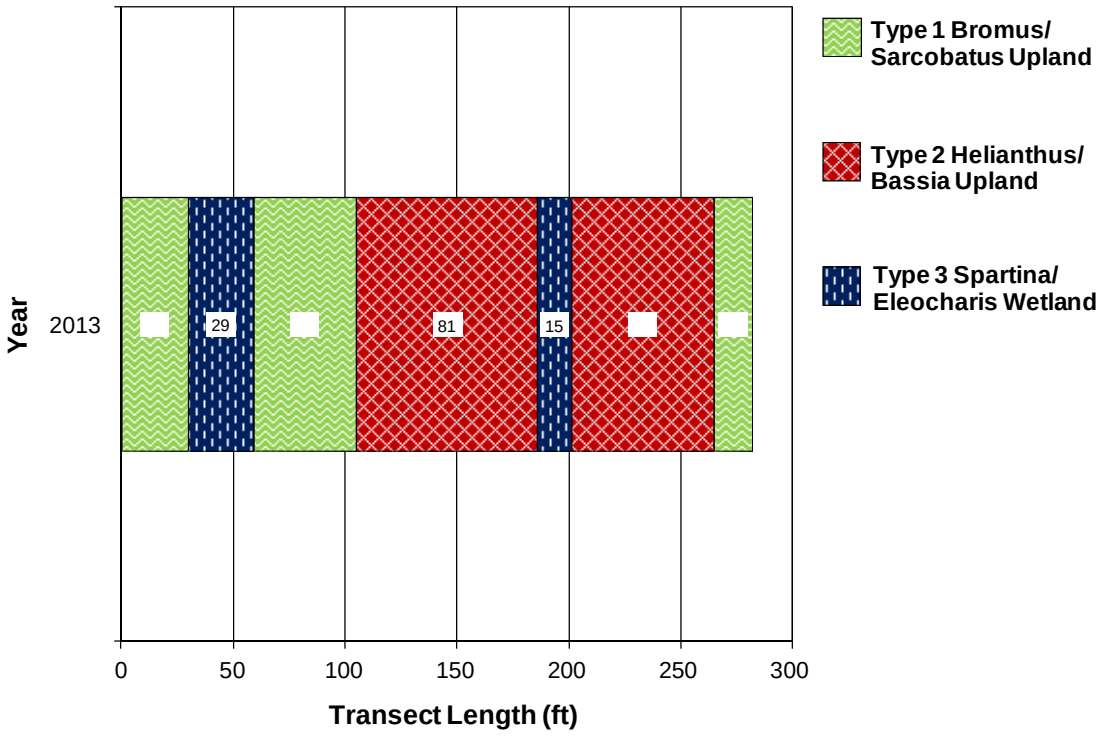


Chart 1. Transect 1 map for FNW-West Site showing vegetation types from transect start (0 feet) to finish (282 feet) for 2013.

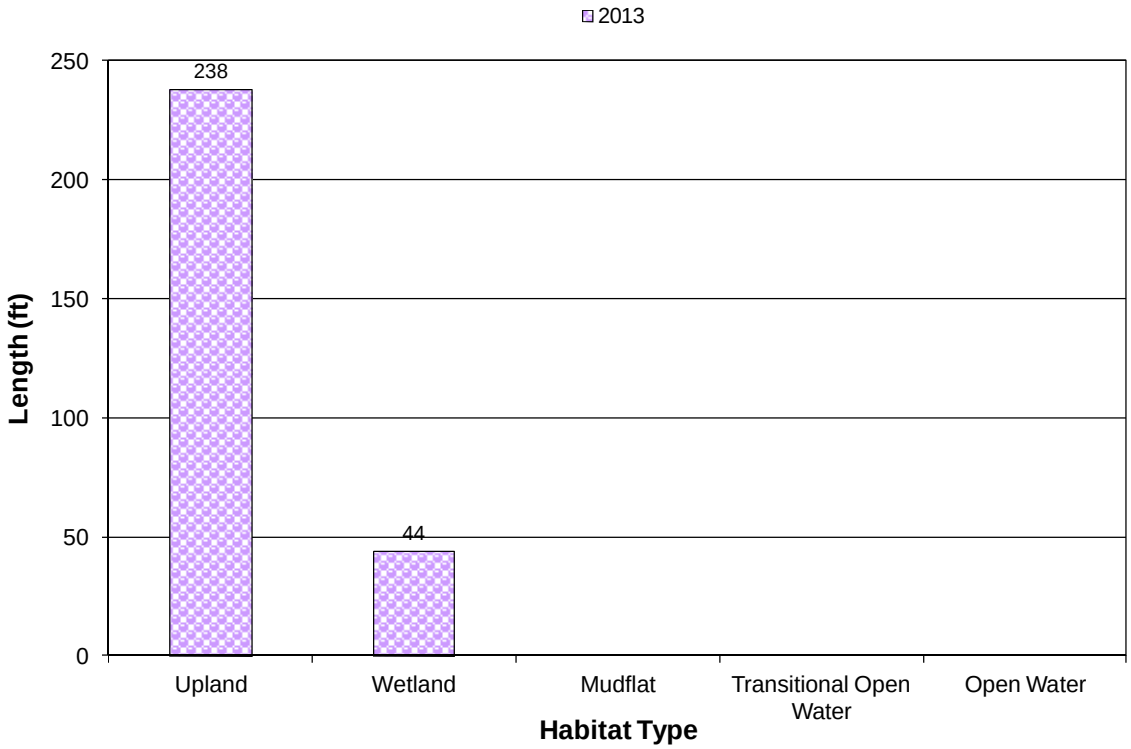


Chart 2. Length of vegetation communities within Transect 1 at FNW-West Site for 2013.

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 was located across the disturbed wetland community type 4. Although mapped as Type 4 – *Eleocharis/Chenopodium* wetland due to the presence of greater than 5 percent vegetation cover, approximately 90 percent of this 261-foot transect consisted of bare ground due to the recent excavation of the site. A total of 21 species, including eight hydrophytes, were identified along transect 2.

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

Monitoring Year	**2013**
Transect Length (feet)	**261**
Vegetation Community Transitions along Transect	2
Vegetation Communities along Transect	2
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	21
Total Hydrophytic Species	8
Total Upland Species	13
Estimated % Total Vegetative Cover	10
% Transect Length Comprising Hydrophytic Vegetation Communities	87.0
% Transect Length Comprising Upland Vegetation Communities	13.0
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	90.0

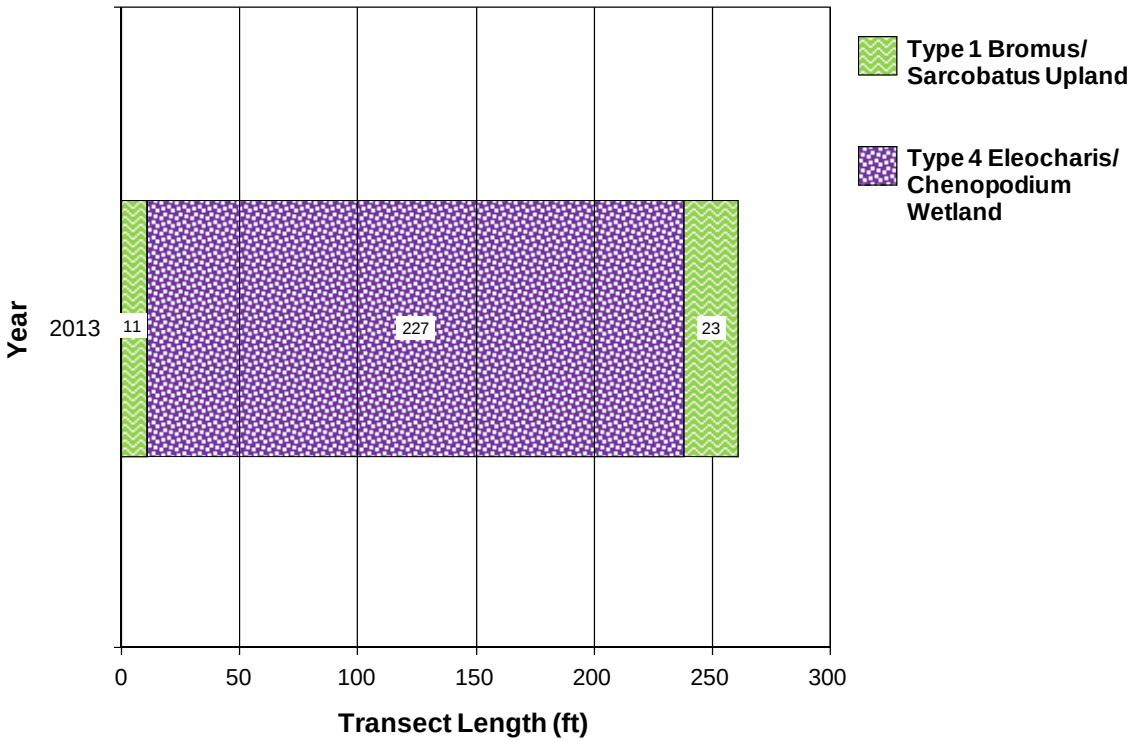


Chart 3. Transect 2 map for FNW-West Site showing vegetation types from transect start (0 feet) to finish (261 feet) for 2013.

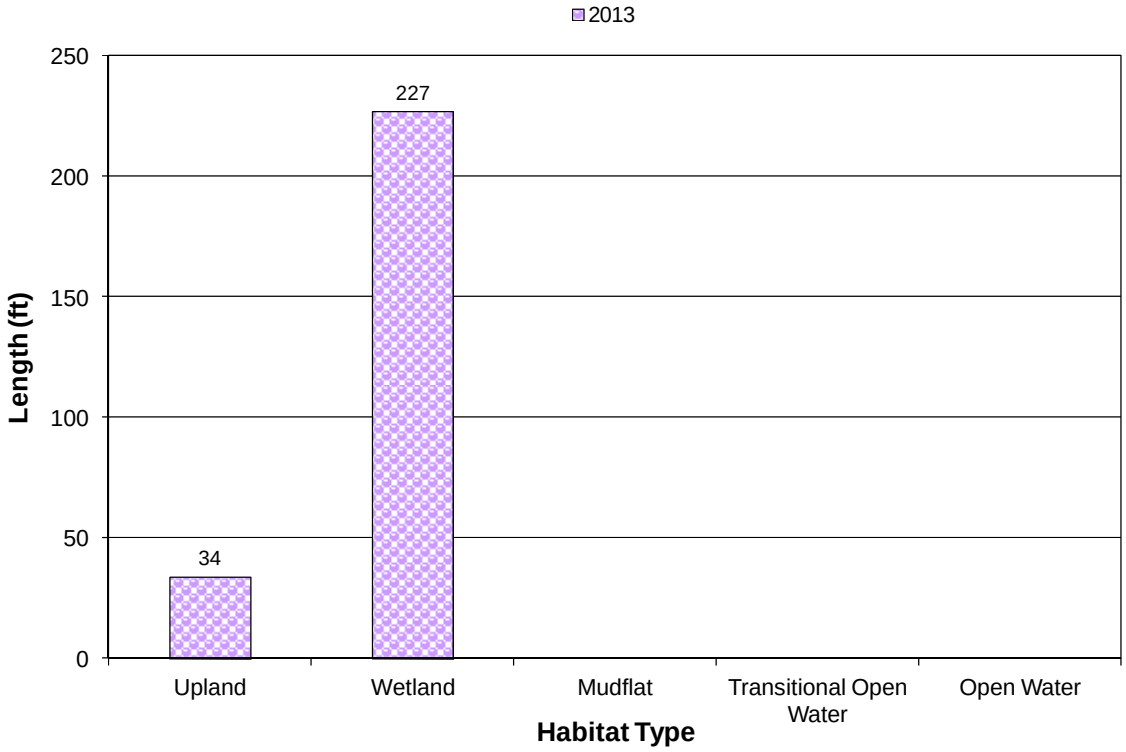


Chart 4. Length of vegetation communities within Transect 2 for FNW-West Site in 2013.

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 on Figure 4, (Appendix A). Canadian thistle was identified in one location in community 1 near the mature cottonwoods. The size of the infestation was less than 0.1 acre and the cover class was moderate (6-25%). Field bindweed was identified in one location within community 1 near the RR grade with a cover class of low (1-5%) at an infestation size of less than 0.1 acre. The RR grade exhibited two areas of infestation by leafy spruge. Both infestation areas were recorded at 0.1-1.0 acre in size with a cover class of low in one spot and moderate (6-25%) in the other. A few sprigs of saltcedar were noted at the mouth of East Spring Coulee at an infestation size less than 0.1 acre and cover class of low.

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 include Dacotah switchgrass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), arctic rush (*Juncus arcticus*), Nebraska sedge (*Carex nebrascensis*), and nuttall alkaligrass (*Puccinellia nuttalliana*). Natural recruitment of woody species may provide supplemental shrub/tree regeneration within this site. Several hundred cottonwood seedlings were observed within the recently excavated wetland areas.

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 pits We-1w and We-2w were located in areas that met hydric soil criteria. Test pit We-1w was situated on the margin of the recently excavated wetland. The soil profile in this area was a gray (5YR 6/1) clay with 5 percent yellowish brown (10YR 5/6) concentrations in the matrix and qualified as depleted matrix (F3). Based on the presence and abundance of mottles in this soil within a relatively short period following disturbance, redoximorphic features were likely present in the sub-soil and exposed during construction. Test pit We-2w was located in an existing wetland and exhibited a dark gray (10YR 4/1) matrix with 20 percent dark yellowish brown (10YR 4/6) redox concentrations. This soil expressed a depleted matrix as a positive hydric indicator. This soil was undisturbed during construction of the mitigation site and displayed a higher portion of roots and organic matter within the upper horizon. Test pit We-1u was located in undisturbed upland near the mature cottonwoods. The soil in this area

was a dark grayish brown (10YR 4/2) silty clay with very dark brown (10YR2/2) concretions. This area was a couple feet higher than the adjacent wetlands and did not exhibit positive signs of hydric soils. Test pit We-2u was situated in an upland area recently excavated to decrease ground elevation. The soil profile included dark grayish brown/brown silty 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 (FNW-West Figures 3 and 4, Appendix A). Vegetation, soil, and hydrology characteristics were documented on the Forsyth NW-West Wetland Data Forms (Appendix B). The total acreage of aquatic habitat at the west site (1) in 2013 was 5.44 acres. This included approximately 1.29 acres of existing wetland and 4.15 acres within the recently excavated areas that exhibited positive response in developing wetland characteristics. These new wetlands showed positive hydrologic indicators and an establishing hydrophytic plant community, although the majority of the disturbed area remained bare. Plants establishing in this area in 2013 included common spike rush, cottonwood, hard-stem clubrush (*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, spikerush, and cattail.

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

WETLAND AND UPLAND HABITATS	2013 (acres)
Project Area	13.71
Existing Wetland	1.29
Created Wetland	4.15
Upland Buffer	8.27

3.1.5. Wildlife

A list of wildlife species observed directly or indirectly during the 2013 field survey is presented in Table 7 and the monitoring form (Appendix B). Seventeen bird species were identified during the initial evaluation of this site. The presence of large trees and mature sunflowers likely supported the diversity of birds observed at this site. A porcupine (*Erethizon dorsatum*) was observed with one of the mature peachleaf willows, which also contained a large (unidentified) bird nest and abundant bird activity. The tracks of deer (*Odocoileus* sp.) and raccoon (*Procyon lotor*) were identified in the softer bare ground around the site. Two plains gartersnakes (*Thamnophis radix*) were encountered during the field survey. The remains of a common carp were observed near the outlet of East Spring Coulee, suggesting periodic surface water connection between the site

and Big Porcupine Creek. There are no nesting structures currently installed at the site.

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

COMMON NAME	SCIENTIFIC NAME
BIRDS	
American Goldfinch	*Spinus tristus*
Bald Eagle	*Haliaeetus leucocephalus*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Cedar Waxwing	*Bombycilla cedrorum*
Grasshopper Sparrow	*Ammodramus savannarum*
Great Blue Heron	*Ardea herodias*
Killdeer	*Charadrius vociferus*
Lark Bunting	*Calamospiza melanocorys*
Mourning Dove	*Zenaida macroura*
Northern Harrier	*Circus cyaneus*
Red-tailed Hawk	*Buteo jamaicensis*
Rock Wren	*Salpinctes obsoletus*
Turkey Vulture	*Cathartes aura*
Western Kingbird	*Tyrannus verticalis*
Western Meadowlark	*Sturnella neglecta*
Yellow Warbler	*Dendroica petechia*
MAMMALS	
Deer Sp.	
Porcupine	*Erethizon dorsatum*
Raccoon	*Procyon lotor*
REPTILES	
Plains Gartersnake	*Thamnophis radix*

3.1.6. Functional Assessment

Results of the 2013 functional assessment are summarized in Table 8 with the completed FNW-West Wetland Assessment Form included in Appendix B. The FNW-West was evaluated as one assessment area (AA-1) that encompassed 5.44 acres in 2013. The AA was rated as a Category III wetland with 54.5 percent of the total possible points. 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 29.6 functional units following the first year of construction. The rating and functional units are expected to increase as this site recovers from the recent excavation and develops increased vegetation cover.

Table 8. MWAM summary at the FNW-West Site.

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

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-4 of Appendix C.

3.1.8. Maintenance Needs

Infestations of Priority 2B noxious weeds, including Canadian thistle (*Cirsium arvense*), leafy spurge (*Euphorbia esula*), field bindweed (*Convulvulus arvensis*), and saltcedar (*Tamarix* sp.) were mapped on Figure 4 (Appendix A). Canadian thistle was identified in one location in community 1 near the mature cottonwoods. The size of the infestation was less than 0.1 acre and the cover class was moderate (6-25%). Field bindweed was identified in one location within community 1 near the RR grade with a cover class of low (1-5%) at an infestation size of less than 0.1 acre. The RR grade exhibited two areas of infestation by leafy spruge. Both infestation areas were recorded at 0.1-1.0 acre in size with a cover class of low in one spot and moderate (6-25%) in the other. A few sprigs of saltcedar were noted at the mouth of East Spring Coulee at an infestation size less than 0.1 acre and a cover class of low.

The dike failure that occurred at the site during high flows in 2013 was repaired by MDT prior to the field survey and was functioning as designed when inspected. An inspection of the dike indicated this structure did not appear to be adequately stabilized and remained susceptible to future failure. Personal communication with MDT suggests this repair may not be adequate and it is

recommended the upstream and downstream ends of the dike be reinforced with rip-rap and/or fabric to protect against future washouts due to the high volume of water flowing through this site from the coulees at the western end of the site. The fence around the perimeter of the monitoring areas was in good condition.

3.1.9. Current Credit Summary

Approximately 5.44 aquatic habitat acres consisting of approximately 1.29 acres of pre-existing wetland habitat and 4.15 acres of newly constructed wetlands were delineated in 2013. Approximately 8.26 acres of upland habitat was identified on the site in 2013. The calculated acreage credits presented in Table 9 were separated by individual mitigation types with appropriate credit ratios applied for the USACE crediting system. The FNW-West mitigation types and ratios included creation (1:1), preservation (4:1), and upland buffer (5:1).

The areas delineated as wetlands met the criteria for hydrophytic vegetation, hydric soil, and wetland hydrology. The overall estimated vegetation cover of hydrophytic species is approximately 30 percent and expected to increase. Noxious weed cover in 2013 is less than 10 percent site wide.

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

WETLAND	2013 Delineated Acres	Ratio	2013 Estimated Credit Acres
Created Wetland	4.15	1:1	4.15
Preserved Wetland	1.29	4:1	0.32
Upland Buffer	8.26	5:1	1.65
TOTAL	**10.38**		**6.12**

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 December 2012 was 14.25 inches (WRCC 2013). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year recorded at this station. The precipitation between January and August totaled 13.85 inches in 2013 and exceeded the long-term average of 10.52 inches between this same period. Several thunderstorms during May 2013 resulted in over 4 inches of precipitation above the long-term average for this month. This resulted in ponding within the recently excavated depression.

The main source of hydrology at this mitigation site is precipitation and surface runoff from adjacent uplands. The site is situated near old meander scars of Big Porcupine Creek that exhibit wetland characteristics and may indicate occasional flooding of the mitigation area during high flows in Big Porcupine Creek. The newly excavated depression supported signs of inundation for an extended period prior to the field survey. Positive hydrologic indicators observed at this

site included inundation, saturation, surface soil cracks, sediment and drift deposits, iron deposits, and drain patterns.

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 within an area that met the three wetland criteria. The data point was saturated within 12 inches of the soil surface with evidence of sediment, drift, and iron deposits and drainage patterns. Data point M-1u exhibited surface soil cracks but did not qualify as supporting wetland hydrology as only one secondary indicator was identified.

3.2.2. Vegetation

A list of the 36 species identified onsite in 2013 is presented in Table 10. Two community types were identified in 2013 and included one upland and one wetland community type. The community types were 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).

Upland Type 1 - *Pascopyrum smithii/Helianthus annuus* represents the uplands surrounding the excavated depression and along Highway 12 within the monitoring boundary. This 1.31-acre community was dominated by western wheatgrass (*Pascopyrum smithii*) and common sunflower (*Helianthus annuus*). Other common components of the vegetation community included Mexican-fireweed (*Bassia scoparia*), curly dock (*Rumex crispus*), field penny-cress (*Thlaspi arvense*), lamb's-quarters (*Chenopodium album*), creeping wild rye (*Elymus repens*), prickly lettuce (*Lactuca serriola*), prairie rose (*Rosa arkansana*), greasewood (*Sarcobatus vermiculatus*), and common snowberry (*Symphoricarpus albus*).

Wetland Type 2 - *Rumex crispus/Eleocharis palustris* was identified on 0.49-acres within the recently excavated depression. Bare ground was recorded at greater than 50 percent and open water at 11-20 percent in this community. Dominant species include curly dock and common spikerush (*Eleocharis palustris*). Nineteen species were identified in this community, including the S2 species of concern grand redstem (*Ammannia robusta*). Other hydrophytes in this community with the likelihood of establishing higher cover classes include northern water-plantain (*Alisma trivale*), large barnyard grass (*Echinochloa crus-galli*), fowl bluegrass (*Poa palustris*), 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 this site running perpendicular to the linear excavated wetland. This transect began at a fence post along the northeastern boundary of the site and followed an azimuth of 205 degrees for 50 feet ending at an existing cottonwood. Both communities were traversed along

Table 10. Vegetation species observed at the FNW-Middle Site.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	UPL
Alisma triviale	Northern Water-Plantain	OBL
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Avena fatua	Wild Oat	UPL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	UPL
Chenopodium album	Lamb's-Quarters	FACU
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FACU
Elymus sp.	Wild Rye	NL
Festuca pratensis	Meadow Fescue	FACU
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Open Water	Open Water	NL
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa palustris	Fowl Blue Grass	FACW
Populus deltoides	Eastern Cottonwood	FAC
Ratibida columnifera	Upright Prairie Coneflower	UPL
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
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Setaria pumila	Yellow Bristle Grass	FACU
Solanum rostratum	Buffalobur Nightshade	UPL
Symphoricarpos albus	Common Snowberry	FACU
Thlaspi arvense	Field Penny-cress	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

[1]Draft NWPL (Lichvar and Kartesz, 2009).

this transect. A total of 16 species were identified along the transect and included six hydrophytes and 10 upland species. Fifty-two percent of the transect was located in the wetland. Approximately 60 percent of the transect consisted of bare ground and reflected the recent disturbance that occurred during construction the site. Vegetation transect results are detailed on the FNW-Middle Monitoring Form (Appendix B) and summarized in Table 11 and Charts 5 and 6. Photos of the transect end points are provided in Appendix C.

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

Vegetation Community Transitions along Transect	2
Vegetation Communities along Transect	2
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	16
Total Hydrophytic Species	6
Total Upland Species	10
Estimated % Total Vegetative Cover	40
% Transect Length Comprising Hydrophytic Vegetation Communities	52.0
% Transect Length Comprising Upland Vegetation Communities	48.0
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	60

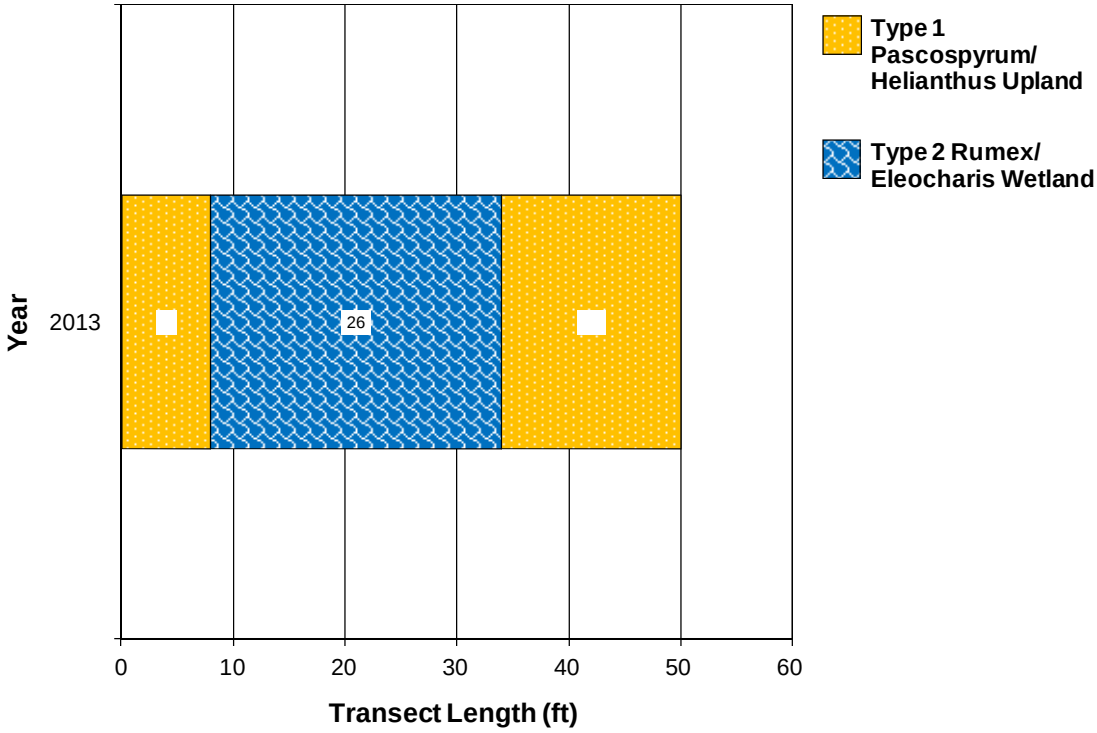


Chart 5. Transect 1 map for FNW-Middle Site showing vegetation types from transect start (0 feet) to finish (50 feet).

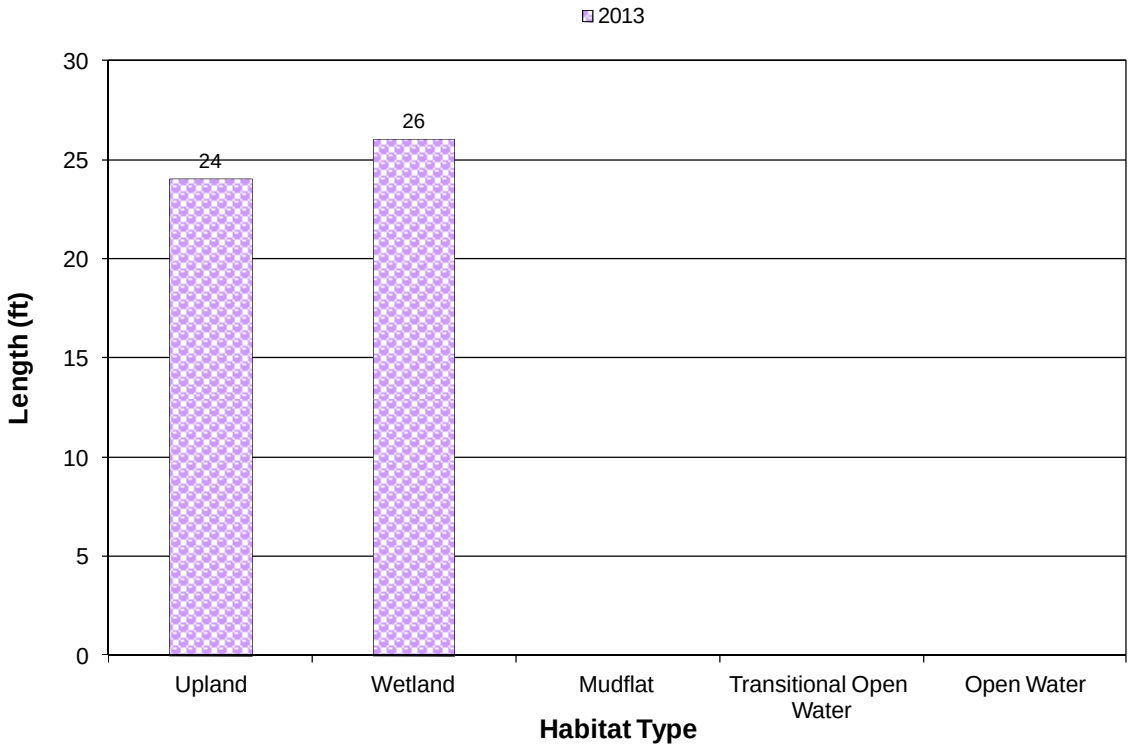


Chart 6. Length of vegetation communities within Transect 1 at FNW-Middle Site.

No Montana-listed noxious weeds were identified at this site. No woody vegetation was installed within the mitigation wetland. During the 2013 field survey, several hundred cottonwood seedlings were observed along the margin of the wetland at the apparent edge of early-season inundation. Revegetation efforts at this site included seeding a mixture of Dacotah switchgrass (*Panicum virgatum*), American mannagrass (*Glyceria grandis*), arctic rush (*Juncus arcticus*), Nebraska sedge (*Carex nebrascensis*), and nuttall alkaligrass (*Puccinellia nuttalliana*) following construction disturbance.

3.2.3. 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 M-1w was located in an area that met the three wetland criteria. The soil profile revealed a dark grayish brown (10YR 4/2) clay with no redox in the upper 8 inches and a grayish brown (10YR 5/2) clay with dark yellowish brown (10YR 4/4) redox concentrations in the matrix from 8 to 14 inches. The low chroma and redox concentrations within 12 inches of the soil surface were positive indicators of hydric soils. The soil in upland test pit M-1u was a dark grayish brown (10YR 4/2) clay without redox concentrations within the upper 12 inches of the profile.

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 several positive wetland hydrology indicators, hydric soils, and the predominance of hydrophytic species identified within the constructed bowl. With continued wetland development, the boundary will likely shift slightly up the side slopes of the excavated basin.

Table 12. Wetland/upland habitat acreages delineated at the FNW-Middle Site.

WETLAND	2013 Wetland Acres
Created Wetland	0.49

3.2.5. Wildlife

A list of wildlife species observed directly and indirectly during the 2013 field survey is shown in Table 13 (Monitoring Form, Appendix B). Five bird species, including American goldfinch, eastern bluebird, killdeer, mourning doves, and turkey vulture, were identified within or flying over the mitigation site. The tracks of coyote, deer, and raccoon were identified in the mud. The coyote and deer appeared to be crossing the wetland while the raccoon tracks were indicative of foraging. Two plains gartersnake and four unidentified frogs (same species) were directly observed using the constructed wetland.

Table 13. Wildlife species observed at the FNW-Middle Site.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Frog sp.	
BIRDS	
American Goldfinch	*Spinus tristus*
Eastern Bluebird	*Sialia sialis*
Killdeer	*Charadrius vociferus*
Mourning Dove	*Zenaida macroura*
Turkey Vulture	*Cathartes aura*
MAMMALS	
Coyote	*Canis latrans*
Deer Sp.	
Raccoon	*Procyon lotor*
REPTILES	
Plains Gartersnake	*Thamnophis radix*

3.2.6. Functional Assessment

Results of the 2013 functional assessment are summarized in Table 14 with the completed FNW-Middle Wetland Assessment Form included 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 this 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 S2 species of concern grand redstem was documented growing within the recently constructed wetland and provided a high MTNHP rating. This site acheived 43.3% of possible score and a total of 1.9 functional units. This wetland may improve from a Category III wetland to a Category II as the vegetation develops and disturbance decreases with time, although the smaller size of the AA may limit the actual score.

Table 14. MWAM summary at the FNW-Middle Site.

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

3.2.7. Photo Documentation

Photographs of photo points PP1 and PP2, the vegetation transect endpoints, and wetland determination data points (Figure5, Appendix A) are shown on pages C-5 and C-6 in Appendix C.

3.2.8. Maintenance Needs

No Montana-listed noxious weeds were identified at this site in 2013. The fence along the mitigation area was recently installed and in good-working order. There were no man-made water control structures installed at this site.

3.2.9. Current Credit Summary

The 2013 wetland delineation identified 0.49 acres of created emergent wetlands and 1.31 acres of upland buffer. Table 15 shows the total delineated acres and credit acres estimated for the FNW-Middle site in 2013. There are no performance standards identified for this site. No noxious weeds were identified within this site. The percent cover of native hydrophytes was low in 2013 but expected to increase as favorable wetland conditions persist and the site recuperates from recent construction.

Table 15. Credit summary at the FNW-Middle Site.

Habitat Type	2013 Delineated Acres	Mitigation Ratio	2013 Estimated Credit Acres
Created Wetland	0.49	1:1	0.49
Upland Buffer	1.31	5:1	0.26
Total	**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 December 2012 was 14.25 inches (WRCC 2013). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year recorded at this station. The precipitation between January and August totaled 13.85 inches in 2013 and exceeded the long-term average of 10.52 inches between this same period. Several thunderstorms during May 2013 resulted in over 4 inches of precipitation above the long-term average for this month. This resulted in substantial ponding within the recently excavated depression.

This site is very similar to the FNW-Middle site. The main source of hydrology at this FNW-East is 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, and iron deposits. Approximately 5% of the site was inundated at the time of the 2013 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 approximately 3 inches of surface water, saturation to the surface, water marks, algal mat or crust, iron deposits, inundation visible on aerial imagery, water-stained leaves, hydrogen sulfide odor,

FAC-neutral test, and geomorphic position. No signs of wetland hydrology were observed at Ea-1u, located along the side slope of the excavated basin.

3.3.2. Vegetation

A comprehensive list of 27 species compiled during the 2013 field survey of FNW-East is presented in Table 16. Two community types were identified and mapped at this site in 2013 (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.

Upland Type 1 – *Helianthus annuus/Thlaspi arvense* represented the roadside and 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, crested wheatgrass (*Agropyron cristatum*), lamb's-quarters, western wheatgrass, curly dock, perennial ragweed (*Ambrosia psilostachya*), Mexican-fireweed, cheatgrass (*Bromus tectorum*), fox-tail barley, and clasping pepperweed (*Lepidium perfoliatum*). Buffalobur nightshade (*Solanum rostratum*) was also present in the upland community.

Wetland Type 2 - *Rumex crispus/Eleocharis palustris* was mapped within the 1.19-acre excavated depression. This community was characterized by mostly bare ground with pockets of standing water and a predominance of hydrophytes in the establishing vegetation. 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*), saltmarch 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. Several cottonwood seedlings were also observed throughout this wetland.

Two vegetation transects were established on either 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 page C-8 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, crosses wetland Type 2 community at a skew, and terminated in upland Type 1 (Chart 7). Sixteen species, including 5 hydrophytes and eleven upland species, were identified along this 125-foot transect. Although mapped as wetland Type 2 *Rumex/Eleocharis*, roughly 60 percent of the ground surface consisted of bare substrate due to the recent excavation of this wetland basin.

Table 16. Vegetation species observed at the FNW-East Site.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	UPL
Alisma triviale	Northern Water-Plantain	OBL
Ambrosia psilostachya	Perennial Ragweed	FACU
Ammannia robusta	Grand Redstem	OBL
Bassia scoparia	Mexican-Fireweed	FACU
Bromus carinatus	California Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Chenopodium album	Lamb's-Quarters	FACU
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	Common Spike-Rush	OBL
Elymus sp.	Wild Rye	NL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Open Water	Open Water	NL
Pascopyrum smithii	Western-Wheat Grass	FACU
Polygonum aviculare	Yard Knotweed	FACU
Populus deltoides	Eastern Cottonwood	FAC
Ratibida columnifera	Upright Prarie Coneflower	UPL
Rumex acetosella	Common Sheep Sorrel	FAC
Rumex crispus	Curly Dock	FAC
Sagittaria cuneata	Arum-Leaf Arrowhead	OBL
Salix amygdaloides	Peach-Leaf Willow	FACW
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Solanum rostratum	Buffalobur Nightshade	UPL
Thlaspi arvense	Field Penny-cress	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL

[1]Draft NWPL (Lichvar and Kartesz, 2009).

Table 17. Transect 1 data summary at FNW-East Site.

Vegetation Community Transitions along Transect	2
Vegetation Communities along Transect	2
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	16
Total Hydrophytic Species	5
Total Upland Species	11
Estimated % Total Vegetative Cover	40
% Transect Length Comprising Hydrophytic Vegetation Communities	51.2
% Transect Length Comprising Upland Vegetation Communities	48.8
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	60

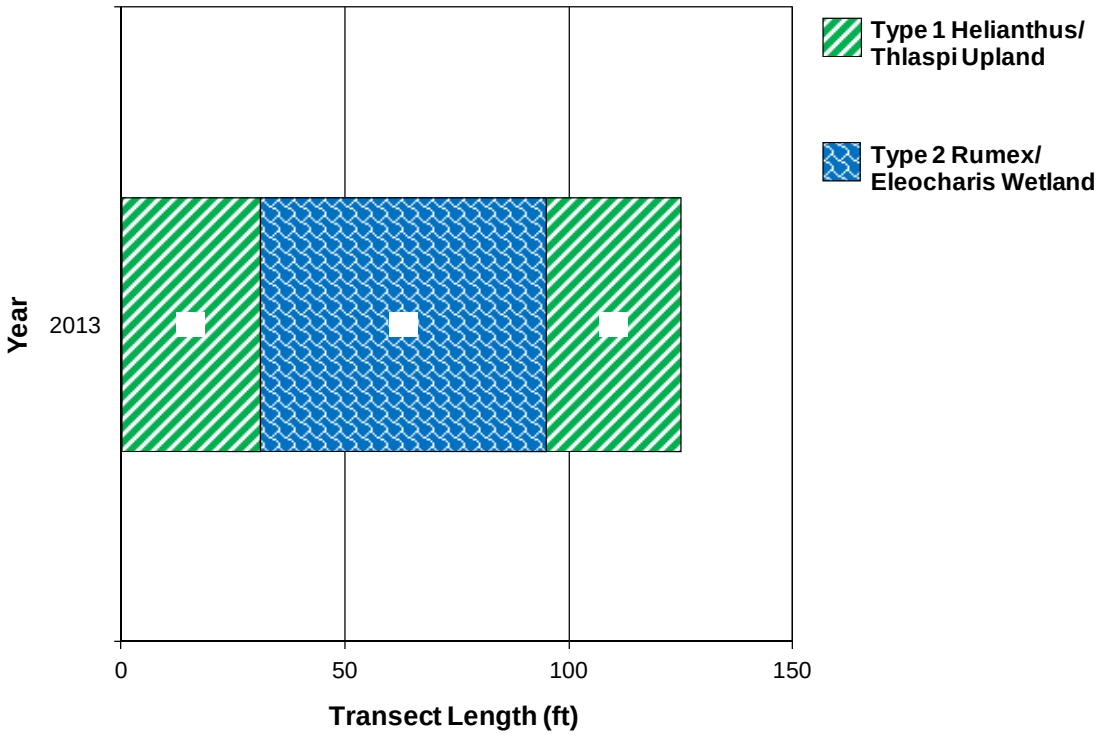


Chart 7. Transect 1 map for FNW-East Site showing vegetation types from transect start (0 feet) to finish (125 feet).

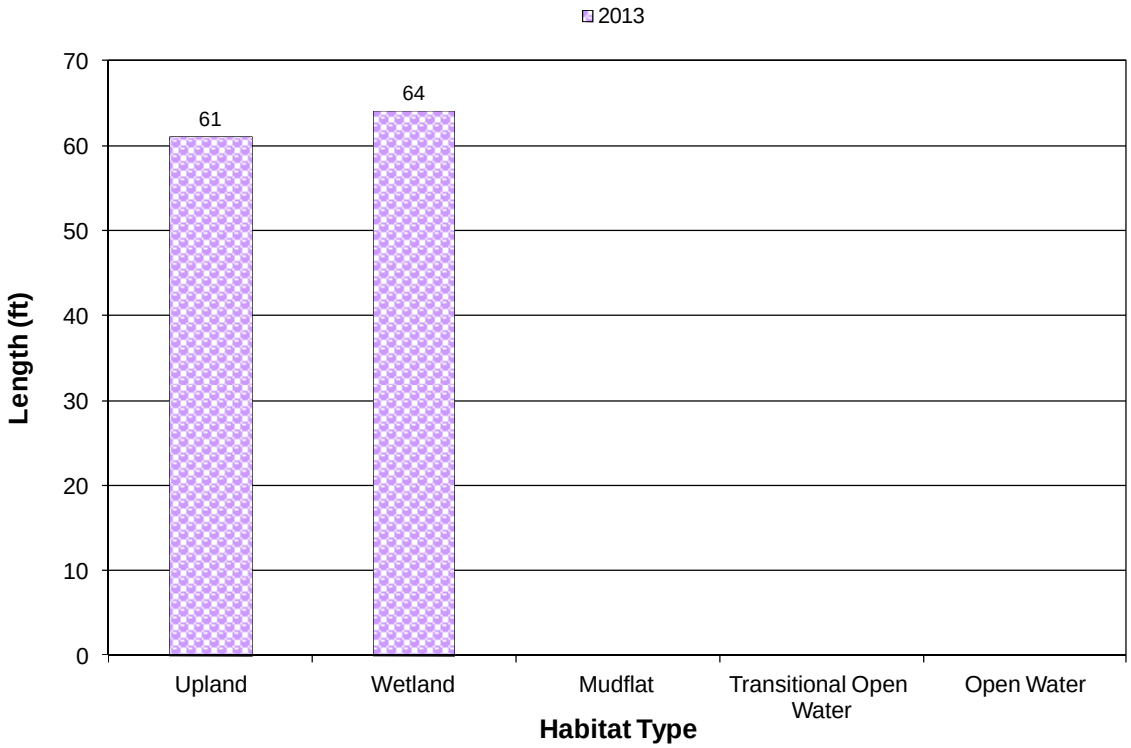


Chart 8. Length of vegetation communities within Transect 1 for FNW-East Site.

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 12 species, including 5 hydrophytes and 7 upland species, were found along this 181-foot transect. Sixty percent of the transect, primarily within the wetland Type 2 *Rumex/Eleocharis* community, was comprised of bare substrate and reflected the recently disturbed condition of the constructed wetland.

Table 18. Transect 2 data summary for FNW-East Site.

Monitoring Year	**2013**
Transect Length (feet)	**181**
Vegetation Community Transitions along Transect	2
Vegetation Communities along Transect	2
Hydrophytic Vegetation Communities along Transect	1
Total Vegetative Species	12
Total Hydrophytic Species	5
Total Upland Species	7
Estimated % Total Vegetative Cover	40
% Transect Length Comprising Hydrophytic Vegetation Communities	63.0
% Transect Length Comprising Upland Vegetation Communities	37.0
% Transect Length Comprising Unvegetated Open Water	0.0
% Transect Length Comprising Bare Substrate	60

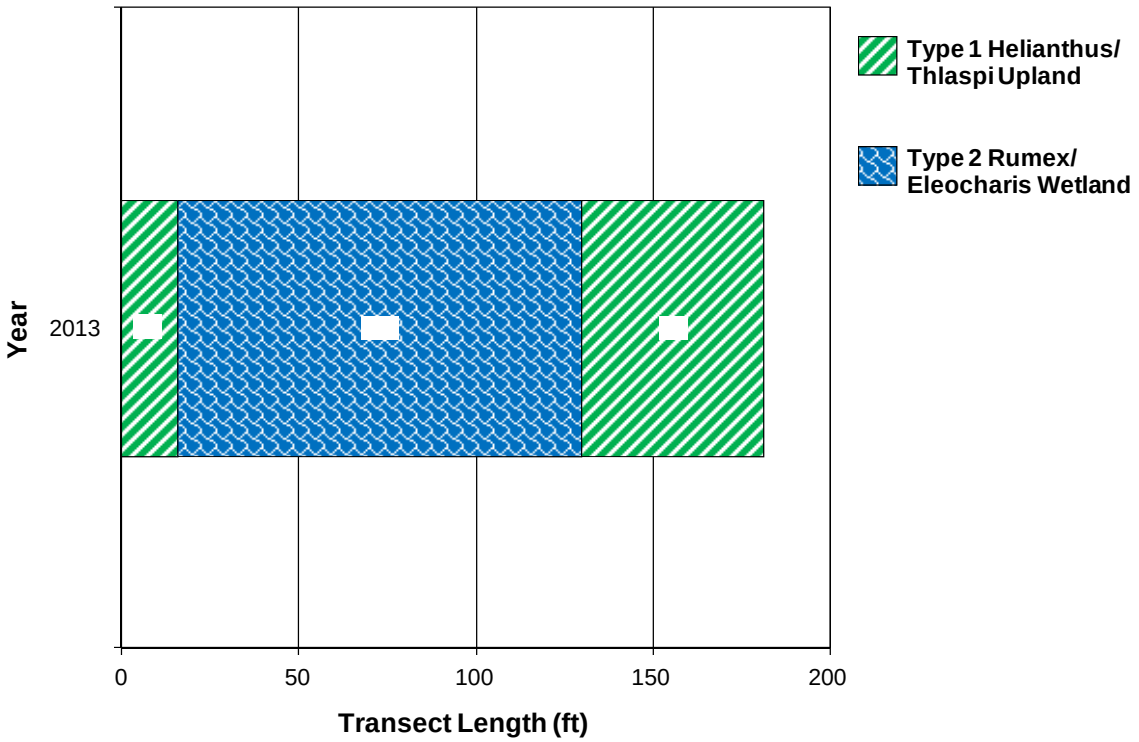


Chart 9. Transect 2 map for FNW-East Site showing vegetation types from transect start (0 feet) to finish (181 feet).

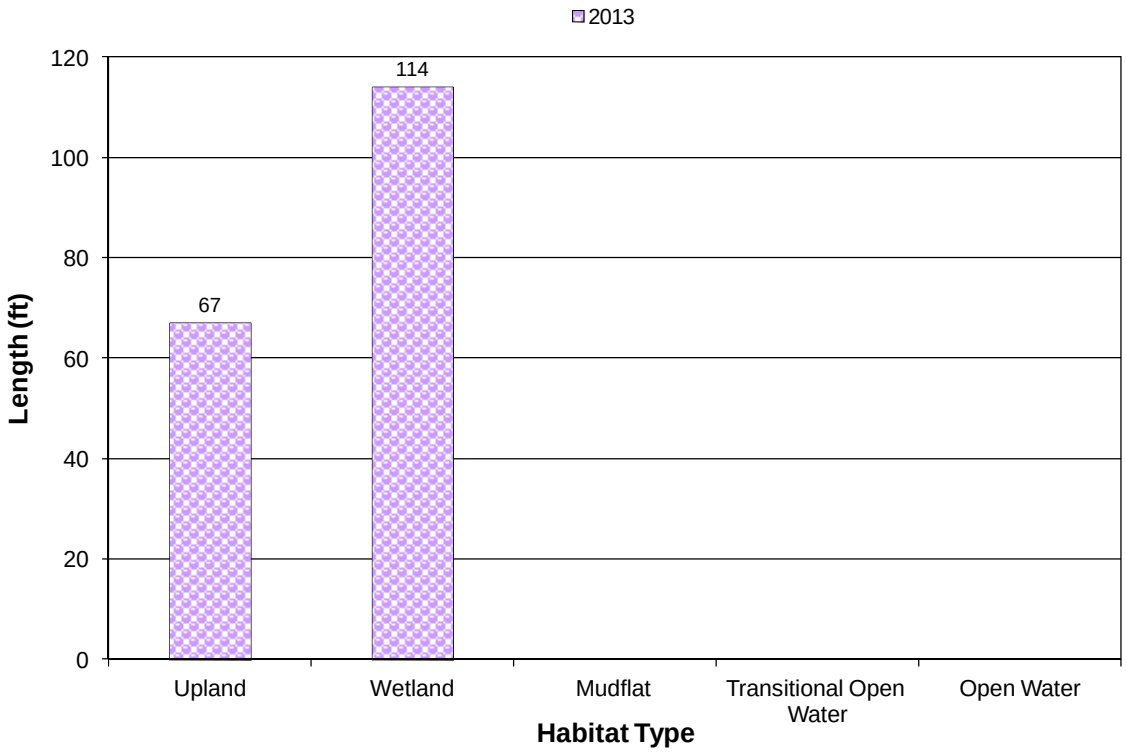


Chart 10. Length of vegetation communities within Transect 2 for FNW-East Site.

No Montana-listed noxious weeds were identified at this site. The site was seeded following construction. 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.

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 very dark gray (10YR 3/1) 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 dark yellowish brown (10YR4/4) clay with black (10YR 2/1) mottles below 3 inches. This profile did not qualify as hydric. Other soil profiles examined throughout the undisturbed uplands generally confirmed the mapped soil series.

3.3.4. Wetland Delineation

Two data points were evaluated in 2013 to determine the wetland and upland boundaries at the site (Wetland Data Forms, Appendix B). The wetland boundaries were delineated and mapped on Figure 8 in Appendix A. The delineation identified 1.19 acres of wetland and 1.55 acres of upland buffer (Table 19).

Table 19. Wetland/upland habitat acreages delineated at the FNW-East Site.

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

3.3.5. Wildlife

A list of wildlife species observed directly and indirectly at the site during the field survey in 2013 is presented in Table 20. Eight birds were observed within of directly over the mitigation site and included American goldfinch, bank and barn swallows, killdeer, lark sparrow, mourning dove, turkey vulture, and vesper sparrow. Tracks of coyote and an unidentified deer species were noted at the FNW-East site. Three northern leopard frogs (*Rana pipiens*) were identified hopping through the constructed wetland.

Table 20. Wildlife species observed at the FNW-East Site.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	*Rana pipiens*
MAMMALS	
Coyote	*Canis latrans*
Deer Sp.	*Odocoileus* sp.
BIRDS	
American Goldfinch	*Spinus tristus*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Killdeer	*Charadrius vociferus*
Lark Sparrow	*Chondestes grammacus*
Mourning Dove	*Zenaida macroura*
Turkey Vulture	*Cathartes aura*
Vesper Sparrow	*Pooecetes gramineus*

3.3.6. Functional Assessment

Results of the 2013 functional assessment are summarized in Table 21. The completed 2013 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 AA was evaluated as one assessment area.

The AA was rated as a Category III wetland with 40 percent of the total possible points. The presence of the grand redstem (S2) provided the site with a high rating for MTNHP species habitat. The high disturbance at the site and relatively low vegetation cover, a result of recent construction, contributed to the overall ratings of low to moderate. The site achieved 4.3 functional units.

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-7 and C-8 of Appendix C.

3.3.8. Maintenance Needs

No Montana-listed noxious weeds were identified at this site in 2013. The recently constructed fence along the site was in good-working order. There were no man-made water control structures installed at FNW-East.

Table 21. MWAM Summary at the FNW-East Site.

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

3.3.9. Current Credit Summary

The wetland acreage delineated in 2013 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).

Table 22. Credit summary at the FNW-East Site.

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

3.4. Treasure County Line Site – Site 4

3.4.1. Hydrology

The Forsythe, Montana weather station (243098) is located approximately 17 miles from the FNW-Treasure Co Line site. The average total annual precipitation recorded at this weather station from January 1975 to December 2012 was 14.25 inches (WRCC 2013). Total precipitation recorded at this station for 2012 was 7.81 inches, the driest year recorded at this station. The long-term average precipitation between January and August is 10.52 inches; this value totaled 5.5 inches in 2012 and 13.85 inches in 2013. In general, the site

experienced below-average precipitation during the 2012 growing season and above-average precipitation levels during the early part of the 2013 season.

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. Occassional overbank flooding, direct precipitation, and surface water runoff provide minor hydrologic contributions. Approximately 90 percent of the wetland was inundated during the 2013 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 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 six inches of surface water, high water table, saturation to the soil surface, water marks, algal mat/crust, aquatic invertebrates, hydrogen sulfide odor, geomorphic position and FAC-neutral test. Data point T-1u was located on the upland island. This upland area appeared to be at a native elevation and relatively undisturbed during excavation of the surrounding wetland. No signs of wetland hydrology were observed in this area, which appeared to be approximately two feet above seasonal high water elevation.

3.4.2. Vegetation

A comprehensive list of 27 species identified during the 2013 field survey 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.

Upland Type 1 - *Artemisia tridentata/Chenopodium album* is located 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 in the upland areas not dominated by big sagebrush and included nodding wild rye and cheatgrass as dominant components of this community. Twelve other species, mostly upland, were identified in this community. This community was identified on the two upland islands that remained intact during construction at this site.

Table 23. Vegetation species observed at the FNW-Treasure County Line Site.

Scientific Names	Common Names	GP Indicator Status[1]
Agropyron cristatum	Crested Wheatgrass	UPL
Algae, green	Algae, green	NL
Artemisia tridentata	Big Sagebrush	UPL
Asclepias speciosa	Showy Milkweed	FAC
Bassia scoparia	Mexican-Fireweed	FACU
Bromus tectorum	Cheatgrass	UPL
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
Festuca pratensis	Meadow Fescue	FACU
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Lactuca serriola	Prickly Lettuce	FAC
Lepidium perfoliatum	Clasping Pepperwort	FAC
Open Water	Open Water	NL
Opuntia polyacantha	Plains Pricklypear	UPL
Poa pratensis	Kentucky Blue Grass	FACU
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rumex crispus	Curly Dock	FAC
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Sonchus arvensis	Field Sow-Thistle	FAC
Symphoricarpos albus	Common Snowberry	FACU
Taraxacum officinale	Common Dandelion	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL

[1]Draft NWPL (Lichvar and Kartesz, 2009).

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 Transects 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-10 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. Nineteen species were identified along the transect, including six hydrophytes and 13 upland species.

Table 24. Transect 1 data summary for the FNW-Treasure County Line Site.

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

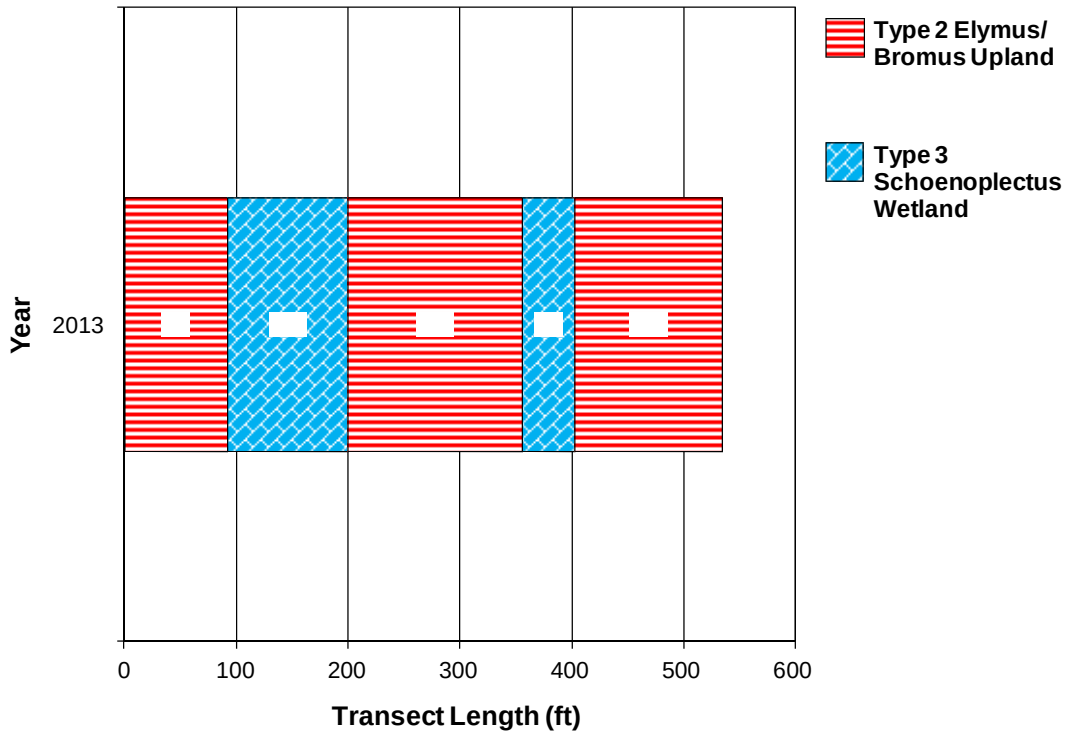


Chart 11. Transect 1 map for the FNW-Treasure County Line Site showing vegetation types from transect start (0 feet) to finish (534 feet).

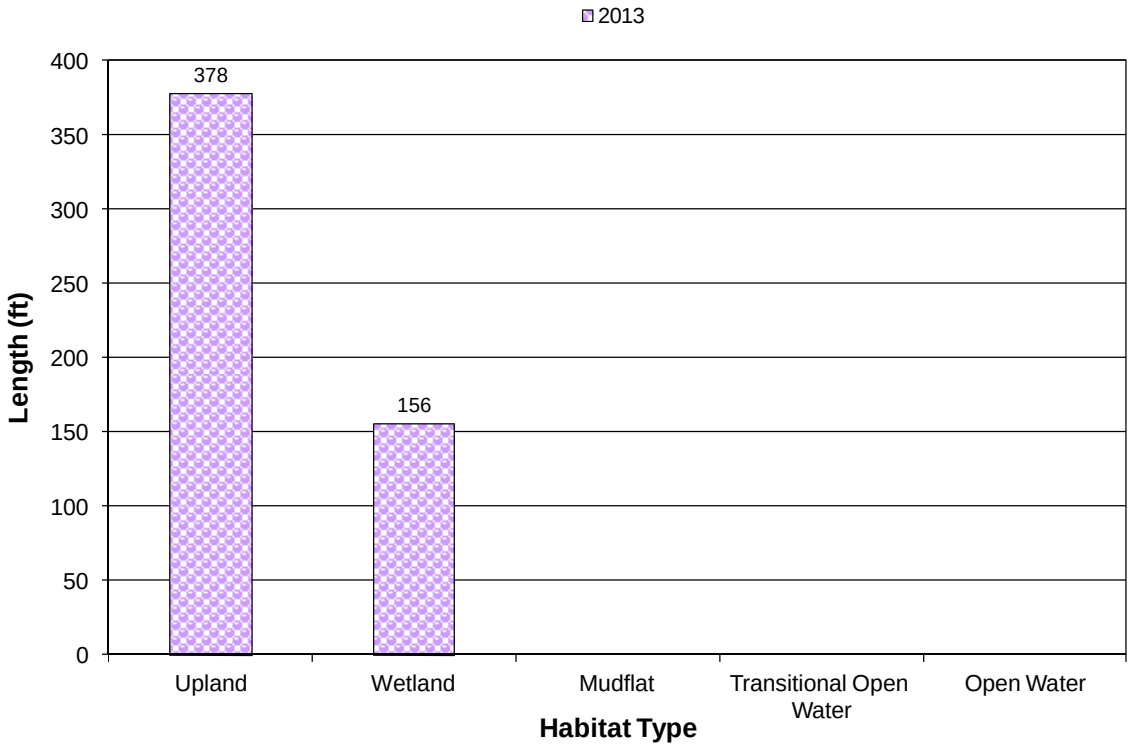


Chart 12. Length of vegetation communities within Transect 1 at the FNW-Treasure County Line Site.

Two patches of Canadian thistle, a Priority 2B noxious weed, were identified within this site in 2013 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 within 12 inches of the soil surface. The soil profile displayed a black (10 YR 2/1) clay surface horizon and a very dark gray (10YR 3/1) matrix with five percent black mottles below five inches. Data point T-1u exhibited very dark brown (10YR 2/2) to dark gray (10YR 4/2) clay loam to clay with no redoximorphic features within the upper 15 inches.

3.4.4. Wetland Delineation

Two data points were evaluated in 2013 to determine the wetland and upland boundaries at the site (Wetland 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

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

3.4.5. Wildlife

A list of wildlife species observed directly and indirectly at the site in 2013 is presented in Table 26. Signs observed and bird activity codes were recorded on the Monitoring Form in Appendix B. Five bird species were identified, including a great blue heron that flew over the mitigation area and landed in the adjacent wetland area along Reservation Creek. Some coyote scat and a muskrat burrow were observed during the field survey.

Table 26. Wildlife species observed at the FNW-Treasure County Line Site.

COMMON NAME	SCIENTIFIC NAME
BIRDS	
Eastern Kingbird	*Tyrannus tyrannus*
Great Blue Heron	*Ardea herodias*
Mourning Dove	*Zenaida macroura*
Red-winged Blackbird	*Agelaius phoeniceus*
Western Meadowlark	*Sturnella neglecta*
MAMMALS	
Coyote	*Canis latrans*
Muskrat	*Ondatra zibethicus*

3.4.6. Functional Assessment

Results of the 2013 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 III wetland with 61.9 percent of the total possible points and 7.4 functional units. The site received high ratings for short/long term surface water storage, sediment/nutrient/toxicant removal, and groundwater discharge/recharge and moderate ratings for MTNHP species habitat, general wildlife habitat, and production export/food chain support.

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-9 and C-10 of Appendix C.

3.4.8. Maintenance Needs

Two patches of Canadian thistle, a Priority 2B noxious weed, were identified within this site in 2013 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 2013.

Table 27. MWAM Summary for the FNW-Treasure County Line Site.

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

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 attained an estimated 2.38 credit acres (Table 28).

Table 28. Credit summary for the FNW-Treasure County Line Site.

Habitat Type	2013 Delineated Acres	Mitigation Ratio	2013 Estimated Credit Acres
Created Wetland	1.50	1:1	1.50
Upland Buffer	4.39	5:1	0.88
Total	**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 ratio of 2:1 ratio per Corps File No.:NWO-2006-90-676, MDT control number 4059. However, 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 personnel have 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 each of these sites.

The credits generated at the Treasure County Line site totaled 2.38 acres in 2013 and exceeded the FNW debit requirement of 2.18 acres. The total credits estimated for all four FNW site in 2013 was 10.75 acres. This value was 1.63 acres short of the required 12.38 acres. Continued wetland development at the FNW-West site is possible 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.

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)	4.15	Creation Credit	1:1	4.15
	1.29	Preservation Credit	4:1	0.32
	8.26	Upland Buffer Credit	5:1	1.65
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	**24.13**		**Total Credits**	**10.75**
			Net Credits	**-1.63**

[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.

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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: 2013 Monitoring Activity Locations

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

Legend

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

Base Photography Date: July 15, 2013

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/Monitor2013.mxd

Project Name
Forsyth NW - West Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

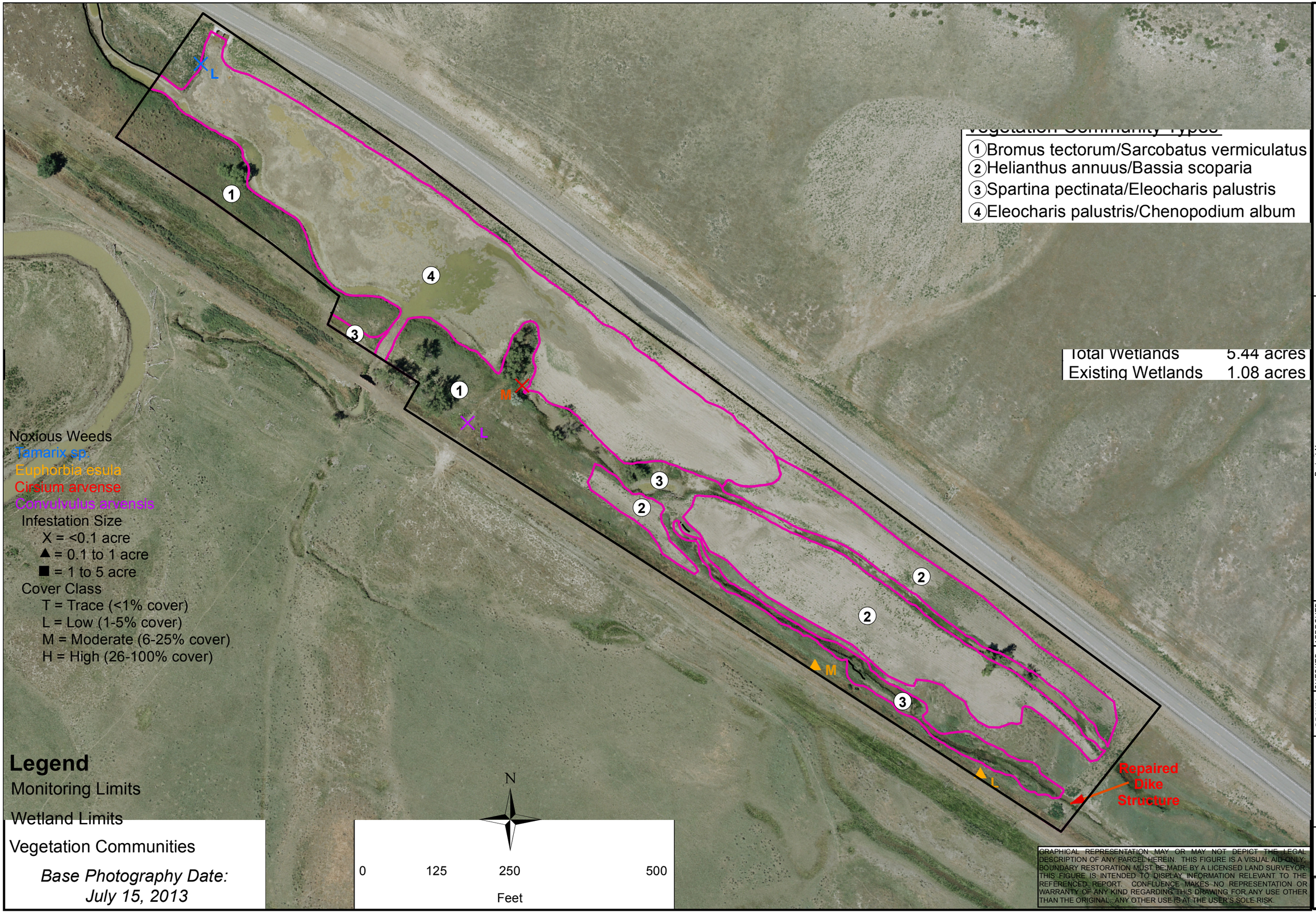
Drawn: September 12, 2013

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 3

REV -



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/Veg2013.mxd

Project Name: Forsyth NW - West Site

Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 12, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 4

REV -

Figure 5: 2013 Monitoring Activity Locations

PP1

T-1, Start

T-1, Finish

M-1w

M-1u

PP2

Legend

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

Base Photography Date: July 15, 2013

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/Monitor2013.mxd

Project Name
Forsyth NW - Middle Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 11, 2013

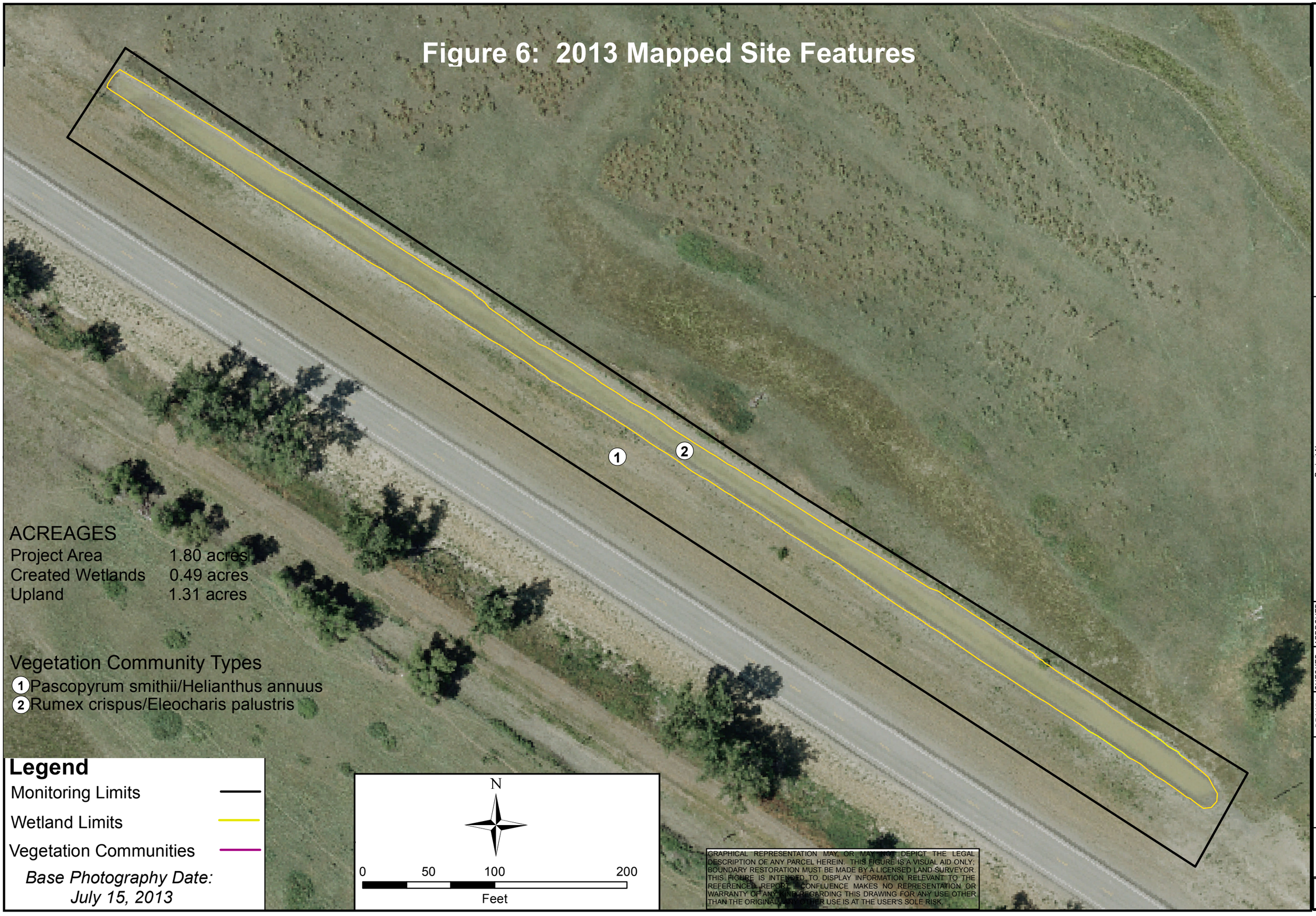
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 5

REV -

Figure 6: 2013 Mapped Site Features



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 15, 2013

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, AND OTHER USE IS AT THE USER'S SOLE RISK.

LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/Middle/Veg2013.mxd

Project Name: Forsyth NW - Middle Site

Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 11, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 6

REV -

Figure 7: 2013 Monitoring Activity Locations

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

Legend

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

Base Photography Date: July 15, 2013

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/East/Monitor2013.mxd

Project Name
Forsyth NW - East Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 11, 2013

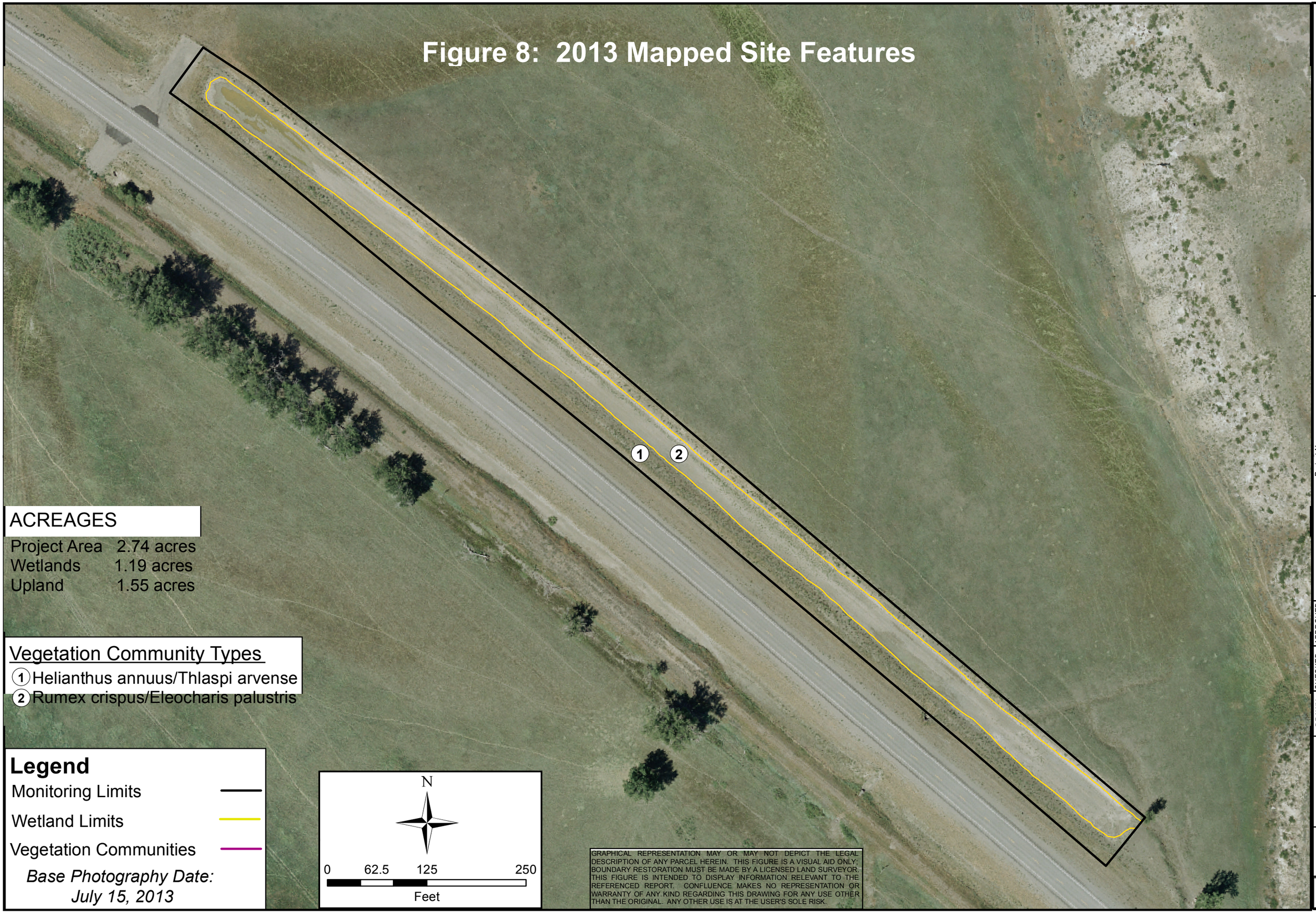
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure 7

REV -

Figure 8: 2013 Mapped Site Features



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 15, 2013

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/East/Veg2013.mxd

Project Name: Forsyth NW - East Site

Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: August 20, 2013

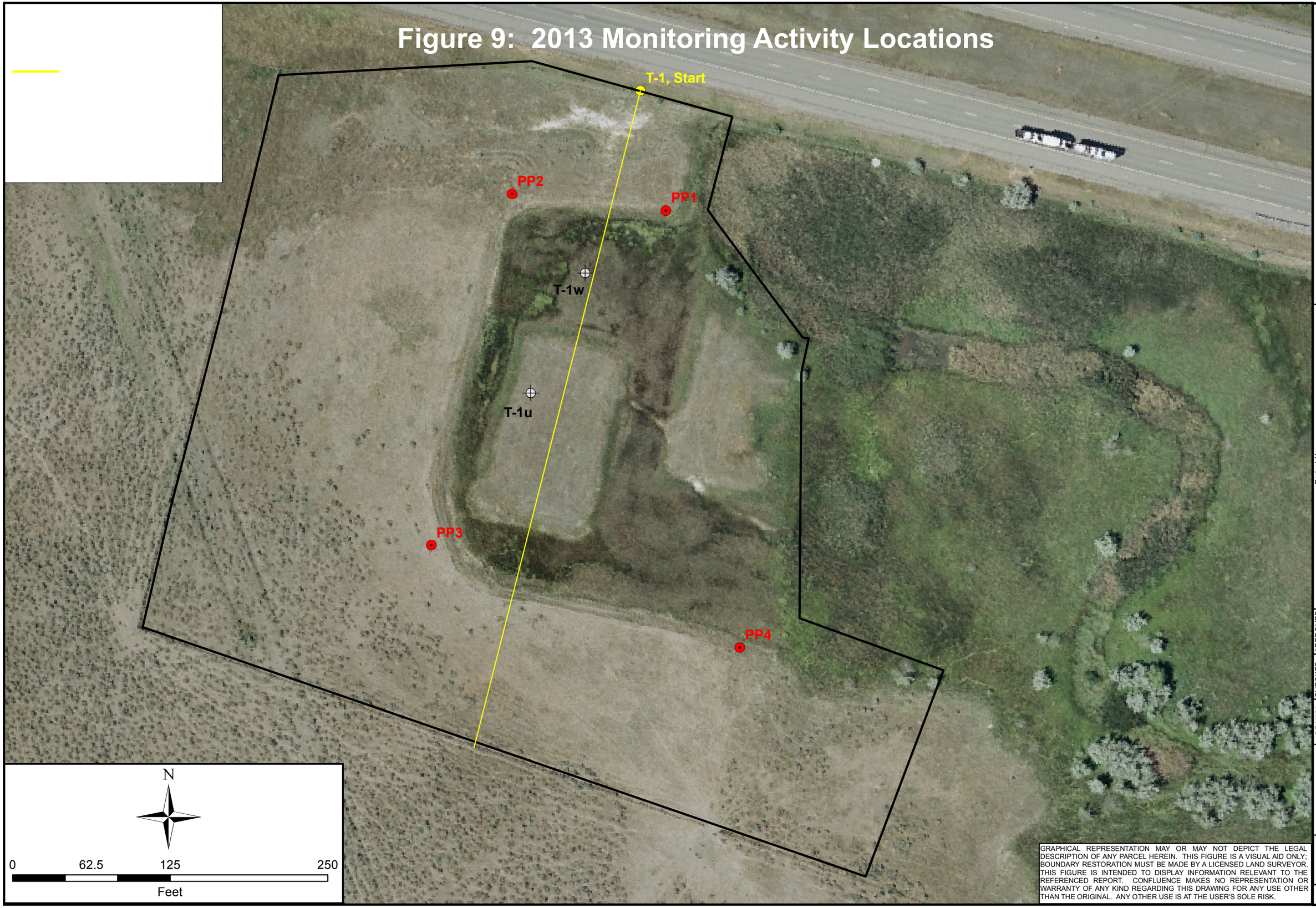
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 8

REV -

Figure 9: 2013 Monitoring Activity Locations



LOCATION: Rosebud Co., MT

PROJ NO: STPP 14-6(9)259

FILE: ForsythNW/Treasure/Monitor2013.mxd

Project Name
Forsyth NW - Treasure Co. Line Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 12, 2013

PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure
9

REV -

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.

Figure 10: 2013 Mapped Site Features

ACREAGES	
Project Area	5.89 acres
Wetlands	1.50 acres
Upland	4.39 acres

N

0 37.5 75 150

Feet

M

L

2 2 3 2 1 1

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)

Legend
Monitoring Limits
Wetland Limits
Vegetation Communities

Base Photography Date: July 15, 2013

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

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/Veg2013.mxd

Project Name: Forsyth NW - Treasure Line Co Site
Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted
Drawn: September 12, 2013
PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 10

REV -

Appendix B

2013 MDT Wetland Mitigation Site Monitoring Form
2013 USACE Routine Wetland Determination Data Form
2013 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 8/15/2013 8:46:32 AM

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

Weather: Sunny & warm, rain night before Location: ~15NW 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: 1 #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: 0.3 **(ft)** Range of Depths: 0-1.2 **(ft)**

Percent of assessment area under inundation: 5 %

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 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** 5.33

Species	Cover class	Species	Cover class
Agropyron cristatum	2	Amaranthus retroflexus	0
Ambrosia psilostachya	1	Bare Ground	1
Bassia scoparia	2	Bromus tectorum	4
Chenopodium album	3	Chenopodium sp.	0
Cichorium intybus	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	Festuca pratensis	2
Glycyrrhiza lepidota	0	Grindelia squarrosa	1
Helianthus annuus	2	Hordeum jubatum	0
Lactuca serriola	2	Lepidium perfoliatum	1
Pascopyrum smithii	2	Phalaris arundinacea	1
Rosa arkansana	1	Rumex crispus	1
Salix amygdaloides	0	Sarcobatus vermiculatus	3
Sonchus arvensis	1	Symphoricarpos albus	1
Thlaspi arvense	3	Xanthium strumarium	1

Comments:

Community represents the undisturbed uplands within monitoring area.

Community # 2 **Community Type:** Helianthus annuus / Bassia scoparia **Acres** 2.93

Species	Cover class	Species	Cover class
Ambrosia psilostachya	2	Atriplex argentea	0
Bare Ground	5	Bassia scoparia	4
Chenopodium album	3	Cirsium arvense	0
Elymus repens	3	Glycyrrhiza lepidota	2
Helianthus annuus	4	Hordeum jubatum	2
Lepidium perfoliatum	0	Pascopyrum smithii	2
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	Chenopodium album	0
Eleocharis palustris	3	Glycyrrhiza lepidota	1
Hordeum jubatum	2	Phalaris arundinacea	1
Rosa arkansana	0	Salix amygdaloides	1
Sonchus arvensis	1	Spartina pectinata	3
Typha latifolia	2		

Comments:

Community represents the undisturbed wetlands within monitoring area.

Community # 4 **Community Type:** Eleocharis palustris / Chenopodium album **Acres** 4.36

Species	Cover class	Species	Cover class
Alisma triviale	0	Ammannia robusta	0
Asclepias speciosa	0	Bare Ground	5
Chenopodium album	1	Echinochloa crus-galli	0
Eleocharis palustris	1	Helianthus annuus	0
Hordeum jubatum	0	Populus deltoides	0
Rumex crispus	0	Sagittaria cuneata	0
Schoenoplectus acutus	0	Setaria pumila	0
Spartina pectinata	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: 8/15/2013 8:46:32 AM

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

Interval Data:

Ending Station 30 **Community Type:** Bromus tectorum / Sarcobatus vermiculatus

Species	Cover class	Species	Cover class
Bassia scoparia	2	Bromus tectorum	4
Chenopodium album	1	Descurainia sophia	1
Elymus sp.	3	Euphorbia esula	1
Lactuca serriola	0	Lepidium perfoliatum	1
Pascopyrum smithii	2	Sarcobatus vermiculatus	1

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

Species	Cover class	Species	Cover class
Bare Ground	1	Chenopodium album	0
Eleocharis palustris	4	Hordeum jubatum	2
Sonchus arvensis	0	Spartina pectinata	2

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

Species	Cover class	Species	Cover class
Bromus tectorum	2	Chenopodium album	5
Elymus sp.	2	Festuca pratensis	1
Grindelia squarrosa	1	Helianthus annuus	0
Lepidium perfoliatum	1	Pascopyrum smithii	2
Sarcobatus vermiculatus	1	Xanthium strumarium	0

Ending Station 186 **Community Type:** Helianthus annuus / Bassia scoparia

Species	Cover class	Species	Cover class
Ambrosia psilostachya	1	Atriplex argentea	0
Bare Ground	5	Bassia scoparia	1
Chenopodium album	1	Glycyrrhiza lepidota	1
Helianthus annuus	2	Hordeum jubatum	1
Rosa arkansana	0	Rumex crispus	1

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

Species	Cover class	Species	Cover class
Eleocharis palustris	5	Glycyrrhiza lepidota	1
Phalaris arundinacea	0	Rosa arkansana	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
Glycyrrhiza lepidota	1	Helianthus annuus	1
Lepidium perfoliatum	0	Pascopyrum smithii	0

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

Species	Cover class	Species	Cover class
Ambrosia psilostachya	2	Bassia scoparia	2
Bromus tectorum	2	Elymus repens	1
Elymus sp.	2	Helianthus annuus	2
Lepidium perfoliatum	1	Rumex crispus	1
Sarcobatus vermiculatus	0	Sonchus arvensis	1
Thlaspi arvense	1	Xanthium strumarium	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	1	Bromus tectorum	1
Chenopodium album	1	Cirsium arvense	2
Glycyrrhiza lepidota	2	Hordeum jubatum	1
Rosa arkansana	3	Sarcobatus vermiculatus	1
Symphoricarpos albus	1		

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

Species	Cover class	Species	Cover class
Alisma triviale	0	Bare Ground	5
Chenopodium album	0	Eleocharis palustris	0
Populus deltoides	0	Sagittaria cuneata	0
Schoenoplectus acutus	0	Typha latifolia	0

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

Species	Cover class	Species	Cover class
Bare Ground	3	Bassia scoparia	1
Bromus tectorum	2	Chenopodium album	1
Chenopodium sp.	1	Elymus sp.	1
Lepidium perfoliatum	1	Sarcobatus vermiculatus	1
Thlaspi arvense	1		

Transect Notes:

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
American Goldfinch	10	F	UP
Bald Eagle	1	FO	UP
Bank Swallow	22	F, N	SS, UP
Barn Swallow	8	F, FO	UP, WM
Cedar Waxwing	3	L	SS, UP
Grasshopper Sparrow	9	F, FO	UP, WM
Great Blue Heron	1	FO	OW, WM
Killdeer	3	F	MF
Lark Bunting	11	F, L	SS, UP
Mourning Dove	13	F, L	UP
Northern Harrier	1	FO	UP
Red-tailed Hawk	1	FO	UP
Rock Wren	3	F, L	SS, UP, WM
Turkey Vulture	1	FO	UP
Western Kingbird	5	F, L	SS, UP
Western Meadowlark	6	F	UP, WM
Yellow Warbler	6	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
Deer Sp.		Yes	No	No	
Plains Gartersnake	2	No	No	No	
Porcupine	1	No	No	No	
Raccoon		Yes	No	No	

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
1231-36	46.339088	-106.874611	230	PP-3
1237-41	46.336914	-106.871132	270	PP-1
1242-46	46.336468	-106.871811	350	PP-2
1254	46.33691	-106.872772	25	T-1, start
1259	46.337456	-106.872063	205	T-1, end
1266	46.339001	-106.87645	25	T-2, start
1267	46.339024	-106.876183	220	W-1w
1269	46.339561	-106.875854	205	T-2, end
1270-76	46.339554	-106.875893	205	T-2 end, pano
1277-83	46.340237	-106.877312	210	PP-4
1284	46.3386	-106.875305	300	W-1u
1286	46.3377766	-106.8729233	200	W-2u
1287	46.33773	-106.873062	300	W-2w
1291-98	46.337817	-106.874587	45	PP-5

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 recently repaired.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 8/15/2013

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

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

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

Subregion (LRR): LRR F Lat: 46.3386 Long: -106.875305 Datum: WGS84

Soil Map Unit Name: Marvan silty clay 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 ☑

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: DP in undisturbed upland near willow trees.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 30ft)	Absolute % Cover	Dominant Species?	Indicator Status
1. Salix amygdaloides	40	☑	FACW
2.	0	☐	
3.	0	☐	
4.	0	☐	
	40	= Total Cover	
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0	= Total Cover	
Herb Stratum (Plot size: 5ft)			
1. Bromus tectorum	70	☑	UPL
2. Descurainia sophia	10	☐	UPL
3. Rosa arkansana	10	☐	FACU
4. Euphorbia esula	5	☐	UPL
5. Chenopodium album	5	☐	FACU
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	100	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	40	x 2 =	80
FAC species	0	x 3 =	0
FACU species	15	x 4 =	60
UPL species	85	x 5 =	425
Column Totals	140 (A)		565 (B)

Prevalence Index = B/A = 4.03571

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

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 4/2	95	D M	10YR 2/2	5		Silty Clay	
7-14	10YR 4/3	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): _____

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: Occasional and ephemeral high groundwater elevation, no surface signs of hydro.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 8/15/2013

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

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

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

Subregion (LRR): LRR F Lat: 46.3390533333333 Long: -106.876246666667 Datum: WGS84

Soil Map Unit Name: Marvan silty clay 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 ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks: DP in recently excavated, highly disturbed area with hydrophytes, contemporary redox development and apparent wetland hydrology.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Schoenoplectus americanus	5	☑	OBL
2. Typha latifolia	3	☑	OBL
3. Alisma triviale	2	☑	OBL
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	10 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 90

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	10	x 1 =	10
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	10 (A)		10 (B)

Prevalence Index = B/A = 1

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No _____

Remarks:

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
0-12	5YR 6/1	95	C M	10YR	5/6	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: Bright redox throughout fisrt 12in of soil, possibly from episaturation.

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 appears to be seasonally/ephemerally inundated with surface flow.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 8/15/2013

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

Investigator(s): B Sandefur Section, Township, Range: 29 7N 39E

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

Subregion (LRR): LRR F Lat: 46.3377766666667 Long: -106.872923333333 Datum: WGS84

Soil Map Unit Name: Marvan silty clay 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 ☑

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: DP in disturbed upland with marginal hydrology, adjacent to native wet area approx 1.5 ft higher.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Chenopodium album	10	☑	FACU
2. Helianthus annuus	10	☑	FACU
3. Ambrosia psilostachya	20	☑	FACU
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	40 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 60

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	40	x 4 =	160
UPL species	0	x 5 =	0
Column Totals	40 (A)		160 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-3	10YR 4/2	100					Silty Clay	
3-12	10YR 5/3	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: Very faint redox, may develop hydric over time.

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 periodically saturated, currently appears insufficient in duration for wetland hydrology.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - West City/County: Rosebud Co. Sampling Date: 8/15/2013

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

Investigator(s): B Sandefur Section, Township, Range: 29 7N 39E

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

Subregion (LRR): LRR F Lat: 46.33789 Long: -106.872771666667 Datum: WGS84

Soil Map Unit Name: Marvan silty clay 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 ☐

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: DP in undisturbed wetland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Eleocharis palustris	70	☑	OBL
2. Rumex crispus	5	☐	FAC
3. Hordeum jubatum	5	☐	FACW
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	80 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 20

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	70	x 1 =	70
FACW species	5	x 2 =	10
FAC species	5	x 3 =	15
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals	80 (A)		95 (B)

Prevalence Index = B/A = 1.1875

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☑ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: We-2w

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 4/1	80	C M	10YR	4/6	20	Silty Clay	
6-12	10YR 5/1	90	C M	10YR	4/6	10	Sandy 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:

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 8/15/2013 **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 5.44

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 5.44

☐ **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	80

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)

AA recently excavated to reduce surface elevation of existing uplands to elevations similar to existing wetlands. Additionally, the US12 Highway corridor was also recently completed resulting in high disturbance to both AA and area adjacent to AA.

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 recently constructed wetlands within floodplain of an Unnamed Tributary of Big Porcupine. Surrounding land includes US 12 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**

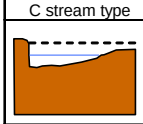
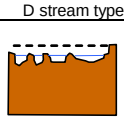
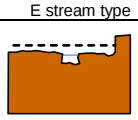
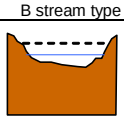
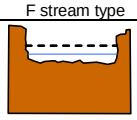
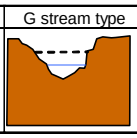
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

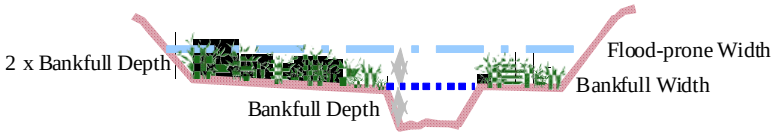
iii. Final Score and Rating: 0 NA **Comments:** A carp skeleton was observed near the outlet of the wetland indicating occassional use by fish during high water. No permanent fish habitat present within AA.

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 at head of mitigation area and from overbank flow from Big Porcupine Creek through an historic flood channel under the old railroad grade.

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. Low vegetation cover a result of recent construction.

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** .6M

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	4.896	☑
C. General Wildlife Habitat	M	.5	1	2.72	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	M	.5	1	2.72	☑
F. Short and Long Term Surface Water Storage	H	1	1	5.44	☑
G. Sediment/Nutrient/Toxicant Removal	M	.4	1	2.176	☐
H. Sediment/Shoreline Stabilization	L	.3	1	1.632	☐
I. Production Export/Food Chain Support	M	.6	1	3.264	☐
J. Groundwater Discharge/Recharge	M	.7	1	3.808	☑
K. Uniqueness	M	.4	1	2.176	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.816	☐
Totals:		5.45	10	29.648	
Percent of Possible Score			**54.5** %		

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 8/15/2013 2:10:29 PM

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

Weather: Hot and sunny 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: 1 #Visits in Year: 1

Size of Evaluation Area: 1.8 (acres)

Land use surrounding wetland:

Undeveloped ag land

HYDROLOGY

Surface Water Source: Precipitation, runoff, shallow groundwater

Inundation: ☑ Average Depth: 0.3 **(ft)** Range of Depths: 0-0.8 **(ft)**

Percent of assessment area under inundation: 5 %

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, 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

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
Ambrosia psilostachya	1	Avena fatua	0
Bare Ground	1	Bassia scoparia	2
Bromus carinatus	1	Chenopodium album	3
Elymus repens	3	Elymus sp.	0
Festuca pratensis	0	Grindelia squarrosa	1
Helianthus annuus	4	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	0
Pascopyrum smithii	4	Polygonum aviculare	0
Populus deltoides	0	Rosa arkansana	1
Rumex crispus	2	Sarcobatus vermiculatus	1
Solanum rostratum	0	Symphoricarpos albus	1
Thlaspi arvense	2		

Comments:

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

Species	Cover class	Species	Cover class
Alisma triviale	0	Ammannia robusta	0
Bare Ground	5	Chenopodium album	1
Echinochloa crus-galli	1	Eleocharis palustris	1
Helianthus annuus	1	Hordeum jubatum	1
Open Water	3	Panicum capillare	0
Poa palustris	0	Populus deltoides	1
Ratibida columnifera	0	Rumex acetosella	0
Rumex crispus	2	Salix amygdaloides	0
Salix sp.	0	Schoenoplectus maritimus	1
Setaria pumila	0	Solanum rostratum	0
Typha latifolia	0	Xanthium strumarium	1

Comments:

Vegetation not well developed due to recent construction of mitigation site.

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: 8/15/2013 2:10:29 PM

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	Chenopodium album	2
Elymus sp.	2	Festuca pratensis	2
Helianthus annuus	1	Lepidium perfoliatum	1
Pascopyrum smithii	1		

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

Species	Cover class	Species	Cover class
Bare Ground	5	Echinochloa crus-galli	0
Eleocharis palustris	0	Open Water	1
Populus deltoides	1	Rumex crispus	0
Salix sp.	0		

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

Species	Cover class	Species	Cover class
Bare Ground	2	Elymus sp.	1
Helianthus annuus	2	Lactuca serriola	1
Pascopyrum smithii	2	Thlaspi arvense	2

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
American Goldfinch	2	F, L	UP, US
Eastern Bluebird	1	FO	UP
Killdeer	1	F	MF
Mourning Dove	4	F, FO, L	UP
Turkey Vulture	1	FO	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
Coyote		Yes	No	No	
Deer Sp.		Yes	No	No	
Frog sp.	4	No	No	No	
Plains Gartersnake	2	No	No	No	
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
1306	46.322754	-106.842438	25	T-1, end
1308	46.322948	-106.842323	205	T-1, start
1309	46.322868	-106.842278	180	M-1w
1310	46.3228	-106.842323	180	M-1u
1311-16	46.322868	-106.842506	25	T1 end, pano
1318	46.323803	-106.844337	120	PP-2
1320	46.322174	-106.840996	300	PP-1

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: 8/15/2013

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

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

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

Subregion (LRR): LRR F Lat: 46.3228166666667 Long: -106.842443333333 Datum: WGS84

Soil Map Unit Name: Harlem silty clay 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 ☑

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: DP in well vegetated upland.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Thlaspi arvense	35	☑	FACU
2. Helianthus annuus	10	☑	FACU
3. Bassia scoparia	10	☑	FACU
4. Chenopodium album	10	☑	FACU
5. Symphoricarpos albus	10	☑	NL
6. Elymus repens	10	☑	FACU
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	85 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 25

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	0	x 3 =	0
FACU species	75	x 4 =	300
UPL species	0	x 5 =	0
Column Totals	75 (A)		300 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-8	10YR 4/2	100					Clay	
8-12	10YR 5/3	95	D M	10YR	2/1	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: Some dark mottles and NA conc below 8in.

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 - Middle City/County: Rosebud Co. Sampling Date: 8/15/2013

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 (%): _____

Subregion (LRR): LRR F Lat: 46.322868 Long: -106.842278 Datum: WGS84

Soil Map Unit Name: Harlem silty clay 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 ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks: DP in bottom of narrow linear excavated swale.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: _____)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size: _____)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Rumex crispus	5	☑	FAC
2. Eleocharis palustris	2	☑	OBL
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	7 = Total Cover		
Woody Vine Stratum (Plot size: _____)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 95

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	2	x 1 =	2
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	7 (A)		17 (B)

Prevalence Index = B/A = 2.42857

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-8	10YR 4/2	100					Clay	
8-14	10YR 5/2	95	C M	10YR	4/4	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:

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: Redox development in recently excavated basin.

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 8/15/2013 **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 recently excavated, high percentage of bare ground.

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

None

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.

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**

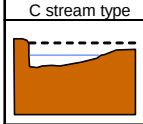
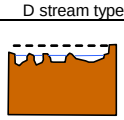
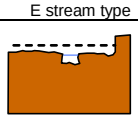
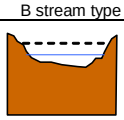
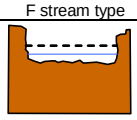
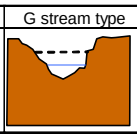
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

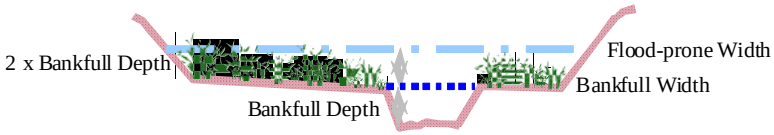
iii. Final Score and Rating: 0 NA **Comments:**

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** .2L

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	L	.2	1	0.098	☐
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	H	1	1	0.49	☑
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	.2	1	0.098	☐
J. Groundwater Discharge/Recharge	NA	0	0	0	☐
K. Uniqueness	L	.1	1	0.049	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		3.9	9	1.911	
Percent of Possible Score			**43.33** %		

Category I Wetland: (must satisfy **one** of the following criteria; otherwise go to Category II)
- ☐ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ☐ Score of 1 functional point for Uniqueness; **or**
- ☐ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ☐ Percent of possible score > 80% (round to nearest whole #).

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to 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 8/15/2013 3:14:07 PM

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: 1 #Visits in Year: 1

Size of Evaluation Area: 2.74 (acres)

Land use surrounding wetland:

Undeveloped ag land

HYDROLOGY

Surface Water Source: Precipitation, runoff, shallow groundwater

Inundation: ☑ Average Depth: 0.2 **(ft)** Range of Depths: 0-0.8 **(ft)**

Percent of assessment area under inundation: 5 %

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 water, inundation visible on aerial imagery, saturation, water marks, water stained leaves, H2S odor, algal mat/crust, iron deposits, geomorphic position, FAC-neutral test.

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	3	Bassia scoparia	1
Bromus carinatus	2	Bromus tectorum	1
Chenopodium album	1	Elymus sp.	0
Helianthus annuus	4	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	1
Pascopyrum smithii	2	Polygonum aviculare	0
Populus deltoides	0	Rumex acetosella	1
Rumex crispus	1	Solanum rostratum	1
Thlaspi arvense	3		

Comments:

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

Species	Cover class	Species	Cover class
Alisma triviale	0	Ammannia robusta	0
Bare Ground	4	Bassia scoparia	0
Chenopodium album	0	Echinochloa crus-galli	2
Eleocharis palustris	2	Helianthus annuus	0
Hordeum jubatum	0	Open Water	2
Polygonum aviculare	1	Populus deltoides	2
Ratibida columnifera	0	Rumex crispus	4
Sagittaria cuneata	0	Salix amygdaloides	0
Schoenoplectus maritimus	1	Solanum rostratum	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: 8/15/2013 3:14:07 PM

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

Interval Data:

Ending Station 31 **Community Type:** Helianthus annuus / Thlaspi arvense

Species	Cover class	Species	Cover class
Agropyron cristatum	0	Bare Ground	5
Bromus tectorum	3	Helianthus annuus	4
Pascopyrum smithii	1	Rumex crispus	0
Thlaspi arvense	1		

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

Species	Cover class	Species	Cover class
Bare Ground	5	Eleocharis palustris	1
Open Water	3	Polygonum aviculare	0
Populus deltoides	1	Rumex crispus	1
Schoenoplectus maritimus	1	Typha latifolia	0

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

Species	Cover class	Species	Cover class
Ambrosia psilostachya	2	Bare Ground	2
Chenopodium album	1	Elymus sp.	1
Helianthus annuus	1	Pascopyrum smithii	1
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	3	Helianthus annuus	1
Pascopyrum smithii	1	Populus deltoides	1
Rumex crispus	3	Thlaspi arvense	1

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

Species	Cover class	Species	Cover class
Bassia scoparia	4	Echinochloa crus-galli	3
Eleocharis palustris	1	Polygonum aviculare	1
Populus deltoides	2	Rumex crispus	2

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

Species	Cover class	Species	Cover class
Bare Ground	2	Elymus sp.	1
Helianthus annuus	5	Lactuca serriola	1
Pascopyrum smithii	1	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
American Goldfinch	10	F, L	UP
Bank Swallow	2	FO	UP, US
Barn Swallow	2	FO	UP
Killdeer	2	F	MF
Lark Sparrow	2	F, L	MF, UP
Mourning Dove	42	F, FO	UP
Turkey Vulture	1	FO	UP
Vesper Sparrow	2	FO	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
Coyote		Yes	No	No	
Deer Sp.		Yes	No	No	
Northern Leopard Frog	3	No	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
1322	46.321045	-106.838486	145	T-1, start
1327	46.320297	-106.838493	325	T-1, end
1328	46.321033	-106.838814	125	PP-1
1329-34	46.320068	-106.837128	210	PP-2
1335	46.318336	-106.834175	280	T-2, start
1336	46.318417	-106.834923	100	T-2, end
1337	46.318233	-106.834335	305	PP-3
1339	46.320953	-106.838531	200	E-1w
1340	46.320786	-106.838676	80	E-1u

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: 8/15/2013

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

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

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

Subregion (LRR): LRR F Lat: 46.32095 Long: -106.83854 Datum: WGS84

Soil Map Unit Name: Harlem silty clay 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 ☑
Wetland Hydrology Present?	Yes ☐	No ☑

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

Remarks: DP along upper slope of swale.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Helianthus annuus	20	☑	FACU
2. Ambrosia psilostachya	30	☑	FACU
3. Bassia scoparia	30	☑	FACU
4. Lepidium perfoliatum	10	☐	FAC
5. Bromus tectorum	10	☐	UPL
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	80	x 4 =	320
UPL species	10	x 5 =	50
Column Totals	100 (A)		400 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-3	10YR 4/4	100					Clay	
3-12	10YR 5/4	95	D M	10YR	2/1	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:

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 surface hdro, occasional high water table when adjacent swale inundated.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Forsyth NW - East City/County: Rosebud Co. Sampling Date: 8/15/2013

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 (%): _____

Subregion (LRR): LRR F Lat: 46.3211716666667 Long: -106.838526666667 Datum: WGS84

Soil Map Unit Name: Harlem silty clay 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 ☐

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: DP in recently constructed roadside swale.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Eleocharis palustris	20	☑	OBL
2. Rumex crispus	5	☑	FAC
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	25 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 75

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	20	x 1 =	20
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	25 (A)		35 (B)

Prevalence Index = B/A = 1.4

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☑ 2 - Dominance Test is >50%

☑ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-12	10YR 3/1	95	C M	10YR	4/4	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:

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): _____

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:

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 8/15/2013 **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 recently excavated, high percentage of bare ground.

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 veg 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.

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**

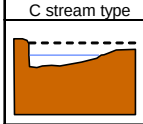
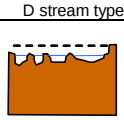
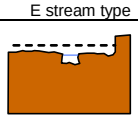
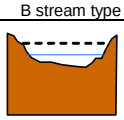
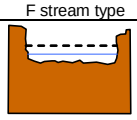
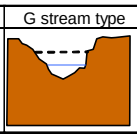
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

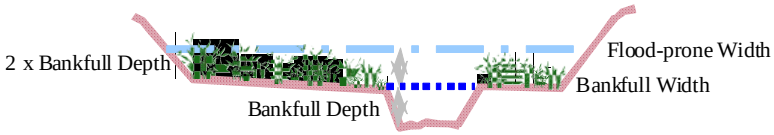
iii. Final Score and Rating: 0 NA **Comments:**

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 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** .2L

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	L	.2	1	0.238	☐
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	M	.7	1	0.833	☑
H. Sediment/Shoreline Stabilization	L	.2	1	0.238	☐
I. Production Export/Food Chain Support	L	.2	1	0.238	☑
J. Groundwater Discharge/Recharge	M	.7	1	0.833	☑
K. Uniqueness	L	.1	1	0.119	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		3.6	9	4.284	
Percent of Possible Score			**40** %		

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 8/14/2013 2:19:12 PM
Person(s) conducting the assessment: B Sandefur, E Sandefur
Weather: Hot and 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: 1 #Visits in Year: 1
Size of Evaluation Area: 5.89 (acres)
Land use surrounding wetland:

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:

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	1	Opuntia polyacantha	0
Poa pratensis	2	Puccinellia nuttalliana	2
Rumex crispus	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
Bare Ground	1	Bassia scoparia	0
Bromus tectorum	2	Chenopodium album	1
Cirsium arvense	0	Cirsium vulgare	1
Elymus canadensis	3	Festuca pratensis	1
Grindelia squarrosa	1	Hordeum jubatum	1
Lactuca serriola	1	Lepidium perfoliatum	1
Poa pratensis	0	Puccinellia nuttalliana	1
Rumex crispus	0	Sonchus arvensis	0
Taraxacum officinale	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	Puccinellia nuttalliana	1
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: 8/14/2013 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	Cirsium vulgare	0
Elymus canadensis	2	Grindelia squarrosa	1
Hordeum jubatum	2	Lepidium perfoliatum	1
Poa pratensis	4	Puccinellia nuttalliana	1
Sonchus arvensis	0	Taraxacum officinale	1

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

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

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

Species	Cover class	Species	Cover class
Bromus tectorum	1	Chenopodium album	2
Cirsium vulgare	0	Elymus canadensis	2
Grindelia squarrosa	0	Hordeum jubatum	1
Lactuca serriola	0	Lepidium perfoliatum	1

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

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

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus tectorum	3
Chenopodium album	4	Elymus canadensis	2
Lepidium perfoliatum	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
Eastern Kingbird	1	L	UP, WM
Great Blue Heron	1		OW, WM
Mourning Dove	2	FO	UP
Red-winged Blackbird	4	FO	UP, WM
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
Coyote		No	Yes	No	
Muskrat		No	No	Yes	

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
1208	46.261635	-106.937218	190	T-1, start
1209-12	46.261292	-106.937012	180	PP-1
1213-16	46.261398	-106.937569	140	PP-2
1217	46.260059	-106.937912	10	T-1, end
1218-22	46.260349	-106.936935	315	PP-4
1223-27	46.260593	-106.937988	45	PP-3
1229	46.26128	-106.93734	280	T-1w
1230	46.260921666	-106.93751833	0	T-1u

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: Treasure Co. Line City/County: Rosebud Co. Sampling Date: 8/14/2013

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

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 F Lat: 46.2609216666667 Long: -106.937518333333 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 ☑

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: DP on upland island.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Elymus canadensis	45	☑	FACU
2. Bromus tectorum	30	☑	UPL
3. Sonchus arvensis	10	☐	FAC
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	85 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0.00% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	45	x 4 =	
UPL species	30	x 5 =	150
Column Totals	85 (A)		360 (B)

Prevalence Index = B/A = 4.23529

Hydrophytic Vegetation Indicators:

☐ 1 - Rapid Test for Hydrophytic Vegetation

☐ 2 - Dominance Test is >50%

☐ 3 - Prevalence Index is ≤3.0[1]

☐ 4 - Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)

☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-3	10YR 2/2	100					Clay Loam	
3-10	10YR 3/2	100					Silty Clay	
10-15	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: Soil friable and non-hydric.

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: Upland island approx 2ft above seasonal high water elevation.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Treasure Co. Line City/County: Rosebud Co. Sampling Date: 8/14/2013

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 (%): _____

Subregion (LRR): LRR F Lat: 46.2611783333333 Long: -106.937335 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 ☐	**Is the Sampled Area within a Wetland?** Yes ☑ No ☐
Hydric Soil Present?	Yes ☑ No ☐	
Wetland Hydrology Present?	Yes ☑ No ☐	

Remarks: DP in excavated depression domanated by bulrush.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Schoenoplectus pungens	100	☑	OBL
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	100 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC−): 1 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100.00% (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

Hydrophytic Vegetation Indicators:

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

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

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
0-5	10YR 2/1	100					Clay	
5-13	10YR 3/1	95	D M	10YR	2/1	5		

[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): 6

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:

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 8/14/2013 **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

Purpose of Evaluation

- ☐ **Wetlands potentially affected by MDT project**
- ☐ **Mitigation Wetlands: pre-construction**
- ☑ **Mitigation Wetlands: post construction**
- ☐ **Other**

How assessed: Measured e.g. by GPS

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)

AA constructed a few years prior, 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**

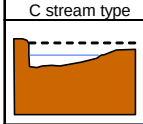
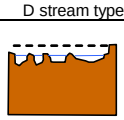
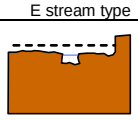
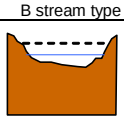
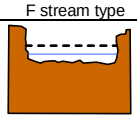
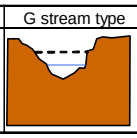
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

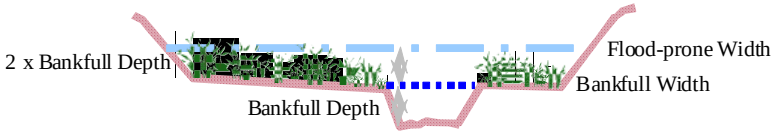
iii. Final Score and Rating: 0 NA **Comments:**

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** .4M

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	M	.7	1	1.05	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	H	.8	1	1.2	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	1.5	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0	☐
I. Production Export/Food Chain Support	M	.4	1	0.6	☐
J. Groundwater Discharge/Recharge	H	1	1	1.5	☑
K. Uniqueness	L	.3	1	0.45	☐
L. Recreation/Education Potential (bonus points)	H	.15	NA	0.225	☐
Totals:		4.95	8	7.425	
Percent of Possible Score			**61.88** %		

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 2 – *Panorama* **Location:** Southwest corner of southeast end
Bearing: 350 Degrees **Taken in 2013**



Photo Point 3 – *Panorama* **Location:** Northeast side (along road) near middle of site
Bearing: 230 Degrees **Taken in 2013**

Forsyth Northwest –West



Photo Point 4 – *Panorama*
Bearing: 210 Degrees
Location: Northeast corner of northwest end
Taken in 2013



Photo Point 5 – *Panorama*
Bearing: 45 Degrees
Location: Southwest side near middle of site
Taken in 2013



Transect 1 – *Start*
Bearing: 25 Degrees
Location: Southeast end
Taken in 2013



Transect 1 – *End*
Bearing: 205 Degrees
Location: Southeast end
Taken in 2013

Forsyth Northwest –West



Transect 2 – *Start*
Bearing: 25 Degrees
Location: Northwest end
Taken in 2013



Transect 2 – *End*
Bearing: 205 Degrees
Location: Northwest end
Taken in 2013



Transect 2 - *Panorama*
Bearing: 205 Degrees
Location: Transect 2 end
Taken in 2013



Data Point – We-1u
Bearing: 300 Degrees
Location: Veg community 1
Taken in 2013



Data Point – We-1w
Bearing: 220 Degrees
Location: Veg community 4
Taken in 2013

Forsyth Northwest –West



Data Point – We-2u
Bearing: 200 Degrees
Location: Veg community 2
Taken in 2013



Data Point – We-2w
Bearing: 300 Degrees
Location: Veg community 3
Taken in 2013

Forsyth Northwest –Middle



Photo Point 1 – *Photo 1*
Bearing: 300 Degrees
Location: Northwest end
Taken in 2013



Photo Point 2 – *Photo 1*
Bearing: 120 Degrees
Location: Southeast end
Taken in 2013





Transect 1 – *End*
Bearing: 25 Degrees
Location: Near middle of site
Taken in 2013



Transect 1 - *Panorama*
Bearing: 25 Degrees
Location: Transect 1 end
Taken in 2013

Forsyth Northwest –Middle



Data Point – M-1u
Bearing: 180 Degrees
Location: Veg community 1
Taken in 2013



Data Point – M-1w
Bearing: 180 Degrees
Location: Veg community 2
Taken in 2013



Photo Point 1 – *Photo 1* **Location:** Northwest end of site
Bearing: 125 Degrees **Taken in 2013**



Photo Point 2 – *Panorama* **Location:** Near center of site
Bearing: 210 Degrees **Taken in 2013**



Photo Point 3 – *Photo 1* **Location:** Southeast end of site
Bearing: 305 Degrees **Taken in 2013**



Transect 1 – *Beginning*
Bearing: 145 Degrees
Location: Northwest end
Taken in 2013



Transect 1 – *End*
Bearing: 325 Degrees
Location: Northwest end
Taken in 2013





Transect 2 – *End*
Bearing: 100 Degrees
Location: Southeast end
Taken in 2013



Data Point – E-1u
Bearing: 80 Degrees
Location: Veg community 1
Taken in 2013



Data Point – E-1w
Bearing: 200 Degrees
Location: Veg community 2
Taken in 2013

Forsyth Northwest – Treasure County Line



Photo Point 1 – *Panorama* **Location:** Northeast corner of wetland
Bearing: 180 Degrees **Taken in 2013**



Photo Point 2 – *Panorama* **Location:** Northwest corner of wetland
Bearing: 140 Degrees **Taken in 2013**



Photo Point 3 – *Panorama* **Location:** Southwest corner of wetland
Bearing: 45 Degrees **Taken in 2013**

Forsyth Northwest – Treasure County Line



Photo Point 4 – *Panorama*
Bearing: 315 Degrees
Location: Southeast corner of wetland
Taken in 2013





Transect 1 – *End*
Bearing: 10 Degrees
Location: West half of wetland
Taken in 2013



Data Point – T-1u
Bearing: 0 Degrees
Location: Veg community 2
Taken in 2013

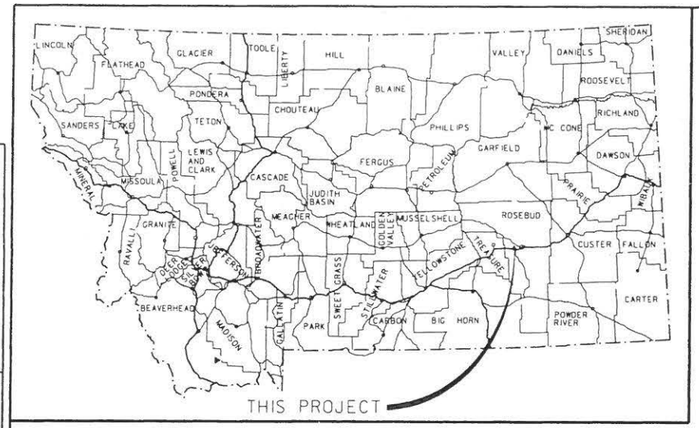


Data Point – T-1w
Bearing: 280 Degrees
Location: Veg community 3
Taken in 2013

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



MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPP 14-6(10)259

PMS OVERLAY, RECONSTRUCTION, PULVERIZATION

FORSYTH – NORTHWEST

ROSEBUD COUNTY

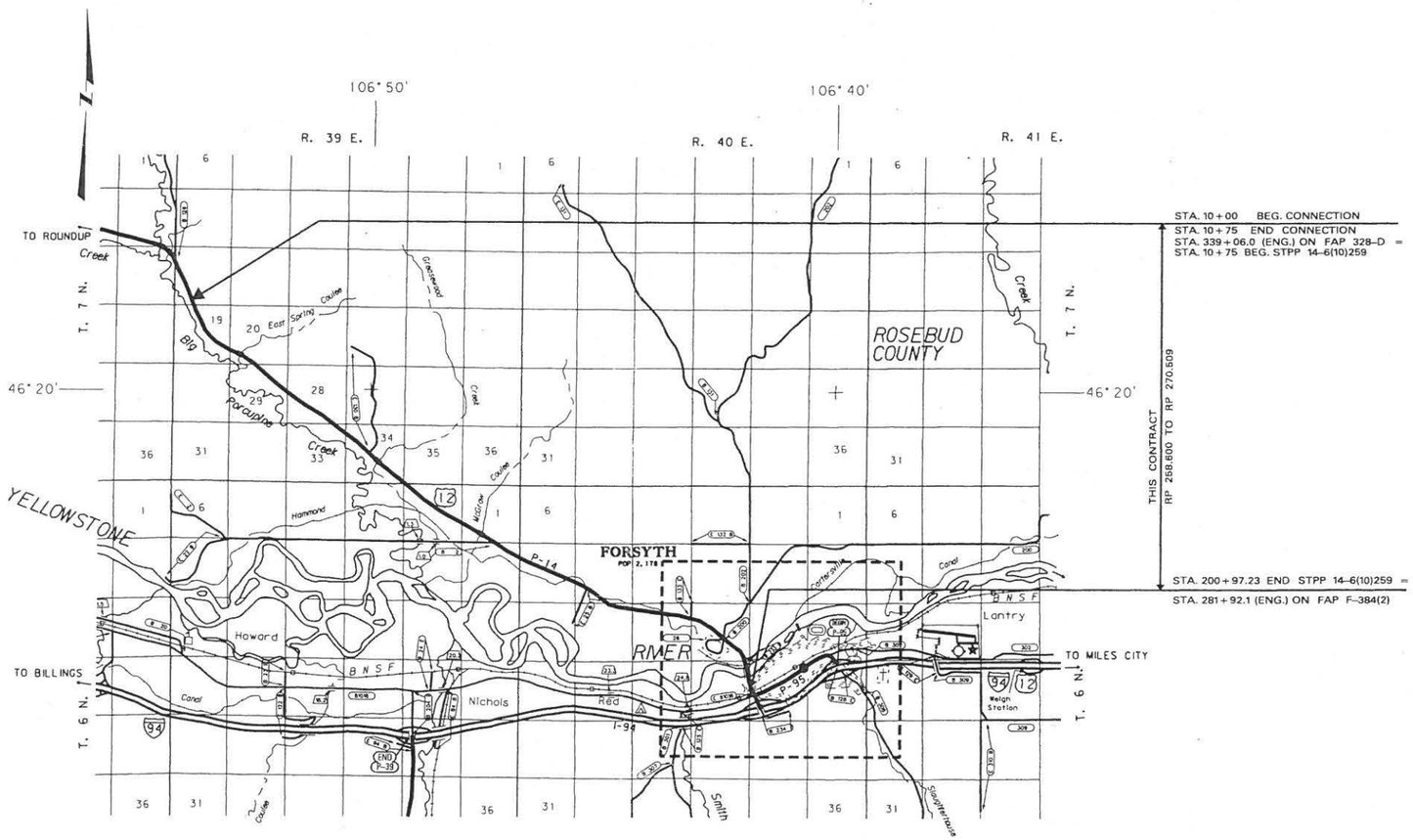
LENGTH 19.1 kilometers

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



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

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DESIGNED BY	
REVIEWED BY	
CHECKED BY	
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MONTANA DEPARTMENT OF TRANSPORTATION

APPROVED : OCTOBER 27, 2011

TIM REARDON
DIRECTOR OF TRANSPORTATION

BY _____
CONSULTANT DESIGN ENGINEER

MONTANA
TIMOTHY J CONWAY
10426PE
REGISTERED PROFESSIONAL ENGINEER

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

_____ _____
DIVISION ADMINISTRATOR DATE

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	2

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MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

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SUMMARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	11

MDT MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

TOPSOIL & SEEDING

STATION		cubic meters	hectares							REMARKS
		TOPSOIL SALVAGING & PLACING	SEED			FERTILIZER		CONDITION SEEDBED AREAS 1 & 3	MULCH AREA 2	
FROM	TO		NO. 1	NO. 2	NO. 3	NO. 1	NO. 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				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	SKEW ANGLE	REMOVE CULVERT mm x m	
		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	
	STEEL CASING SCH. 80	REMARKS
	100 mm	
12+07	57	MIN. 0.6 m COVER CAP ENDS
TOTAL	57	PLACE MARKER AT R/W LINE AT BOTH ENDS

WETLAND SITE

STATION		LUMP SUM	
		WETLAND MITIGATION SITE	REMARKS
FROM	TO		
30+00	36+00	0.6	RT. 4.2 ha
61+23	64+20	0.2	LT.
66+60	71+07	0.2	LT.
TOTAL		1.0	

DELTA ENGINEERING P.C. CONSULTING ENGINEERS

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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	26

CSF = 0.999347553

MONTANA DEPARTMENT OF TRANSPORTATION
MDT
MONTANA CADD

30 31 32 33 34 35 36 37

T.7 N. R.39 E.

SE 4 SW 4
SEC. 20
(BLM)

NW 4 NE 4
SEC. 29
(ANCHOR L. & C.)

NE 4 NW 4
SEC. 29
(ANCHOR L. & C.)

NORTH EDGE WETLAND = CONST. LIMIT LINE

SPRING COULEE DRAINAGE

EXIST. TIMBER BRIDGE

WATER RETENTION DIKE (SEE DETAILS)

PRIMARY ROUTE 12

S 52° 34' 56" E

FORSYTH

WETLAND CELL (4.20 ha)

WETLAND EASEMENT BOUNDARY

EX. EASE.

OUTLET CONTROL DIKE (SEE DETAILS)

TIMBER BRIDGE @ RR EMBANKMENT

A A' B B' C C' D D'

INFORMATIONAL QUANTITIES

4800 m³ UNC EXC
980 m³ EMBANKMENT
4.20 ha SEEDING - Area No. 1

WETLAND MITIGATION SITE

STA. 30+00 TO 36+00 RT.

SCALE 1:1000
0 50M 100M

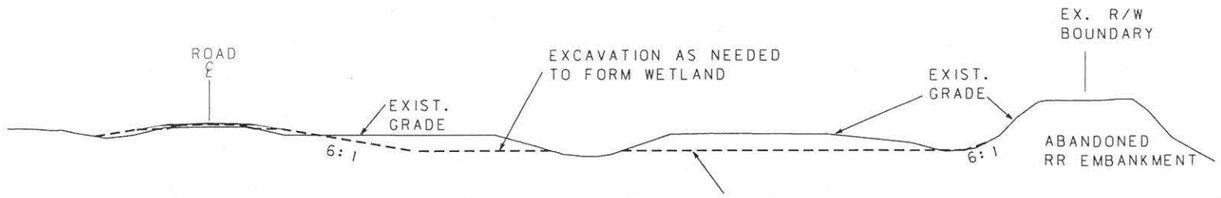
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	INITIALS	DATE
DESIGNER		
DRAWN		
APPROVED		
REVISED		

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	27

MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

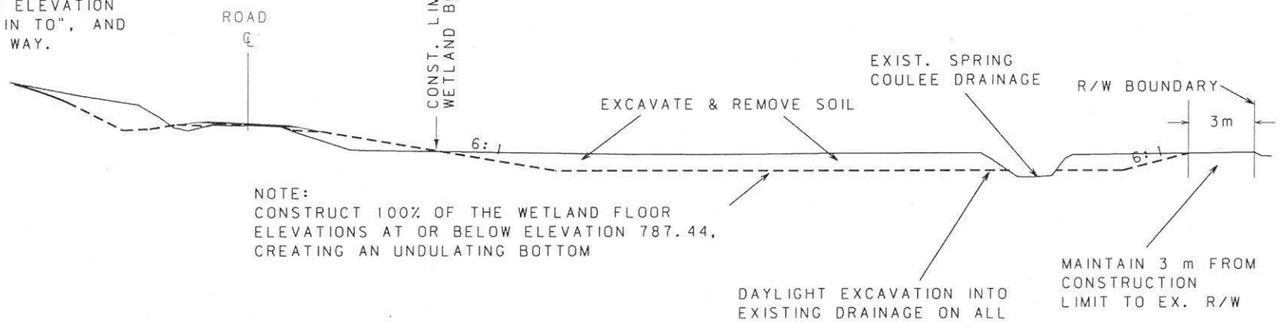


TYPICAL SECTION A-A'

NO SCALE

NOTE:
CONSTRUCT 100% OF THE WETLAND FLOOR ELEVATIONS AT OR BELOW ELEVATION 787.44, CREATING AN UNDULATING BOTTOM

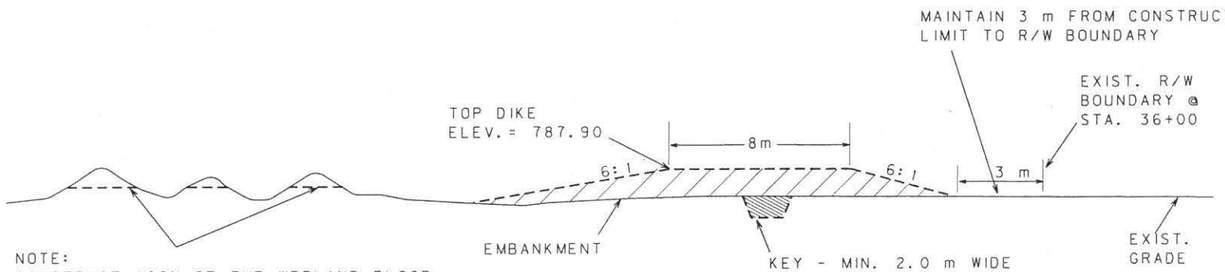
AREAS WITHIN THE CONSTRUCTION LIMITS THAT ARE ALREADY BELOW DESIGN ELEVATION 787.44 ARE TO BE "DAYLIGHTED IN TO", AND ARE NOT TO BE "FILLED" IN ANY WAY.



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



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.

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

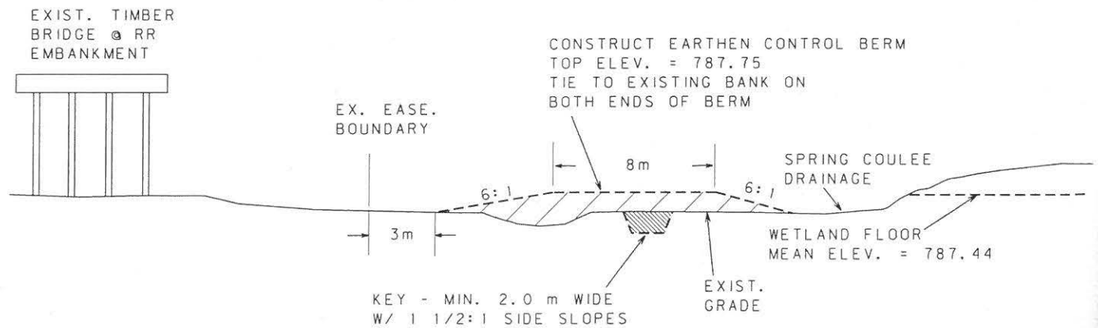
WATER RETENTION DIKE
TYPICAL SECTION C-C'

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.

TYPICAL SECTION B-B'

NO SCALE



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

		INITIALS	DATE
DESIGNER			
DRAWN			
APPROVED			
REVISED			

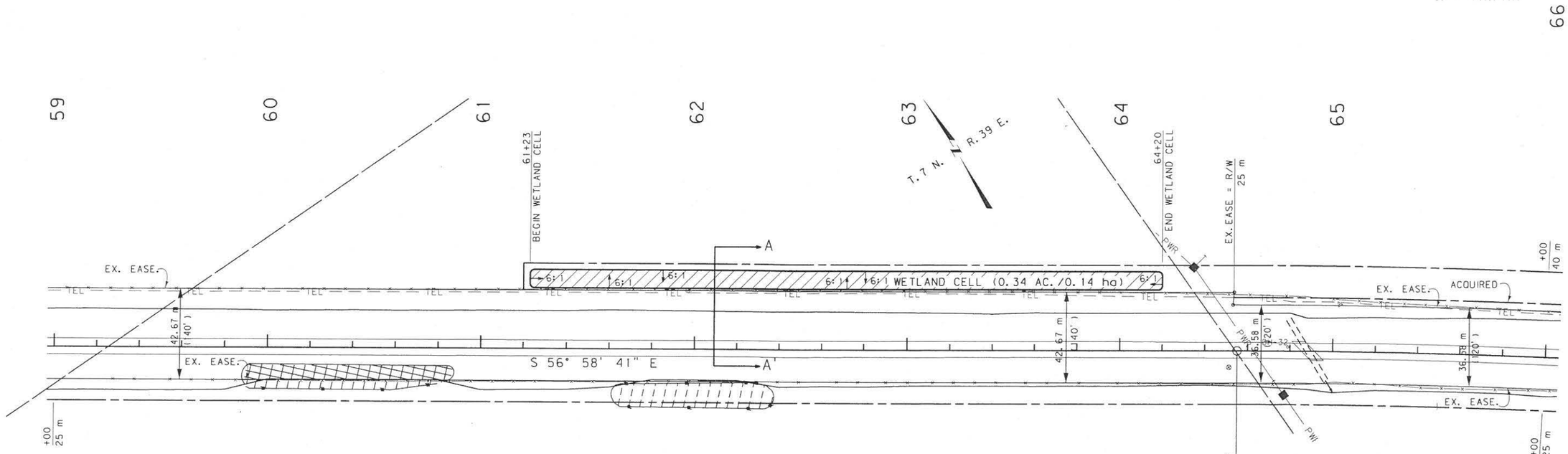
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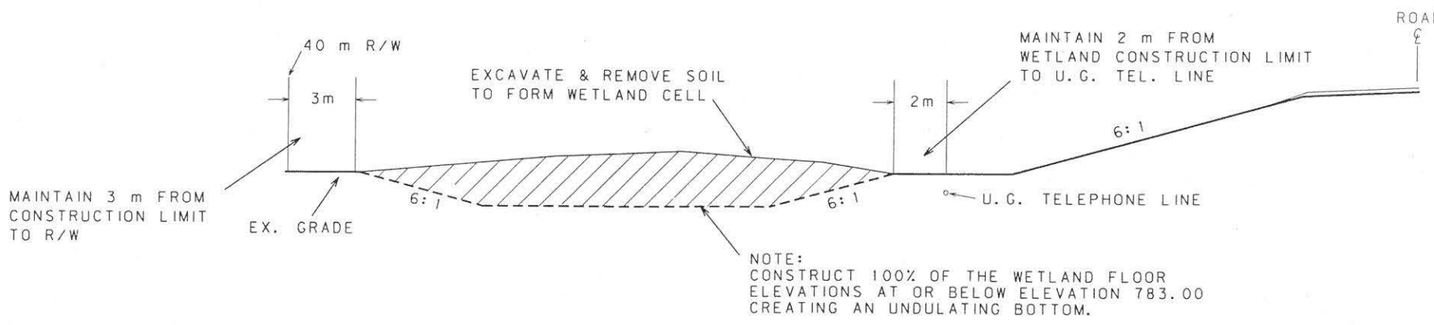
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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	28

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 m³ UNC EXC
0.14 ha SEEDING- AREA NO. 1

WETLAND MITIGATION SITE
STA. 61+23 TO 64+20 LT.

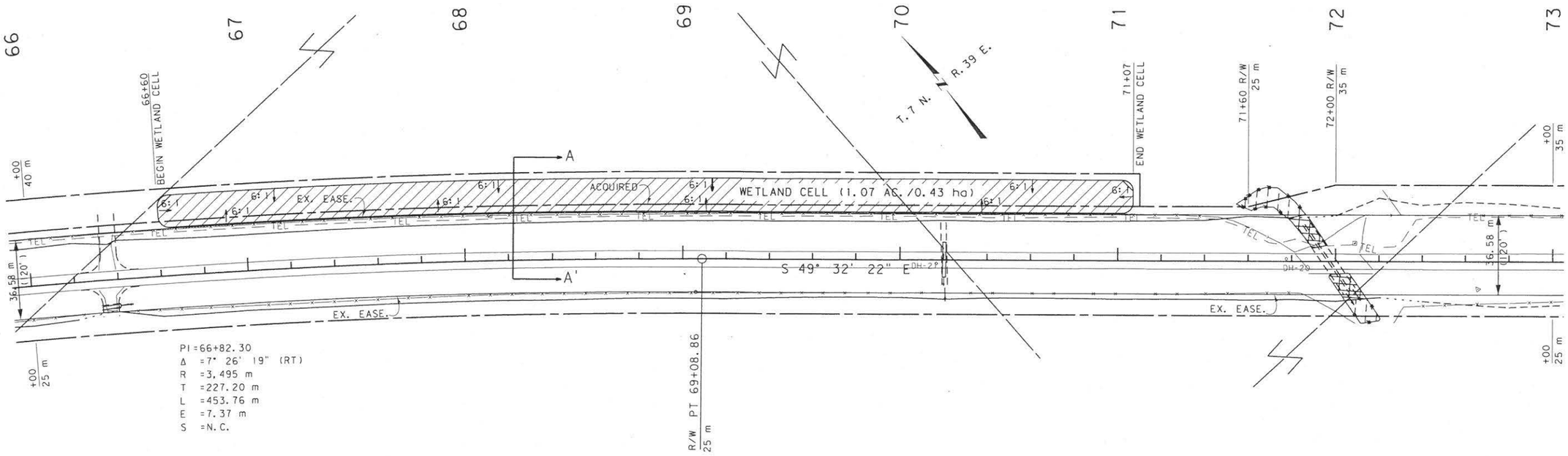
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0 50M 100M

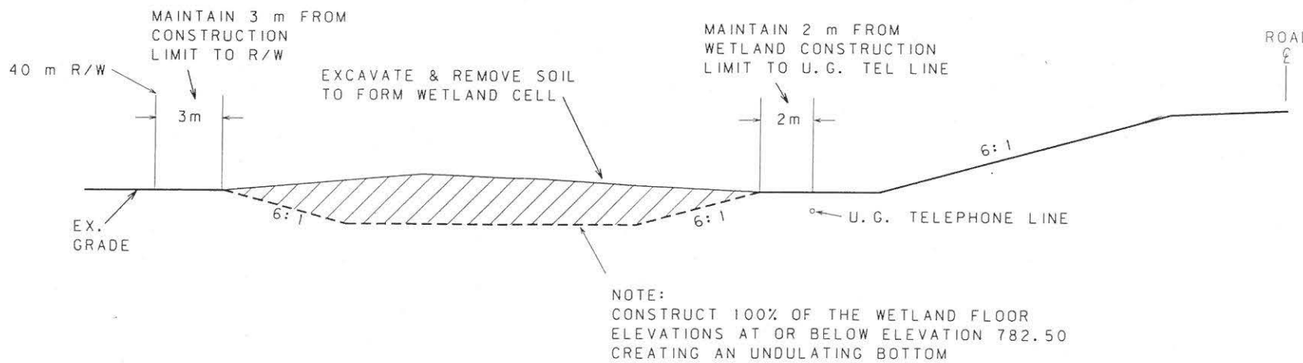
59-00 - 66-00

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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	29

CSF = 0.999347553





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

MONTANA DEPARTMENT OF TRANSPORTATION
MDT
MONTANA CADD

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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	32

CSF = 0.999347553

MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

24 25 26 27 28 29 30 31

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

T. 7 N.
R. 39 E.

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

21.34 m (70')

S 60° 59' 10" E

DH-27

DH-26

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

EX. EASE.

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

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

30+00
OUTLET DT. RT.
100m VC
+0.280%
+30
30+00.00
EL. 791.05

800 798 796 794 792 790 788 786 784 782 780

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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 14-6(10)259	38

CSF = 0.999347553

MONTANA DEPARTMENT OF TRANSPORTATION

MONTANA CADD

66 67 68 69 70 71 72 73

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.

71+10 R/W 40 m END WETLAND

71+60 R/W 25 m

72+00 R/W 35 m

+00 40 m

+00 35 m

ACQUIRED

EX. EASE.

TEL

B-9 BORE HOLE

DH-21

DH-20

S 49° 32' 22" E

36.58 m (120')

+00 25 m

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.

796 794 792 790 788 786 784 782 780 778 776

B-9
.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

60m VC

-0.022%

+0.016%

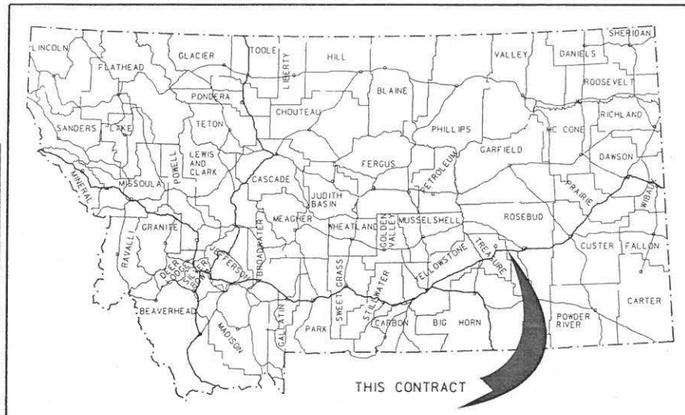
DH-21
.12 m ASPHALT PAVEMENT
.49 m AGGREGATE FILL
1.22 m SANDY CLAY
1.83 m TOTAL DEPTH OF BORING
+20

DH-20
.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
+97

72+20.00
EL. 785.49

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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

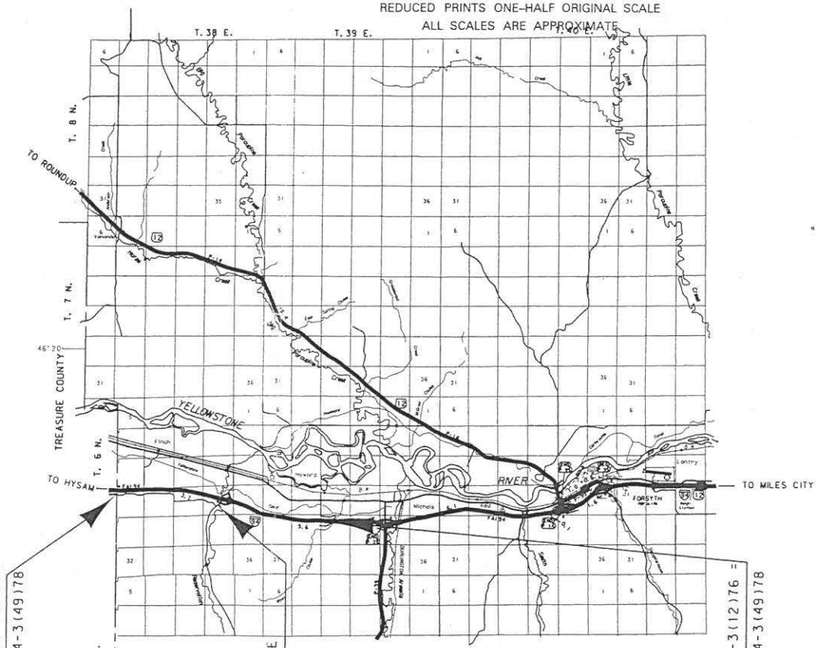
SCALES

VERTICAL: 1 :

HORIZONTAL: 1 :

CROSS SECTION - HORIZONTAL & VERTICAL: 1 :

REDUCED PRINTS ONE-HALF ORIGINAL SCALE
ALL SCALES ARE APPROXIMATE



SURFACING MATERIALS - CONTRACTOR FURNISHED

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	
P.E.	IM94-3(48)78

CONTROL NO. 3101

8-11-2000
DALE BOEHNING

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

MONTANA DEPARTMENT OF TRANSPORTATION
MDT
MONTANA CADD

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STATE	PROJECT NUMBER	SHEET NO.
MONTANA	IM 94-3(49)78	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		451	

* 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	meters BITUMINOUS CURB RIGHT	meters REMOVE BITUMINOUS CURB * LEFT	meters 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 DISPOSIAL

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	1.63 mm	meters CSP-75 x 25 mm	2.77 mm	meters SSPP-152 x 51 mm	2.82 mm	END SECTIONS		cubic meters CEMENT GROUT	C.T.S. GRAVEL GRADE 2A	CLASS "DD" CONCRETE	CULVERT RIPRAP	meters CLEAN CULVERT	REMOVE	COATING	IN PLACE mm X m	REMARKS
		600 mm		2700 mm		3.980 m	LEFT	RIGHT				CLASS I					
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			2:1STEP	2:1STEP	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 16.9 mm	MEDIAN CROSSOVER
503+38						74.0	2:1STEP	2:1STEP	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	~	~	531.74	130.2	6.2	0.0	281.3	15.2			

@ SEE STANDARD SPEC. 709.04 FIELD COAT

8-11-2000
DALE BOEHNING

MONTANA DEPARTMENT OF TRANSPORTATION
MDT
MONTANA CADD
3101SU2.ASB

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2/9/2012	REVIEWED BY
11:11:43 AM	CHECKED BY
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1	

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	IM 94-3(48)78	15

DETAIL

AS-BUILTS

MONTANA DEPARTMENT OF TRANSPORTATION

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 Sto 476+77.72 BK =
Sto 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

NEW FENCE

PT 476+77.08

POT 481+58.42

S 62° S

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

(2) 477+96
118.3 m RT.
EL. 797.35

(3) 477+76
78.3 m RT.
EL. 796.90

(4) 477+76
118.3 m RT.
EL. 797.35

(5) 478+38
60.9 m RT.
EL. 795.31

(6) 478+38
100.9 m RT.
EL. 796.25

(7) 478+18
60.9 m RT.
EL. 795.31

(8) 478+18
100.9 m RT.
EL. 796.25

(A) STA. 478+08
36.8 m RT.
EL 795.72

(B) STA. 477+96
39.8 m RT.
EL 797.50

(C) STA. 477+60
48 m RT.
EL797.66

(D) STA. 477+60
84.5 m RT.
EL 797.92

(E) STA. 477+60
119.8 m RT.
EL 798.27

(F) STA. 477+96
141.1 m RT.
EL 798.22

(G) STA. 478+08
140.0 m RT.
EL 798.46

(H) STA. 478+38
140.0 m RT.
EL 797.43

(I) STA. 478+54
140.5 m RT.
EL 796.41

(J) **STA. 478+91**
126.5 m RT.
EL 796.5 EXIST.

(K) STA. 478+54
126.8 m RT.
EL 796.08 EXIST.

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. B.E.

STA 481+80
END NEW FENCE EASTBOUND.
BEG. NEW FENCE UNDER STRUCTURE
TIE TO WESTBOUND FENCE.

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2/9/2012	REVIEWED BY		
11:09:50 AM	CHECKED BY		
N/A	u3288		

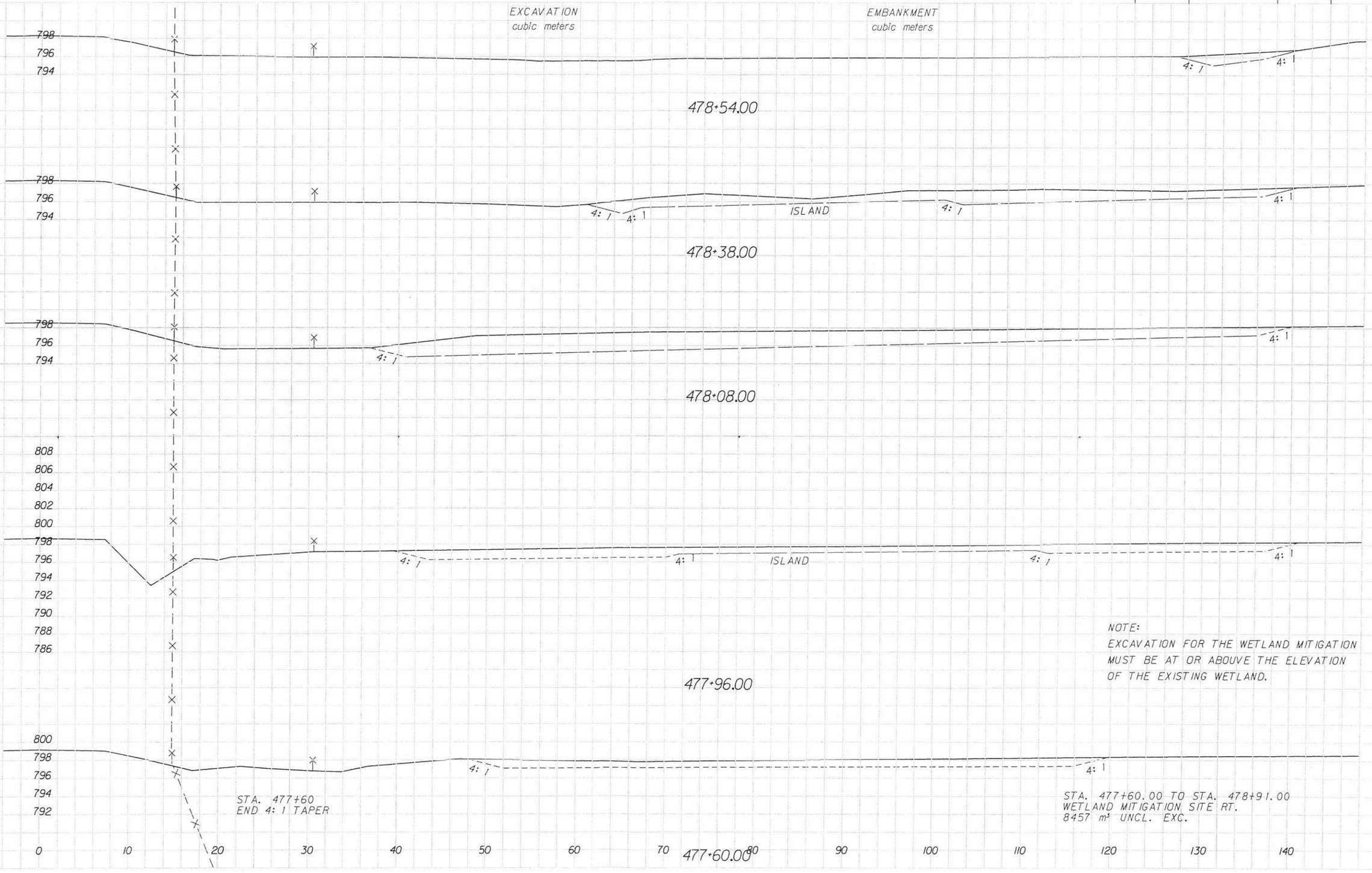
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STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(49)178	4

EXCAVATION
cubic meters

EMBANKMENT
cubic meters



NOTE:
EXCAVATION FOR THE WETLAND MITIGATION MUST BE AT OR ABOUVE THE ELEVATION OF THE EXISTING WETLAND.

STA. 477+60.00 TO STA. 478+91.00
WETLAND MITIGATION SITE RT.
8457 m³ UNCL. EXC.

STATE	PROJECT NO.	SHEET NO.
MONTANA	IM 94-3(49)178	5

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EXCAVATION
cubic meters

EMBANKMENT
cubic meters

STA. 481+00
END WETLAND EASEMENT AT R/W RT.

802
800
798

481+00
END 4:1 TAPER

480+93.00

802
800
798

480+47.00

804
802
800
798
796

480+40
BEG. 4:1 TAPER TO EXIST. FENCE LINE

480+19.00

798
796

479+65.00

798
796

479+27.00

798
796
794

1
4:1

0 10 20 30 40 50 60 70 478+91.00 80 90 100 110 120 130 140