MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2015

Rostad Ranch
Meagher County, Montana



Prepared for:

2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

PO Box 1133
Bozeman, MT 59771-1133

October 2015

MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND MITIGATION MONITORING REPORT:

YEAR 2015

Rostad Ranch
Meagher County, Montana
Constructed: 2012

MDT Project Number STPX-0002 (749)
Control Number 5565

USACE: NWO-2006-90851-MTB

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

October 2015

CCI Project No: MDT.006

"MDT attempts to provide accommodations for any known disability that may interfere with a person participating in any service, program, or activity of the Department of Transportation. Alternative accessible formats of this information will be provided upon request. For further information, call 406-444-7228, TTY at 800-335-7592, or Montana Relay at 711."

TABLE OF CONTENTS

1. INTRODUCTION....1

2. METHODS....6

2.1. Hydrology....6
2.2. Vegetation....6
2.3. Soil....7
2.4. Wetland Delineation....7
2.5. Wildlife....8
2.6. Functional Assessment....8
2.7. Photo Documentation....8
2.8. GPS Data....9
2.9. Maintenance Needs....9

3. RESULTS....9

3.1. Hydrology....9
3.2. Vegetation....10
3.3. Soil....19
3.4. Wetland Delineation....20
3.5. Wildlife....20
3.6. Functional Assessment....21
3.7. Photo Documentation....23
3.8. Maintenance Needs....23
3.9. Current Credit Summary....23

4. REFERENCES....26

TABLES

Table 1. Wetland Credit Determination for the Rostad Ranch Wetland Mitigation Site. 3
Table 2. Vegetation species observed from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 12
Table 3. Data summary for Transect T-1 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site..... 14
Table 4. Data summary for Transect T-2 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site..... 15
Table 5. Data summary for Transect T-3 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site..... 17
Table 6. Total wetland acres delineated in 2013, 2014, and 2015 at the Rostad Ranch Wetland Mitigation Site..... 20
Table 7. Wildlife species observed from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 21
Table 8. Functions and Values of the Rostad Ranch Wetland Mitigation Site from 2004, and 2013 to 2015. 22
Table 9. Summary of wetland credits at the Rostad Ranch Wetland Mitigation Site from 2013 to 2015. 24
Table 10. Summary of performance standards and success criteria. 25

CHARTS

Chart 1. Transect maps showing community types on Transect T-1 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 14
Chart 2. Length of habitat types within Transect T-1 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 15
Chart 3. Transect maps showing community types on Transect T-2 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 16
Chart 4. Length of habitat types within Transect T-2 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 16
Chart 5. Transect maps showing community types on Transect T-3 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 18
Chart 6. Length of habitat types within Transect T-3 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site. 18

FIGURES

Figure 1. Project location of Rostad Ranch wetland mitigation site..... 2
Figure 2. 2015 Monitoring Activity Locations……Appendix A
Figure 3. 2015 Mapped Site Features……Appendix A

APPENDICES

Appendix A Project Area Maps – Figures 2 and 3
Appendix B 2015 MDT Wetland Mitigation Site Monitoring Form
2015 USACE Wetland Determination Data Forms
2015 MDT Montana Wetland Assessment Method Forms
Appendix C Project Area Photographs
Appendix D Project Plan Sheet

Cover: View of hydrophytic vegetation development along the inundated man-made northern impoundment at the Rostad Ranch wetland mitigation site.

1. INTRODUCTION

The Rostad Ranch 2015 Wetland Mitigation Monitoring Report presents the results of the third year of post-construction monitoring at the Rostad Ranch wetland mitigation site. The Montana Department of Transportation (MDT) Rostad Ranch wetland mitigation project is located in the southwest quarter of Section 12 and the northwest quarter of Section 13, Township 8 North, Range 11 East, Meagher County, Montana. The property is located approximately 0.6 miles northeast of Martinsdale, Montana (Figure 1). The wetland site was constructed to provide MDT with an estimated 39.70 acres of wetland mitigation credits on a private ranch that had been historically used for grazing cattle and hay production.

The entire 60-acre mitigation site is protected long-term by a MDT Wetland Conservation Easement agreement with the landowner. A fence installed along the boundaries of the MDT Conservation Easement demarcates the site.

Figures 2 and 3 in Appendix A show the site Monitoring Activity Locations and Mapped Site Features, respectively. Appendix B contains the MDT Wetland Mitigation Site Monitoring Forms, the US Army Corps of Engineers (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. Project area photographs are included in Appendix C and the Project Plan Sheet is included in Appendix D.

The wetland mitigation site is located within Watershed 10 – Musselshell River Basin. Wetlands were developed at this location to provide compensatory mitigation for wetland impacts associated with future transportation projects in the Musselshell River Basin. The Rostad Ranch site was selected based on site evaluations and project feasibility assessments initiated by MDT in 2002.

The project objectives include:

- Provide 39.70 acres of wetland mitigation credits resulting from restoration, creation, rehabilitation, and preservation within the site.
- Establish three types of wetland vegetation communities including;
  1.) Palustrine, emergent, wet meadow
  2.) Palustrine, scrub/shrub
  3.) Emergent zones around the open water areas and the establishment of upland buffer around the perimeter of wetlands.

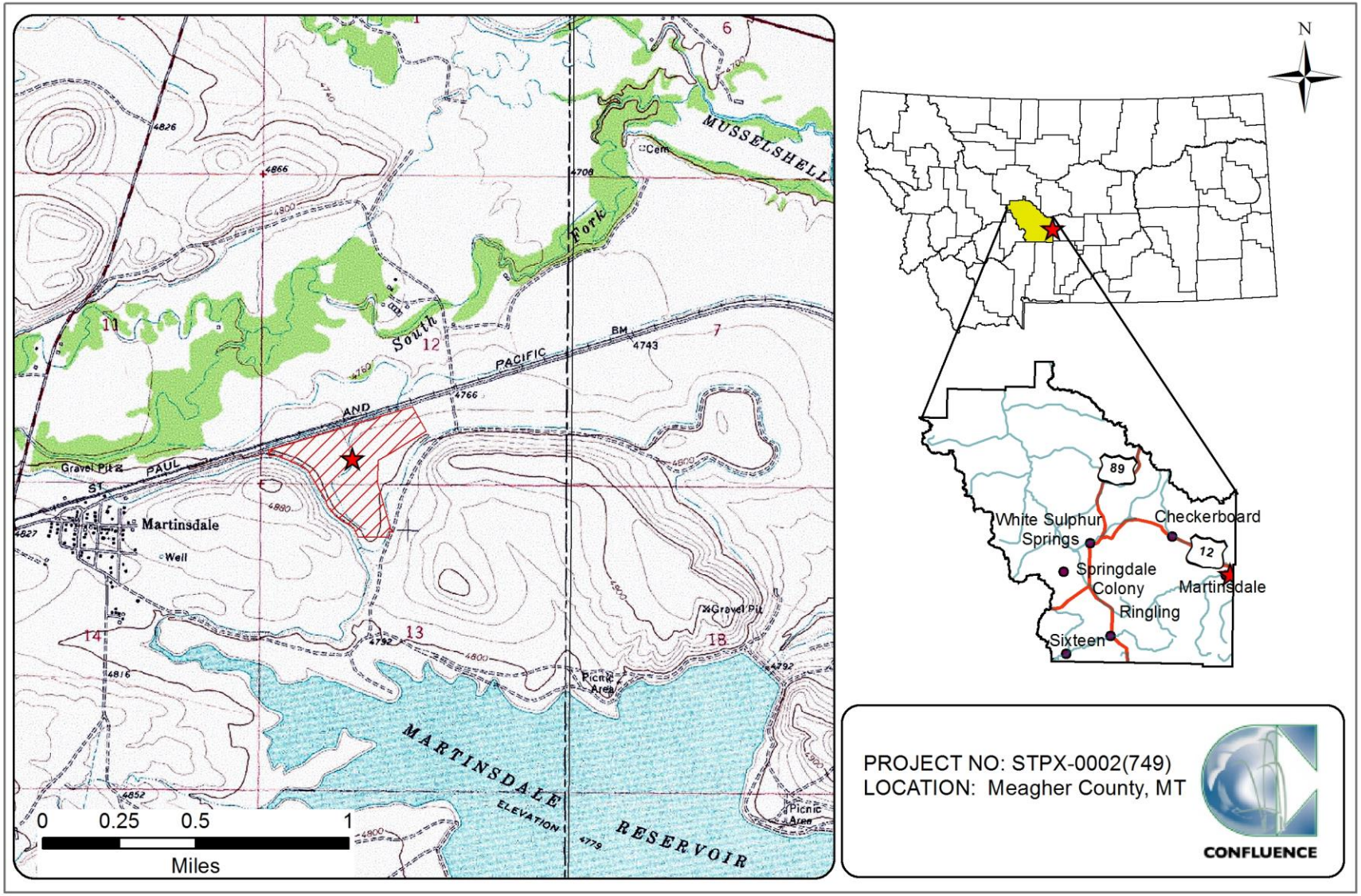


Figure 1. Project location of Rostad Ranch wetland mitigation site.

CONFLUENCE

The project credit ratios as presented in the Rostad Ranch Wetland Mitigation Plan approved by the USACE are shown in Table 1.

Table 1. Wetland Credit Determination for the Rostad Ranch Wetland Mitigation Site.

Compensatory Mitigation Type	Proposed Wetland Type (Cowardin)	Anticipated Mitigation Area (acres)	Approved Mitigation Ratios*	Anticipated Mitigation Credit (acres)
Restoration (Re-establishment)	Palustrine Emergent & Scrub/shrub	27.11	1:1	27.11
Creation (Establishment)	Palustrine Emergent & Scrub/shrub	9.84	1:1	9.84
Restoration (Rehabilitation)	Palustrine Emergent	2.63	1.5:1	1.75
Preservation	Palustrine, Scrub/shrub	0.25	4:1	0.06
Upland Buffer	N/A	6.76	5:1	1.35
Permanent Wetland Impact	N/A	N/A	1:1	-0.41
Totals	**Site Acreage**	**46.59**	**Credit Acreage**	**39.70**

*Mitigation credit ratios utilized were from the Montana Corps Regulatory Programs 2005 Wetland Credit Ratios (USACE 2005)

The USACE approved performance standards are listed below.

1. **Wetland Characteristics**: All restored, created, enhanced, and preserved wetlands within the project limits will meet the standard three criteria (hydrology, hydrophytic vegetation, and hydric soils) established for determining wetland areas as outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *2010 Regional Supplement to the USACE of Engineers Manual: Great Plains Region* (USACE 2010).

    a) **Wetland Hydrology Success** will be achieved where wetland hydrology is observed according to technical guidelines in the above-referenced documents. The USACE technical standard for monitoring wetland hydrology requires 14 or more consecutive days of flooding or ponding, or a water table 12 inches (30 centimeters) or less below the soils surface, during the growing season at a minimum frequency of 5 years in 10 (50 percent or higher probability).

    b) **Hydric Soil Success** will be achieved where hydric soil conditions are present [per the most recent Natural Resource Conservation

Service (NRCS) definitions for hydric soil] or appear to be forming, the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Soil sampling will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Wetland Manual. Since typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.

c) **Hydrophytic Vegetation Success** will be achieved where combined absolute cover of facultative or wetter species is greater than or equal to 70 percent and Montana State-listed noxious weeds do not exceed 5 percent absolute cover. The following concept of "dominance", as defined in the new Regional supplement to the 1987 US Army Corps of Engineers Wetland Delineation Manual for the Great Plains Region, will be applied during future routine wetland determinations in the created/restored wetlands: "*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines).*"

i. **Woody Plants** – Plantings will be considered successful where they exceed 50 percent survival after 5 years. We anticipate natural colonization of woody plant species from nearby sources after construction activities are complete. The rate and extent of natural woody plant colonization will be dependent on factors such as habitat availability, animal activity, seed sources, and other natural selection factors.

ii. **Herbaceous Plants** – At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation (wetland plants listed as OBL, FACW and FAC) will be at least 80 percent. A wetland seed mix was prepared for this site that included tufted hair grass (*Deschampsia caespitosa*), Northwest Territory sedge (*Carex utriculata*), Baltic rush (*Juncus balticus*), American slough grass (*Beckmannia syzigachne*), American manna grass (*Glyceria grandis*), and bluejoint reedgrass (*Calamagrostis canadensis*).

2. **Open Water Areas –** It is the intent of the project to provide seasonal open water in the wetland enhancement areas where excavation in the existing wetland and upland will be completed. Open water that is established within the designated open water areas will be considered

successful and creditable if it does not exceed 10 percent of the total wetland acreage (39.83 acres).

3. **Upland Buffer:** Success will be achieved when noxious weeds do not exceed 5 percent of cover within the buffer areas on site. Any area within the creditable buffer zone disturbed by project construction must have at least 50 percent aerial cover of desirable upland plant species by the end of the monitoring period.

4. **Weed Control:** Implementation of weed control will be based on annual monitoring of the site to determine the weed species present and degree of infestation within the site. Control measures, based on the monitoring results, will be implemented by MDT to minimize and/or eliminate infestations of state-listed noxious weed species within the site.

5. **Fencing:** Fencing for the proposed mitigation site has been installed along the perimeter of the easement boundary to protect the integrity of the wetland from disturbance that may be detrimental to the site. The installed fencing is designed to be wildlife-friendly, to allow for wildlife movement into and out of the wetland mitigation site.

Construction entailed filling of existing ditches, excavating and grading the site to distribute water across the mitigation site, and creating open water areas. The primary source of wetland hydrology for the site is groundwater. A groundwater seep located in the south portion of the site provides water to the site during high groundwater periods. Surface water from an irrigation ditch that runs along the south boundary of the site augments the site hydrology. A diversion structure was installed at the south end of the project to direct surface water onto the site to recharge groundwater.

Revegetation tasks included the use of a combination of wetland seed mixes, native tree/shrub plantings, and willow cuttings collected from a variety of native species found in the area. Mitigation habitat types developed on the site through the construction process include: restored open water; created, restored, and enhanced wetland areas; and upland buffer areas. Specific revegetation tasks were developed for each habitat type.

Monitoring of the MDT wetland mitigation site will be completed according to MDT's Standard Monitoring Protocol utilized for all MDT wetland mitigation sites since 1998. Monitoring will be implemented for a minimum of 5 years or longer as determined by the USACE – Montana Regulatory Office's review of the annual monitoring reports for the site. The USACE will make the final decision as to whether the site has met wetland success criteria.

2. METHODS

The first year of monitoring at the Rostad Ranch wetland mitigation site was completed on August 21, 2013. During this visit, MDT and Confluence personnel established permanent photo points and vegetation transects within the site. The third year of monitoring was completed on June 23, 2015. Information for the Mitigation Monitoring Form and Wetland Determination Data Form was collected during the field investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) as shown on Figure 2 (Appendix A). Information collected included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird and wildlife use documentation, photographic documentation, 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 Determination Data Form was assessed at four data points established within the project area. The hydrologic indicators were evaluated according to features observed during the site visit. The data were recorded on the electronic Wetland Determination Data Form (Appendix B). Hydrologic assessments allow evaluation of mitigation criteria addressing inundation/saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season) during the growing season" (USACE 2010). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are classified as 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 28.5 degrees Fahrenheit (Environmental Laboratory 1987). Temperature data recorded for the meteorological station at the Martinsdale 3NNW, Montana (245387) weather station, located approximately 1 mile from the wetland mitigation site, have a median (5 years in 10) growing season length of 119 days. Areas defined as wetlands would require 15 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 the dominant vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2015 aerial photograph. Percent cover of dominant species within a community type was visually estimated and recorded using the following classes: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to10 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 dominant vegetation species that characterized each mapped polygon (Figure 3, Appendix A).

Temporal changes in vegetation will be evaluated through annual assessments of static belt transects established in August 2013 (Figure 2, Appendix A). Vegetation composition was assessed and recorded along three vegetation belt transects (T-1, T-2, and T-3) approximately 10 feet wide and 422, 453, and 320 feet long, respectively (Figure 2, Appendix A).

The transect locations were recorded with a resource-grade GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the vegetation community composition (Figure 3, Appendix B). Photographs were taken at the start and end points of each transect during the monitoring event (Appendix C).

The survival of woody species planted onsite was recorded during each monitoring event. The Montana State Noxious Weed List (July 2015), 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 and mapped on the aerial photograph (Figure 3, Appendix A). The noxious weed species identified are color-coded and denoted with the symbol “x”, “▲”, or “■” on Figure 3, representing 0 to 0.1 acre, .1 to 1 acre, or greater than 1 acre in extent, respectively. The letters T, L, M, or H represent the cover classes on Figure 3, standing for less than 1 percent, 1 to 5 percent, 6 to 25 percent, and 26 to 100 percent, respectively.

2.3. Soil

Soil information was obtained from the *Soil Survey for Meagher County Area* (SSURGO 2012) and *in situ* soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Manual and the 2010 Regional Supplement. A description of the soil profile, including hydric soil indicators when present, was recorded on the Wetland Determination Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the U.S. including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Manual and the 2010 Great Plains Regional Supplement (USACE 2010). The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 2010 Regional Supplement must be satisfied to delineate a representative area as jurisdictional. The name and indicator status of plant species was derived from the 2014 National Wetland Plant List (NWPL) (Lichvar *et al*. 2014). A Routine Level-2 on-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas within

the project boundaries. The information was recorded electronically on the Wetland Determination Data Form (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross-referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area, or special aquatic site, i.e., mudflat. The wetland boundary was GPS-surveyed as shown on the 2015 aerial photograph (Figure 3). Wetland areas were calculated from these GPS boundary data using geographic information system (GIS) methods.

2.5. Wildlife

Observations of mammal, reptile, amphibian, and bird use were recorded on the Mitigation Monitoring form during the site visit. Indirect use indicators including tracks, scat, burrows, eggshells, skins, and bones were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods such as snap traps, live traps, and pitfall traps, were not used. A comprehensive species list of wildlife observed during the annual monitoring periods has been compiled and is presented in the results section.

2.6. Functional Assessment

The 1999 MDT Montana Wetland Assessment Method (MWAM) (Berglund 1999) was used to evaluate the functions and values of the 3.4 acres of existing wetlands identified on the site in 2004. The 2008 MDT MWAM (Berglund and McEldowney 2008) was used to evaluate functions and values of wetlands delineated on the site from 2013 to 2015. 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. The Wetland Assessment Form was completed for one assessment area (AA) that included both created and existing wetlands within the 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 area during the site visit (Appendix C). Photo point locations were recorded with a resource-grade GPS unit (Figure 2, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource-grade Thales Pro Mark III GPS unit during the 2015 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, imported into GIS, and presented in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with a GPS included wetland boundaries, fence boundaries, photograph points, transect start and end points, and wetland/upland data points.

2.9. Maintenance Needs

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

3. RESULTS

3.1. Hydrology

Climate data from the meteorological station at the Martinsdale 3 NNW, Montana (245387), weather station recorded an average annual precipitation rate of 13.61 inches from January 1893 to July 2012 (Western Region Climate Center [WRCC] 2013). The historic precipitation average for the time period of January to August (1893 through 2012) was 10.55 inches. This station, however, was missing precipitation data for the latter part of 2011 through 2014. The Lennep 6 WSW weather station is located near the site (approximately 11 miles southwest) with a period of record extending from August 1959 through August 2015. Based on data recorded from the Lennep Station for the January through August time period, precipitation totals for this region were 12.56 inches (long-term average), 16.32 inches (2011), 9.42 inches (2012), 12.3 inches (2013), 14.27 inches (2014), and 11.77 inches (2015). The data following construction indicate below average precipitation in 2012 and 2015, near average precipitation in 2013, and above average precipitation in 2014.

The hydrology for the wetland mitigation site is supplied from multiple sources, including a shallow seasonal groundwater table, groundwater emerging from a natural spring located near the narrow-leaf willow (*Salix exigua*) stand in south portion of the site, direct precipitation, and surface runoff. Construction included excavating and grading to fill drainage ditches, distributing water across the mitigation site, creating open water areas, and installing a diversion structure in the south end of the site to direct irrigation water to the mitigation site. The MDT has secured water rights to use surface water as a secondary source of hydrology to supplement the groundwater and ensure long-term viability of the wetland mitigation site.

During the 2015 field survey, approximately 45 percent of the wetland area was inundated, including one wetland depression impounded by a constructed dike in

the north half of the site, and one excavated depression located in the south half of the site. Although the irrigation structure was not flowing at the time of the site visit, recent evidence of use was observed (saturated soil and flow lines) within the constructed channel immediately downstream from the diversion. Water depths ranged from 0.25 to 3.5 feet and averaged 0.5 feet. Water depth at the edge of the open water boundary was 0.5 feet. Vegetation around the perimeter of the open boundary increased since the 2014 monitoring event. Areas not inundated exhibited seasonal soil saturation to the ground surface. The groundwater level in monitoring well MW-1, located along the constructed dike, was greater than 6 feet below the ground surface (bgs) during the 2015 survey (Figure 2, Appendix A). Other evidence of wetland hydrology observed on the site in 2015 included drainage patterns, soil saturation, high water table, oxidized rhizospheres on living roots, geomorphic position, water marks, drift deposits, and a positive FAC-neutral test.

Four data points were sampled to determine the upland and wetland boundaries (Wetland Determination Data Forms, Appendix B). Data points R1-w and R2-w were located near the center of the site in areas that met the wetland criteria. Wetland hydrology indicators at R1-w, located near the edge of a created wetland cell, included drainage patterns and a positive FAC-neutral test. Data point R-2w was located in a newly delineated wetland swale, and included the following wetland hydrology indicators: a high water table within 2 inches of the soil surface, saturation to the ground surface, oxidized rhizospheres on living roots, drainage patterns, and a positive FAC-neutral test. No primary or secondary indicators of wetland hydrology were observed at R1-u or R2-u, located upslope of the wetland data points in upland community Type 1.

3.2. Vegetation

Sixty-five plant species were identified on the site from 2013 through 2015 (Table 2). Vegetation plant communities were identified by plant composition and dominance. Five vegetation community types were identified in 2015, including upland Type 1 – *Phleum pratense/Trifolium* spp., wetland Type 2 – *Juncus balticus/Carex nebrascensis*, wetland Type 3 – *Salix exigua*, wetland Type 5 – *Glyceria grandis/Typha latifolia*, and wetland Type 6 – Open Water/Aquatic Macrophytes. The community composition is provided in full detail on the Monitoring Form in Appendix B and the community boundaries are shown on Figure 3 in Appendix A. These community types are discussed below.

Upland community Type 1 – *Phleum pratense/Trifolium* spp. was identified on approximately 45.1 acres across a majority of the site. This community decreased by 0.5 acres since 2014 due to a shift in species composition and their associated cover classes, resulting in the expansion of wetland community Type 2 – *Juncus balticus/Carex nebrascensis*. The community generally represented undisturbed uplands historically used for hay and cattle production and areas where spoils from excavation activities were deposited. Forty-two species were identified within the community. Dominant species included common timothy (*Phleum pratense*) and white clover (*Trifolium repens*), with

lesser percent coverage of smooth brome (*Bromus inermis*), creeping wild rye (*Elymus repens*), meadow false rye grass (*Schedonorus pratensis*), spotted knapweed (*Centaurea stoebe*), red clover (*Trifolium pratense*), and yellow sweet-clover (*Melilotus officinalis*).

Wetland community Type 2 – *Juncus balticus/Carex nebrascensis* characterized a majority of the wetland areas delineated from 2013 to 2015. The community was mapped across 11.7 acres within the creation, re-establishment, and rehabilitation areas of the mitigation site, an increase of 0.5 acres since 2014. Thirty-five species were identified within the community. Baltic rush (*Juncus balticus*), Nebraska sedge (*Carex nebrascensis*), and American slough grass (*Beckmannia syzigachne*) were dominant components of this community. Other species included fox-tail barley (*Hordeum jubatum*), tufted hair grass (*Deschampsia caespitosa*), reed canary grass (*Phalaris arundinacea*), common spike-rush (*Eleocharis palustris*), and narrow-leaf willow (*Salix exigua*).

Wetland community Type 3 – *Salix exigua* was identified within the 0.31-acre pre-existing wetland area in the south end of the site that remained undisturbed during 2012 construction. Narrow-leaf willow dominated the area. Numerous willow cuttings were installed around this community, which exhibited an approximate 75 percent survival during the 2015 field survey. This community is expected to expand over time, as indicated by the willow saplings/cuttings noted around the margins of the community. Fowl bluegrass (*Poa palustris*), tufted hair grass, Nebraska sedge, Northwest Territory sedge (*Carex utriculata*), field meadow-foxtail (*Alopecurus pratensis*), American slough grass, black bentgrass (*Agrostis gigantea*), broad-leaf cat-tail (*Typha latifolia*), common spike-rush, and neckweed (*Veronica peregrina*) were also identified within the community.

Wetland community Type 5 – *Glyceria grandis/Typha latifolia* was observed at the edge of an excavated cell located in the south half of the site. The 0.03-acre community was dominated by emergent species including American manna grass, broad-leaf cat-tail, common spike-rush, and American slough grass.

Wetland community Type 6 – Open Water/Aquatic Macrophytes was identified on 2.85 acres and included two inundated areas, one impounded by a constructed dike in the north half of the site, and the second an excavated depression located in the south half of the site. This community replaced open water Type 4 due to a decrease in the open water component and an increase in wetland vegetation cover during the 2015 survey. Emergent and submergent species are expected to continue to establish in subsequent monitoring years. Twelve species were observed within the community, including common spike-rush, broad-leaf cat-tail, American slough grass, American manna grass (*Glyceria grandis*), and Great Basin calico flower (*Downingia laeta*). A trace amount of green algae (a protist) was present in the open water. While open water accounted for greater than 50 percent of this wetland community during the 2015 survey, it had retracted considerably since the 2013 and 2014 field surveys.

Table 2. Vegetation species observed from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Scientific Names	Common Names	GP Indicator Status[1]
Achillea millefolium	Common Yarrow	FACU
Agrostis gigantea	Black Bent	FACW
Algae, green	Algae, green	NL
Alopecurus pratensis	Field Meadow-Foxtail	FACW
Amaranthus retroflexus	Red-Root	FACU
Ambrosia acanthicarpa	Flat-spine Ragweed	NL
Aster sp.	Aster	NL
Bassia scoparia	Mexican-Fireweed	FACU
Beckmannia syzigachne	American Slough Grass	OBL
Berteroa incana	Hoary False-alyssum	NL
Brassica kaber	Brassica kaber	NL
Bromus arvensis	Field Brome	FACU
Bromus carinatus	California Brome	NL
Bromus inermis	Smooth Brome	UPL
Carex nebrascensis	Nebraska Sedge	OBL
Carex utriculata	Northwest Territory Sedge	OBL
Centaurea stoebe	Spotted Knapweed	NL
Chenopodium album	Lamb's-Quarters	FACU
Chenopodium sp.	Goosefoot	NL
Cirsium arvense	Canadian Thistle	FACU
Convolvulus arvensis	**Field Bindweed**	**NL**
Cynoglossum officinale	Gypsy-Flower	FACU
Cyrtorhyncha cymbalaria	Alkali Buttercup	OBL
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia sophia	Herb Sophia	NL
Downingia laeta	Great Basin Calico-Flower	NL
Eleocharis palustris	Common Spike-Rush	OBL
Elymus repens	Creeping Wild Rye	FACU
Elymus trachycaulus	Slender Wild Rye	FACU
Epilobium ciliatum	Fringed Willowherb	FACW
Glyceria grandis	American Manna Grass	OBL
Helianthus annuus	Common Sunflower	FACU
Hordeum jubatum	Fox-Tail Barley	FACW
Juncus articulatus	Joint-Leaf Rush	OBL
Juncus balticus	Baltic Rush	FACW
Juncus bufonius	Toad Rush	OBL

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

New species identified in 2015 are **bolded.**

Table 2. (Continued). Vegetation species observed from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Scientific Names	Common Names	GP Indicator Status[1]
Lactuca serriola	Prickly Lettuce	FAC
Lepidium densiflorum	Miner's Pepperwort	FAC
Medicago sativa	Alfalfa	UPL
Melilotus albus	White Sweetclover	NL
Melilotus officinalis	Yellow Sweet-Clover	FACU
Pascopyrum smithii	Western-Wheat Grass	FACU
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FACU
Poa palustris	Fowl Blue Grass	FACW
Poa pratensis	Kentucky Blue Grass	FACU
Polypogon monspeliensis	Annual Rabbit's-Foot Grass	FACW
Populus angustifolia	Narrow-Leaf Cottonwood	FACW
Populus balsamifera	Balsam Poplar	FACW
Populus tremuloides	Quaking Aspen	FAC
Potentilla gracilis	Graceful Cinquefoil	FAC
Rumex crispus	Curly Dock	FAC
Rumex occidentalis	Western Dock	OBL
Salix exigua	Narrow-Leaf Willow	FACW
Schedonorus pratensis	Meadow False Rye Grass	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Tanacetum vulgare	Common Tansy	FACU
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	NL
Trifolium arvense	Rabbit-foot Clover	NL
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FACU
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Veronica peregrina	Neckweed	FACW

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

New species identified in 2015 are **bolded.**

Vegetation cover was measured along three transects at the Rostad Ranch Mitigation Site in 2015 (Figure 2, Appendix A). The data recorded on Transect 1 (Monitoring Forms, Appendix B) are summarized in tabular and graphical formats in Table 3 and Charts 1 and 2, respectively. Photographs of the transect ends are provided on Page C-9 of Appendix C. Transect T-1 extends 422 feet from a corner of the easement area into the large wetland depression impounded by the constructed dike. The transect intercepted upland community Type 1, wetland community Type 2, and ended in wetland community Type 6. Nine hydrophytic

and 21 upland species were identified along the transect. Wetland community Type 2 – *Juncus balticus/Carex nebrascensis* comprised approximately 30 percent of the transect, while approximately 17 percent of the transect intercepted wetland community Type 6 – Open water/Aquatic Macrophytes.

Table 3. Data summary for Transect T-1 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**422**	**422**	**422**
Vegetation Community Transitions along Transect	4	3	3
Vegetation Communities along Transect	2	2	3
Hydrophytic Vegetation Communities along Transect	1	1	2
Total Vegetative Species	27	30	30
Total Hydrophytic Species	9	9	9
Total Upland Species	18	21	21
Estimated % Total Vegetative Cover	90	95	95
Estimated % Unvegetated	10	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	30.6	30.3	47.2
% Transect Length Comprising Upland Vegetation Communities	56.9	52.8	52.8
% Transect Length Comprising Unvegetated Open Water	12.6	16.8	0
% Transect Length Comprising Mudflat	0	0	0

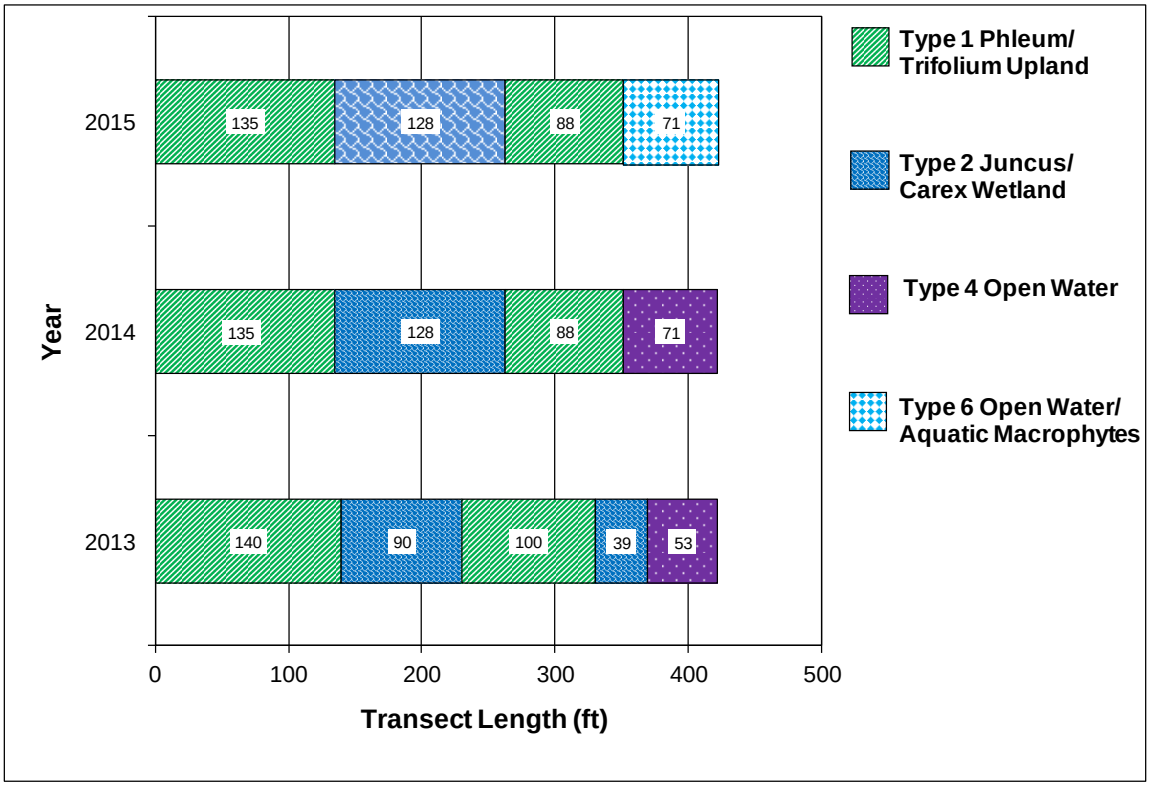


Chart 1. Transect maps showing community types on Transect T-1 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

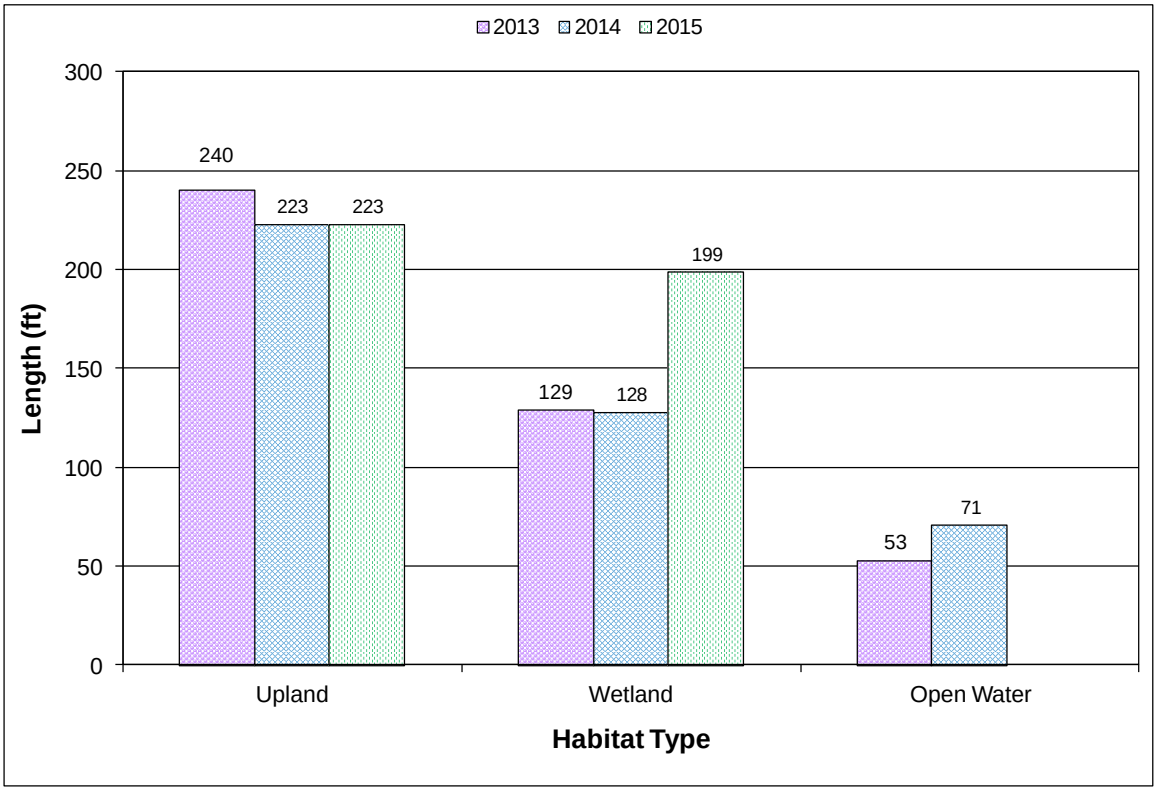


Chart 2. Length of habitat types within Transect T-1 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Data collected on Transect T-2 (Monitoring Form, Appendix B) are summarized in tabular and graphic formats in Table 4 and Charts 3 and 4, respectively. Photographs at the transect endpoints are provided on Page C-10 of Appendix C. This transect began at a mature narrow-leaf cottonwood (*Populus angustifolia*) tree near the entrance of the site and extended 453 feet, alternating between upland community Type 1 and wetland community Type 2. Seven hydrophytic and 20 upland species were identified along the transect. Hydrophytic vegetation comprised 55.2 percent of T-2 in 2014 and 2015.

Table 4. Data summary for Transect T-2 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Monitoring Year	**2013**	**2014**	**2015**
Transect Length (feet)	**453**	**453**	**453**
Vegetation Community Transitions along Transect	4	4	4
Vegetation Communities along Transect	2	2	2
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	26	27	27
Total Hydrophytic Species	8	7	7
Total Upland Species	18	20	20
Estimated % Total Vegetative Cover	90	95	95
Estimated % Unvegetated	10	5	5
% Transect Length Comprising Hydrophytic Vegetation Communities	44.6	55.2	55.2
% Transect Length Comprising Upland Vegetation Communities	55.4	44.8	44.8
% Transect Length Comprising Unvegetated Open Water	0	0	0
% Transect Length Comprising Mudflat	0	0	0

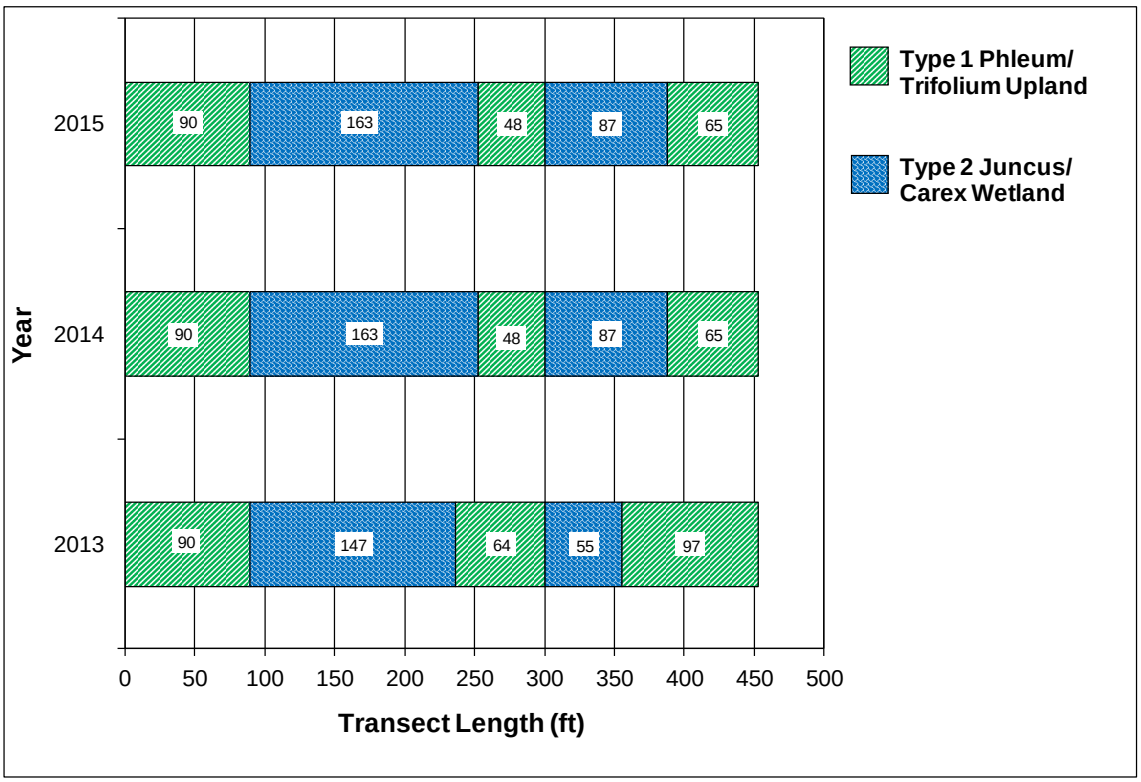


Chart 3. Transect maps showing community types on Transect T-2 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

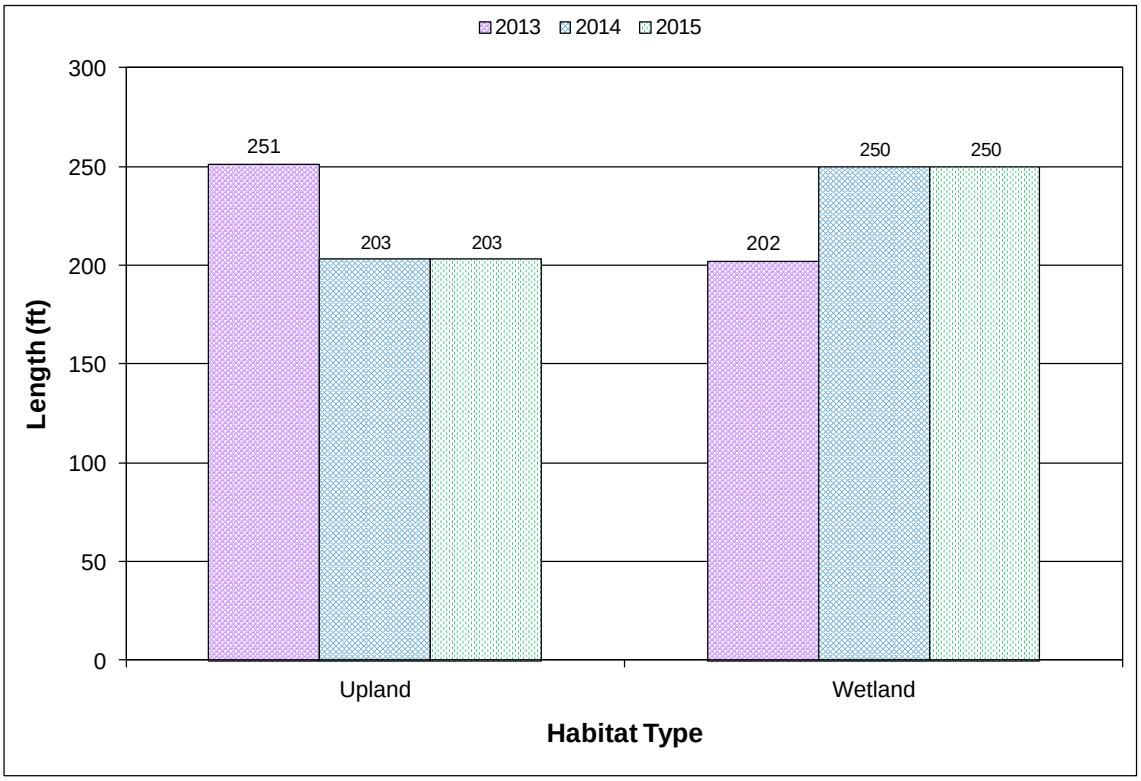


Chart 4. Length of habitat types within Transect T-2 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Vegetation Transect T-3 was established in the south end of the mitigation site and traversed the excavated re-establishment and rehabilitation credit areas. Transect T-3 also began at a mature narrow-leaf cottonwood tree and extended east for 320 feet (Figure 2, Appendix A). Photographs of the transect endpoints are shown on page C-11 (Appendix C). This transect originated in upland community Type 1, transitioned into wetland community Type 2, continued through wetland community Types 5 and 6, and ended in wetland community Type 2. Wetland community Type 5 – *Glyceria grandis/Typha latifolia* replaced a majority of the open water observed on the transect in 2013. Hydrophytic vegetation communities represented 93.4 percent of the transect intervals. Bare ground accounted for approximately 10 percent of the transect.

Table 5. Data summary for Transect T-3 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Monitoring Year	2013	2014	2015
Transect Length (feet)	**320**	**320**	**320**
Vegetation Community Transitions along Transect	3	4	4
Vegetation Communities along Transect	2	3	4
Hydrophytic Vegetation Communities along Transect	1	2	3
Total Vegetative Species	25	31	31
Total Hydrophytic Species	14	16	16
Total Upland Species	11	15	15
Estimated % Total Vegetative Cover	85	90	90
Estimated % Unvegetated	15	10	10
% Transect Length Comprising Hydrophytic Vegetation Communities	65.3	88.4	93.4
% Transect Length Comprising Upland Vegetation Communities	6.6	6.6	6.6
% Transect Length Comprising Unvegetated Open Water	28.1	5	0
% Transect Length Comprising Mudflat	0	0	0

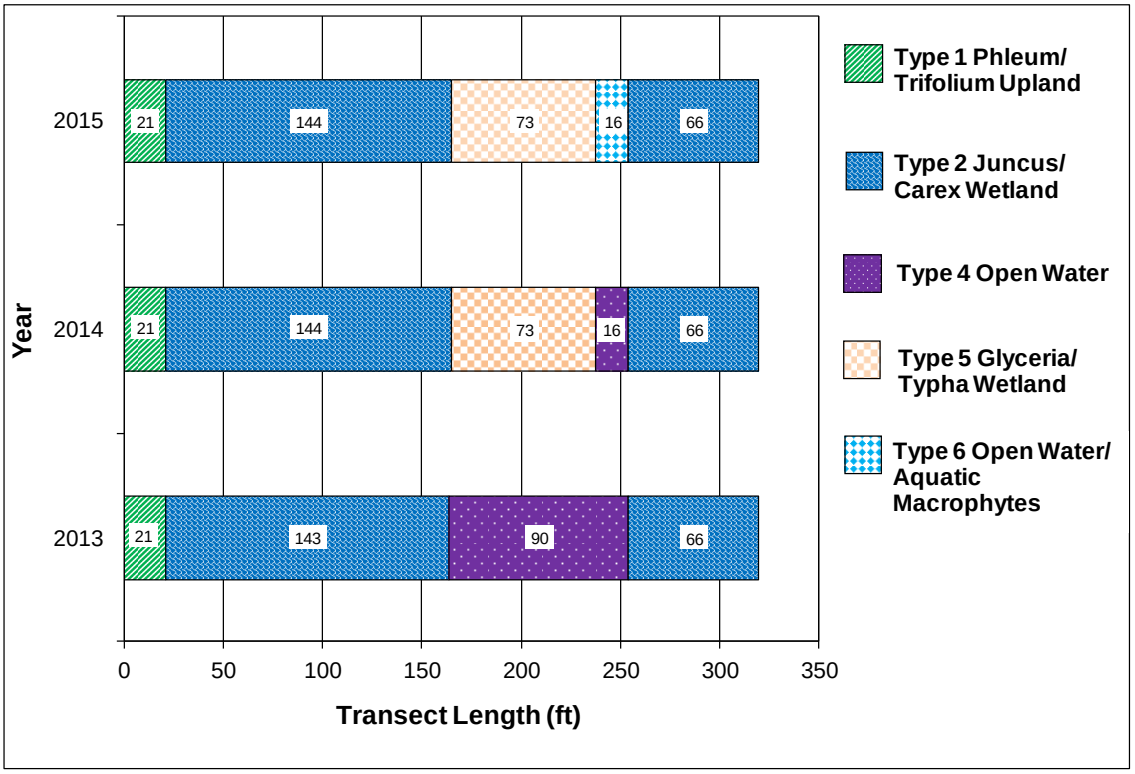


Chart 5. Transect maps showing community types on Transect T-3 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

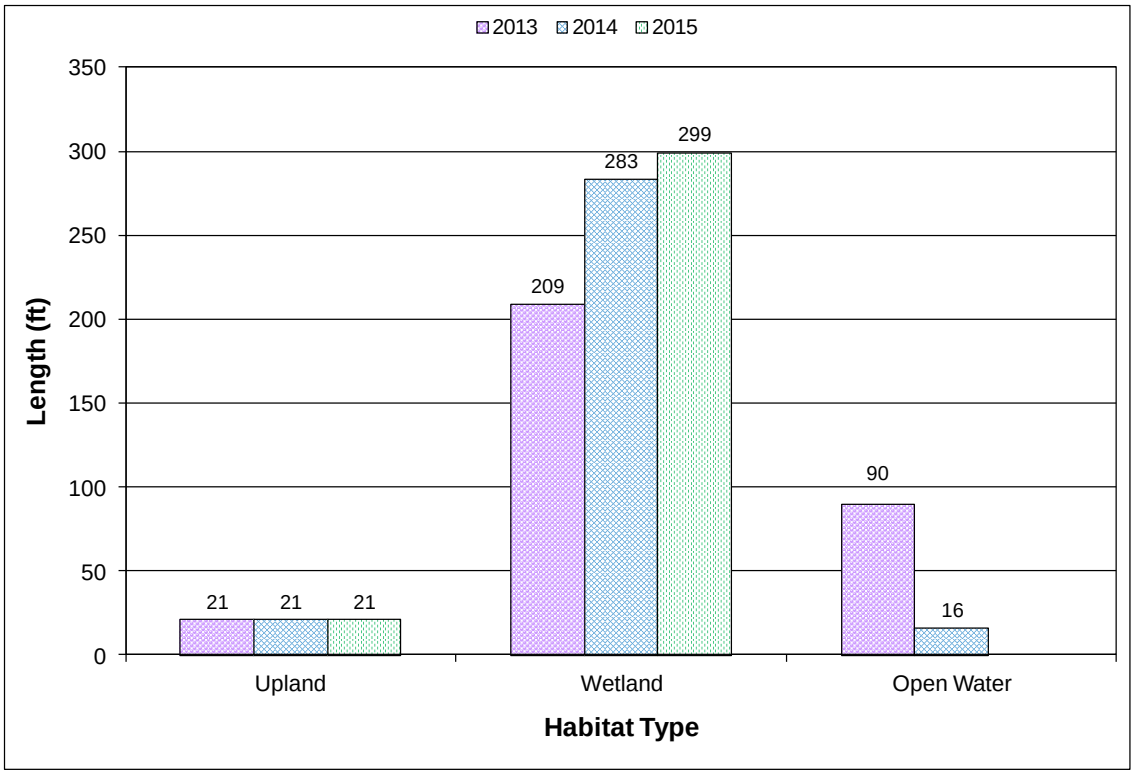


Chart 6. Length of habitat types within Transect T-3 from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

Priority 2B noxious weeds identified within the Rostad Ranch mitigation site included hoary alyssum (*Berteroa incana*), spotted knapweed (*Centaurea stoebe*), Canadian thistle (*Cirsium arvense*), Gypsy-flower (*Cynoglossum officinale*), field bindweed (*Convolvulus arvensis*), and common tansy (*Tanacetum vulgare*). A total of 30 infestation areas were mapped in 2015, ranging in size from less than 0.1 acre to greater than 1 acre in size. The majority of the infestations, with cover classes ranging from trace (less than 1 percent) to moderate (6 to 25 percent), were located at the edge of the constructed wetlands in upland community Type 1. Many of the infestations appear to have established on the site prior to mitigation construction, while eight new infestations were observed and documented during the field survey in 2014 and five additional infestations in 2015.

Approximately 2,000 willow cuttings were planted throughout the excavated wetland mitigation areas. An estimated 75 percent of the willow cuttings survived through 2015. The cuttings appeared healthy and vigorous with little to no sign of browse. One hundred black cottonwoods (*Populus balsamifera*) and 100 quaking aspens (*Populus tremuloides*) were installed around the perimeter of the proposed open water areas in 2012. Survival of these containerized, 5-gallon plant materials was also estimated at 75 percent in 2015.

3.3. Soil

Soils on the site were mapped in the *Meagher County Soil Survey* (SSURGO 2012) as the Varney-Notter cobbly loam and Delpoint variant-Marmarth-Cabbart loam soil series. The Varney-Notter cobbly loam mapped soil unit was located across the north half of the mitigation site while the Delpoint variant-Marmarth-Cabbart loam mapped soil unit was located across the south half. Both series generally consist of very deep, well-drained soils formed in alluvium. The mapped soil units were not identified on the Montana Hydric Soils list.

Soil test pits were excavated at four locations, all within what was originally mapped as the Delpoint variant-Marmarth-Cabbart loam soil series (Figure 2, Appendix A). Data points R1-w and R2-w were located in areas that exhibited hydric soils. The soil at R1-w, located at the edge of an excavated depression, consisted of an upper three-inch very dark gray (10YR 3/1) sandy loam and a lower 21-inch dark gray (10YR 4/1) sandy loam with twenty percent yellowish brown (10YR 5/6) redoximorphic concentrations. The soil met the criteria for depleted below dark surface (A11) and classification as a hydric soil. The soil profile at R2-w, located in a drainage area between two wetland cells, revealed an upper four-inch black (10YR 2/1) sandy clay loam and a lower 16-inch black (10YR 2/1) sandy clay loam with fifteen percent yellowish brown (10YR 5/6) redoximorphic concentrations. The soil met the criteria for redox dark surface (F6) and classification as a hydric soil. Data point R1-u, located upslope from R1-w, displayed a dark grayish brown (10YR 4/2) sandy clay loam and did not meet the criteria for any hydric soil indicators. Data point R2-u, located upslope from R2-w, exhibited a dark grayish brown (10YR 4/2) sandy clay loam and did not meet the criteria for any hydric soil indicators.

3.4. Wetland Delineation

Four data points were evaluated in 2015 to determine the wetland and upland boundaries at this site (Figure 2, Appendix A) and Wetland Determination Data Forms, Appendix B). Data points R1-w and R2-w were located in areas that met the wetland criteria. The total wetland acreage delineated in 2015, including pre-existing wetland areas, was 14.9 acres, an increase of 0.5 acres since 2014 (Table 6). The proposed wetland areas identified within the mitigation plan were overlaid with the wetlands surveyed in 2015 to identify the extent of wetlands within each crediting area. The 2015 wetland delineation included 0.25 acres within the preservation credit area, 9.91 acres within the re-establishment credit area, 1.56 acres within the wetland rehabilitation credit area, and 3.18 acres within the creation credit area. The 2012 construction activities completed to raise the groundwater table site wide are not increasing ground water levels as expected. Groundwater level in monitoring well MW-1 was consistently measured at greater than six feet below the ground surface (bgs) during the 2013 through 2015 field surveys.

Table 6. Total wetland acres delineated in 2013, 2014, and 2015 at the Rostad Ranch Wetland Mitigation Site.

WETLAND AND UPLAND HABITATS	2013 Delineated Acres	2014 Delineated Acres	2015 Delineated Acres
Project Area	60.00	60.00	60.00
Created Wetlands	1.07	2.68	3.18
Restoration Wetlands (Re-establishment)	10.89	9.91	9.91
Restoration Wetlands (Rehabilitation)	1.53	1.56	1.56
Preservation Wetlands	0.25	0.25	0.25
Total Wetlands	**13.74**	**14.40**	**14.90**

3.5. Wildlife

A comprehensive list of bird and other wildlife species observed directly or indirectly from 2013 through 2015 is presented in Table 7 and the monitoring form (Appendix B). Seven bird species were identified in 2015 including one northern harrier (*Circus cyaneus*), two sandhill cranes (*Grus canadensis*), two Wilson's snipe (*Gallinago delicata*), two northern shovelers (*Anas clypeata)*, five American robins (*Turdus migratorius*), twenty red-winged blackbirds (*Agelaius phoeniceus)*, and eighteen tree swallows (*Tachycineta bicolor*). All the bird boxes were occupied by swallows. Six boreal chorus frogs (*Pseudacris maculata*), two white-tailed deer (*Odocoileus virginianus*), and two pronghorns (*Antilocapra americana*) were observed during the 2015 site visit.

Table 7. Wildlife species observed from 2013 to 2015 at the Rostad Ranch Wetland Mitigation Site.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Boreal Chorus Frog	***Pseudacris maculata***
BIRDS	
American Goldfinch	*Spinus tristus*
American Robin	***Turdus migratorius***
American White Pelican	*Pelecanus erythrorhynchos*
Bank Swallow	*Riparia riparia*
Blue-winged Teal	*Anas discors*
Brewer's Blackbird	*Euphagus cyanocephalus*
Canada Goose	*Branta canadensis*
Common Grackle	*Quiscalus quiscula*
Grasshopper Sparrow	*Ammodramus savannarum*
Green-winged Teal	*Anas crecca*
Mallard	*Anas platyrhynchos*
Northern Harrier	***Circus cyaneus***
Northern Shoveler	***Anas clypeata***
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	***Agelaius phoeniceus***
Sandhill Crane	***Grus canadensis***
Spotted Sandpiper	*Actitis macularius*
Tree Swallow	***Tachycineta bicolor***
Willet	*Tringa semipalmata*
Wilson's Snipe	***Gallinago delicata***
MAMMALS	
Black Bear	*Ursus americanus*
Coyote	*Canis latrans*
Deer sp.	*Odocoileus* sp.
Muskrat	*Ondatra zibethicus*
Pronghorn	***Antilocapra americana***
Raccoon	*Procyon lotor*
White-tailed Deer	***Odocoileus virginianus***

Species identified in 2015 are **bolded**.

3.6. Functional Assessment

The 1999 MDT MWAM (Berglund 1999) was used to evaluate the three existing wetlands identified within the site in 2004. The 2008 MWAM (Berglund and McEldowney 2008) has been used to evaluate the site from 2013 through 2015. All wetlands identified in 2013 through 2015 were evaluated as one AA. The results of the 2004, 2013, 2014, and 2015 assessments are summarized in Table 8. The completed 2015 MWAM form is included in Appendix B.

The 2004 assessment identified a total of 3.4 acres of Category III wetlands. The majority of the existing wetlands within the site prior to construction consisted of man-made drainage and irrigation ditches constructed to drain and disperse water throughout the site. The only remnants of the historic wetlands are a willow thicket and roadside drainage ditch. The pre-existing wetlands averaged 34 percent of the possible score and attained a total of 12.46 functional units.

Due to the complex boundaries of the proposed mitigation credits within the site, the Rostad Ranch mitigation wetland was assessed as one AA. The functional ratings displayed a decrease between 2013 and 2014, primarily due to re-evaluation of the water regime within the site from perennial to seasonal. The AA was rated as moderately disturbed in 2015 as a result of increased vegetation growth and time following disturbance from construction and/or grazing/cultivation. In 2015, wetland vegetation had successfully established on approximately 94 percent of the wetland areas, resulting in high ratings for sediment/shoreline stabilization and sediment/nutrient/toxicant removal. The AA also received a high rating for MTNHP species habitat due to the documented primary habitat for the Great Basin calico-flower (*Downingia laeta*), observed on site in 2013 to 2015. There was a slight increase (0.5 acres) in the extent of wetland within the site in 2015 which influenced the acreage used to calculate the functional units score. The AA was rated as a Category III wetland in 2015, scoring 63.9 percent of the possible points and attaining 85.7 functional units, an increase of 18.7 functional units since 2014. The ratings and functional units are expected to increase as the constructed areas continue to recover from disturbance and desirable wetland vegetation becomes more established within the developing wetland communities.

Table 8. Functions and Values of the Rostad Ranch Wetland Mitigation Site from 2004, and 2013 to 2015.

Function and Value Parameters from the Montana Wetland Assessment Method	2004* W-1-04	2004* W-2-04	2004* W-3-04	2013**	2014**	2015**
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0)	Low (0)
MTNHP Species Habitat	Low (0.2)	Low (0.2)	Low (0.2)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.5)	Low (0.3)	Mod (0.5)
General Fish/Aquatic Habitat	NA	NA	NA	NA	NA	NA
Flood Attenuation	NA	NA	NA	NA	NA	NA
Short and Long Term Surface Water Storage	Low (0.2)	Low (0.2)	Low (0.2)	High (0.8)	Mod (0.6)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.7)	Mod (0.7)	High (1.0)
Sediment/Shoreline Stabilization	Mod (0.6)	Mod (0.6)	NA	NA	Mod (0.6)	High (0.9)
Production Export/Food Chain Support	Mod (0.7)	Mod (0.7)	Low (0.3)	High (0.9)	Mod (0.6)	High (0.8)
Groundwater Discharge/Recharge	High (1.0)	High (1.0)	NA	High (1.0)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Mod (0.4)	Low (0.2)	Low (0.3)
Recreation/Education Potential (bonus points)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.05)	Low (0.05)	Low (0.05)
Actual Points/Possible Points	**3.9 / 10**	**3.9 / 10**	**1.9 / 8**	**5.25 / 8**	**4.65 / 9**	**5.75 / 9**
% of Possible Score Achieved	**39.0%**	**39.0%**	**24.0%**	**65.6%**	**51.7%**	**63.9%**
Overall Category	**III**	**III**	**III**	**II**	**III**	**III**
Total Acreage of Assessed Wetlands within Site	**1.2**	**1.8**	**0.4**	**13.74**	**14.40**	**14.90**
Functional Units (acreage x actual points)	**4.68**	**7.02**	**0.76**	**72.1**	**67.0**	**85.7**

*1999 MWAM form (Berglund, 1999)

**2008 MWAM form (Berglund and McEldowney, 2008)

3.7. Photo Documentation

Photographs taken in 2015 at photo points one through seven (PP1 through PP7; Figure 2, Appendix A) are shown on pages C-1 to C-8 of Appendix C. Vegetation transect start and end points are shown on pages C-9 to C-11. Photographs of the data points are included on page C-12.

3.8. Maintenance Needs

Priority 2B noxious weeds identified within the Rostad Ranch mitigation site included hoary alyssum, spotted knapweed, Canadian thistle, gypsy-flower, field bindweed, and common tansy. A total of 30 infestation areas were mapped in 2015, ranging in size from less than 0.1 acre to greater than 1 acre in size. The majority of the infestations, with cover classes ranging from trace (less than 1 percent) to moderate (6 to 25 percent), were located at the edge of the constructed wetlands in upland community Type 1. Many of the infestations appear to have established on the site prior to mitigation construction, while eight new infestations were observed and documented during the field survey in 2014 and five additional infestations in 2015. A weed contractor with MDT treated two acres of the site in July 2015, with treatment concentrated in areas of infestation by the six noxious weed species observed on site. The MDT has an ongoing weed control program for their mitigation sites that includes an annual assessment of weeds identified at each location and treatment to contain and control identified populations.

The wildlife-friendly fence installed around the easement area was intact during the 2015 site visit. Seven bluebird boxes were installed around the site perimeter in 2012 and were in good condition in 2015. Swallows occupied all seven bird boxes during the 2015 site visit. The irrigation headgate structure was in good condition during the 2015 site visit. A small amount of fine sediment was beginning to accumulate in the stilling pool but didn't appear to be inhibiting hydrology or the function of the structure. During future monitoring efforts, it would be good to inspect this structure and stilling pool to ensure proper functionality. Also, there were no indicators of hydrology observed in the northwestern portion of the site during the 2015 monitoring event. Therefore, it is recommended that MDT consider implementing adaptive management techniques to supply hydrology to the northwestern corner of the site for development of wetland habitat in this area.

3.9. Current Credit Summary

Table 9 summarizes the estimated wetland credits based on the USACE-approved credit ratios and the wetland delineation completed in July 2015. Proposed mitigation credits from the 2007 Rostad Ranch Mitigation Plan included the re-establishment of 27.11 wetland acres, rehabilitation of 2.63 wetland acres, creation of 9.84 wetland acres, preservation of 0.25 wetland acres, and maintenance of 6.76 acres of upland buffer (Table 1). The wetland acreages delineated in 2015 included 9.91 acres of re-established wetlands, 1.56 acres of rehabilitated wetland, 3.18 acres of created wetland, and 0.25 acres of preservation wetland (community Type 3). The total mitigation credit estimated

in 2015, including the upland buffer credit and the deduction for the 0.41-acre wetland impact incurred during mitigation construction, totaled 15.13 credit acres, an increase of 0.5 credit acres since 2014.

Table 10 provides a summary of the approved performance standards and success criteria based on site conditions documented in 2015. All wetlands delineated at the Rostad Ranch mitigation site in 2015 satisfied the three criteria of wetland hydrology, hydrophytic vegetation, and hydric soils. Willow stakes planted within the site exhibited a 75 percent survival rate during the third year of planting, the same survival rate observed in 2014. Although the site was recently disturbed from construction efforts in 2012, vegetation is successfully establishing, with aerial coverage by desirable plants estimated at greater than 90 percent. The coverage of state-listed noxious weeds in the upland buffer exceeded 5 percent in 2015. The cover of noxious weeds within the delineated wetlands was less than 5 percent. The extent of the open water surveyed in 2015 comprised approximately 6 percent of the total wetland acreage, which is below the cap of 10 percent stipulated in the USACE-approved performance criteria. The percentage of open water may continue to decrease as additional emergent wetlands develop on site. The entire 60-acre easement area has been fenced to exclude grazing.

Table 9. Summary of wetland credits at the Rostad Ranch Wetland Mitigation Site from 2013 to 2015.

Compensatory Mitigation Type	Wetland Type (Cowardin)	Approved Migiation Ratios*	Anticipated Mitigation Area (acres)	Anticipated Mitigation Credit (acres)	2013 Delineated Mitigation Areas (acres)	2013 Estimated Mitigation Credit (acres)	2014 Delineated Mitigation Areas (acres)	2014 Estimated Mitigation Credit (acres)	2015 Delineated Mitigation Areas (acres)	2015 Estimated Mitigation Credit (acres)
Restoration (Re-establishment)	Palustrine Emergent	1:1	27.11	27.11	10.89	10.89	9.91	9.91	9.91	9.91
Creation (Establishment)	Palustrine Emergent	1:1	9.84	9.84	1.07	1.07	2.68	2.68	3.18	3.18
Restoration (Rehabilitation)	Palustrine Emergent	1.5:1	2.63	1.75	1.53	1.02	1.56	1.04	1.56	1.04
Preservation	Palustrine, Scrub/shrub	4:1	0.25	0.06	0.25	0.06	0.25	0.06	0.25	0.06
Upland Buffer	N/A	5:1	6.76**	1.35	6.76	1.35	6.76	1.35	6.76	1.35
Permanent Wetland Impact	N/A	1:1	N/A	-0.41	N/A	-0.41	N/A	-0.41	N/A	-0.41
	Totals		**46.59**	**39.70**	**20.5**	**13.98**	**21.16**	**14.63**	**21.66**	**15.13**

*Mitigation credit ratios utilized were from the Montana Corps Regulatory Programs 2005 Wetland Credit Ratios (USACE 2005).
**Anticipated upland buffer credit utilized until wetland areas expand to full enxtent.

Table 10. Summary of performance standards and success criteria.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	Meet the three parameter criteria for hydrology, vegetation, and soils as outlined in the 1987 Wetland Delineation Manual and 2010 Great Plains Region.	Y	Areas identified as wetland habitat within the mitigation site meet the three parameter criteria.
Wetland Hydrology	Soil saturation present for at least 12.5 percent of the growing season.	Y	Areas identified as wetland habitat within the mitigation site exhibit soil saturation for a minimum 12.5 percent of growing season.
Hydric Soil	Hydric soil conditions present or appear to be forming.	Y	The recently constructed wetland complex exhibits weak hydric soil development in areas originally identified as upland prior to construction. Pre-existing hydric soil characteristics are present in several areas identified as wetland prior to project construction.
	Soil is sufficiently stable to prevent erosion.	Y	Disturbed soil is stable and does not exhibit signs of erosion.
	Soil is able to support plant cover.	Y	Plant cover has continued to develop across disturbed soils.
Hydrophytic Vegetation	Achieved where combined absolute cover of facultative or wetter species is greater than or equal to 70 percent.	Y	Areas identified as wetland habitat within the mitigation site support a prevalence of hydrophytic vegetation (OBL, FACW, and FAC).
	Noxious weeds do not exceed 5 percent cover.	Y	Numerous noxious weed infestations have been mapped across this site, primarily outside of site wetlands. Estimated noxious weed cover within delineated wetlands is below 5 percent.
Woody Plants	Plantings will be considered successful where they exceed 50 percent survival after 5 years.	Y	Approximately 75 percent of the woody plantings observed were alive in 2015, exceeding the 50 percent survival rate.
Herbaceous Plants	At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation will be at least 80 percent.	Y	Created wetlands generally exhibited greater than 90 percent vegetation cover during the 2015 monitoring event and showed increased vegetation cover from 2013.
Open Water Areas	Open water that is established within the designated wetland cells will be considered successful and creditable if it does not exceed 10 percent of the total wetland acreage.	Y	Open water was mapped within 6% of the total wetland acreage in 2015. These areas are exhibiting emergent vegetation development and are anticipated to continue to develop aquatic macrophyte communities within the 5 year monitoring period.
Upland Buffer	Success will be achieved when noxious weeds do no exceed 5 percenct cover within the buffer areas on site.	N	Numerous noxious weed infestations, including field bindweed, gypsy-flower, Canadian thistle, spotted knapweed, common tansy, and hoary alyssum were mapped within the site in 2015. It is currently estimated that noxious weeds cover greater than 5 percent of the upland buffer within the conservation easement area. MDT will need to continue to implement weed control measures to meet this criteria.
	Any area disturbed within creditable buffer zone must have at least 50 percent aerial cover of desirable upland plant species by end of monitoring period.	Y	Upland buffers surround wetland areas within the site exhibited greater than 50 percent aerial cover of non-weed species in 2015.
Weed Control	Implement weed control measures to minimize and/or eliminate infestations of state-listed noxious weed species within the site.	N	State-listed noxious weed species across the site have been estimated at greater than 5 percent absolute cover in 2015.
Fencing	Install wildlife-friendly fencing along the easement boundaries.	Y	Wildlife-friendly fencing has been installed around the easement boundaries and is in good condition.

4. REFERENCES

Berglund, J. and R. McEldowney. 2008. *MDT Montana Wetland Assessment Method.* Prepared for Montana Department of Transportation, Helena, Montana. Post, Buckley, Schuh, & Jernigan, Helena, Montana. 42pp.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. FWS/OBS-79/31. U.S.D.I Fish and Wildlife Service. Washington D.C.

Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual*. U.S. Army Corps of Engineers. Washington, DC.

Lichvar, R.W., M. Butterwick, N.C. and W.N. Kirchner. 2014. *The National Wetland Plant List. 2014 Update of Wetland Ratings.* Phytoneuron 2014-41:1-42.

USDA, Natural Resource Conservation Service. *Montana Hydric Soils List*. April 2012.

U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)*, ed. J. S. Wakeley, R. W. Lichvar, and C. V. Noble. ERDC/EL TR-10-1.Vicksburg, MS: U.S. Army Engineer Research and Development Center.

Websites:

Montana Department of Agriculture. July 2015. *Montana Noxious Weed List.* Accessed October 2015 at http://agr.mt.gov/agr/Programs/Weeds/PDF/2015WeedList.pdf

Montana Natural Heritage Program website. Accessed October 2015 at http://mtnhp.org/SpeciesOfConcern/?AorP=a.

USDA, Natural Resources Conservation Service Soil Survey Geographic (SSURGO) Data. Meagher County, Montana. Time Stamped September 2012.

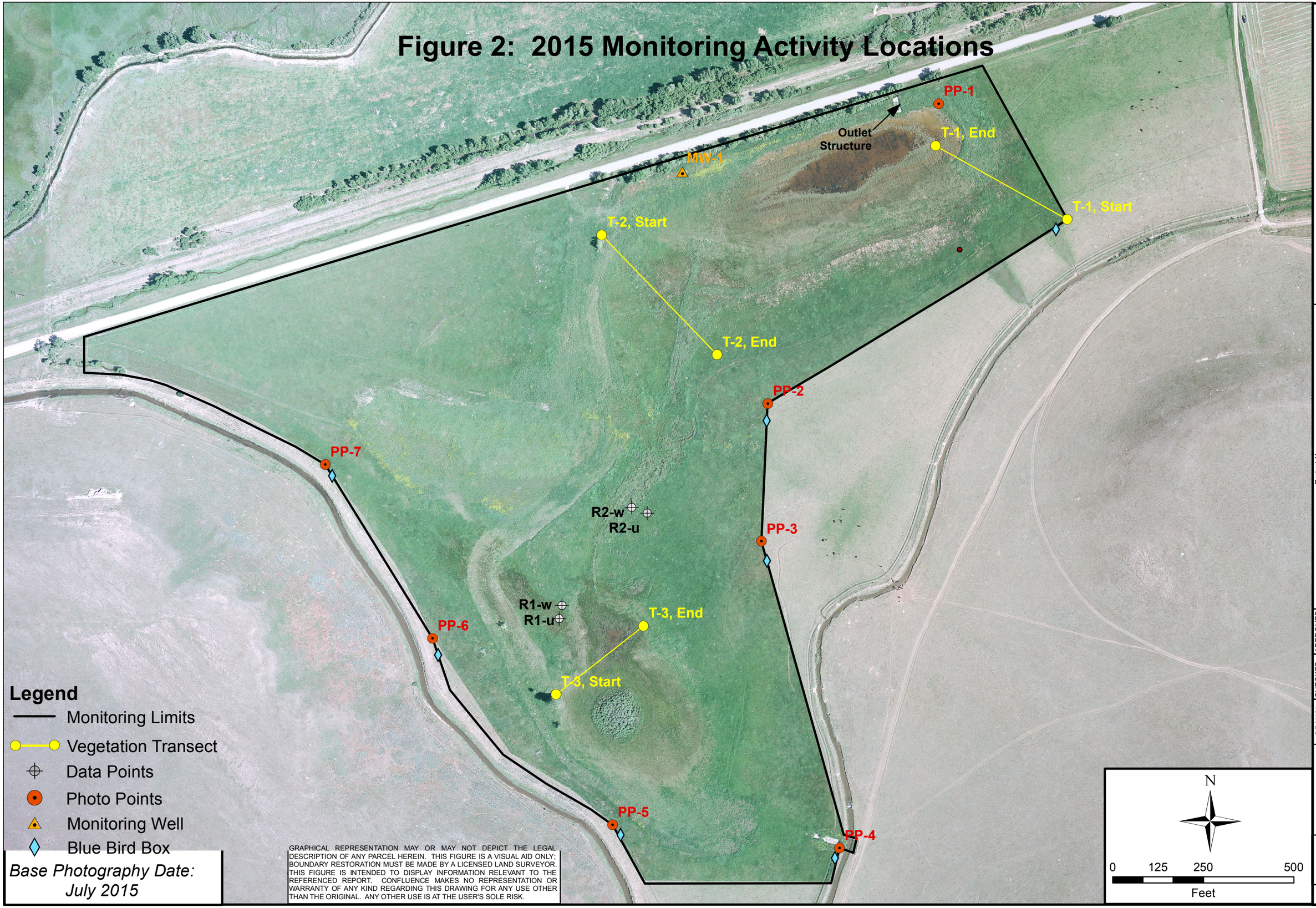
WRCC United States Historical Climatology Network. Accessed October 2015 at: http://www.wrcc.dri.edu/CLIMATEDATA.html.

Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
Rostad Ranch
Meagher County, Montana

Figure 2: 2015 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points
- Monitoring Well
- Blue Bird Box

Base Photography Date: July 2015

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.

N

0 125 250 500

Feet

LOCATION: Meagher Co., MT

PROJ NO: STPX-0002(749)

FILE: Rostad/Monitor2015.mxd

Project Name: Rostad Ranch Wetland Mitigation Site

Drawing Title: 2015 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
JJ	JJ	JJ

SCALE: As Shown

Drawn: October 15, 2015

PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 2

Figure 3: 2015 Mapped Site Features

ACREAGES

Project Area	60.00 acres
Total Wetlands	14.90 acres
Re-established Wetlands	9.91 acres
Created Wetlands	3.18 acres
Rehabilitated Wetlands	1.56 acres
Preserved Wetlands	0.25 acres
Upland	45.10 acres

Noxious Weeds
- Tanacetum vulgare
- Centaurea stoebe
- Cynoglossum officinale
- Berteroa incana
- Cirsium arvense
- Convulvulus arvensis

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

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

Vegetation Community Types
1. Phleum pratense/Trifolium spp.
2. Juncus balticus/Carex nebrascensis
3. Salix exigua
5. Glyceria grandis/Typha latifolia
6. Open Water/Aquatic Macrophytes

Legend
- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 2015

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.

N

0 125 250 500
Feet

LOCATION: Meagher Co., MT
PROJ NO: STPX-0002(749)
FILE: Rostad/Veg2015.mxd

Project Name: Rostad Ranch Wetland Mitigation Site
Drawing Title: 2015 Mapped Site Features

DRAWN JJ | CHECKED JJ | APPROVED JJ
SCALE: As Shown
Drawn: August 30, 2015
PROJ MGR: J Johnson

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2015 MDT Wetland Mitigation Site Monitoring Form
2015 USACE Wetland Determination Data Forms
2015 MDT Montana Wetland Assessment Form

MDT Wetland Mitigation Monitoring
Rostad Ranch
Meagher County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Rostad Ranch Assessment Date/Time 6/23/2015

Person(s) conducting the assessment: Erik Nyquist

Weather: Sunny, clear 70 degrees Location: Martinsdale, MT

MDT District: 5 Milepost:

Legal Description: T 8N R 11E Section(s) 12 and 13

Initial Evaluation Date: 8/21/2013 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 60 (acres)

Land use surrounding wetland:

Agriculture

HYDROLOGY

Surface Water Source: Groundwater,supplemental hydrology from ditch/headgate, surface runoff

Inundation: ☑ Average Depth: 0.5 **(ft)** Range of Depths: 0.25-3.5 **(ft)**

Percent of assessment area under inundation: 45 %

Depth at emergent vegetation-open water boundary: 0.5 **(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**:**

Drainage patterns, soil saturation, water marks, drift deposits, oxidized rhizospheres on living roots, geomorphic position, FAC-nuetral test

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
MW-1	

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:

MW-1 groundwater level >6 feet below ground surface. Additional hydrology is being provided to the site and wetland boundary is expanding. Evidence of recent flow from ditch through diversion structure.

VEGETATION COMMUNITIES

Site Rostad Ranch

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

Community # 1 **Community Type:** Phleum pratense / Trifolium spp. **Acres** 45.1

Species	Cover class	Species	Cover class
Achillea millefolium	1	Amaranthus retroflexus	0
Ambrosia acanthicarpa	0	Aster sp.	0
Bare Ground	0	Bassia scoparia	1
Berteroa incana	0	Brassica kaber	0
Bromus arvensis	0	Bromus carinatus	1
Bromus inermis	2	Centaurea stoebe	2
Chenopodium album	0	Chenopodium sp.	1
Cirsium arvense	1	Convolvulus arvensis	0
Cynoglossum officinale	1	Deschampsia caespitosa	0
Descurainia sophia	1	Elymus repens	2
Elymus trachycaulus	1	Helianthus annuus	1
Hordeum jubatum	1	Juncus balticus	1
Lactuca serriola	0	Medicago sativa	1
Melilotus albus	0	Melilotus officinalis	2
Pascopyrum smithii	1	Phalaris arundinacea	0
Phleum pratense	4	Poa palustris	1
Populus angustifolia	1	Potentilla gracilis	0
Rumex crispus	0	Rumex occidentalis	0
Schedonorus pratensis	2	Tanacetum vulgare	0
Taraxacum officinale	1	Thlaspi arvense	1
Tragopogon dubius	0	Trifolium arvense	0
Trifolium pratense	1	Trifolium repens	3

Comments:

One upland community on site, previously grazed meadow.

Community # 2 **Community Type:** Juncus balticus / Carex nebrascensis **Acres** 11.7

Species	Cover class	Species	Cover class
Algae, green	0	Bare Ground	1
Bassia scoparia	0	Beckmannia syzigachne	3
Carex nebrascensis	4	Centaurea stoebe	0
Chenopodium album	0	Chenopodium sp.	0
Cyrtorhyncha cymbalaria	0	Deschampsia caespitosa	1
Eleocharis palustris	1	Elymus repens	0
Elymus trachycaulus	0	Epilobium ciliatum	0
Glyceria grandis	0	Hordeum jubatum	2
Juncus articulatus	0	Juncus balticus	4
Juncus bufonius	0	Lactuca serriola	0
Lepidium densiflorum	0	Melilotus officinalis	0
Open Water	1	Pascopyrum smithii	0
Phalaris arundinacea	2	Phleum pratense	0
Poa palustris	1	Populus balsamifera	0
Populus tremuloides	0	Rumex crispus	1
Rumex occidentalis	0	Salix exigua	1
Sonchus arvensis	1	Thlaspi arvense	0
Trifolium pratense	0	Typha latifolia	1
Veronica peregrina	0		

Comments:

Wet meadow, revegetation successful since 2013

Community # 3 **Community Type:** Salix exigua / **Acres** 0.31

Species	Cover class	Species	Cover class
Agrostis gigantea	0	Alopecurus pratensis	1
Beckmannia syzigachne	1	Carex nebrascensis	1
Carex utriculata	1	Deschampsia caespitosa	2
Eleocharis palustris	1	Poa palustris	2
Salix exigua	5	Typha latifolia	0
Veronica peregrina	0		

Comments:

Undisturbed salix community near southern extent of monitoring boundary.

Community # 5 **Community Type:** Glyceria grandis / Typha latifolia **Acres** 0.03

Species	Cover class	Species	Cover class
Beckmannia syzigachne	2	Eleocharis palustris	3
Glyceria grandis	4	Open Water	3
Typha latifolia	3		

Comments:

Community # 6 **Community Type:** Open Water / Aquatic macrophytes **Acres** 2.85

Species	Cover class	Species	Cover class
Algae, green	0	Beckmannia syzigachne	1
Carex nebrascensis	0	Downingia laeta	0
Eleocharis palustris	1	Glyceria grandis	1
Juncus balticus	0	Open Water	5
Polypogon monspeliensis	0	Rumex crispus	0
Typha latifolia	1	Veronica peregrina	0

Comments:

Originally designated as open water community type #4 in previous survey years. Species composition had combined areal coverage greater than 5%, thus wetland community type #6 was created to reflect this increase in vegetation cover in 2015.

Total Vegetation Community Acreage **59.99**

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

VEGETATION TRANSECTS

Site: Rostad Ranch Date: 6/23/2015

Transect Number: 1 **Compass Direction from Start:** 290

Interval Data:

Ending Station 135 **Community Type:** Phleum pratense / Trifolium spp.

Species	Cover class	Species	Cover class
Achillea millefolium	1	Aster sp.	1
Bromus inermis	4	Centaurea stoebe	0
Cirsium arvense	0	Cynoglossum officinale	0
Medicago sativa	1	Pascopyrum smithii	1
Phleum pratense	1	Poa palustris	2
Rumex crispus	0	Taraxacum officinale	1
Tragopogon dubius	1	Trifolium pratense	2

Ending Station 263 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Carex nebrascensis	2	Deschampsia caespitosa	1
Eleocharis palustris	1	Juncus balticus	3
Phalaris arundinacea	2	Phleum pratense	1
Poa palustris	3	Rumex crispus	0
Trifolium pratense	2		

Ending Station 351 **Community Type:** Phleum pratense / Trifolium spp.

Species	Cover class	Species	Cover class
Amaranthus retroflexus	1	Bare Ground	0
Bromus carinatus	2	Chenopodium album	1
Cynoglossum officinale	0	Helianthus annuus	1
Lactuca serriola	1	Medicago sativa	1
Melilotus officinalis	2	Pascopyrum smithii	2
Phleum pratense	3	Thlaspi arvense	1
Trifolium pratense	4		

Ending Station 422 **Community Type:** Open Water / Aquatic macrophytes

Species	Cover class	Species	Cover class
Beckmannia syzigachne	1	Carex nebrascensis	1
Eleocharis palustris	2	Juncus balticus	1
Open Water	5	Rumex crispus	0
Typha latifolia	2		

Transect Notes:

Transect Number: 2 **Compass Direction from Start:** 120

Interval Data:

Ending Station 90 **Community Type:** Phleum pratense / Trifolium spp.

Species	Cover class	Species	Cover class
Achillea millefolium	0	Aster sp.	1
Bare Ground	1	Bassia scoparia	1
Bromus inermis	2	Chenopodium album	1
Cirsium arvense	1	Descurainia sophia	1
Elymus repens	2	Melilotus officinalis	3
Phleum pratense	2	Poa palustris	1
Populus angustifolia	0	Rumex occidentalis	1
Taraxacum officinale	1	Thlaspi arvense	1
Trifolium pratense	3		

Ending Station 253 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Carex nebrascensis	3	Elymus repens	0
Juncus balticus	4	Phalaris arundinacea	2
Phleum pratense	2	Rumex occidentalis	0
Salix exigua	1	Trifolium pratense	3
Typha latifolia	1		

Ending Station 301 **Community Type:** Phleum pratense / Trifolium spp.

Species	Cover class	Species	Cover class
Achillea millefolium	0	Bromus inermis	2
Elymus trachycaulus	1	Hordeum jubatum	1
Juncus balticus	3	Pascopyrum smithii	0
Phleum pratense	5	Trifolium arvense	1
Trifolium pratense	2		

Ending Station 388 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Bare Ground	1	Carex nebrascensis	3
Juncus balticus	3	Pascopyrum smithii	1
Phalaris arundinacea	3	Phleum pratense	1
Poa palustris	1	Rumex occidentalis	0
Salix exigua	1	Trifolium pratense	0
Typha latifolia	1		

Ending Station 453 **Community Type:** Phleum pratense / Trifolium spp.

Species	Cover class	Species	Cover class
Achillea millefolium	1	Aster sp.	0
Bromus inermis	1	Elymus repens	2
Elymus trachycaulus	2	Hordeum jubatum	0
Juncus balticus	2	Medicago sativa	0
Pascopyrum smithii	2	Phalaris arundinacea	1
Phleum pratense	2	Rumex occidentalis	0
Taraxacum officinale	0	Trifolium pratense	1

Transect Notes:

Transect Number: 3 **Compass Direction from Start:** 30

Interval Data:

Ending Station 21 **Community Type:** Phleum pratense / Trifolium spp.

Species	Cover class	Species	Cover class
Amaranthus retroflexus	1	Bare Ground	1
Brassica kaber	1	Bromus arvensis	1
Cynoglossum officinale	0	Deschampsia caespitosa	0
Elymus repens	2	Hordeum jubatum	0
Phleum pratense	1	Populus angustifolia	4
Tanacetum vulgare	0		

Ending Station 165 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Bare Ground	0	Beckmannia syzigachne	1
Carex nebrascensis	1	Chenopodium album	0
Cyrtorhyncha cymbalaria	0	Deschampsia caespitosa	3
Epilobium ciliatum	1	Glyceria grandis	0
Hordeum jubatum	3	Juncus articulatus	0
Juncus balticus	2	Juncus bufonius	1
Salix exigua	0	Sonchus arvensis	0

Ending Station 238 **Community Type:** Glyceria grandis / Typha latifolia

Species	Cover class	Species	Cover class
Beckmannia syzigachne	2	Eleocharis palustris	3
Glyceria grandis	4	Open Water	2
Typha latifolia	3		

Ending Station 254 **Community Type:** Open Water / Aquatic macrophytes

Species	Cover class	Species	Cover class
Algae, green	1	Beckmannia syzigachne	0
Downingia laeta	0	Eleocharis palustris	0
Glyceria grandis	0	Open Water	5
Polypogon monspeliensis	0	Typha latifolia	2
Veronica peregrina	0		

Ending Station 320 **Community Type:** Juncus balticus / Carex nebrascensis

Species	Cover class	Species	Cover class
Beckmannia syzigachne	1	Deschampsia caespitosa	1
Eleocharis palustris	3	Elymus trachycaulus	2
Hordeum jubatum	1	Juncus balticus	1
Melilotus officinalis	0	Pascopyrum smithii	1
Typha latifolia	2		

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

Rostad Ranch

Planting Type	#Planted	#Alive	Notes
Populus balsamifera	100		75% survival rate
Populus tremuloides	100		75% survival rate
Salix spp.	2000		estimate approximately 75% survival

Comments

Willow stakes were planted in spring 2013 with observations of approximately 75% survival the third year of monitoring. Plants looked healthy with minimal browse. Approximately 75% survival for cottonwoods and aspen.

Rostad Ranch

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: Blue bird boxes

How many? 7

Are the nesting structures being used? Yes

Do the nesting structures need repairs? No

Nesting Structure Comments:
All bird boxes in good condition and occupied by nesting swallows.

Species	#Observed	Behavior	Habitat
American Robin	5		
Northern Harrier	1		WM,
Northern Shoveler	2		MA, OW,
Red-winged Blackbird	20		MA, SS, WM,
Sandhill Crane	2		WM,
Tree Swallow	18		MA, OW, WM,
Wilson's Snipe	2		AB, AB, MA, WM,

Bird Comments

Swallows occupying bird boxes.

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
Boreal Chorus Frog	6	No	No	No	auditory observation and observed 5 tadpoles in open water
Pronghorn	2	No	No	No	
White-tailed Deer	2	No	No	No	

Wildlife Comments:

observed pronghorn and deer within mitigation site.

Rostad Ranch

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
15	46.46191	-110.295059	310	T-2, end
1-5	46.463894	-110.292686	140	PP-1, panoramic 140-240 degrees
16	46.46286	-110.296341	130	T-2, start
17-22	46.460579	-110.294502	270	PP-3, panoramic 160-360 degrees
23-27	46.458241	-110.29377	290	PP-4, panoramic 300-110 degrees
28-32	46.458417	-110.296185	200	PP-5, panoramic 300-110 degrees
33	46.459827	-110.295876	210	T-3, end
34	46.459347	-110.296814	30	T-3, start
35	46.459839	-110.298195	30	PP-6
36	46.45982	-110.298035	100	PP-6
37-41	46.461119	-110.299371	300	PP-7, panoramic 0-300 degrees
42	46.462457	-110.294063	180	R1-u
43	46.462577	-110.294263	80	R-1w
44	46.459122	-110.295368	270	R2-w
45	46.458892	-110.294915	270	R2-u
6	46.463043	-110.291222	290	T-1, start
7	46.463577	-110.29274	110	T-1, end
8-14	46.461612	-110.294534	180	PP-2, panoramic 180-70 degrees

Comments:

Rostad Ranch

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

increase in wetland area from 2014

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? Yes

If yes, do they need to be repaired? No

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.

structures and fencing all in good condition

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 6/23/2015

Applicant/Owner: MDT State: Montana Sampling Point: R1-u

Investigator(s): E. Nyquist Section, Township, Range: 12 8N 11E

Landform (hillslope, terrace, etc.): Footslope Local relief (concave, convex, none): convex Slope (%): 1.5

Subregion (LRR): LRR F Lat: 46.462457 Long: -110.294063 Datum: WGS_19

Soil Map Unit Name: Delpoint variant-Marmarth-Cabbart loam, 2 to 8 percent slopes NWI classification: Not Mapped

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

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

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

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

Hydrophytic Vegetation Present?	Yes ☐	No ☑	
Hydric Soil Present?	Yes ☐	No ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Wetland Hydrology Present?	Yes ☐	No ☑	

Remarks: Upland sample point.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	80	☑	UPL
Cirsium arvense	20	☐	FACU
Sisymbrium altissimum	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

Dominance Test worksheet

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: % (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	25 X 4	100
UPL species	80 X 5	400
Column Totals	105 (A)	500 (B)

Prevalence Index = B/A = 4.76

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: R1-u

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
0-24	10YR 4/2	100					Sandy Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators observed.

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 indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 6/23/2015

Applicant/Owner: MDT State: Montana Sampling Point: R1-w

Investigator(s): E. Nyquist Section, Township, Range: 12 8N 11E

Landform (hillslope, terrace, etc.): Lowland Local relief (concave, convex, none): concave Slope (%): 1.5

Subregion (LRR): LRR F Lat: 46.462577 Long: -110.294263 Datum: WGS_19

Soil Map Unit Name: Delpoint variant-Marmarth-Cabbart loam, 2 to 8 percent slopes NWI classification: Not Mapped

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

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

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

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

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☑	No ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: Newly delineated wetland area.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Carex nebrascensis	5	☐	OBL
Eleocharis palustris	5	☐	OBL
Juncus balticus	80	☑	FACW
Poa palustris	10	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

	Total % Cover of:		Multiply by:
OBL species	10	X 1	10
FACW species	90	X 2	180
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	100 (A)		190 (B)

Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: R1-w

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 3/1	100					Sandy Loam	
3-24	10YR 4/1	80	10YR 5/6	20	C	M	Sandy Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

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: 2 secondary indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 6/23/2015

Applicant/Owner: MDT State: Montana Sampling Point: R2-u

Investigator(s): E. Nyquist Section, Township, Range: 12 8N 11E

Landform (hillslope, terrace, etc.): Undulating Local relief (concave, convex, none): convex Slope (%): 1

Subregion (LRR): LRR F Lat: 46.458892 Long: -110.294915 Datum: WGS_19

Soil Map Unit Name: Delpoint variant-Marmarth-Cabbart loam, 2 to 8 percent slopes NWI classification: Not Mapped

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

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

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

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

Hydrophytic Vegetation Present?	Yes ☐ No ☑	Is the Sampled Area within a Wetland? Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks: Upland sample point.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	45	☑	UPL
Pascopyrum smithii	40	☑	FACU
Poa palustris	10	☐	FACW
Poa pratensis	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	10	X 2	20
FAC species	0	X 3	0
FACU species	45	X 4	180
UPL species	45	X 5	225
Column Totals	100 (A)		425 (B)

Prevalence Index = B/A = 4.25

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

SOIL

Sampling Point: R2-u

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
0-24	10YR 4/2	100					Sandy Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No indicators observed.

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 hydrology indicators observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: Rostad Ranch City/County: Meagher Sampling Date: 6/23/2015

Applicant/Owner: MDT State: Montana Sampling Point: R2-w

Investigator(s): E. Nyquist Section, Township, Range: 12 8N 11E

Landform (hillslope, terrace, etc.): Swale Local relief (concave, convex, none): concave Slope (%): 1.5

Subregion (LRR): LRR F Lat: 46.459122 Long: -110.295368 Datum: WGS_19

Soil Map Unit Name: Delpoint variant-Marmarth-Cabbart loam, 2 to 8 percent slopes NWI classification: PEM

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

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

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

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

Hydrophytic Vegetation Present?	Yes ☑	No ☐	
Hydric Soil Present?	Yes ☑	No ☐	Is the Sampled Area within a Wetland? Yes ☑ No ☐
Wetland Hydrology Present?	Yes ☑	No ☐	

Remarks: Newly delineated wetland swale.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus pratensis	10	☐	FACW
Carex nebrascensis	10	☐	OBL
Phalaris arundinacea	80	☑	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 0

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	10	X 1	10
FACW species	90	X 2	180
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	100 (A)		190 (B)

Prevalence Index = B/A = 1.90

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

SOIL

Sampling Point: R2-w

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
0-4	10YR 2/1	100					Sandy Clay Loam	
4-20	10YR 2/1	85	10YR 5/6	15	C	M	Sandy Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

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): 2

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 Rostad Ranch **2. MDT project#** STPX-0002(749) **Control#** 5565

3. Evaluation Date 6/23/2015 **4. Evaluators** Erik Nyquist **5. Wetland/Site# (s)** Rostad Ranch - created and existing w etland

6. Wetland Location(s): T 8N **R** 11E **Sec1** 12 **T** 8N **R** 11E **Sec2** 13

Approx Stationing or Mileposts

Watershed 10040201 **Watershed/County** Upper Musselshell River Watershed, Meagher County

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 14.9

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 14.9

☐ **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
Slope	Emergent Wetland	Excavated	Seasonal/Intermittent	78
Slope	Scrub-Shrub Wetland		Seasonal/Intermittent	2
Depressional	Unconsolidated Bottom	Excavated	Seasonal/Intermittent	6
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	14

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	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)

The wetland mitigation site was constructed in Fall 2012/Spring 2013. Extensive excavation occurred to create depressional areas and spread out water across the site. Site was revegetated Fall 2012/Spring 2013 with good growth observed during the first growing season (2013) following construction activities. Significant increases in vegetative growth were observed in 2014 and 2015 since the 2013 monitoring effort. Decreased disturbance from cultivation, grazing, and construction since 2013 led to moderate disturbance rating in 2015.

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

Spotted knapweed, Canada thistle, houndstongue, hoary alyssum, field bindweed, common tansy

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

The AA is a historically drained wetland area/meadow that was heavily grazed by cattle. A drainage ditch bisected the property prior to wetland mitigation construction. Existing wetlands were expanded through construction activities with emergent and scrub-shrub wetland communities present. Surrounding land use includes transportation (county road, historic railroad berm), agriculture (hay production and cattle grazing), and the South Fork of the Musselshell River located to the north of the mitigation site.

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 and scrub-shrub vegetation classes

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 USFWS list for Meagher County; no habitat specifications present for species or documented occurences.

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 Downingia laeta (S2S3)

Secondary habitat (list Species) ◉ D ○ S Long-billed curlew (S3B); Mountain plover (S2B)

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 Observations of Downingia laeta in wetland during 2013-2015site visits; past observations of curlew/plover

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 Moderate use of AA area by wildlife observed.

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

i. Habitat Quality and Known / Suspected Fish Species in AA (use matrix to arrive at [check the functional points and rating)

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

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

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

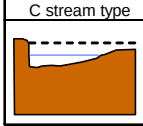
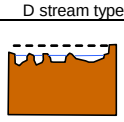
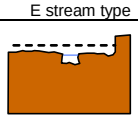
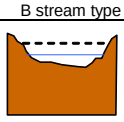
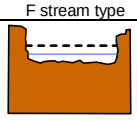
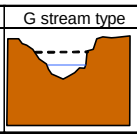
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

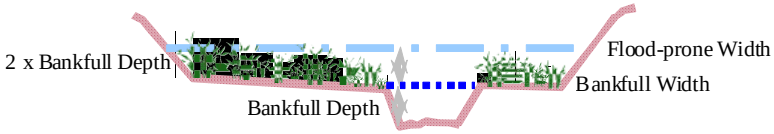
iii. Final Score and Rating: 0 NA **Comments:** No perennially flowing water within AA for fish habitat.

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: No flooding occurs via in-channel or overbank flow.

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: Depressional area and portions of slope wetlands maintain water seasonally/intermittently. Approximately 6.7 acres inundated to 0.5 foot (6.7 acres x 0.5 foot = 3.35 acre feet).

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: More than 80 percent of the non-open water area is covered with wetland vegetation. A restricted outlet is located on the depressional area as a constructed overflow channel.

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 supports open water areas subject to 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** .8H

Comments: Moderate biologial activity; no fish habitat; vegetative component >5 acres with a upland buffer.

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

i. Discharge Indicators

- [x] The AA is a slope wetland
- [x] Springs or seeps are known or observed
- [x] Vegetation growing during dormant season/drought
- [x] Wetland occurs at the toe of a natural slope
- [ ] Seeps are present at the wetland edge
- [x] AA permanently flooded during drought periods
- [x] 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: Seasonal water regime within AA.

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:

Currently no recreation/education occurs at the site.

General Site Notes

A supplemental hydrology source was identified in 2014 and 2015 during the site visits. Water is entering the site along the southern boundary from the ditch located upslope. This additional hydrology has resulting in increased wetland acreage in 2015.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Rostad Ranch - created and existing wetlan

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	13.41	☑
C. General Wildlife Habitat	M	.5	1	7.45	☐
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	8.94	☐
G. Sediment/Nutrient/Toxicant Removal	H	1	1	14.9	☑
H. Sediment/Shoreline Stabilization	H	.9	1	13.41	☑
I. Production Export/Food Chain Support	H	.8	1	11.92	☑
J. Groundwater Discharge/Recharge	M	.7	1	10.43	☐
K. Uniqueness	L	.3	1	4.47	☐
L. Recreation/Education Potential (bonus points)	L	.05	NA	0.745	☐
Totals:		5.75	9	85.675	
Percent of Possible Score			**63.89** %		

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

I	II	III	IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
Rostad Ranch
Meagher County, Montana



Photo Point 1 – *Panorama*
Bearing: 140-240 degrees

Location: Northeast corner of site
Taken in 2013



Photo Point 1 – *Panorama*
Bearing: 140-240 degrees

Location: Northeast corner of site
Taken in 2014



Photo Point 1 – *Panorama*
Bearing: 140-240 degrees

Location: Northeast corner of site
Taken in 2015



Photo Point 2 – *Panorama*
Bearing: 180 -70 degrees

Location: East fence corner
Taken in 2013



Photo Point 2 – *Panorama*
Bearing: 180 -70 degrees

Location: East fence corner
Taken in 2014



Photo Point 2 – *Panorama*
Bearing: 180 -70 degrees

Location: East fence corner
Taken in 2015



Photo Point 3 – *Panorama*
Bearing: 160-360 degrees

Location: East fence line
Taken in 2013



Photo Point 3 – *Panorama*
Bearing: 160-360 degrees

Location: East fence line
Taken in 2014



Photo Point 3 – *Panorama*
Bearing: 160-360 degrees

Location: East fence line
Taken in 2015



Photo Point 4 – *Panorama*
Bearing: 190-340 degrees

Location: Southeast fence corner
Taken in 2013



Photo Point 4 – *Panorama*
Bearing: 190-340 degrees

Location: Southeast fence corner
Taken in 2014



Photo Point 4 – *Panorama*
Bearing: 190-340 degrees

Location: Southeast fence corner
Taken in 2015



Photo Point 5 – *Panorama*
Bearing: 300-110 degrees

Location: Southwest fence corner
Taken in 2013



Photo Point 5 – *Panorama*
Bearing: 300-110 degrees

Location: Southwest fence corner
Taken in 2014



Photo Point 5 – *Panorama*
Bearing: 300-110 degrees

Location: Southwest fence corner
Taken in 2015



Photo Point 6 – *Photo 1*
Bearing: 30 degrees

Location: West fence line
Taken in 2013



Photo Point 6 – *Photo 1*
Bearing: 30 degrees

Location: West fence line
Taken in 2014



Photo Point 6 – *Photo 1*
Bearing: 30 degrees

Location: West fence line
Taken in 2015



Photo Point 6 – *Photo 2*
Bearing: 100 degrees

Location: West fence line
Taken in 2013



Photo Point 6 – *Photo 2*
Bearing: 100 degrees

Location: West fence line
Taken in 2014



Photo Point 6 – *Photo 2*
Bearing: 100 degrees

Location: West fence line
Taken in 2015



Photo Point 7 – *Panorama*
Bearing: 0-330 degrees

Location: West fence corner
Taken in 2013



Photo Point 7 – *Panorama*
Bearing: 0-330 degrees

Location: West fence corner
Taken in 2014



Photo Point 7 – *Panorama*
Bearing: 0-330 degrees

Location: West fence corner
Taken in 2015



Transect 1 – *Beginning* **Location:** NE branch of site
Bearing: 290 degrees **Taken in 2013**



Transect 1 – *End* **Location:** NE branch of site
Bearing: 110 degrees **Taken in 2013**



Transect 1 – *Beginning* **Location:** NE branch of site
Bearing: 290 degrees **Taken in 2014**



Transect 1 – *End* **Location:** NE branch of site
Bearing: 110 degrees **Taken in 2014**



Transect 1 – *Beginning* **Location:** NE branch of site
Bearing: 290 degrees **Taken in 2015**



Transect 1 – *End* **Location:** NE branch of site
Bearing: 110 degrees **Taken in 2015**



Transect 2 – *Beginning* **Location:** North central
Bearing: 130 degrees **Taken in 2013**



Transect 2 – *End* **Location:** North central
Bearing: 310 degrees **Taken in 2013**



Transect 2 – *Beginning* **Location:** North central
Bearing: 130 degrees **Taken in 2014**



Transect 2 – *End* **Location:** North central
Bearing: 310 degrees **Taken in 2014**



Transect 2 – *Beginning* **Location:** North central
Bearing: 130 degrees **Taken in 2015**



Transect 2 – *End* **Location:** North central
Bearing: 310 degrees **Taken in 2015**



Transect 3 – *Beginning*
Bearing: 30 degrees

Location: Southern portion of site
Taken in 2013



Transect 3 – *End*
Bearing: 210 degrees

Location: Southern portion of site
Taken in 2013



Transect 3 – *Beginning*
Bearing: 30 degrees

Location: Southern portion of site
Taken in 2014



Transect 3 – *End*
Bearing: 210 degrees

Location: Southern portion of site
Taken in 2014



Transect 3 – *Beginning*
Bearing: 30 degrees

Location: Southern portion of site
Taken in 2015



Transect 3 – *End*
Bearing: 210 degrees

Location: Southern portion of site
Taken in 2015



Data Point – R1-w
Bearing: 80 degrees
Location: Veg community 2
Taken in 2015



Data Point – R1-u
Bearing: 180 degrees
Location: Veg community 1
Taken in 2015



Data Point – R2-w
Bearing: 270 degrees
Location: Veg community 2
Taken in 2015



Data Point – R2-u
Bearing: 270 degrees
Location: Veg community 1
Taken in 2015

Appendix D

Project Plan Sheets

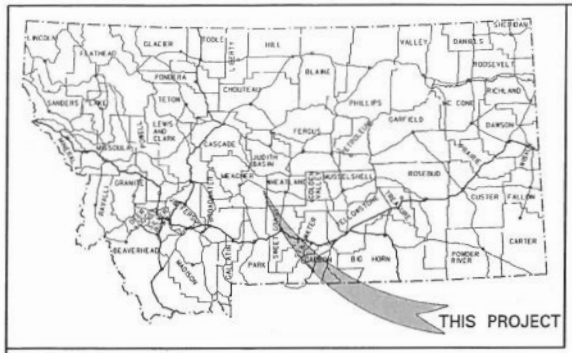
MDT Wetland Mitigation Monitoring
Rostad Ranch
Meagher County, Montana

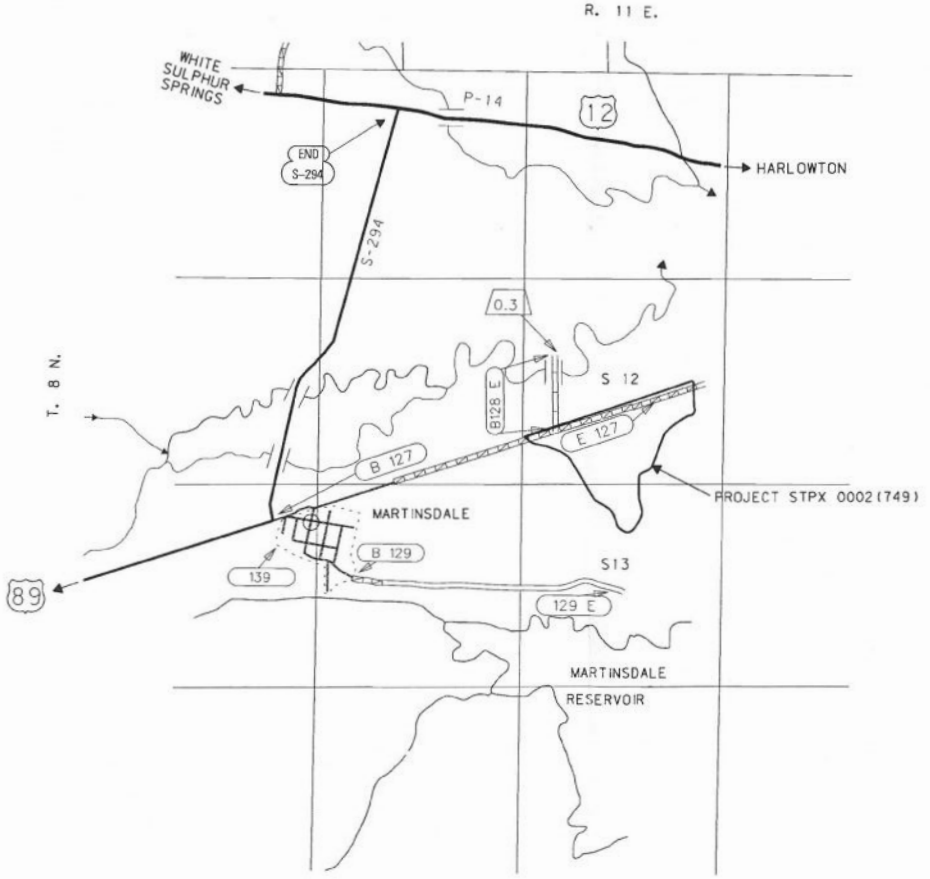
MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPX 0002(749)

ROSTAD RANCH WETLAND

MEAGHER COUNTY





MORRISON MAIERLE, INC.

PLANS PREPARED BY
MORRISON-MAIERLE, INC. 1 ENGINEERING PLACE P.O. BOX 6347 HELENA, MT 59604 PHONE (406) 442-3050 FAX (406) 442-7062

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R / W & I.C.	STPX 0002(749)
P. E.	STPX 0002(749)

MORRISON-MAIERLE, INC.

BY Phillip J. Forbes

DATE 05.11.12

PHILLIP J. FORBES 9112 PE REGISTERED PROFESSIONAL ENGINEER MONTANA

MONTANA DEPARTMENT OF TRANSPORTATION

RECEIVED

BY CONSULTANT DESIGN ENGINEER

DATE MAY 14, 2012

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED :

DIVISION ADMINISTRATOR DATE

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\6565000\rdtitle01.dgn	DESIGNED BY			ROSTAD MITIGATION	
2		5/17/2012	REVIEWED BY			MEAGHER COUNTY	
1		9:40:00 AM CPS - U2162	CHECKED BY				

TABLE OF CONTENTS

PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	2
LINEAR & LEVEL DATA	2
CONTROL DIAGRAM	3
SUMMARIES	4
GRADING	4
REVEGETATION	4
CULVERTS	4
CULVERT SUMMARY RECAP	4
DIVERSION STRUCTURE	4
FENCING	4
ABANDON PIEZOMETER	4
BROAD-CRESTED WEIR	4
DETAILS	5-9
DIVERSION STRUCTURE INLET	5
DIVERSION STRUCTURE CROSS SECTION	6
BROAD-CRESTED WEIR	6
FENCING	7
OBLITERATE DRAIN	8
SPREADER BERM	9
EXISTING SITE OVERVIEW	10
PROPOSED SITE OVERVIEW	11
PROPOSED GRADING PLAN	12
TOPSOIL SALVAGE PLAN	13
WORK AREA #1 PLAN	14
WORK AREA #2 PLAN	15
WORK AREA #3 PLAN	16
WETLAND MITIGATION OVERVIEW	17
CONCEPTUAL REVEGETATION PLAN	18
WATER DISTRIBUTION OVERVIEW	19

NOTES

TEMPORARY EROSION AND SEDIMENT CONTROL

REFER TO SECTION 208 OF THE MDT DETAILED DRAWINGS FOR EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES. INSTALL TEMPORARY EROSION CONTROL MEASURES AS DEEMED NECESSARY BY THE ENGINEER. PAYMENT TO BE DETERMINED BY USING THE EROSION AND SEDIMENT CONTROL RATE SCHEDULE AND PAID FOR UNDER MISCELLANEOUS WORK. ALL INSTALLED TEMPORARY EROSION CONTROL BLANKETS MUST BE COMPOSED AND CONSTRUCTED OF 100% BIODEGRADABLE FIBERS, NETTING, AND STITCHING.

SOILS INFORMATION

TO OBTAIN THE COMPLETE SOILS INFORMATION CONTACT THE MDT GEOTECHNICAL SECTION AT (406) 444-6281.

UTILITIES

CONTACT THE UTILITIES UNDERGROUND LOCATION CENTER (1-800-424-5555) OR OTHER NOTIFICATION SYSTEM FOR THE MARKING AND LOCATION OF ALL LINES AND SERVICES BEFORE EXCAVATING.

CLEARING AND GRUBBING

CLEAR AND GRUB TO STAKED GRADING LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN THE UNIT PRICE BID FOR UNCLASSIFIED EXCAVATION.

TOPSOIL SALVAGING AND PLACING

TOPSOIL QUANTITIES SHOWN IN THE PLANS ARE SUFFICIENT TO RE-TOPSOIL IN AREAS WHERE CUTS OR FILLS EXCEED 1 FOOT. ALL REMAINING GRADING IS CONSIDERED UNCLASSIFIED EXCAVATION.

PIEZOMETER REMOVAL

SEE SHEET 10 FOR LOCATIONS OF PIEZOMETERS ON THE PROJECT. ABANDON WELLS IN ACCORDANCE WITH ARM 36.21.810.

WETLANDS

ONLY WETLANDS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED. WETLANDS MAY EXIST BEYOND THE PROJECT LIMITS AND ANY ACTION AFFECTING SUCH WETLANDS IS THE RESPONSIBILITY OF THE CONTRACTOR.

WETLANDS LEGEND

DELINEATED WETLANDS

IMPACTED WETLANDS

COMBINATION SCALE FACTOR

ALL SURVEY AND STAKING WILL REQUIRE THE USE OF A COMBINATION SCALE FACTOR (CSF) 0.99922160. ALL DIMENSIONS ON THE PLANS ARE GRID DIMENSIONS AND MUST BE DIVIDED BY THE CSF TO ARRIVE AT GROUND DIMENSIONS.

SURVEY DATA

DTM FILES FORMATTED FOR TRIMBLE, LEICA, AND TOPCON SURVEY CONTROLLERS ARE AVAILABLE UPON REQUEST. CONTACT WADE SALYARDS, MDT WETLAND ENGINEER, AT 444-0451.

LINEAR & LEVEL DATA

BEARING SOURCE

NAD 83 (1992)

LEVEL DATUM SOURCE

NAVD 88

BENCH MARKS

SEE CONTROL ABSTRACT FOR BENCHMARK INFORMATION

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000ntlfz01.dgn	DESIGNED BY			WETLAND PLANS	ROSTAD RANCH WETLAND	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY					
1		10:31:40 AM CPS - U2166	CHECKED BY			MEAGHER COUNTY	CSF = 0.99922160 UPN NUMBER 5565	SHEET 2 OF 19

2JEB △

CONTROL DIAGRAM

7TE △

Control marks 1 through 7 were established to provide control in the areas of future wetlands mitigation. MDT secondary control procedures were used to establish the state plane coordinates and GPS derived orthometric heights of the new control.

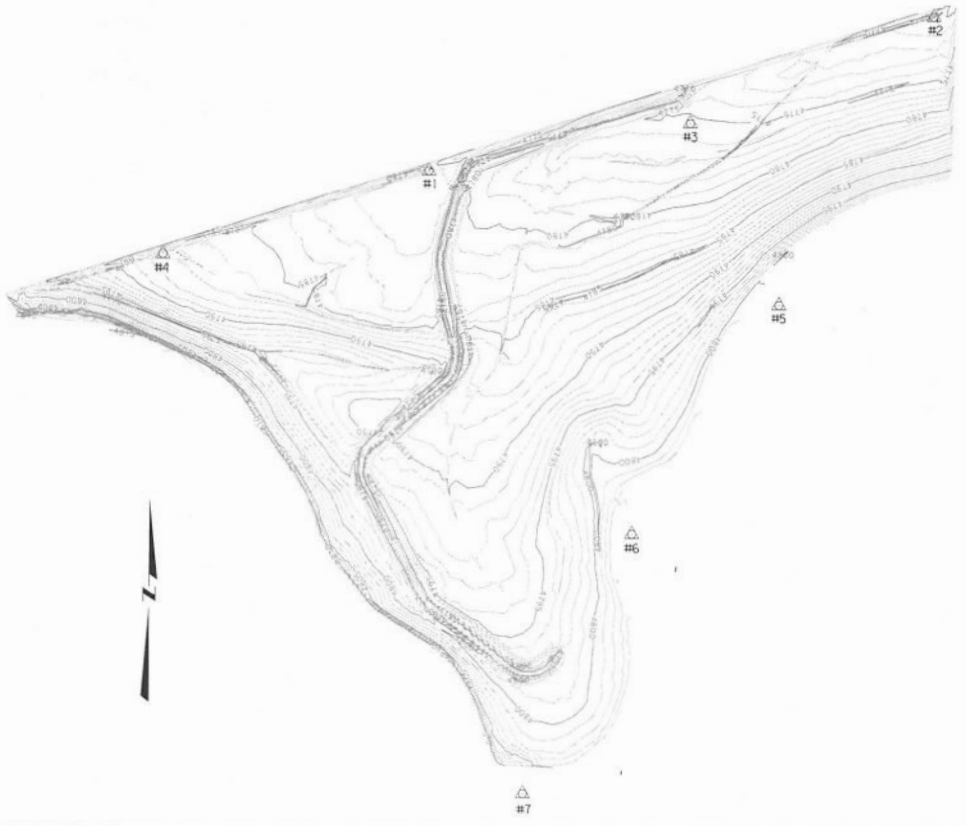
Coordinates shown hereon are referenced to the Montana Coordinate System NAD83(1992), International feet. Elevations are referenced to NAVD88, U.S. Feet (Geoid03). Redundant GPS RTK methods of survey were used to tie this survey to MDT control survey CN 4889, which was tied to the National Spatial Reference System through first-order order or better control points "A 295", "B80RESET" and "K812", using GPS static procedures with dual-frequency GPS receivers.

In order to maintain a relative accuracy of 1:50,000, one Combination Scale Factor can be used for this project: .99922160, which is the Combination Scale Factor for CN 4889.

CONTROL MARK ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
2JEB	820176.707	1755842.913	4837.33	FOUND USGS BENCHMARK. FROM THE JUNCTION OF HIGHWAY 294 AND 12, GO 2 MILES WEST ALONG HIGHWAY 12. THE MARK IS 95' NORTHWEST OF AND 60' SOUTHWEST OF A "T" ROAD GOING NORTH OFF OF HIGHWAY 12, 11' WEST OF AN IRRIGATION DITCH CROSSING HIGHWAY 12, 1' NORTH OF SOUTH R/W FENCE AND POST WITH SURVEY MARKER SIGN, BRASS CAP STAMPED "2-JEB, 1972."
7TE	815626.843	1773445.444	4735.58	FOUND MDT CONTROL CAP AT MP 77.55, A STANDARD MDT CONTROL CAP ON 5/8" REBAR 0.03m BELOW GROUND STAMPED "7TE 2003". CAP IS 250' NORTH OF THE PT#, 195' NORTH OF CORNER IN NORTH R/W FENCE WEST OF THE NORTH ROAD TO MARTINSDALE HUTTERITE COLONY, 82' WEST OF WEST FENCE ALONG THE ROAD, 42' WEST OF AN IRRIGATION DITCH, 75' EAST OF A POWER POLE "TAP 8", AND ON HIGH POINT ABOVE AN IRRIGATION DITCH. WITNESS POSTS SET 1' NORTH AND SOUTH.
1	807908.694	1757815.256	4781.01	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "1 2008". MARK IS 2.6' NORTH OF THE SOUTH ROW FENCE OF MARTINSDALE ROAD, 15' WEST OF AN APPROACH, AND 2.6' NORTH OF A WITNESS POST.
2	808455.543	1769626.308	4770.81	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "2 2008". MARK IS 2' SOUTH OF THE SOUTH ROW FENCE OF MARTINSDALE ROAD, 7.7' WEST OF A FENCE CORNER, 35' WEST OF AN APPROACH, AND 2' SOUTH OF A WITNESS POST.
3	808076.674	1768751.668	4775.16	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "3 2008". MARK IS 100' SOUTH OF THE SOUTH ROW FENCE OF MARTINSDALE ROAD, AND 2' NORTH OF A WITNESS POST.
4	807615.353	1766864.291	4787.63	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "4 2008". MARK IS 3' SOUTH OF THE SOUTH ROW FENCE OF MARTINSDALE ROAD, 450' EAST OF A DIVERSION STRUCTURE, AND 2' SOUTH OF A WITNESS POST.
5	807432.042	1765972.531	4808.98	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "5 2008". MARK IS 2' NORTH OF AN EAST-WEST FENCE, AND 2' SOUTH OF A WITNESS POST.
6	806616.942	1766550.880	4806.07	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "6 2008". MARK IS IN AN OPEN FIELD, 30' EAST OF AN IRRIGATION CANAL, AND 2' SOUTH OF A WITNESS POST.
7	805695.871	1768165.498	4812.40	SET MDT CONTROL CAP, FLUSH WITH GROUND, STAMPED "7 2008". MARK IS ON TOP OF THE EAST BANK OF CANAL, 40' NORTH OF AN EAST-WEST FENCE, 120' SOUTHEAST OF CONCRETE DIVERSION STRUCTURE, AND 2' SOUTH OF A WITNESS POST.

NOTE: CONTROL DIAGRAM NOT TO SCALE



MORRISON MAIERLE, INC.

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdtlz01.dgn	DESIGNED BY			WETLAND PLANS	ROSTAD RANCH WETLAND	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY			MEAGHER COUNTY	CSF = 0.99922160 UPN NUMBER 5565	SHEET 3 OF 19
1		10:31:43 AM CPS - U216	CHECKED BY					

SUMMARY

GRADING

TOTAL	cubic yards			REMARKS
	UNCL. EXC.	EXCESS EXCAVATION	EMB.+	
	9,400	9,400		SITE GRADING
	500		500	KEYED BERM
TOTAL	9,900	# 9,400	# 500	

FOR INFORMATION ONLY

NOTE: 20% SHRINK FACTOR APPLIED TO GRADING

REVEGETATION

STATION		lump sum		cubic yards	acres	REMARKS
FROM	TO	REVEGE-TATION	TREE & SHRUB PLANTING **	TOPSOIL SALVAGING & PLACING	WETLAND SEEDING *	
		1	1	22.235	35.83	
TOTAL		1	1	22.235	~	

* FOR INFORMATION ONLY

** SEE SHEET 17 FOR CONCEPTUAL REVEGETATION PLAN

ABANDON PIEZOMETER

STATION	ITEM DESCRIPTION	square yards	cubic yards	each	REMARKS
	ABANDON WELL			4	SEE SHEET 10 FOR LOCATIONS
TOTAL		~	~	4	

CULVERTS (INCLUDED IN CULVERT SUMMARY RECAP)

CULVERT	BASIC BID ITEMS											PIPE OPTIONS in		COATING *	END SECTIONS		cubic yards				square yards	linear feet	SKEW ANGLE	CULVERT IN PL. in x ft	REMARKS
	CULVERT PIPE in	linear feet				cubic yards					square yards				LEFT	RIGHT	FOUND-ATION MATERIAL	BEDDING MATERIAL	CLASS "DD" CONCRETE	CULVERT RIPRAP CLASS	GEOTEX-TILE #	HEIGHT OF COVER			
		LENGTH OF PIPE	RELAY CULVERT	CLEAN CULVERT	REMOVE CULVERT	CULVERT EXC. **	FOUND-ATION MATERIAL	BEDDING MATERIAL	CLASS "DD" CONCRETE	CULVERT RIPRAP CLASS	GEOTEX-TILE #	CONCRETE STEEL - 2 2/3 x 1/2 CORR. ALUMINUM - 2 2/3 x 1/2 CORR.	CLASS OR THK.											
CULVERT A					23.0																			18 X 23.0 CMP	REMOVE
CULVERT B					75.0																			18 X 75.0 CMP	REMOVE
CULVERT C					22.0																			18 X 22.0 CMP	REMOVE
CULVERT D					42.0																			18 X 42.0 CMP	REMOVE
TOTAL	~	~	~	~	162.0	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	~	

BROAD-CRESTED WEIR

STATION		cubic yards	square yards	each						REMARKS
FROM	TO	BANK PROTECTION	TURF REINFORCEMENT MAT	CANAL GATE	HEAD GATE	TRASH GUARD	CHECK	TURNOUT	REMOVE IRRIGATION STRUC-TURE	
		TYPE 3	TYPE C350	in	in					
		35	120							BROAD-CRESTED WEIR
TOTAL		35	120	~	~	~	~	~	~	

CULVERT SUMMARY RECAP

BASIC BID	linear feet				cubic yards				square yards	
	NEW PIPE (TOTAL)	RELAY CULVERT	CLEAN CULVERT	REMOVE CULVERT	FOUND-ATION MATERIAL	BEDDING MATERIAL	CLASS "DD" CONCRETE	CULVERT RIPRAP CLASS	GEOTEXTILE	PERM. EROS. CNTRL. SURV. CLASS
				162.0						
TOTAL	~	~	~	162.0	~	~	~	~	~	

FENCING

STATION		linear feet			each			linear feet		REMARKS
		WILDLIFE FRIENDLY FENCE		REMOVE FENCE	WILDLIFE FRIENDLY FENCE PANEL		DEADMAN	FARM GATE*		
FROM	TO	TYPE 1 - FM	TYPE 1 - FW		SINGLE	DOUBLE		TYPE G2	TYPE G3	
		2,592.4		2,592.4	4	1		12		
		495.2			1	1		12		
		974.6				2				
		379.2			1	1				
		838.9				2				
		215.8			1	4		12		
		530.3				1				
		99.5			1	1				
		2,271.7			4	1				
TOTAL		8,397.6	~	# 2,592.4	12	14	~	36	~	

FOR INFORMATION ONLY

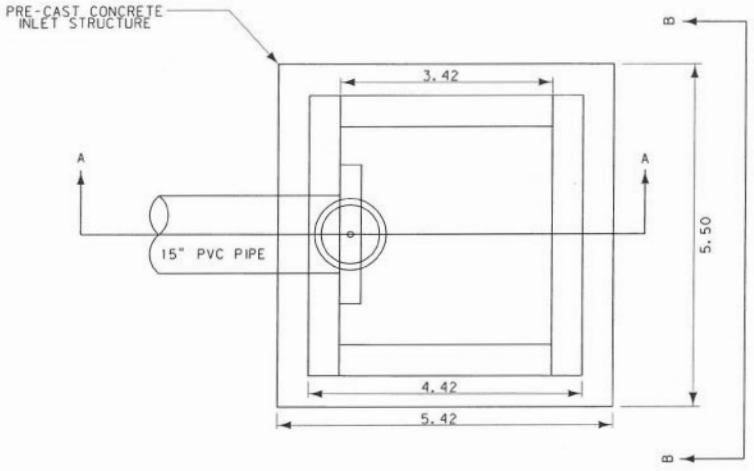
DIVERSION STRUCTURE

DIVERSION	cubic yard		square yard	each		feet	lump sum	REMARKS
	CLASS "DD" CONC.	BANK PROTECTION	TURF REINFORCEMENT MAT	CANAL GATE	HEAD GATE	PVC PIPE	TOTAL	
		TYPE 3	TYPE C350	15 in	15 in	15 in		
	4			1		20.0	1	SEE DETAIL
		20	70					SEE DETAIL
	~	20	70	~	~	~	1	

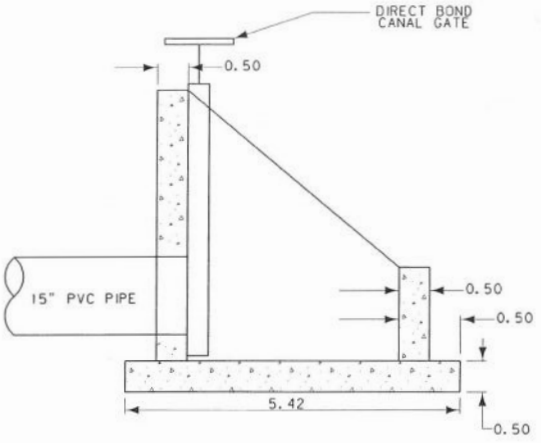
MORRISON MAIERLE, INC

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdsumz01.dgn	DESIGNED BY		WETLAND PLANS	ROSTAD RANCH WETLAND MITIGATION	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY				
1		10:31:49 AM CPS - U2160	CHECKED BY		MEAGHER COUNTY	CSF = 0.99922160 UPN NUMBER 5565	SHEET 4 OF 19

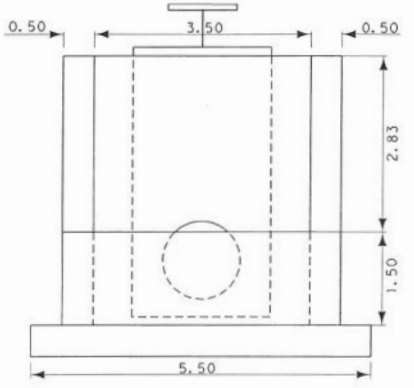
DETAIL



PLAN VIEW



SECTION A-A



SECTION B-B

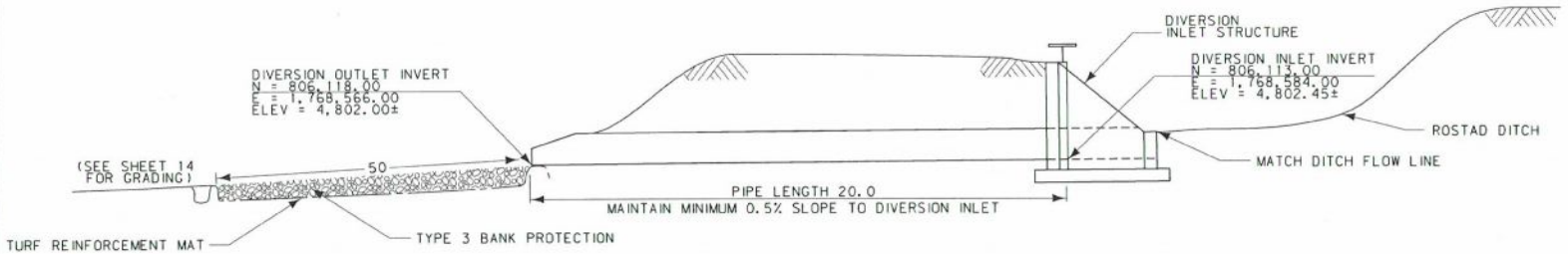
DIVERSION INLET STRUCTURE

NTS

NOTE: ALL DIMENSION IN FEET UNLESS OTHERWISE NOTED

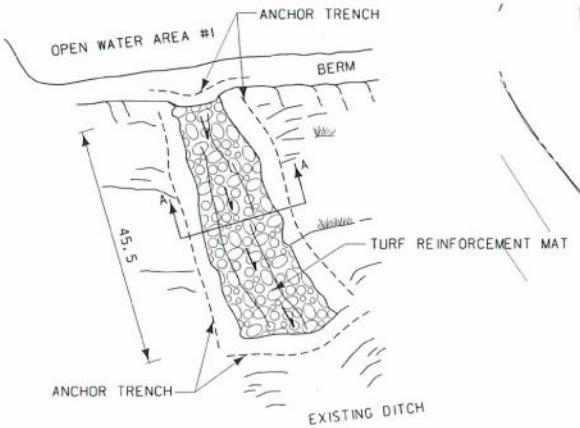
3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rddetz01.dgn	DESIGNED BY			WETLAND PLANS		ROSTAD RANCH WETLAND	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY						
1		10:31:57 AM CPS - U216	CHECKED BY			MEAGHER COUNTY		CSF = 0.99922160 UPN NUMBER 5565	SHEET 5 OF 19

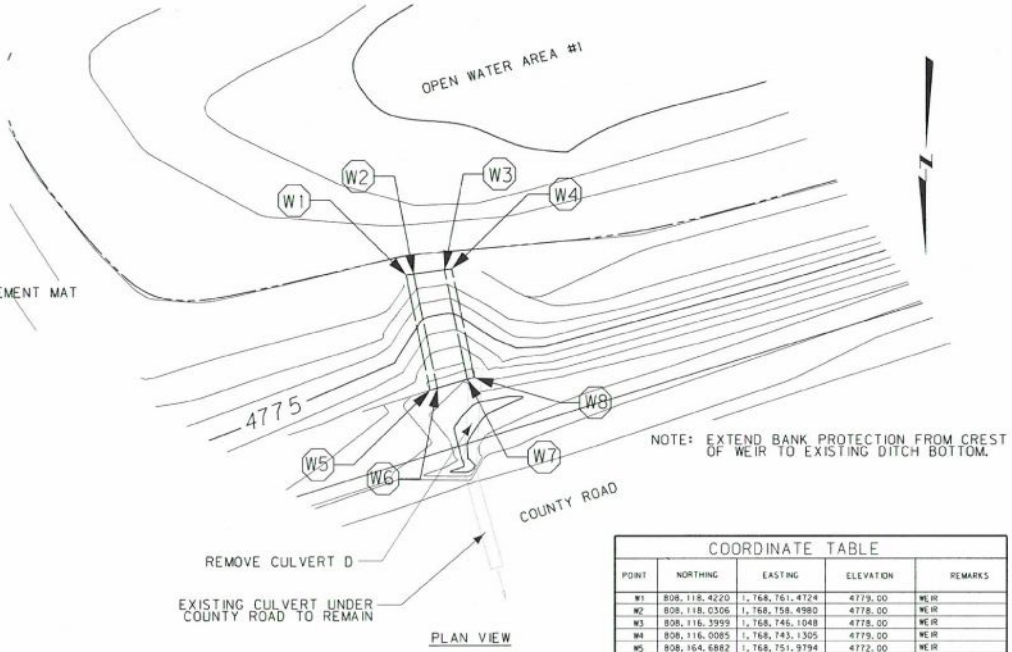
DETAIL

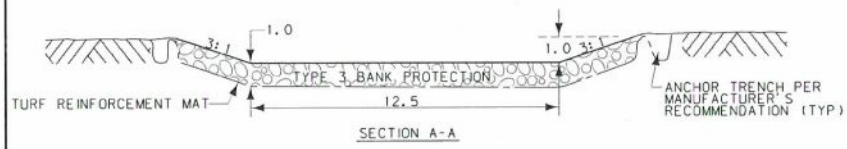


DIVERSION STRUCTURE CROSS SECTION

NTS







COORDINATE TABLE

POINT	NORTHING	EASTING	ELEVATION	REMARKS
W1	808,118.4220	1,768,761.4724	4779.00	WEIR
W2	808,118.0306	1,768,758.4980	4778.00	WEIR
W3	808,116.3999	1,768,746.1048	4778.00	WEIR
W4	808,116.0085	1,768,743.1305	4779.00	WEIR
W5	808,164.6882	1,768,751.9794	4772.00	WEIR
W6	808,163.8578	1,768,749.0875	4771.00	WEIR
W7	808,160.5978	1,768,737.0378	4771.00	WEIR
W8	808,159.5674	1,768,734.1459	4772.00	WEIR

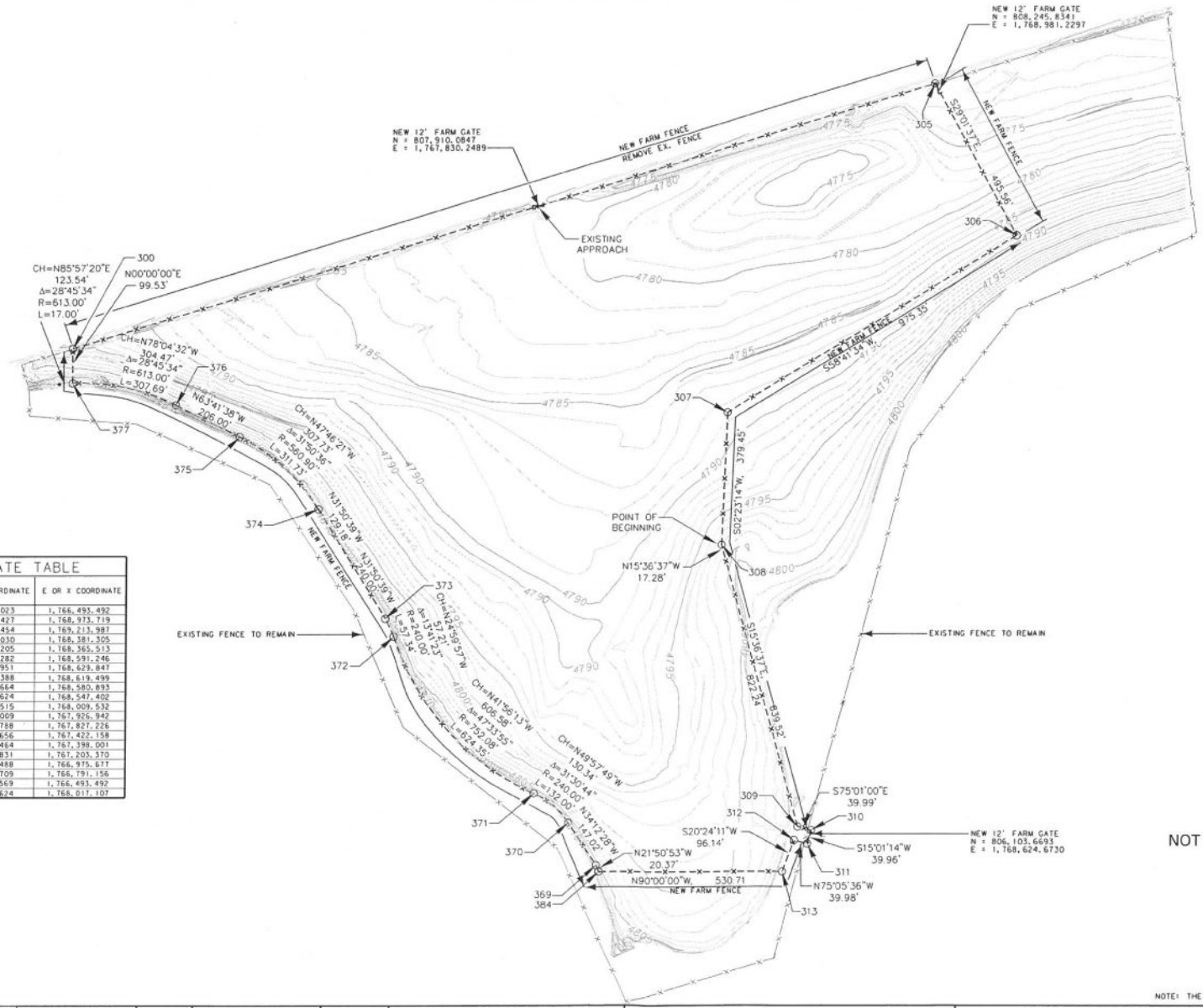
BROAD-CRESTED WEIR

NTS

NOTE: ALL DIMENSION IN FEET UNLESS OTHERWISE NOTED

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rddetz01.dgn	DESIGNED BY			WETLAND PLANS	ROSTAD RANCH WETLAND	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY					
1		10:32:00 AM CPS - U2160	CHECKED BY			MEAGHER COUNTY	CSF = 0.99922160 UPN NUMBER 5565	SHEET 6 OF 19

FENCING DETAIL



COORDINATE TABLE

POINT #	N OR Y COORDINATE	E OR X COORDINATE
300	807,505.023	1,766,493.492
305	808,259.427	1,768,973.719
306	807,826.454	1,769,213.981
307	807,320.030	1,768,381.305
308	806,941.205	1,768,365.513
309	806,133.282	1,768,591.246
310	806,122.951	1,768,629.847
311	806,084.388	1,768,619.499
312	806,094.664	1,768,580.893
313	806,004.624	1,768,547.402
369	806,023.515	1,768,009.532
370	806,145.009	1,767,926.942
371	806,228.788	1,767,827.226
372	806,679.656	1,767,422.158
373	806,731.464	1,767,398.001
374	807,044.831	1,767,203.370
375	807,251.488	1,766,975.677
376	807,342.709	1,766,791.156
377	807,405.569	1,766,493.492
384	806,004.624	1,768,017.107

NOTE: THE CSF HAS BEEN APPLIED TO ALL DIMENSIONS ON THIS SHEET.

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5585000rdplna03.dgn				WETLAND PLANS		ROSTAD RANCH WETLAND MITIGATION		PROJECT NO. STPX 0002(749)	
2		5/21/2012				MEAGHER COUNTY		CSF = 0.99922160	UPN NUMBER 5565	SHEET 7 OF 19	
1		10:32:12 AM CPS - U2160									

DETAIL



TYPICAL SECTION

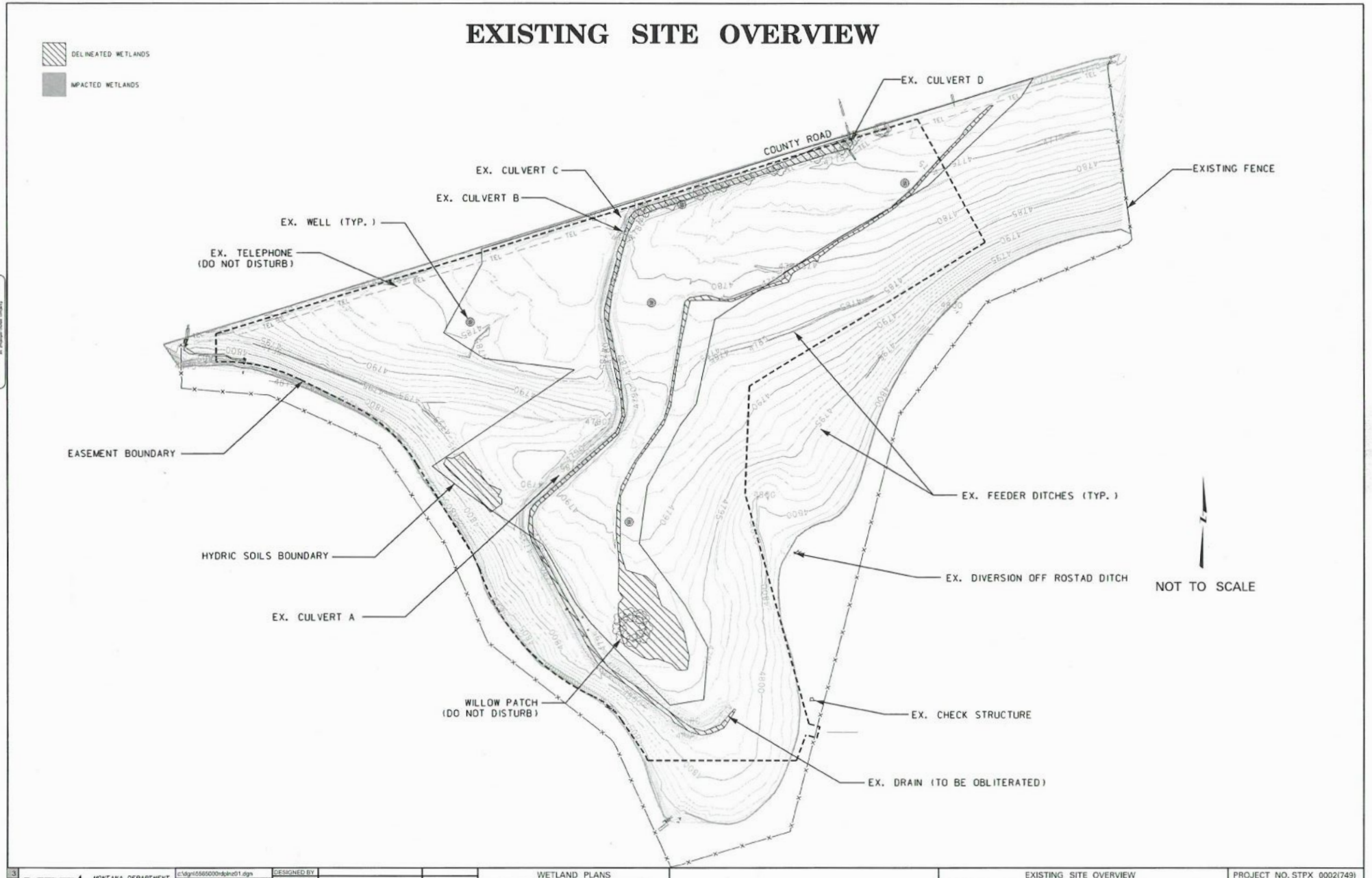
NOTES:

COMPACT PROPOSED EMBANKMENT AS SPECIFIED BY STD SPEC 203.03.3 TO 90% COMPACTION (OPTIMUM MOISTURE CONTENT MAY VARY).

OBLITERATE 'DRAIN
NTS

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rddetz02.dgn	DESIGNED BY			WETLAND PLANS	ROSTAD RANCH WETLAND		PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY						
1		10:32:21 AM CPS - U2160	CHECKED BY			MEAGHER COUNTY	CSF = 0.99922160	UPN NUMBER 5565	SHEET 8 OF 19

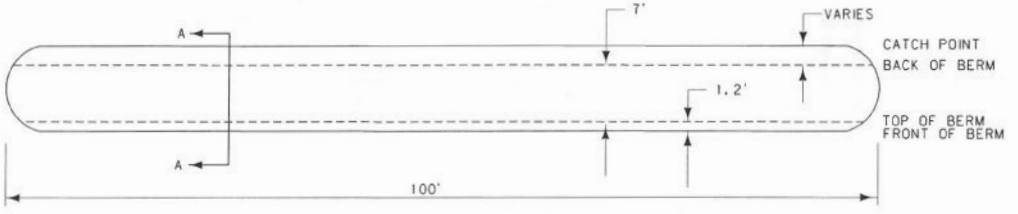
EXISTING SITE OVERVIEW



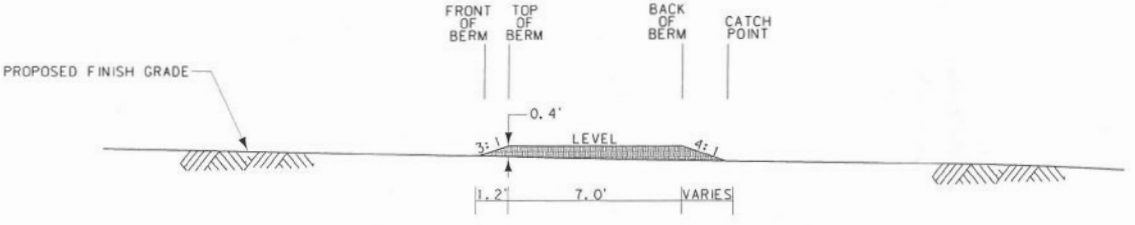
MORRISON MAIERLE, INC

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdplnz01.dgn	DESIGNED BY			WETLAND PLANS	EXISTING SITE OVERVIEW	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY			MEAGHER COUNTY	CSF = 0.99922160 UPN NUMBER 5565	SHEET 10 OF 19
1		10:32:38 AM CPS - U2160	CHECKED BY					

DETAIL



PLAN VIEW



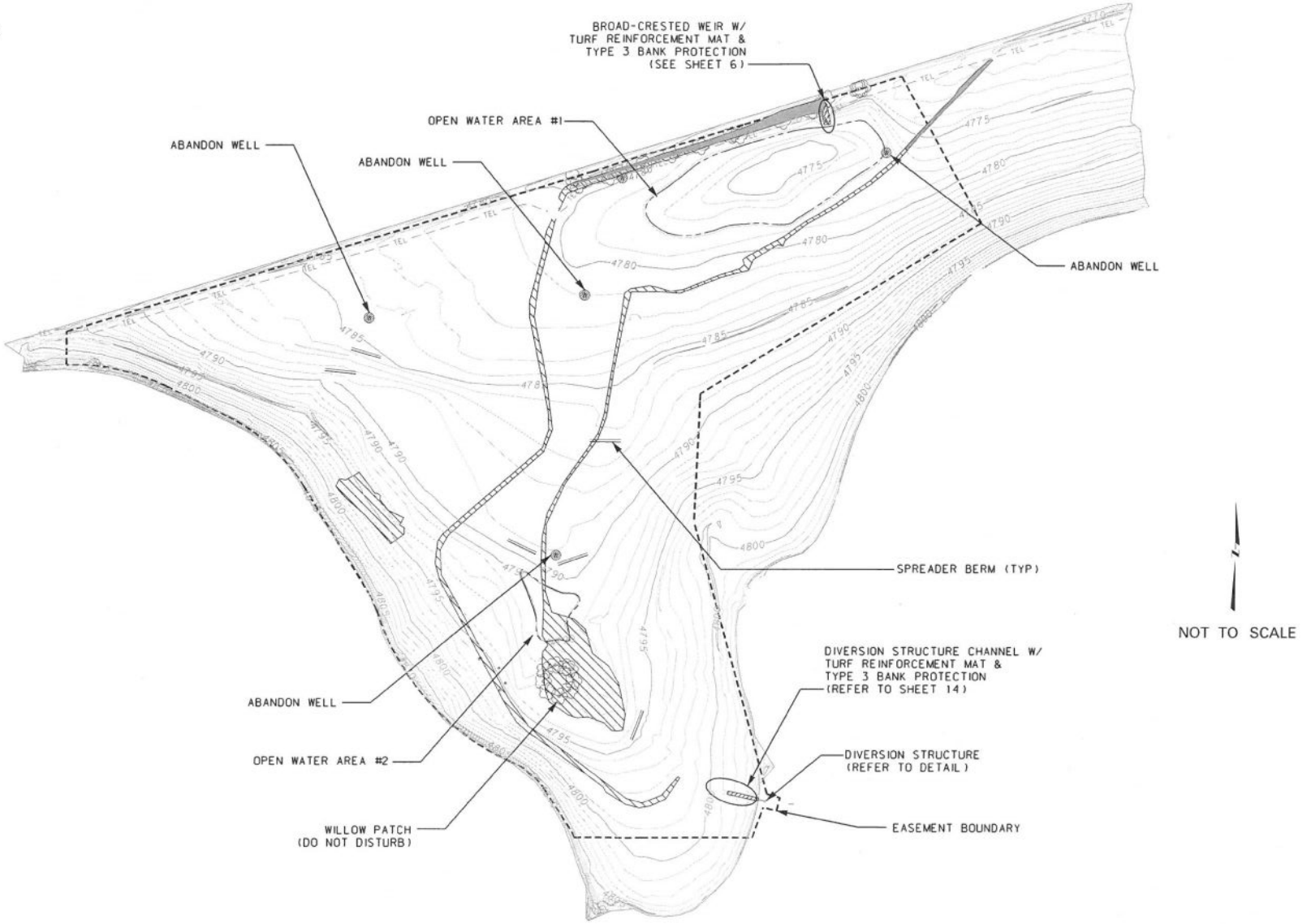
SECTION A-A

SPREADER BERM
NTS

NOTE: SEE POINTS B1 THROUGH B36 ON SHEETS 14 AND 15.

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rddetc03.dgn 5/21/2012 10:32:29 AM CPS - U216	DESIGNED BY REVIEWED BY CHECKED BY			WETLAND PLANS MEAGHER COUNTY		ROSTAD RANCH WETLAND MITIGATION CSF = 0.99922160 UPN NUMBER 5565	PROJECT NO. STPX 0002(749) SHEET 9 OF 19

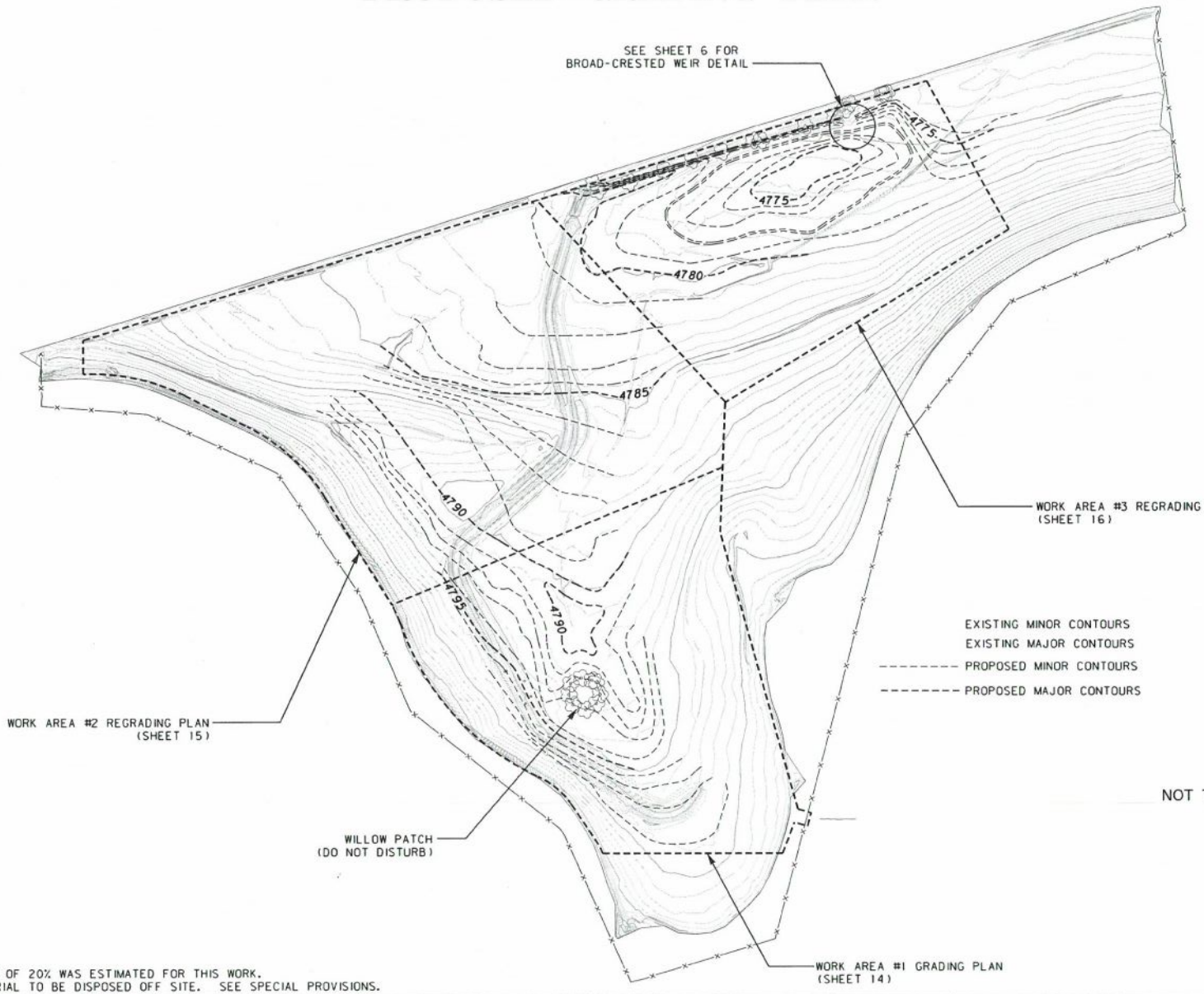
PROPOSED SITE OVERVIEW



MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdplnz01.dgn 5/21/2012 10:32:43 AM CPS - U2160	DESIGNED BY REVIEWED BY CHECKED BY	WETLAND PLANS MEAGHER COUNTY	ROSTAD RANCH WETLAND		PROJECT NO. STPX 0002(749)
				CSF = 0.99922160	UPN NUMBER 5565	SHEET 11 OF 19

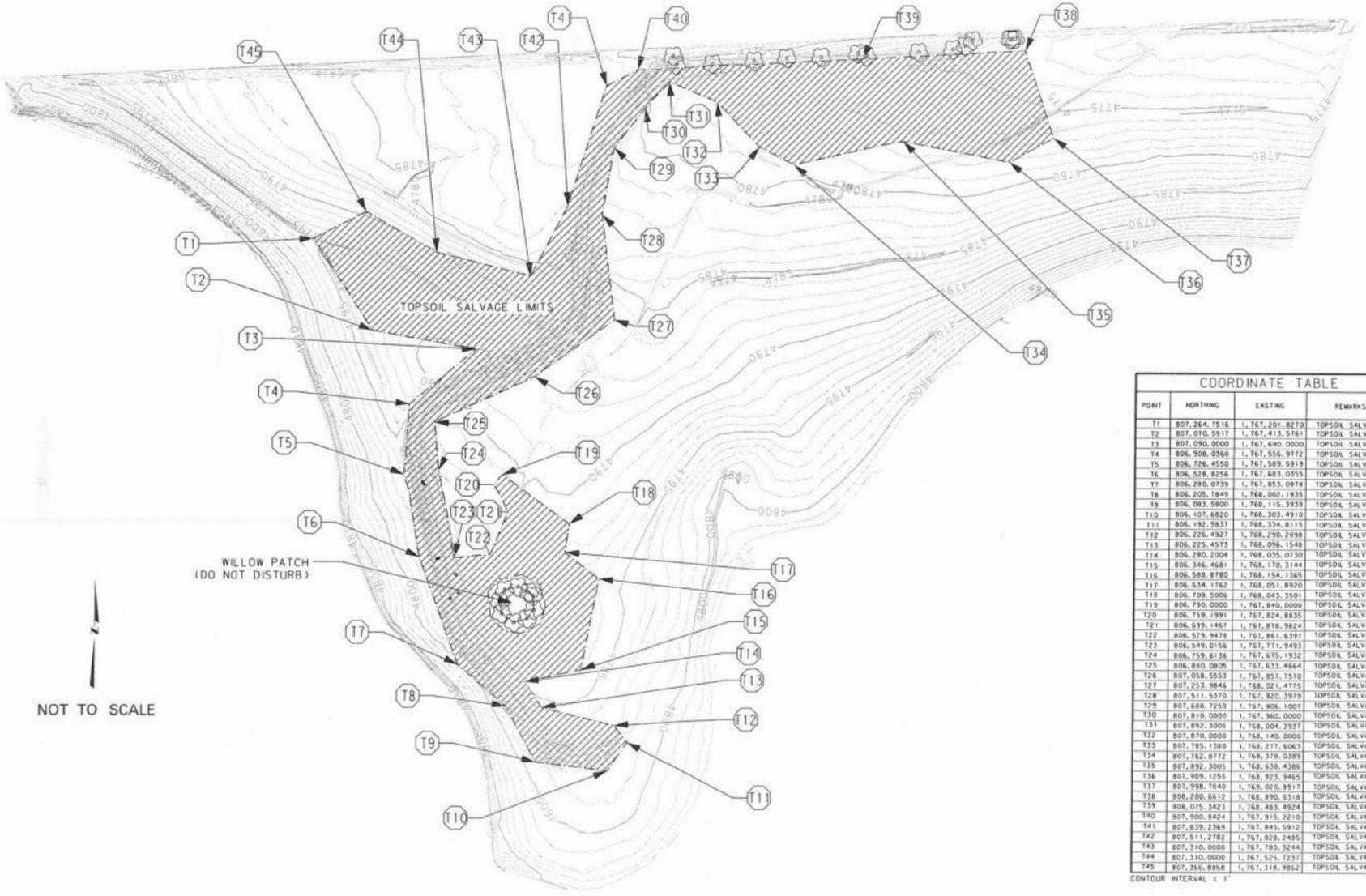
PROPOSED GRADING PLAN



NOTE: A SHRINK FACTOR OF 20% WAS ESTIMATED FOR THIS WORK.
ALL WASTE MATERIAL TO BE DISPOSED OF SITE. SEE SPECIAL PROVISIONS.

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdplnz01.dgn 5/21/2012 10:32:47 AM CPS - U2166		WETLAND PLANS MEAGHER COUNTY		ROSTAD RANCH WETLAND CSF = 0.99922160 UPN NUMBER 5565		PROJECT NO. STPX 0002(749) SHEET 12 OF 19

TOPSOIL SALVAGE PLAN



COORDINATE TABLE			
POINT	NORTHING	EASTING	REMARKS
T1	807,264.7516	1,767,201.8270	TOPSOIL SALVAGE LIMIT
T2	807,070.5917	1,767,413.5761	TOPSOIL SALVAGE LIMIT
T3	807,090.0000	1,767,690.0000	TOPSOIL SALVAGE LIMIT
T4	806,908.0360	1,767,556.9172	TOPSOIL SALVAGE LIMIT
T5	806,726.4550	1,767,589.5919	TOPSOIL SALVAGE LIMIT
T6	806,528.8256	1,767,683.0355	TOPSOIL SALVAGE LIMIT
T7	806,280.0739	1,767,853.0978	TOPSOIL SALVAGE LIMIT
T8	806,205.7849	1,768,002.1935	TOPSOIL SALVAGE LIMIT
T9	806,083.5800	1,768,115.3939	TOPSOIL SALVAGE LIMIT
T10	806,107.6820	1,768,303.4910	TOPSOIL SALVAGE LIMIT
T11	806,192.5837	1,768,334.8115	TOPSOIL SALVAGE LIMIT
T12	806,226.4927	1,768,290.2898	TOPSOIL SALVAGE LIMIT
T13	806,225.4573	1,768,096.1548	TOPSOIL SALVAGE LIMIT
T14	806,280.2004	1,768,035.0730	TOPSOIL SALVAGE LIMIT
T15	806,346.4681	1,768,170.3144	TOPSOIL SALVAGE LIMIT
T16	806,588.8780	1,768,154.1365	TOPSOIL SALVAGE LIMIT
T17	806,634.1762	1,768,051.8920	TOPSOIL SALVAGE LIMIT
T18	806,709.5006	1,768,043.3501	TOPSOIL SALVAGE LIMIT
T19	806,790.0000	1,767,840.0000	TOPSOIL SALVAGE LIMIT
T20	806,759.1991	1,767,824.8835	TOPSOIL SALVAGE LIMIT
T21	806,699.1467	1,767,878.9824	TOPSOIL SALVAGE LIMIT
T22	806,579.9478	1,767,861.6397	TOPSOIL SALVAGE LIMIT
T23	806,549.0156	1,767,771.9493	TOPSOIL SALVAGE LIMIT
T24	806,759.6136	1,767,675.1932	TOPSOIL SALVAGE LIMIT
T25	806,880.0805	1,767,633.4664	TOPSOIL SALVAGE LIMIT
T26	807,058.5553	1,767,857.7570	TOPSOIL SALVAGE LIMIT
T27	807,253.9846	1,768,021.4775	TOPSOIL SALVAGE LIMIT
T28	807,511.5370	1,767,920.3979	TOPSOIL SALVAGE LIMIT
T29	807,688.7250	1,767,906.1007	TOPSOIL SALVAGE LIMIT
T30	807,810.0000	1,767,960.0000	TOPSOIL SALVAGE LIMIT
T31	807,892.3005	1,768,004.3937	TOPSOIL SALVAGE LIMIT
T32	807,870.0000	1,768,140.0000	TOPSOIL SALVAGE LIMIT
T33	807,785.1380	1,768,277.6063	TOPSOIL SALVAGE LIMIT
T34	807,762.8772	1,768,378.0389	TOPSOIL SALVAGE LIMIT
T35	807,892.3005	1,768,638.4386	TOPSOIL SALVAGE LIMIT
T36	807,909.1255	1,768,923.9465	TOPSOIL SALVAGE LIMIT
T37	807,998.7840	1,769,020.8917	TOPSOIL SALVAGE LIMIT
T38	808,200.6612	1,768,890.6318	TOPSOIL SALVAGE LIMIT
T39	808,075.3423	1,768,483.4924	TOPSOIL SALVAGE LIMIT
T40	807,900.8424	1,767,915.2210	TOPSOIL SALVAGE LIMIT
T41	807,839.2369	1,767,845.5912	TOPSOIL SALVAGE LIMIT
T42	807,511.2782	1,767,828.2485	TOPSOIL SALVAGE LIMIT
T43	807,310.0000	1,767,780.3244	TOPSOIL SALVAGE LIMIT
T44	807,310.0000	1,767,525.7237	TOPSOIL SALVAGE LIMIT
T45	807,366.8868	1,767,318.9862	TOPSOIL SALVAGE LIMIT

CONTOUR INTERVAL = 1'

NOTE: SALVAGE TOPSOIL A MINIMUM OF 10 INCHES IN THE AREA SHOWN.
ALL REMAINING GRADING IS CONSIDERED UNCLASSIFIED EXCAVATION.

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

c:\dgn\5565000rddetz03.dgn
5/21/2012
10:32:56 AM CPS - U2160

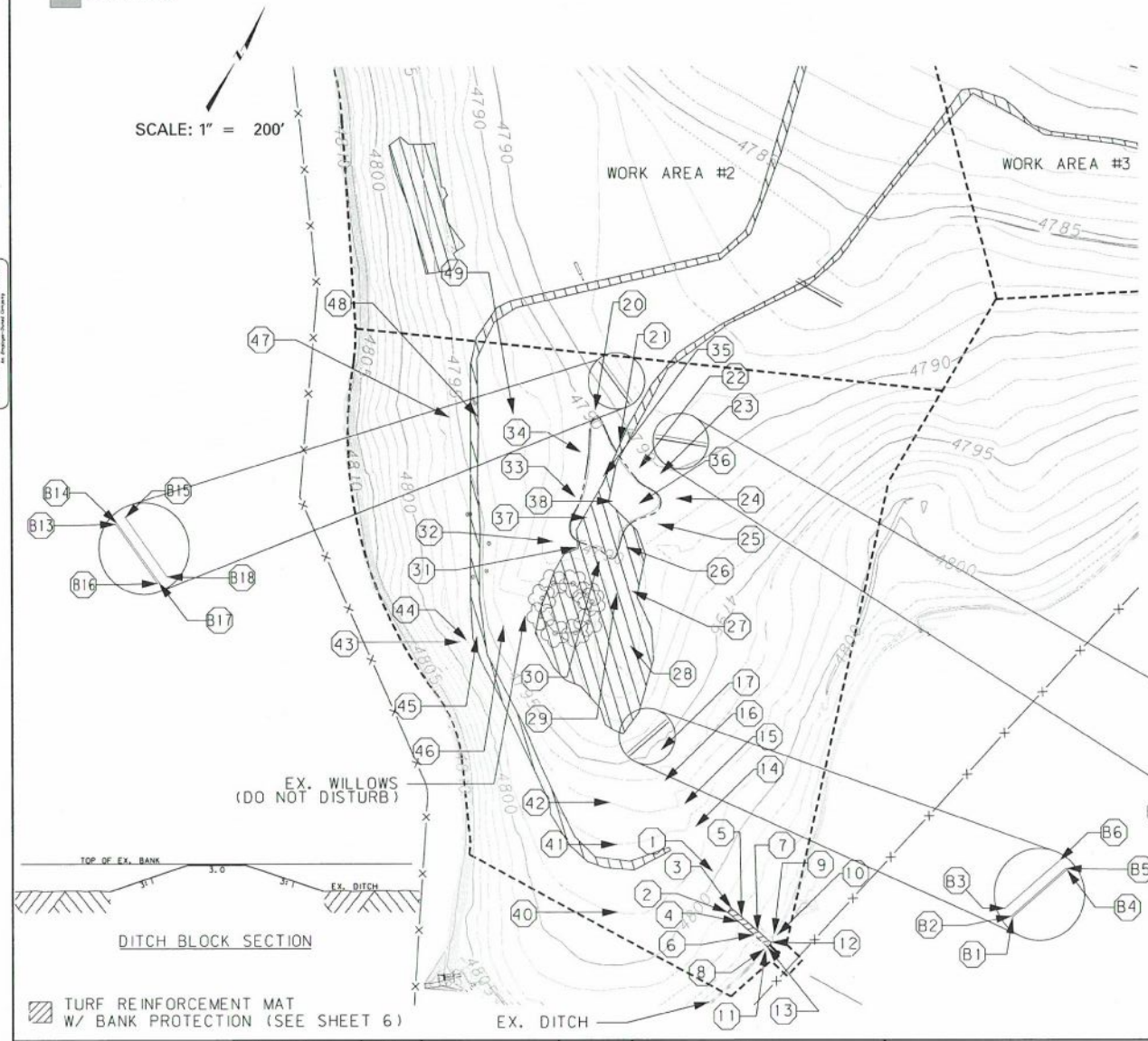
DESIGNED BY
REVIEWED BY
CHECKED BY

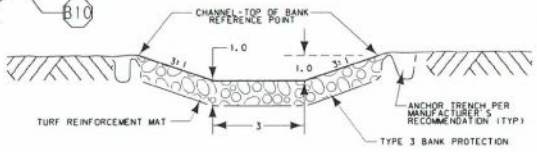
WETLAND PLANS
MEAGHER COUNTY

ROSTAD RANCH WETLAND MITIGATION
CSF = 0.99922160
UPN NUMBER 5565

PROJECT NO. STPX 0002(749)
SHEET 13 OF 19

WORK AREA # 1 PLAN





CHANNEL SECTION

COORDINATE TABLE

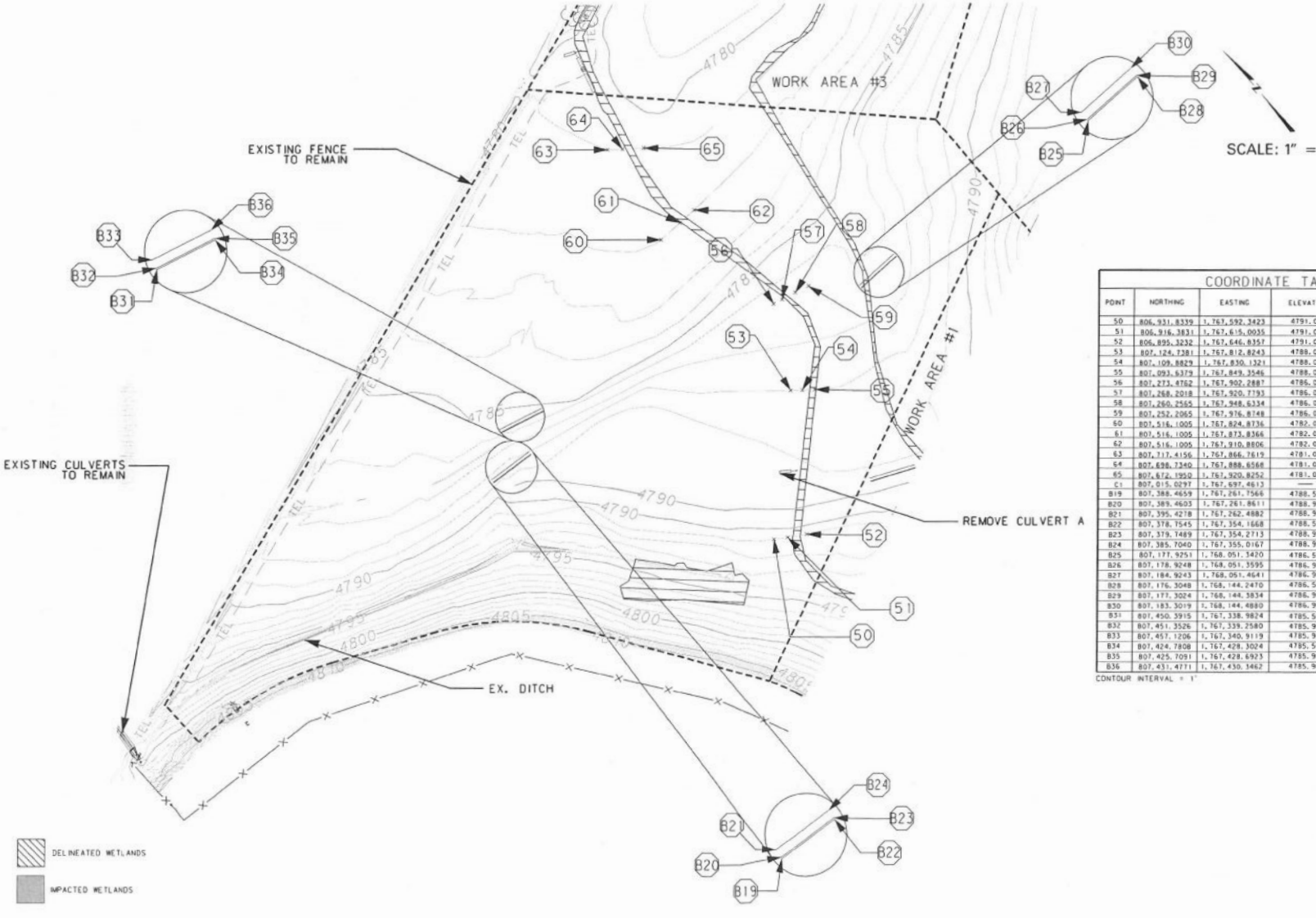
POINT	NORTHING	EASTING	ELEVATION	REMARKS
1	806,183.7684	1,768,414.9164	4799.20	CHANNEL
2	806,132.9122	1,768,472.4120	4801.30	CHANNEL-TOP OF BANK
3	806,142.6865	1,768,474.5246	4801.30	CHANNEL-TOP OF BANK
4	806,127.5586	1,768,497.1812	4802.00	CHANNEL-TOP OF BANK
5	806,137.7688	1,768,497.3283	4802.00	CHANNEL-TOP OF BANK
6	806,119.9620	1,768,532.3148	4802.45	CHANNEL-TOP OF BANK
7	806,129.7231	1,768,534.4863	4802.45	CHANNEL-TOP OF BANK
8	806,106.6996	1,768,558.4394	4804.00	CHANNEL-DITCH BLOCK
9	806,139.1246	1,768,563.4538	4804.00	CHANNEL-DITCH BLOCK
10	806,139.7844	1,768,569.1690	4804.00	CHANNEL-DITCH BLOCK
11	806,105.6421	1,768,564.2952	4804.00	CHANNEL-DITCH BLOCK
12	806,123.1108	1,768,565.0944	4803.00	CHANNEL-TOP OF BANK
13	806,113.3365	1,768,562.9818	4803.00	CHANNEL-TOP OF BANK
14	806,239.0870	1,768,349.4505	4798.50	CHANNEL
15	806,264.2403	1,768,312.9344	4797.50	CHANNEL
16	806,283.6638	1,768,262.7391	4796.50	CHANNEL
17	806,329.2134	1,768,230.8726	4795.50	CHANNEL
20	806,806.3859	1,767,843.6451	4790.50	OPEN WATER AREA # 2 EXTERIOR
21	806,776.2491	1,767,908.9437	4790.50	OPEN WATER AREA # 2 EXTERIOR
22	806,751.8351	1,767,961.3927	4790.50	OPEN WATER AREA # 2 EXTERIOR
23	806,760.6282	1,767,998.4262	4790.50	OPEN WATER AREA # 2 EXTERIOR
24	806,735.9179	1,768,044.1600	4790.50	OPEN WATER AREA # 2 EXTERIOR
25	806,681.3181	1,768,037.1836	4790.50	OPEN WATER AREA # 2 EXTERIOR
26	806,618.4258	1,768,006.4424	4790.50	OPEN WATER AREA # 2 EXTERIOR
27	806,554.3518	1,768,052.1552	4790.50	OPEN WATER AREA # 2 EXTERIOR
28	806,467.6404	1,768,095.9506	4790.50	OPEN WATER AREA # 2 EXTERIOR
29	806,537.7578	1,768,030.1275	4790.50	OPEN WATER AREA # 2 EXTERIOR
30	806,574.1908	1,767,976.1301	4790.50	OPEN WATER AREA # 2 EXTERIOR
31	806,576.0841	1,767,928.9690	4790.50	OPEN WATER AREA # 2 EXTERIOR
32	806,565.2908	1,767,887.2322	4790.50	OPEN WATER AREA # 2 EXTERIOR
33	806,653.4524	1,767,885.6321	4790.50	OPEN WATER AREA # 2 EXTERIOR
34	806,728.1229	1,767,856.9940	4790.50	OPEN WATER AREA # 2 EXTERIOR
35	806,710.2073	1,767,912.0417	4789.50	OPEN WATER AREA # 2 INTERIOR
36	806,695.9364	1,767,989.8888	4785.50	OPEN WATER AREA # 2 INTERIOR
37	806,631.0688	1,767,921.1292	4789.50	OPEN WATER AREA # 2 INTERIOR
38	806,678.0000	1,767,947.0000	4789.00	OPEN WATER AREA # 2 BOTTOM
40	806,040.6685	1,768,299.6277	4799.00	REGRADE EX. DITCH
41	806,145.0003	1,768,240.9999	4798.00	REGRADE EX. DITCH
42	806,205.0003	1,768,194.9999	4797.00	REGRADE EX. DITCH
43	806,329.0003	1,767,824.4999	4798.00	REGRADE EX. DITCH
44	806,337.2215	1,767,833.6240	4797.00	REGRADE EX. DITCH
45	806,351.8941	1,767,846.4795	4796.00	REGRADE EX. DITCH
46	806,391.3380	1,767,879.5246	4794.00	REGRADE EX. DITCH
47	806,671.0527	1,767,620.0033	4796.00	REGRADE EX. DITCH
48	806,696.3214	1,767,663.6379	4794.00	REGRADE EX. DITCH
49	806,731.3791	1,767,717.5281	4793.00	REGRADE EX. DITCH
B1	806,293.2331	1,768,187.1786	4794.50	SPREADER BERM
B2	806,293.5914	1,768,186.2451	4794.90	SPREADER BERM
B3	806,295.7416	1,768,180.6452	4794.90	SPREADER BERM
B4	806,379.9810	1,768,220.4766	4794.50	SPREADER BERM
B5	806,380.3393	1,768,219.5431	4794.90	SPREADER BERM
B6	806,382.6006	1,768,213.9839	4794.90	SPREADER BERM
B7	806,811.8007	1,767,961.0310	4789.50	SPREADER BERM
B8	806,812.7460	1,767,960.7046	4789.90	SPREADER BERM
B9	806,818.4195	1,767,958.7509	4789.90	SPREADER BERM
B10	806,842.0534	1,768,048.8864	4789.50	SPREADER BERM
B11	806,842.9988	1,768,048.5609	4789.90	SPREADER BERM
B12	806,848.7110	1,768,046.7197	4789.90	SPREADER BERM
B13	806,885.5189	1,767,808.5176	4789.50	SPREADER BERM
B14	806,886.4176	1,767,808.9559	4789.90	SPREADER BERM
B15	806,891.8108	1,767,811.5863	4789.90	SPREADER BERM
B16	806,844.7870	1,767,892.0334	4789.50	SPREADER BERM
B17	806,845.6857	1,767,892.4717	4789.90	SPREADER BERM
B18	806,851.0267	1,767,895.2089	4789.90	SPREADER BERM

CONTOUR INTERVAL = 1'

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdplnc02.dgn	DESIGNED BY		WETLAND PLANS	ROSTAD RANCH WETLAND		PROJECT NO. STPX 0002(749)
	5/21/2012	REVIEWED BY		MEAGHER COUNTY	SCALE: 1" = 200'	UPN NUMBER 5565	SHEET 14 OF 19
	10:33:08 AM CPS - U2160	CHECKED BY					

WORK AREA # 2 PLAN



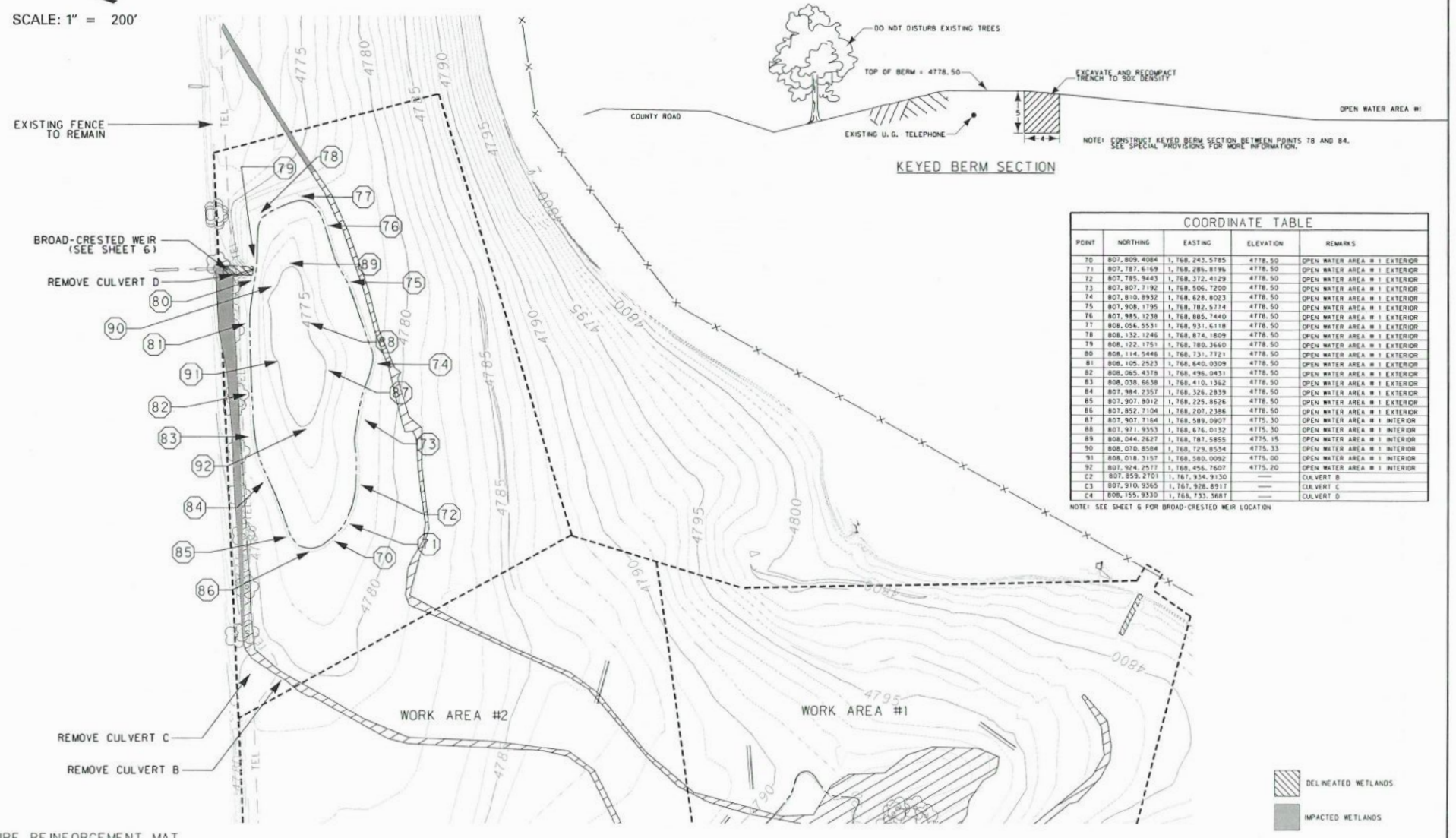
COORDINATE TABLE				
POINT	NORTHING	EASTING	ELEVATION	REMARKS
50	806,931.8339	1,767,592.3423	4791.00	REGRADE EX. DITCH
51	806,916.3831	1,767,615.0035	4791.00	REGRADE EX. DITCH
52	806,895.3232	1,767,646.8357	4791.00	REGRADE EX. DITCH
53	807,124.7381	1,767,812.8243	4788.00	REGRADE EX. DITCH
54	807,109.8829	1,767,830.1321	4788.00	REGRADE EX. DITCH
55	807,093.6379	1,767,849.3546	4788.00	REGRADE EX. DITCH
56	807,273.4762	1,767,902.2887	4786.00	REGRADE EX. DITCH
57	807,268.2018	1,767,920.7793	4786.00	REGRADE EX. DITCH
58	807,260.2565	1,767,948.6334	4786.00	REGRADE EX. DITCH
59	807,252.2065	1,767,976.8748	4786.00	REGRADE EX. DITCH
60	807,516.1005	1,767,824.8736	4782.00	REGRADE EX. DITCH
61	807,516.1005	1,767,873.8366	4782.00	REGRADE EX. DITCH
62	807,516.1005	1,767,910.8806	4782.00	REGRADE EX. DITCH
63	807,717.4156	1,767,866.7619	4781.00	REGRADE EX. DITCH
64	807,698.7340	1,767,888.6568	4781.00	REGRADE EX. DITCH
65	807,672.1950	1,767,920.8252	4781.00	REGRADE EX. DITCH
C1	807,015.0297	1,767,697.4613	—	CULVERT A
B19	807,388.4659	1,767,261.7566	4788.50	SPREADER BERM
B20	807,389.4603	1,767,261.8611	4788.90	SPREADER BERM
B21	807,395.4218	1,767,262.4882	4788.50	SPREADER BERM
B22	807,378.7545	1,767,354.1668	4788.50	SPREADER BERM
B23	807,379.7489	1,767,354.2713	4788.90	SPREADER BERM
B24	807,385.7040	1,767,355.0167	4788.90	SPREADER BERM
B25	807,177.9251	1,768,051.3420	4786.50	SPREADER BERM
B26	807,178.9248	1,768,051.3595	4786.90	SPREADER BERM
B27	807,184.9243	1,768,051.4641	4786.90	SPREADER BERM
B28	807,176.3048	1,768,144.2470	4786.50	SPREADER BERM
B29	807,177.3024	1,768,144.3834	4786.90	SPREADER BERM
B30	807,183.3019	1,768,144.4880	4786.90	SPREADER BERM
B31	807,450.3915	1,767,338.9824	4785.50	SPREADER BERM
B32	807,451.3526	1,767,339.2580	4785.90	SPREADER BERM
B33	807,457.1206	1,767,340.9119	4785.90	SPREADER BERM
B34	807,424.7808	1,767,428.3024	4785.50	SPREADER BERM
B35	807,425.7091	1,767,428.6923	4785.90	SPREADER BERM
B36	807,431.4771	1,767,430.3462	4785.90	SPREADER BERM

CONTOUR INTERVAL = 1'

MORRISON MAIERLE, INC

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdpkwt02.dgn	DESIGNED BY		WETLAND PLANS	ROSTAD RANCH WETLAND		PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY					
1		10:33:11 AM CPS - U2160	CHECKED BY		MEAGHER COUNTY	SCALE: 1" = 200'	UPN NUMBER 5565	SHEET 15 OF 19

WORK AREA # 3 PLAN



COORDINATE TABLE

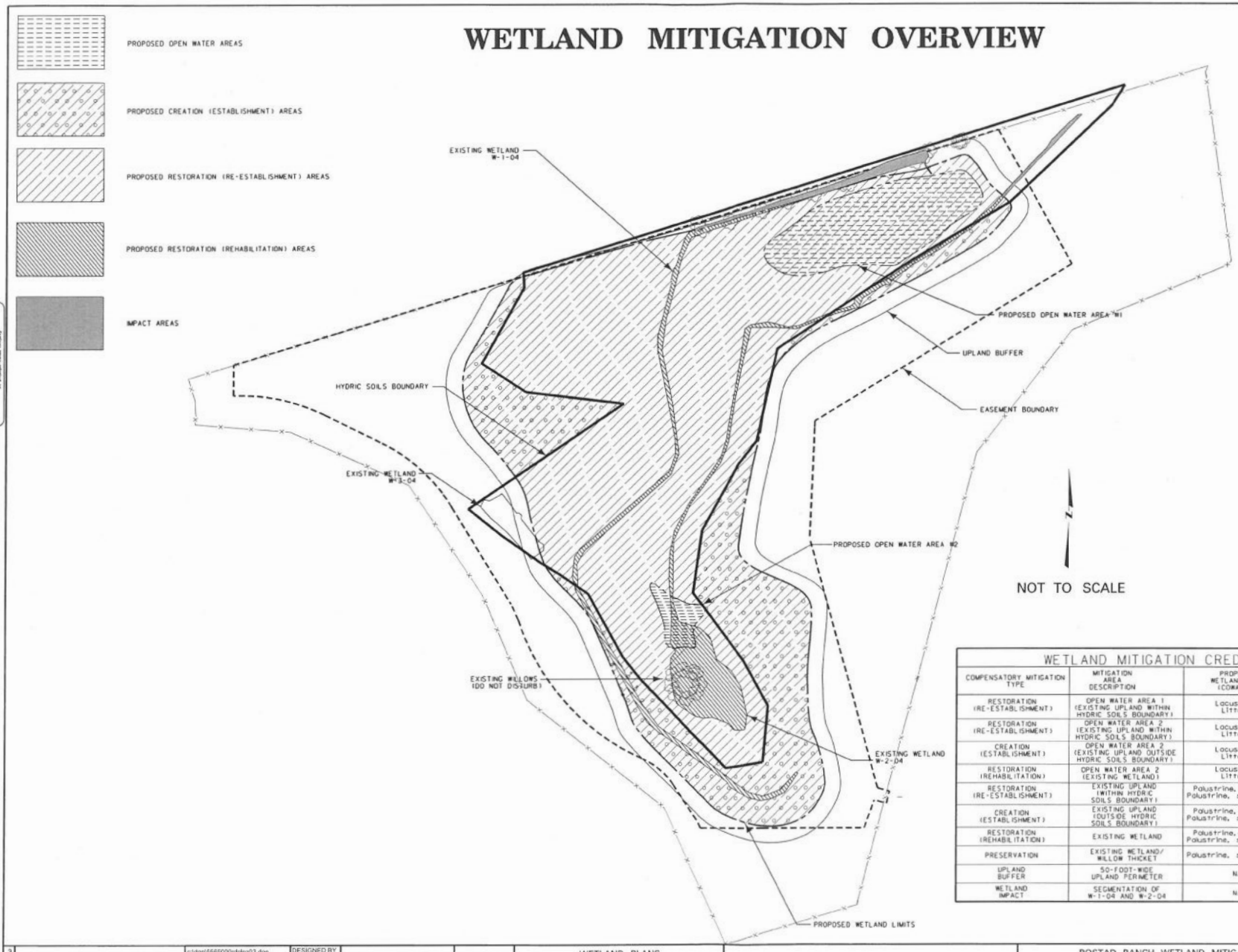
POINT	NORTHING	EASTING	ELEVATION	REMARKS
70	807,809.4084	1,768,243.5785	4778.50	OPEN WATER AREA # 1 EXTERIOR
71	807,787.6169	1,768,286.8196	4778.50	OPEN WATER AREA # 1 EXTERIOR
72	807,785.9443	1,768,372.4129	4778.50	OPEN WATER AREA # 1 EXTERIOR
73	807,807.7192	1,768,506.7200	4778.50	OPEN WATER AREA # 1 EXTERIOR
74	807,810.8932	1,768,628.8023	4778.50	OPEN WATER AREA # 1 EXTERIOR
75	807,908.1795	1,768,782.5774	4778.50	OPEN WATER AREA # 1 EXTERIOR
76	807,985.1238	1,768,885.7440	4778.50	OPEN WATER AREA # 1 EXTERIOR
77	808,056.5531	1,768,931.6118	4778.50	OPEN WATER AREA # 1 EXTERIOR
78	808,132.1246	1,768,874.1809	4778.50	OPEN WATER AREA # 1 EXTERIOR
79	808,122.1751	1,768,780.3660	4778.50	OPEN WATER AREA # 1 EXTERIOR
80	808,114.5446	1,768,731.7721	4778.50	OPEN WATER AREA # 1 EXTERIOR
81	808,105.2523	1,768,640.0309	4778.50	OPEN WATER AREA # 1 EXTERIOR
82	808,065.4378	1,768,496.0431	4778.50	OPEN WATER AREA # 1 EXTERIOR
83	808,038.6638	1,768,410.1362	4778.50	OPEN WATER AREA # 1 EXTERIOR
84	807,984.2357	1,768,326.2839	4778.50	OPEN WATER AREA # 1 EXTERIOR
85	807,907.8012	1,768,225.8626	4778.50	OPEN WATER AREA # 1 EXTERIOR
86	807,852.7104	1,768,207.2386	4778.50	OPEN WATER AREA # 1 EXTERIOR
87	807,907.7164	1,768,589.0907	4775.30	OPEN WATER AREA # 1 INTERIOR
88	807,971.9353	1,768,676.0132	4775.30	OPEN WATER AREA # 1 INTERIOR
89	808,044.2627	1,768,787.5855	4775.15	OPEN WATER AREA # 1 INTERIOR
90	808,070.8584	1,768,729.8534	4775.33	OPEN WATER AREA # 1 INTERIOR
91	808,018.3157	1,768,580.0092	4775.00	OPEN WATER AREA # 1 INTERIOR
92	807,924.2577	1,768,456.7607	4775.20	OPEN WATER AREA # 1 INTERIOR
C2	807,859.2701	1,767,934.9130	—	CULVERT B
C3	807,910.9365	1,767,928.8917	—	CULVERT C
C4	808,155.9330	1,768,733.3687	—	CULVERT D

NOTE: SEE SHEET 6 FOR BROAD-CRESTED WEIR LOCATION

MORRISON MAIERLE, INC.

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000\dplru02.dgn	DESIGNED BY		WETLAND PLANS	ROSTAD RANCH WETLAND	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY				
1		10:33:14 AM CPS - U216S	CHECKED BY		MEAGHER COUNTY	SCALE: 1" = 200' UPN NUMBER 5565	SHEET 16 OF 19

WETLAND MITIGATION OVERVIEW



WETLAND MITIGATION CREDITING STRATEGY TABLE

COMPENSATORY MITIGATION TYPE	MITIGATION AREA DESCRIPTION	PROPOSED WETLAND TYPE (COWARDIN)	MITIGATION SURFACE AREA (acres)	ANTICIPATED MITIGATION RATIOS	ANTICIPATED MITIGATION CREDIT (acres)
RESTORATION (RE-ESTABLISHMENT)	OPEN WATER AREA 1 (EXISTING UPLAND WITHIN HYDRIC SOILS BOUNDARY)	Lacustrine, Littoral	3.21	1:1	3.21
RESTORATION (RE-ESTABLISHMENT)	OPEN WATER AREA 2 (EXISTING UPLAND WITHIN HYDRIC SOILS BOUNDARY)	Lacustrine, Littoral	0.45	1:1	0.45
CREATION (ESTABLISHMENT)	OPEN WATER AREA 2 (EXISTING UPLAND OUTSIDE HYDRIC SOILS BOUNDARY)	Lacustrine, Littoral	0.04	1:1	0.04
RESTORATION (REHABILITATION)	OPEN WATER AREA 2 (EXISTING WETLAND)	Lacustrine, Littoral	0.30	1.5:1	0.20
RESTORATION (RE-ESTABLISHMENT)	EXISTING UPLAND WITHIN HYDRIC SOILS BOUNDARY)	Palustrine, emergent/ Palustrine, scrub-shrub	23.45	1:1	23.45
CREATION (ESTABLISHMENT)	EXISTING UPLAND (OUTSIDE HYDRIC SOILS BOUNDARY)	Palustrine, emergent/ Palustrine, scrub-shrub	9.80	1:1	9.80
RESTORATION (REHABILITATION)	EXISTING WETLAND	Palustrine, emergent/ Palustrine, scrub-shrub	2.33	1.5:1	1.55
PRESERVATION	EXISTING WETLAND/ WILLOW THICKET	Palustrine, scrub-shrub	0.25	4:1	0.06
UPLAND BUFFER	50-FOOT-WIDE UPLAND PERIMETER	N/A	6.76	5:1	1.35
WETLAND IMPACT	SEGMENTATION OF W-1-04 AND W-2-04	N/A	N/A	1:1	-0.41
				TOTAL MITIGATION CREDIT =	39.70

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

c:\dgn\5565000rdplna03.dgn
5/21/2012
10:33:26 AM CPS - U216A

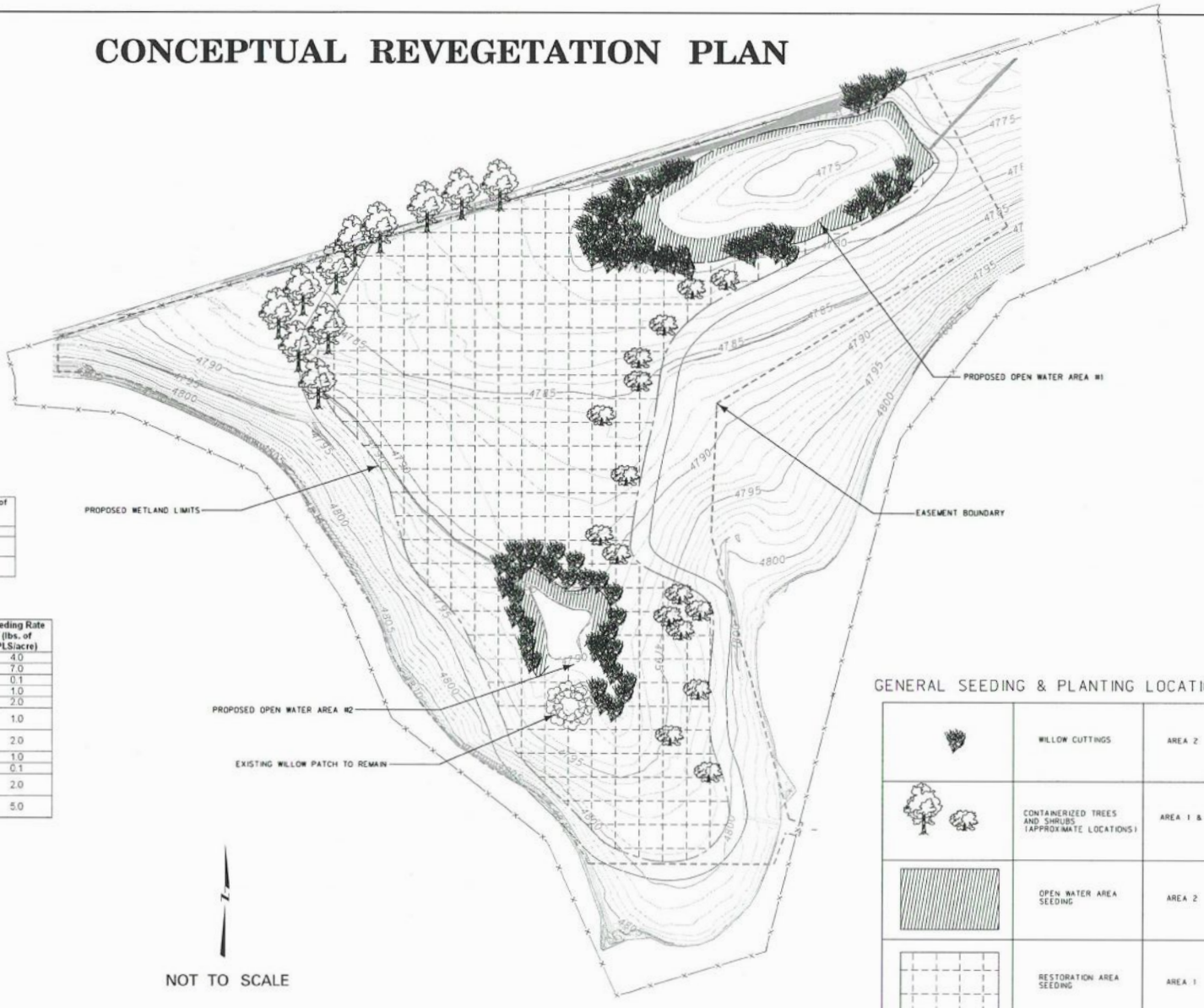
DESIGNED BY
REVIEWED BY
CHECKED BY

WETLAND PLANS
MEAGHER COUNTY

ROSTAD RANCH WETLAND MITIGATION
CSF = 0.99922160 UPN NUMBER 5565

PROJECT NO. STPX 0002(749)
SHEET 17 OF 19

CONCEPTUAL REVEGETATION PLAN



NOT TO SCALE

Table 1. Live Plantings

Area Descriptions 16A	Species – Common Name	Species – Scientific Name	Planting Methodology	Number of Plants*
2	Willows**	*Salix species*	Cuttings	2,000
1, 3	quaking aspen	*Populus tremuloides*	Containerized trees (5 gallon)	100
	black cottonwood	*Populus balsamifera*	Containerized trees (5 gallon)	100

*Plant locations to be provided in the field by MDT personnel.
** Willow cuttings should be from a variety of species found in the region.

Table 2. Seed Mixtures

Area Descriptions 16A	Species – Common Name	Species – Scientific Name	Seeding Rate (lbs. of PLS/acre)
Wetland Seed Mixture – Open Water Areas (2)	American mannagrass	*Glyceria grandis*	4.0
	American sloughgrass	*Beckmannia syzigachne*	7.0
	Baltic rush	*Juncus balticus*	0.1
	Beaked sedge	*Carex utriculata*	1.0
	Nebraska sedge	*Carex nebrascensis*	2.0
	'Nortran' tufted hairgrass	*Deschampsia cespitosa*	1.0
Wetland Seed Mixture – Restoration Area (1)	'Nortran' tufted hairgrass	*Deschampsia cespitosa*	2.0
	Bluejoint reedgrass	*Calamagrostis canadensis*	1.0
	Baltic rush	*Juncus balticus*	0.1
	'Prior' slender wheatgrass	*Elymus trachycaulus*	2.0
	'Rosana' western wheatgrass	*Pascopyrum smithii*	5.0

Seed application rate by drill seeding (rates double for broadcast seeding)

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rdplnz03.dgn	DESIGNED BY			WETLAND PLANS	ROSTAD RANCH WETLAND MITIGATION		PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY			MEAGHER COUNTY	CSF = 0.99922160	UPN NUMBER 5565	SHEET 18 OF 19
1		10:33:30 AM CPS - U2109	CHECKED BY						

WATER DISTRIBUTION OVERVIEW



NOTE: FOR INFORMATION PURPOSES ONLY

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5565000rddetz03.dgn	DESIGNED BY			WETLAND PLANS	ROSTAD RANCH WETLAND MITIGATION	PROJECT NO. STPX 0002(749)
2		5/21/2012	REVIEWED BY					
1		10:33:39 AM CPS - U216	CHECKED BY			MEAGHER COUNTY	CSF = 0.99922160 UPN NUMBER 5565	SHEET 19 OF 19