MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT

KINDSFATER MITIGATION SITE
YELLOWSTONE COUNTY, MONTANA

PROJECT CONSTRUCTED: 2012

MONITORING REPORT #6: DECEMBER 2018

Prepared for:

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

2701 Prospect Avenue
Helena, Montana 59620

Prepared by:

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MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2018

KINDSFATER
YELLOWSTONE COUNTY, MONTANA
INITIAL CONSTRUCTION: 2012

MDT Project Number STPX-0056 (56)
Control Number 5034

USACE: NWO-2007-00824-MTB

prepared for

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December 2018

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1.0 INTRODUCTION

The Kindsfater 2018 Wetland Mitigation Monitoring Report presents the results of the sixth year of post construction monitoring at the Kindsfater mitigation area. This Montana Department of Transportation (MDT) wetland mitigation project is located in the northwest quarter of Section 6, Township 2 South, Range 25 East, Yellowstone County, Montana. This MDT-owned property is located approximately 3 miles northeast of Laurel, Montana, and is adjacent to 72nd Street West and Laurel Airport Road, as illustrated in Figure 1-1. The site is intended to provide 43.8 acres of wetland mitigation credits to assist MDT in meeting compensatory mitigation requirements for proposed construction projects in Watershed #13 – Upper Yellowstone. The US Army Corps of Engineers (USACE) permit number NWO-2007-00824-MTB approved the Kindsfater project and proposed crediting that was presented in the August 2012 Kindsfater wetland mitigation plan [MDT and Morrison-Maierle, Inc., 2015]. The objectives of this project included creating, restoring, enhancing, and preserving wetland habitat within the historic Kindsfater gravel pit.

The Kindsfater site was previously a gravel mining operation that ended mining in 1987. The mining excavations exposed groundwater throughout the site. The historic gravel pit eventually evolved into a wetland complex that included emergent, scrub/shrub, and forested wetland habitats. The site was identified in 2002 as a potential wetland restoration site and evaluated by Carter Burgess, Inc. (CB) to determine the practicality of developing wetland mitigation credits. A wetland delineation conducted by CB in 2002 identified 47.6 acres within the site. In 2006, Morrison-Maierle, Inc. (MMI) delineated wetlands within the site and identified 32.9 acres of emergent, scrub/shrub, and forested wetlands. In 2012, MMI re-delineated the site to verify the wetland acreage and identified a total of 25.9 acres of wetlands on the site. Based on these findings, approximately 22 acres of wetland habitat were converted to upland between 2002 and 2012.

The project was designed for two phases of development: the Base Project and Alternative Option. The Base Project would involve creating, restoring, enhancing, and preserving wetlands within the western half of the site. The Alternative Option would include excavating and removing gravel materials and constructing new wetlands within the eastern half of the site (see Appendix D for design plan details). Credits to be developed from both phases would total 43.8 credit acres under full build-out. The following section provides the amount of wetland credits that are estimated for each phase as presented in the mitigation plan.

Base Project:

- Create (establishment) two emergent wetland areas (Cells 7 and 9) that total 1.8 acres (1:1 mitigation ratio)
- Restore (rehabilitation) former wetland areas within the site (Cells 1–6 and a portion of Cell 8) with tree/shrub plantings that total 14.0 acres (1:1 mitigation ratio)
- Restore (reestablishment) several depressional emergent wetland areas (adjacent to Cells 1–12) that total 9.2 acres (1.5:1 mitigation ratio)

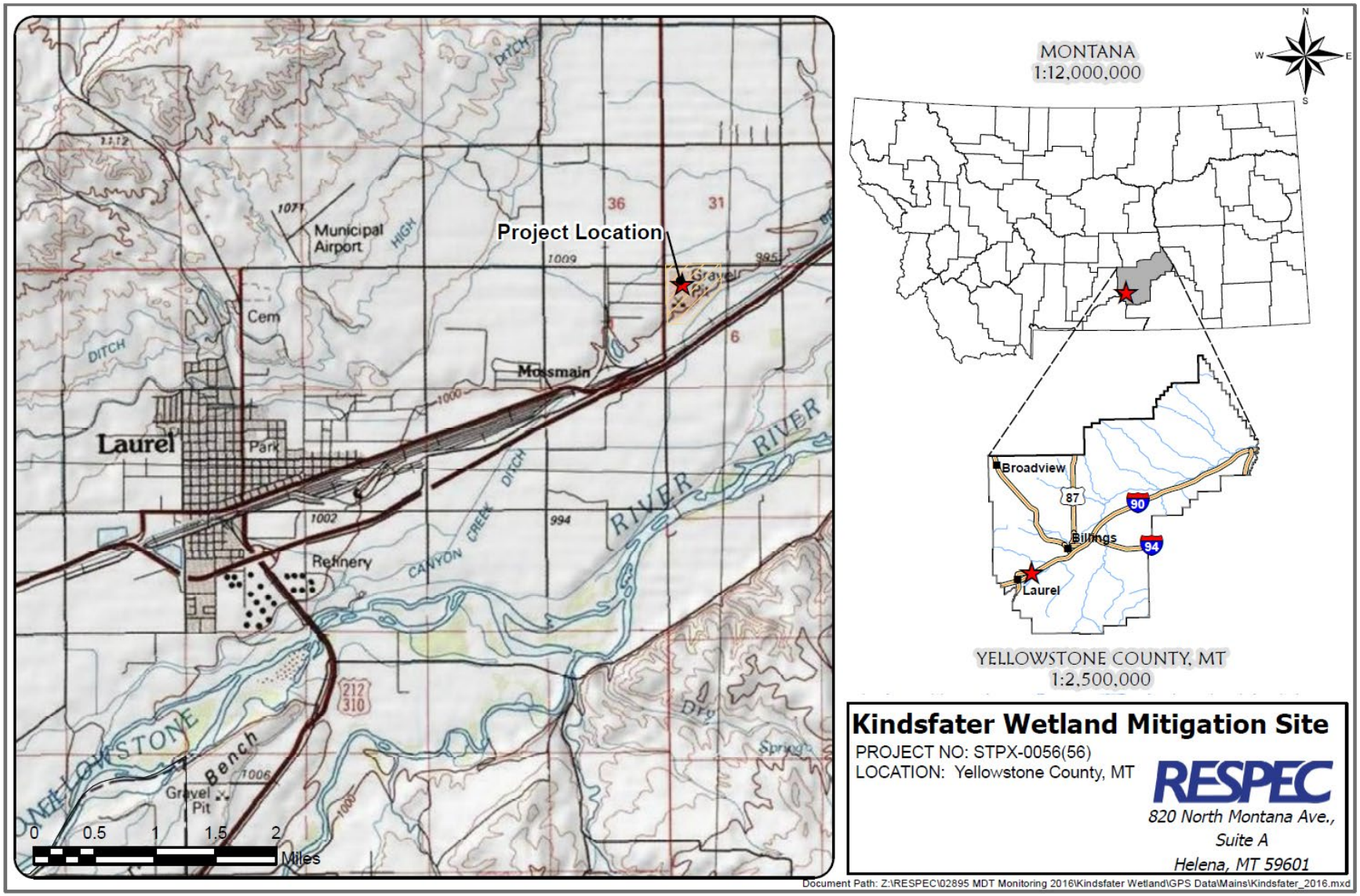

Figure 1-1. Project Location of the Kindsfater Site.

- Enhance 3.1 acres (3:1 mitigation ratio) of existing palustrine, emergent, scrub/shrub, and forested wetland (Cells 10–12 and a portion of Cell 8)
- Preserve 21.9 acres (4:1 mitigation ratio) of existing palustrine emergent, scrub/shrub, and forested wetlands
- Designate a 50-foot-wide upland buffer around the mitigation area that totals 4.3 acres (5:1 mitigation ratio)
- Mitigate temporary impacts during establishment of wetland Cells 10–12 and a portion of Cell 8, which totals 3.6 acres (0:1 mitigation ratio).

Alternative Option:

- Create two lacustrine emergent wetland cells that total 2.8 acres (1:1 mitigation ratio)
- Create palustrine emergent and scrub/shrub wetlands that total 11.1 acres (1:1 mitigation ratio)
- Designate a 50-foot-wide upland buffer around the perimeter of the excavated area that will total 3.0 acres (5:1 mitigation ratio).

Table 1-1 provides a breakdown of the compensatory credits by bid phase and mitigation type and includes a brief description of each credit type, approved mitigation ratios, and anticipated mitigation credits, assuming that the site develops to its full potential. A total of 29.3 mitigation credits may be generated after the base bid phase in the western half of the site is complete. The additional Alternative Bid phase in the eastern half of the site would result in 14.5 mitigation credits as designed. A maximum of 43.8 mitigation credits would be anticipated at the Kindsfater site after both phases are complete.

The project was constructed during the fall and winter of 2012 and consisted of excavating a series of 14 cells that range in size from 0.24 to 1.39 acres. Each cell was designed to expose the shallow groundwater table for limited portions of the year. Wetland Cells 1–12 were constructed under the base bid phase. Wetland Cells 13 and 14 were completed as part of the Alternative Bid phase; however, the 11.1 acres of created wetlands within the gravel mining area were not completed as planned. Because of the steepness of the slopes from the gravel excavation, the contractor and MDT construction project manager decided to lessen the slopes so the Kindsfater site would still be accessible from a gravel parking area along Laurel Airport Road. The area around the excavated cells was not constructed to the bottom elevation of the preexisting wetland areas. Because of this design change, the total wetland credits possible at this site has been reduced from 43.8 acres (as described above) to 32.7 acres.

The site consists of an upper terrace with a slope that descends into a lower terrace that is adjacent to the Billings Bench Water Canal (BBWC). The project was designed to intercept shallow, unconfined groundwater flow through the project area to provide the hydrology that was required to sustain the wetland and open-water areas. Revegetating preferred species included a combination of plantings and cuttings (*Salix* spp.); seeding with wetland plant species; and natural recruitment of existing shrubs, trees, and emergent plants. Woody plantings that were identified in the mitigation plan included locally collected willow cuttings, red osier (*Cornus alba*), cottonwoods (*Populus* spp.), choke cherry (*Prunus virginiana*), black hawthorn (*Crataegus douglasii*), silver buffalo-berry (*Shepherdia argentea*),

Table 1-1. Wetland Credit Determination for the Kindsfater Site

Compensatory Mitigation Type	Mitigation Area Description	Proposed Wetland Type[a]	Mitigation Surface Area (Acres)	USACE-Approved Mitigation Ratios	Anticipated Mitigation Credit (Acres)
Base Bid Credits					
Creation (Establishment)	Wetland Cells 7 and 9	Lacustrine emergent	1.8	1:1	1.8
Restoration (Reestablishment)	Wetland Cells 1–6 and parts of Cell 8	Lacustrine emergent and Palustrine emergent, scrub/shrub	14.0	1:1	14.0
Restoration (Rehabilitation)	Areas adjacent to Wetland Cells 1–12	Palustrine emergent, scrub/shrub	9.2	1.5:1	6.1
Enhancement	Wetland Cells 10–12 and parts of Cell 8	Palustrine emergent, scrub/shrub	3.1	3:1	1.0
Preservation	Existing wetland areas	Palustrine emergent, scrub/shrub	21.9	4:1	5.5
Upland Buffer	50-foot wide upland perimeter	N/A	4.3	5:1	0.9
Temporary Impacts	Wetland Cells 10–12 and parts of Cell 8	N/A	3.6	0:1	0.0[b]
Subtotal Mitigation Credit					**29.3**
Alternative Bid Credits					
Creation (Establishment)	Gravel mining area	Palustrine emergent, scrub/shrub	–11.1[c]	1:1	-11.1
Creation (Establishment)	Wetland Cells 13 and 14	Lacustrine emergent	2.8	1:1	2.8
Upland Buffer	50-foot-wide upland perimeter	N/A	2.3	5:1	0.5
Subtotal Mitigation Credit					**3.3**

(a) Cowardin et al., 1979.
(b) Temporary impacts will result from construction activities in proposed enhancement areas for Wetland Cells 10, 11, and 12 and parts of Cell 8.
(c) 11.1 acres of creation wetlands in Alternative Bid Credits (gravel mining area) were not constructed as planned; therefore, the anticipated credits for this gravel mining area have been subtracted to indicate this reduction in credits. Additionally, upland buffer credits have been reduced to include a 50-foot-wide perimeter around only wetland Cells 13 and 14.

Woods' rose (*Rosa woodsii*), and Rocky Mountain juniper (*Juniperus scopulorum*). The wetland seed mix included beaked spike-rush (*Eleocharis rostellata*), Baltic rush (*Juncus balticus*), hard-stem club-rush (*Schoenoplectus acutus*), bluejoint (*Calamagrostis canadensis*), tufted hairgrass (*Deschampsia caespitosa*), fowl blue grass (*Poa palustris*), and slender wild rye (*Elymus trachycaulus*). The locations of the woody planting areas are shown in Figure A-2 (Appendix A). A weed contractor with MDT treated noxious weed infestations across this site in 2012 before construction activities commenced and continues to conduct an ongoing weed-control program for wetland mitigation sites statewide.

The USACE-approved performance standards for the Kindsfater wetland mitigation site are listed below.

1. **Wetland Characteristics** for all of the restored, created, enhanced, and preserved wetlands within the project limits will meet the three parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the 1987 *Corps of Engineers Wetland Delineation Manual* (1987 Wetland Manual) [Environmental Laboratory, 1987] and the 2010 *Regional Supplement to the Corps of Engineers Manual: Great Plains* (GP) *Region (Version 2.0)* (2010 GP Regional Supplement) [USACE, 2010]. These methodologies were used to establish baseline wetland conditions on site.
    a. **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Wetland Manual and the 2010 GP Regional Supplement. Wetland hydrology will be confirmed through the periodic observations of surface water across the site and saturated soil conditions during the annual mid-season monitoring event. Soil saturation will be present for at least 12.5 percent of the growing season.
    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. Because 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 by delineating the developing wetlands by using the technical guidelines established in the 1987 Wetland Manual and the 2010 GP Regional Supplement. Noxious weeds do not exceed 5 percent cover. The following concept of "dominance," as defined in the 1987 Wetland Manual, will be applied during future routine wetland determinations in 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)"* [Environmental Laboratory, 1987]. Additionally, as per guidance from the USACE, hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 80 percent in created wetland areas within 5 years after site construction.

   i. **Woody Plants** – Plantings will be considered successful where they exceed 50 percent survival after 5 years. Natural colonization of woody plant species from nearby sources is anticipated after construction activities are complete. The rate and extent of natural woody plant colonization will depend on factors such as planting locations, 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.

2. **Open-Water Areas:** The intent of the project is to provide seasonal open water in the wetland enhancement areas where excavation in the existing wetland will be completed and in the gravel removal area where wetland will be created. Open water that is established within the designated wetland cells will be considered successful and creditable.
3. **Upland Buffer:** Success will be achieved when noxious weeds do not exceed 5 percent cover within the buffer areas on site. Any area within the creditable buffer area that is disturbed by project construction must have at least 50 percent aerial cover of non-noxious weed species by the end of the monitoring period.
4. **Weed Control:** Implementing weed control will be based on annual monitoring of the site to determine weed species and the degree of infestation within the site. Control measures based upon the monitoring results will be implemented by MDT to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site. Success will be achieved where less than 5 percent absolute cover of noxious weed species occurs across the site.
5. **Fencing** has been installed along the easement boundaries to protect the integrity of the wetland from disturbance that may be detrimental to the site. Fencing installed along the perimeter of the site has been designed to be wildlife-friendly to allow for wildlife movement into and out of the wetland complex.
6. **Monitoring** this MDT mitigation site will be based on the MDT standard monitoring protocols used for all of the MDT wetland mitigation sites for a minimum period of 5 years or longer as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and whether or not the site has met the wetland success criteria. The site will be monitored annually beginning with the first full growing season following construction.

Figures A-2 and A-3 (Appendix A) of this report show the site monitoring activity locations and mapped site features, respectively, and Figure A-4 (Appendix A) shows the 2018 wetland delineation boundaries compared to the pre-project wetland boundaries. The MDT Wetland Mitigation Site Monitoring form, USACE Wetland Determination Data forms [USACE, 2010], and the 2008 MDT Montana Wetland Assessment Method (MWAM) forms [Berglund and McEldowney, 2008] are included in Appendix B. Project area photographs are included in Appendix C, and the MDT plan sheets for the Kindsfater wetland mitigation complex are in Appendix D.

2.0 METHODS

The 2018 monitoring event was completed on June 25, 2018. Information for the Wetland Mitigation Site Monitoring form and Wetland Determination Data forms was recorded in the field during the site investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and are illustrated on Figure A-2 (Appendix A). Data-collection activities included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data collection, bird- and wildlife-use documentation, photographic documentation, functional assessment, and a nonengineering examination of the infrastructure established within the mitigation project area. Monitoring methods have remained relatively consistent at this site since the onset of monitoring. The initial 2013 Kindsfater monitoring report [Confluence Consulting, Inc., 2013] provides a detailed description of the monitoring methods used at this site. The 2013 monitoring report for this site can be found online (*https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2013/kindsfater_final.pdf*).

3.0 RESULTS

3.1 HYDROLOGY

Climate data from the meteorological station at Laurel, Montana (244894) [Western Regional Climate Center, 2018], which is located approximately 3 miles southwest of the site, recorded an average annual precipitation rate of 14.3 inches from September 1951 to October 1993. Data collection at this station was discontinued after 1994. The weather station at the Billings Logan International Airport, Montana (240807), which is located approximately 10 miles northeast of the site, recorded an average annual precipitation rate of 14.19 inches from August 1934 through August 2018. Annual precipitation in recent years was 18.75 (2010), 19.54 (2011), 7.13 (2012), 16.70 (2013), 14.03 (2014), 11.91 (2015), 14.89 (2016), and 17.64 (2017). Comparing the historic average with the annual precipitation, the data indicate that 2012, 2014, and 2015 were below the long-term average for precipitation, and 2010, 2011, 2013, 2016, and 2017 were above average. Precipitation from January 2018 through August 2018 was 16.38 inches, which is well above the long-term average of 10.39 inches for this same time period.

The wetland area decreased by approximately 1.0 acre between 2017 and 2018 with an upward trend in precipitation, as shown in Chart 3-1. The site history suggests that direct precipitation may not affect this site's wetland development from year to year. However, mid- to long-term drought may affect recharge of groundwater, which appears to be the primary hydrologic driver on this site.

Reductions in the areal extent of wetlands before the mitigation plan was implemented could be caused by several factors, including less flood irrigation on fields west and north of the site, reduced recharge of groundwater because of persistent drought conditions, increased withdrawal of groundwater for domestic usage from the underlying aquifer, and ongoing dewatering activities associated with the Fisher-Mobley gravel operation directly north of the site. Decreased flood irrigation will likely affect the long-term supply of water that enters the Kindsfater site on a permanent basis. Although the trend in precipitation at this site over the last 17 years has been positive, this trend

represents the climb out of statewide drought conditions; precipitation for most years during that period remained well below the long-term average, which likely reduced groundwater recharge. The dewatering associated with the adjacent active gravel operation and resultant cone of depression has likely compounded this effect and further reduced the site's hydrology. Groundwater data from monitoring wells on and surrounding the project area show a decline in groundwater elevations over the period of record, as shown in Chart 3-2, which supports the idea that below-average precipitation and pumping may be negatively affecting recharge and suppressing groundwater levels. These negative effects ultimately reduced the opportunity for wetland development on this site.

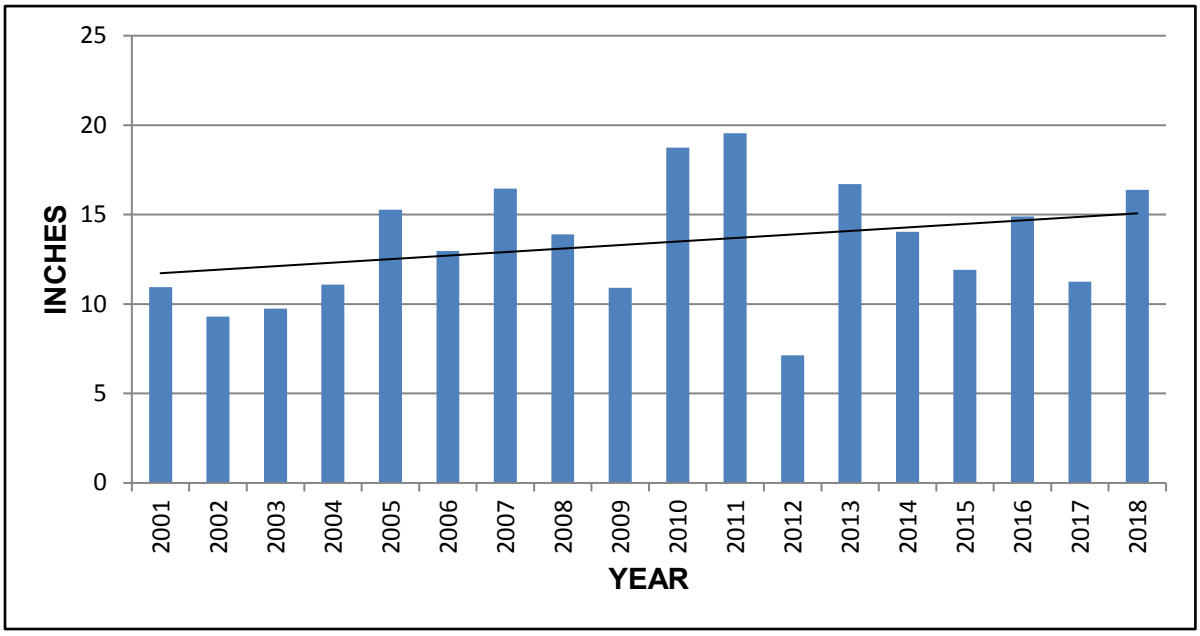

Chart 3-1. Average Yearly Precipitation Totals From 2001 Through 2018 at Station 240807.

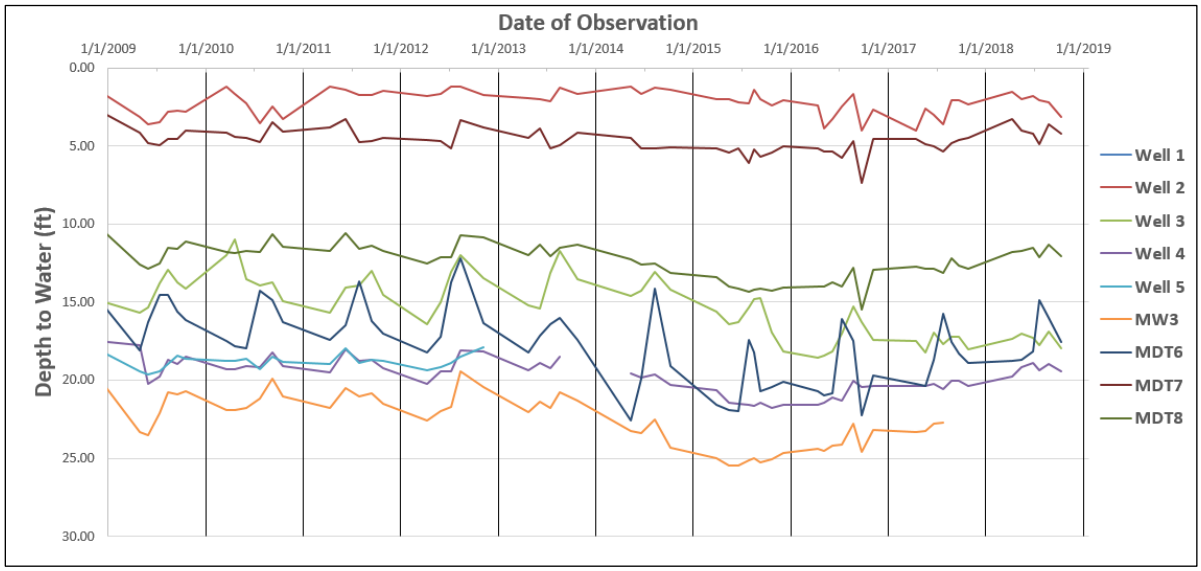

Chart 3-2. Groundwater Levels in Monitoring Wells Local to the Kindsfater Site.

Given the current recovery from the drought conditions of the early 2000s, the groundwater table may be expected to increase after the gravel mining is terminated, unless that operation permanently alters the nature of the aquifer. A portion of the Fisher Sand & Gravel pit operation directly to the north of the site has begun to be reclaimed by the company and is expected to lead to an increase in groundwater levels in this area (data already indicate some recovery). However, de-watering of the pit will continue as it expands to the north and east of this site. MDT will continue to have the US Geological Survey (USGS) monitor groundwater wells in the project vicinity to document groundwater levels moving forward. Negative changes in groundwater levels could occur if mining activities remove or increase the permeability of the aquifer's confining layers, such as the underlying Colorado shale.

Eight data points were sampled to determine the wetland/upland boundaries. DP-1W, DP-2W, DP-3W, and DP-4W are located in areas that met the wetland criteria. Primary and secondary wetland hydrology indicators at DP-1W included visible saturation, saturation on aerial imagery, drainage patterns, and a positive FAC-neutral test. DP-2W exhibited soil saturation to the surface, high groundwater, hydrogen sulfide odor, and geomorphic position. DP-3W included soil saturation to the surface, and geomorphic position secondary indicator. Wetland hydrology indicators for DP-4W included surface saturation and a drainage pattern. All of the wetland sample points have a positive FAC-neutral test. No primary or secondary indicators of wetland hydrology were observed at DP-1U, DP-2U, DP-3U, or DP-4U, which are located in upland areas that did not meet the wetland criteria.

During the June 2018 monitoring, all areas that had been defined as wetlands across the site were saturated or exhibited signs of periodic saturation within 12 inches (1 foot) of the ground. Inundation was present in many of these cells including Cells 8, 11, 12, 13 and a small area within 4 and 14. Constructed Cells 3, 4, 5, 6, 7, 8, 13, and 14 represented isolated wetland depressions surrounded by upland habitat. The remaining constructed cells were situated within a contiguous wetland mosaic with frequent surface drainages between cells. Shallow groundwater flows through the cells that were constructed along the upper terrace then discharges into the natural slope wetlands to recharge the depressional wetlands along the lower terrace.

3.2 VEGETATION

Monitoring year 2018 marked the sixth year of monitoring at the Kindsfater site. A total of 28 new plants were noted in 2018 for a total of 141 plant species site-wide from 2013 through 2018. These species are listed in Table 3-1. In 2017, one of the new plants was a potential species of concern listed by the Montana Natural Heritage Program: centaury, aka desert mountain-pink, (*Zeltnera exaltata*) found near Transect 2 and is listed as G5 and SH. G5 is defined as "demonstrably secure, though it may be quite rare in parts of its range." SH is defined as "historical, known only from records over 50 year ago; may be rediscovered." According to Peter Lesica's *Manual of Montana Vascular Plants* "the only collection of centaury from Yellowstone County was made over 100 years ago" [Lesica, 2012]. This plant was not noted in 2018 because of the shallow surface water that covered most of wetland Cell 8 or Transect 2.

Table 3-1. Vegetation Species Observed From 2013 Through 2018 at the Kindsfater Site (Page 1 of 4)

Common Names	Scientific Names	GP Indicator Status[a]
Common Yarrow	***Achillea millefolium***	**FACU**
Crested Wheatgrass	*Agropyron cristatum*	UPL
Spreading Bent	*Agrostis stolonifera*	FACW
Creeping Meadow-Foxtail	*Alopecurus arundinaceus*	FACW
Dwarf Alyssum	***Alyssum desertorum***	**UPL**
Red-Root	*Amaranthus retroflexus*	FACU
Common Sagewort	***Artemisia absinthium***	**UPL**
Wild Tarragon	*Artemisia dracunculus*	UPL
Fringed Sage	*Artemisia frigida*	UPL
Michaux Sagewort	*Artemisia michauxiana*	FAC
Showy Milkweed	*Asclepias speciosa*	FAC
Suckley's Saltbush	*Atriplex suckleyi*	UPL
Mexican-Fireweed	*Bassia scoparia (Kochia scoparia)*	FACU
Hoary False Alyssum	***Berteroa incana***	**UPL**
Black Mustard	*Brassica nigra*	UPL
Field Brome	*Bromus arvensis*	FACU
Smooth Brome	*Bromus inermis*	UPL
Japanese Brome	***Bromus japonicus***	**UPL**
Cheatgrass	*Bromus tectorum*	UPL
Bluejoint	*Calamagrostis canadensis*	FACW
Nebraska Sedge	*Carex nebrascensis*	OBL
Wooly Sedge	*Carex pellita*	OBL
Clustered Field Sedge	*Carex praegracilis*	FACW
Northwest Territory Sedge	*Carex utriculata*	OBL
Spotted Knapweed	*Centaurea stoebe*	UPL
Centaury	*Centaurium exaltatum*	UPL
Lamb's-Quarters	*Chenopodium album*	FACU
Goosefoot	*Chenopodium* sp.	NL
Canadian Thistle	*Cirsium arvense*	FACU
Bull Thistle	*Cirsium vulgare*	UPL
Poison-Hemlock	*Conium maculatum*	FACW
Field Bindweed	*Convolvulus arvensis*	UPL
Red Osier	*Cornus alba*	FACW
Hawksbeard	***Crepis atribarba***	**UPL**
Gypsy-Flower	*Cynoglossum officinale*	FACU
Tufted Hair Grass	*Deschampsia caespitosa*	FACW

Table 3-1. Vegetation Species Observed From 2013 Through 2018 at the Kindsfater Site (Page 2 of 4)

Common Names	Scientific Names	GP Indicator Status[a]
Flixweed Tansymustard	*Descurainia sophia*	UPL
Russian-Olive	*Elaeagnus angustifolia*	FACU
American Silver-Berry	*Elaeagnus commutata*	UPL
Common Spike-Rush	*Eleocharis palustris*	OBL
Streamside Wild Rye	***Elymus lanceolatus***	**FACU**
Creeping Wild Rye	*Elymus repens*	FACU
Slender Wild Rye	*Elymus trachycaulus*	FACU
Fringed Willowherb	*Epilobium ciliatum*	FACW
Tall Scouring-Rush	*Equisetum hyemale*	FACW
Smooth Scouring Rush	*Equisetum laevigatum*	FACW
Tufted Fleabane	*Erigeron caespitosus*	UPL
Canada Horseweed	*Erigeron canadensis*	FACU
Stork's bill	*Erodium cicutarium*	UPL
Leafy Spurge	*Euphorbia esula*	UPL
Fumitory	***Fumaria vaillantii***	**UPL**
Sticky-Willy	***Galium aparine***	**FACU**
American Licorice	*Glycyrrhiza lepidota*	FACU
Curly-Cup Gumweed	***Grindelia squarrosa***	**FACU**
Common Sunflower	***Helianthus annuus***	**FACU**
Needle-and-Thread	*Hesperostipa comata*	UPL
Golden-Aster	*Heterotheca villosa*	UPL
Fox-Tail Barley	*Hordeum jubatum*	FACW
Black Henbane	*Hyoscyamus niger*	UPL
Joint-Leaf Rush	*Juncus articulatus*	OBL
Baltic Rush	*Juncus balticus*	FACW
Dagger-Leaf Rush	*Juncus ensifolius*	FACW
Saltmarsh Rush	*Juncus gerardii*	FACW
Long-style Rush	***Juncus longistylis***	**FACW**
Torrey's Rush	*Juncus torreyi*	FACW
Rocky Mountain Juniper	*Juniperus scopulorum*	UPL
Prickly Lettuce	*Lactuca serriola*	FAC
Common Duckweed	*Lemna minor*	OBL
Field Pepperweed	*Lepidium campestre*	UPL
Fluffweed	*Logfia arvensis*	UPL
Rough Water-Horehound	*Lycopus asper*	OBL

Table 3-1. Vegetation Species Observed From 2013 Through 2018 at the Kindsfater Site (Page 3 of 4)

Common Names	Scientific Names	GP Indicator Status[a]
White Horehound	*Marrubium vulgare*	FACU
Black Medick	*Medicago lupulina*	FACU
Alfalfa	*Medicago sativa*	UPL
White Sweetclover	*Melilotus albus*	FACU
Yellow Sweet-Clover	*Melilotus officinalis*	FACU
American Wild Mint	*Mentha arvensis*	FACW
Alkali Muhly	*Muhlenbergia asperiflora*	FACW
Green Needlegrass	*Nassella viridula*	UPL
Water Cress	***Nasturium officinale***	**OBL**
Catnip	*Nepeta cateria*	FACU
Hairly Evening-Primrose	***Oenothera villosa***	**FACU**
Scotch Thistle	***Onopordum acanthium***	**UPL**
Plains Pricklypear	*Opuntia polyacantha*	UPL
Common Panic Grass	*Panicum capillare*	FAC
Western-Wheat Grass	*Pascopyrum smithii*	FACU
Water Smartweed	***Persicaria amphibia***	**OBL**
Dock-Leaf Smartweed	*Persicaria lapathifolia*	OBL
Reed Canary Grass	*Phalaris arundinacea*	FACW
Long-leaf Ground Cherry	***Physalis longifolia***	**UPL**
Flat-Stem Blue Grass	***Poa compressa***	**FACU**
Fowl Blue Grass	*Poa palustris*	FACW
Kentucky Blue Grass	*Poa pratensis*	FACU
Yard Knotweed	***Polygonum aviculare***	**FACU**
Annual Rabbit's-Foot Grass	*Polypogon monspeliensis*	FACW
Narrow-Leaf Cottonwood	*Populus angustifolia*	FACW
Eastern Cottonwood	*Populus deltoides*	FAC
Pennsylvania Cinquefoil	*Potentilla pensylvanica*	FACU
Prairie Coneflower	***Ratibida columnifera***	**UPL**
Wood's Rose	***Rosa woodsii***	**FACU**
Curly Dock	*Rumex crispus*	FAC
Narrow-Leaf Willow	*Salix exigua*	FACW
Yellow Willow	*Salix lutea (S. eriocephala)*	FACW
Willow	*Salix* sp.	NL
Prickly Russian-Thistle	*Salsola tragus*	FACU
Tall False Rye Grass	***Schedonorus arundinaceus***	**FAC**

Table 3-1. Vegetation Species Observed From 2013 Through 2018 at the Kindsfater Site (Page 4 of 4)

Common Names	Scientific Names	GP Indicator Status[(a)]
False Meadow Rye	*Schedonorus pratensis*	FACU
Flax-leaf Plains Mustard	***Schoenocrambe linifolia***	**UPL**
Schoenoplectus acutus	Hard-Stem Club-Rush	OBL
Schoenoplectus pungens	Three-Square	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Silene latifolia	**White Cockle**	**UPL**
Sisymbrium altissimum	Tall Hedge-Mustard	FACU
Sisymbrium loeselii	Smallpod Tumble Mustard	UPL
Solanum dulcamara	Climbing Nightshade	FACU
Solidago canadensis	Canadian Goldenrod	FACU
Sonchus arvensis	Field Sow-Thistle	FAC
Sphaeralcea coccinea	**Scarlet Globemallow**	**UPL**
Tanacetum vulgare	Common Tansy	FACU
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	FACU
Tragopogon dubius	Meadow Goat's-beard	UPL
Typha angustifolia	Narrow-Leaf Cat-Tail	OBL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Ulmus americana	**American Elm**	**FAC**
Verbascum thapsus	Great Mullein	UPL
Verbena bracteata	Carpet Vervain	FACU
Veronica anagallis-aquatica	**Blue Water Speedwell**	**OBL**
Veronica peregrina	Neckweed	FACW
Vicia americana	**American Purple Vetch**	**FACU**
Vicia sativa	Garden Vetch	FACU
Xanthium strumarium	Rough Cockleburr	FAC
Zeltnera exaltata	Desert Mountain-pink	FACW

(a) 2016 NWPL [Lichvar et al., 2016].

New species that were identified in 2018 are bolded.

Vegetation plant communities were identified by plant composition, species dominance, and the results of the wetland delineation. The community composition is provided on the Wetland Mitigation Site Monitoring form (Appendix B), and the community boundaries are shown on Figure A-3 (Appendix A).

Sixteen vegetation community types were identified in 2018, including eight upland communities and eight wetland communities:

- Wetland Type 2 – *Eleocharis palustris*/*Bromus* spp.
- Wetland Type 3 – *Alopecurus arundinaceus*/*Poa palustris*
- Wetland Type 5 – *Typha latifolia*
- Wetland Type 8 – *Populus deltoides*
- Wetland Type 9 – *Salix exigua*
- Wetland Type 10 – *Poa palustris*
- Wetland Type 11 – *Phalaris arundinacea*
- Wetland Type 16 – *Juncus* spp.
- Upland Type 4 – *Elaeagnus angustifolia*
- Upland Type 6 – *Elymus trachycaulus*/*Bromus* spp.
- Upland Type 7 – *Bromus tectorum*/*Agropyron cristatum*.
- Upland Type 12 – *Alopecurus arundinaceus/Poa pratensis*
- Upland Type 13 – *Elymus trachycaulus/Elymis repens*
- Upland Type 14 – *Elymus* spp./*Bromus* spp.
- Upland Type 15 – *Bromus* spp./*Nassella viridula*
- Upland Type 17 – *Bromus* spp./*Poa pratensis*

Wetland community Type 2 – *Eleocharis palustris/Bromus* spp. was previously mapped across 2.0 acres of the project area within two of the excavated wetland cells. This community was dominated by common spike-rush (*Eleocharis palustris*) with decreasing cover by field brome (*Bromus arvensis*) and cheatgrass (*Bromus tectorum*), and increasing cover by three-square (*Schoenoplectus pungens*) and Baltic rush. Changes in the vegetation across some areas that were mapped as Type 2 include the transition from common spike-rush to a dominance of eastern cottonwood (*Populus deltoides*), narrow-leaf willow (*Salix exigua*) or creeping meadow-foxtail (*Alopecurus arundinaceus*). In 2016, Type 2 had a 7.5-acre decrease compared to 2015 (9.0 acres), which is likely a result of decreased regional precipitation rates and lower site-wide saturation and inundation levels compared to what was observed in previous years. In 2018, Type 2 was mapped across 1.2 acres within wetland Cells 11 and 12, which is a 0.8-acre reduction over the last year primarily because of a shift to community Type 16 – *Juncus* spp. around the perimeter of the cells.

Wetland community Type 3 – *Alopecurus arundinaceus*/*Poa palustris* was identified across 18.3 acres of preexisting wetland that remained relatively undisturbed during the 2012 construction and replaced community Type 2 in one restored wetland cell located near the western project boundary in 2016. In 2017, Type 3 acreage was 16.7 acres because of a shift from creeping meadow-foxtail/fowl bluegrass to a dominance of reed canary grass (Type 11) in the northwest corner of the property as well as a reduction in Type 3 acreage within the perimeter of wetland Cell 4. In 2018, Type 3 represented 12.8 acres because of the Type 5 – *Typha latifolia* and Type 11 – *Phalaris arundinacea*

expansion primarily within the lower terrace. This community type currently occupies the lower terrace along the southeastern boundary and includes the wetlands within the perimeter of wetland Cell 4. Creeping meadow-foxtail and fowl bluegrass dominated the community. Other species identified in this community included Kentucky bluegrass (*Poa pratensis*), creeping wild rye (*Elymus repens*), cheatgrass, slender wild rye, western- wheatgrass (*Pascopyrum smithii*), Nebraska sedge (*Carex nebrascensis*), broad-leaf cattail *(Typha latifolia*), eastern cottonwood seedlings and saplings, field sow-thistle (*Sonchus arvensis*), and many additional species in trace amounts.

Upland community Type 4 – *Elaeagnus angustifolia* was a scrub/shrub and forested community identified on 58.6 acres in 2017 scattered throughout upland community Type 7. Russian olive (*Elaeagnus angustifolia*), American silverberry (*Elaeagnus commutata*), eastern cottonwood, and narrow-leaf cottonwood (*Populus angustifolia*) are the dominant, mature woody species that were identified in this community. In 2018, Type 4 was mapped with Type 14 – *Elymus spp./Bromus* spp. or Type 15 – *Bromus spp./Nassella viridula* across the northwestern and western portions of the project site. Together, upland community Types 4 and 14 represent 18.3 acres; Types 4 and 15 represent approximately 11 acres and have formed a mosaic across 29.2 acres of the site.

Wetland community Type 5 – *Typha latifolia* was identified across 5.0 acres of the site in 2018. This community type of preexisting cattail wetland has decreased from 9.6 acres in 2016 to 5.0 acres in 2018. Some of the Type 5 wetlands in the southwestern corner of the property have transitioned to upland Type 6 and those in the northwestern corner of the site have transitioned to wetland Type 11. This community type was undisturbed during 2012 construction and was characterized by seasonal/intermittent to permanent/perennial wetland hydrology. Hard-stem club-rush, common spike-rush, Baltic rush, dock-leaf smartweed (*Persicaria lapathifolia*), horehound (*Marrubium vulgare*), annual rabbit's-foot grass (*Polypogon monspeliensis*), and climbing nightshade (*Solanum dulcamara*) were identified in this community.

Upland community Type 6 – *Elymus trachycaulus/Bromus* spp. was created in 2014 to characterize 19.0 acres along the dry slopes near the east boundary. Type 6 represented 20.4 acres in 2017, which was a slight increase compared to 19.4 acres in 2016. In 2018, Type 6 represents a total of 4.6 acres, which is a large reduction in acreage compared to 2017 and was primarily caused by the expansion of wetland communities Type 5 and Type 11 as well as the upland community Type 14 – *Elymus* spp./*Bromus* spp. along the slopes and lower terrace near the southeastern project boundary. Species identified within this community included slender wild rye, cheatgrass, smooth brome, creeping wild rye, Kentucky bluegrass and a mix undesirable weedy species such as prickly Russian-thistle (*Salsola tragus*) and prickly lettuce (*Lacuta serriola*). This community was represented by primarily nonnative, drought-tolerant species that are commonly found in recently disturbed and/or degraded landscapes.

Upland community Type 7 – *Bromus tectorum*/*Agropyron cristatum* replaced community Type 1 – *Chenopodium* spp./*Bromus* spp. in 2016 because of the absence of *Chenopodium* species, a dominance of cheatgrass, and a codominance of crested wheatgrass (*Agropyron cristatum*) across uplands that were disturbed by the 2012 construction. Additionally, one wetland cell transitioned from common spike-rush to a dominance of cheatgrass in 2016, which represented a 0.8-acre shift from community Type 2 – *Eleocharis palustris/Bromus* spp. to Type 7 – *Bromus tectorum/Agropyron*

cristatum. As noted in 2016 and 2017, shifts in vegetation composition across cheatgrass-dominated landscape will likely depend on whether perennial species are present in the seed bank. Originally, this community was represented by primarily nonnative species that were commonly found in recently disturbed and/or degraded landscapes; however, this community type also included native species, such as green needlegrass (*Nassella viridula*), fringed sage (*Artemisia frigida*), and plains pricklypear (*Opuntia polyacantha*). In 2018, a significant reduction in the cover by crested wheatgrass and a notable increase in green needlegrass occurred. Some areas of Type 7 were also replaced by wild rye species (*Elymus* spp.). Two new communities, Type 14 – *Elymus* spp./*Bromus* spp. and Type 15 – *Bromus* spp./*Nassella viridula* were established in 2018 and replaced most of the Type 7 community. The total acreage remaining for community Type 7 represents approximately 1.3 acres and encompasses the constructed wetland Cell 1 and the perimeter of wetland Cell 14.

Wetland community Type 8 – *Populus deltoides* was the dominant species in several wetland areas that replaced community Type 2 – *Eleocharis palustris/Bromus* spp. This vegetation shift was generally noted in rocky substrates within constructed wetland Cells 5, 8, 10, and 13 and part of 14. Wetland Cell 12 will likely transition to a dominance of cottonwood in the near future based on the number of eastern cottonwood seedlings and saplings noted across this cell during the 2017 and 2018 surveys. In addition to eastern cottonwood, narrow-leaf willow, fowl bluegrass, common spike-rush, and three-square bulrush were common species. The soils across Cells 10, 13, and part of 14 were saturated to the surface with a shallow surface water within the lower portions of the excavated depressions during the June 2018 delineation; however, most of Cell 8 was inundated with water that was 4–6 inches deep, which is shown in the T-2 photograph in Appendix C. The saturated soils across most of Type 8, in combination with the rock substrate, allows woody plants to establish roots more efficiently, which provides more favorable conditions for the growth of woody species. This community type represents 3.14 acres across five wetland cells.

Wetland community Type 9 – *Salix exigua* replaced a small portion of community Type 2 – *Eleocharis palustris/Bromus* spp. in 2016 and represents approximately 0.7 acre of created scrub/shrub wetlands. Currently, narrow-leaf willows that are 6–9 feet tall occupy the northeastern border around wetland Cell 14, which is located near the eastern project boundary. This community type will likely increase with time because of the number of small narrow-leaf seedlings and saplings noted in other wetland cells.

Wetland community Type 10 – *Poa palustris* was previously mapped across 1.1 acre and replaced community Type 2 – *Eleocharis palustris/Bromus* spp. in three wetland cells located in the northwestern quarter of the project site. In 2017, the perimeter of wetland Cell 7 converted to community Type 13 – *Elymus trachycaulus/Elymus repens*. In 2018, Type 10 persists in the three wetland cells for a total of 0.5 acre. This acreage reduction was caused by the increasing upland vegetation inside the perimeter of these wetland cells, while areas that were dominated by fowl bluegrass occur in the lower excavated areas. Soils were saturated to the surface within Cell 3 (DP-4W), but soils across the remaining two constructed wetlands were generally dry on the surface and moist 12 inches below the surface. Fowl bluegrass exhibited a high cover value of 50 percent or greater with a variety of other species that represent lower values. Fowl bluegrass was included in the

wetland seed mix and has a facilitative wetland (FACW) NWPL rating, which, in some cells, has replaced obligate (OBL) species (e.g., common spike-rush) that require wetter soil conditions.

Wetland community Type 11 – *Phalaris arundinacea* characterized 0.2 acre of preexisting wetlands that were dominated by reed canary grass. These areas were undisturbed during the 2012 construction and represent a monoculture of reed canary grass with a small amount of creeping wild rye. Because of the dense, tall patches of this grass, establishment by other species is limited. In 2017, constructed wetland Cell 2 converted from community Type 3 – *Alopecurus arundinaceus/Poa palustris* to a dominance of reed canary grass, which increased the total acreage for Type 11 to 0.7. Wetland Cell 2 is located along the far northwestern corner of the project site. In 2018, several areas that were previously identified as Type 6 or Type 3, that are located along the lower terrace near the southeastern project boundary were mapped as Type 11, which increased the total acreage to 6.3 acres. This vegetation shift is likely caused by increased soil moisture and higher groundwater levels over the last year because of higher than average precipitation.

Upland community Type 12 – *Alopecurus arundinaceus/Poa pratensis* was mapped across 1.4 acres in 2018 and in 2017 replaced a small portion of community Type 7 – *Bromus tectorum/Agropyron cristatum* along the western project site boundary and a very small portion of community Type 8 – *Populus deltoides* within wetland Cell 8. In addition to a dominance of creeping meadow-foxtail and Kentucky bluegrass, other common species included slender wild rye, creeping wild rye, eastern cottonwood (a mix of age classes from seedlings, saplings to mature trees), and Russian olive. Cheatgrass and crested wheatgrass and still present but represent a lower percent cover.

Upland community Type 13 – *Elymus trachycaulus/Elymus repens* replaced community Types 7 – *Bromus tectorum*/*Agropyron cristatum* and 3 – *Alopecurus arundinaceus/Poa palustris* around the perimeter of several depressional wetlands. Previously, the total acreage for community Type 13 represented approximately 1.0 acres and provided preferable perennial grasses that encroached on the cheatgrass but slightly reduced the wetland acreage for Type 3 between wetland Cells 11 and 12. In 2018, Type 13 acreage increased to 1.6 acres because of expanding creeping wild rye cover and density that replaced Type 6 along the lower southeastern terrace.

Upland community Type 14 – *Elymus* spp./*Bromus* spp. was identified on 23.6 acres for the first time in 2018 and characterizes a new community type along the southeastern boundary slope and the western side of the project site, which previously contained the upland communities Type 6 and Type 7. Community Type 14 reflects the increase of creeping wild rye and codominance of smooth brome and/or cheatgrass. Although slender wild rye (Type 6) is still present, a reduction in the abundance and cover of this grass occurred in 2018. Other common species that were observed within Type 14 include yellow sweet clover (*Melilotus officinalis*), fringed sage, western wheatgrass and green needle grass.

Upland community Type 15 – *Bromus* spp./*Nassella viridula* replaced a large portion of community Type 7 in 2018. Type 7 was previously a dominance of cheatgrass and crested wheatgrass across the northern and eastern portions of the project site. Although both species are still present, a notable increase in the green needle grass cover required that a community Type 15 be established to reflect

this shift in a codominance species. Community Type 15 occurred in some of the drier areas across the project site and included alfalfa (*Medicago sativa),* carpet vervain (*Verbena bracteata*), wild tarragon *(Artemisia dracunculus*), plains pricklypear, and white horehound. Bare ground was estimated at less than 10 percent during the 2018 survey. Type 15 represents 19.1 acres of upland that is primarily located in the northeastern quarter of the project site.

Wetland community Type 16 – *Juncus* spp. was identified for the first time in 2018 to characterize areas with a dominance of rush species, primarily Baltic rush, Torrey's rush (*Juncus torreyi*) and saltmarsh rush (*Juncus geraridii)* that are replacing small areas of Type 5 (*Typha latifolia*) and Type 2 (*Eleocharis palustris/Bromus* spp.) along the upper slope break. This small diverse community represents 2.7 acres and includes Nebraska sedge, seedlings of eastern cottonwood, cattails, annual rabbit's foot grass, three-square bulrush, fringed willow herb, and American wild mint.

Upland community Type 17 – *Bromus* spp./*Poa pratensis* represents three small areas located on 2.3 acres in the southeastern portion of the project site, previously community Type 6 – *Elymus trachycaulus/Bromus* spp. This shift from a dominance of slender wild rye to brome species and Kentucky bluegrass along this lower slope could be that rhizomatous grasses are increasing as short-lived perennial grasses such as slender wild rye are declining in dominance and abundance. Additional species noted during the monitoring included cheatgrass and creeping wild rye with seven other species present at 5 percent cover or less as shown on the Wetland Mitigation Site Monitoring form, Appendix B).

Vegetation cover was measured along three transects at the Kindsfater mitigation site in 2018 (Figure A-2, Appendix A). Baseline conditions were documented along the vegetation transects for the first time in 2013. The data recorded on T-1 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-2 and Charts 3-3 and 3-4, respectively. T-1 began in upland Type 7 – *Bromus tectorum/Agropyron cristatum*, extended 300 feet across excavated Cell 14, intersected wetland Types 9 – *Salix exigua* and 8 – *Populus deltoides*, crossed an upland island Type 14 – *Elymus* spp./*Bromus* spp. and ended in upland Type 6 – *Elymus trachycaulus/Bromus* spp. Changes in vegetation included the shift from community Type 2 – *Eleocharis palustris/Bromus* spp. to a dominance of eastern cottonwood and narrow-leaf willow. Other changes included a shift across the upland island from Type 7 – *Bromus tectorum*/*Agropyron cristatum* to a codominance of slender wheatgrass, creeping wild rye, cheatgrass and smooth brome (Type 14). Wetland acreage remained consistent from 2013 through 2017. In 2018, hydrophytic vegetation communities increased from 40 percent to 49 percent of the transect length A total of 35 species were identified, including 12 hydrophytes and 23 upland species. Because of modifications to the wetland plan in this area and the distinct topographic breaks between upland and wetland habitat along this transect, small changes to the percent wetland/upland habitat are expected, although, community composition will likely shift with time.

Table 3-2. Data Summary for T-1 From 2013 Through 2018 at the Kindsfater Site

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**300**	**300**	**300**	**300**	**300**	**300**
Vegetation Community Transitions Along Transect	4	4	4	4	4	4
Vegetation Communities Along Transect	2	2	2	4	4	5
Hydrophytic Vegetation Communities Along Transect	1	1	1	2	2	2
Total Vegetative Species	24	36	45	40	38	35
Total Hydrophytic Species	9	13	14	14	13	12
Total Upland Species	15	23	31	26	25	23
Estimated % Total Vegetative Cover	70	70	70	75	75	85
Estimated % Unvegetated	30	30	30	25	25	15
% Transect Length Comprising Hydrophytic Vegetation Communities	40.3	40.3	40.3	40.3	40.3	49.3
% Transect Length Comprising Upland Vegetation Communities	59.7	59.7	59.7	59.7	59.7	50.7
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

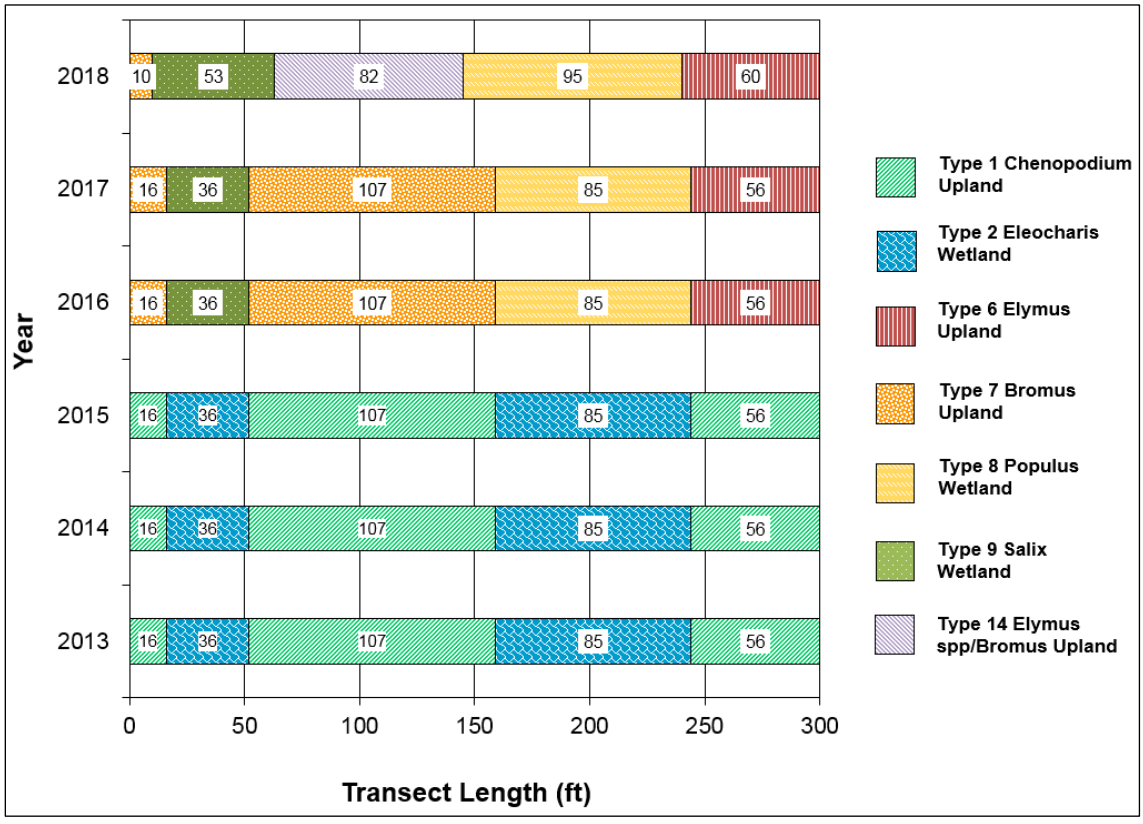

Chart 3-3. Transect Map Showing Community Types on T-1 From Start (0 Foot) to Finish (300 Feet) at the Kindsfater Site From 2013 Through 2018.

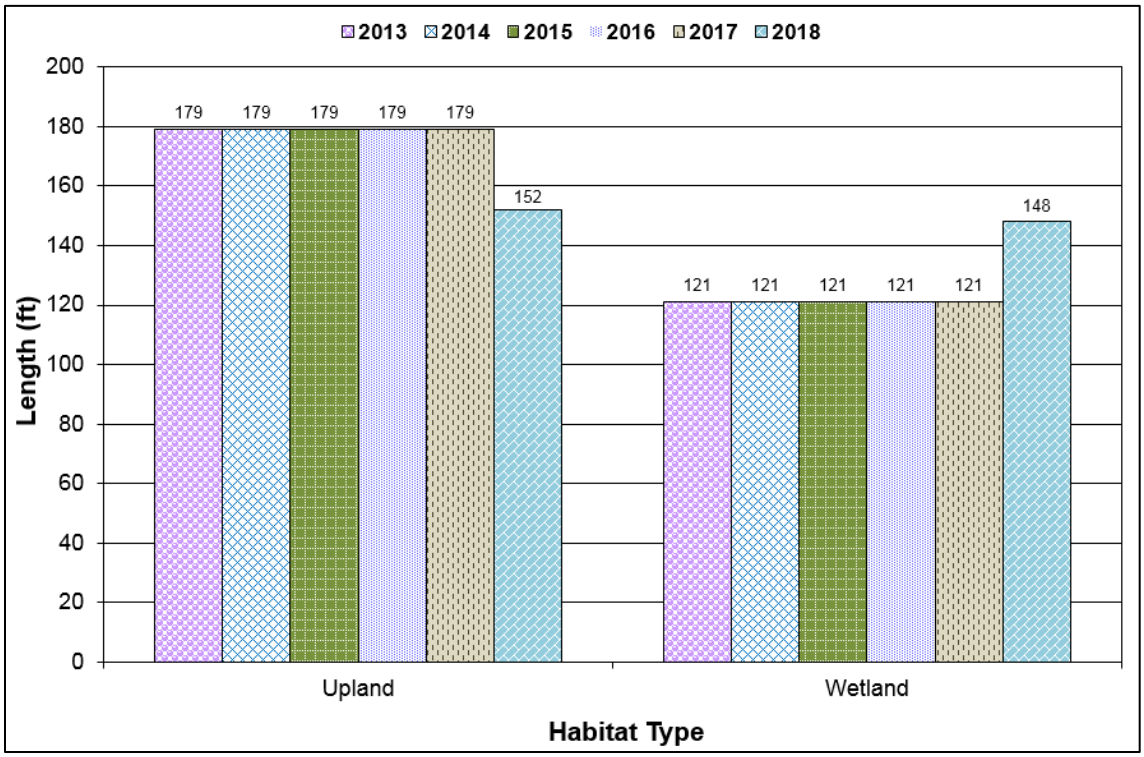

Chart 3-4. Length of Habitat Types Within T-1 From 2013 Through 2018 at the Kindsfater Site.

Data collected on T-2 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphical formats in Table 3-3 and Charts 3-5 and 3-6, respectively. This 388-foot transect began in preexisting wetland Type 3 – *Alopecurus arundinaceus/Poa palustris*, bisected excavated Cell 8 and wetland Type 8 – *Populus deltoides*, and ended in wetland Type 3. Hydrophytic vegetation remained consistent with 2013, 2014, 2015, 2016, and 2017 observations and composed 100 percent of the transect during the 2018 survey. A total of 26 species were identified, including 20 hydrophytes and 6 upland species. The estimated total cover increased to 75 percent in 2018 with litter, bare ground, or open water estimated at 25 percent across the transect length. Approximately 82 percent of the transect is represented by wetland Type 8 – *Populus deloides* and occurs primarily within the rocky substrate of this constructed basin. In 2018, shallow surface water (several inches deep) covered approximately 75 percent of this community type.

Table 3-3. Data Summary for T-2 From 2013 Through 2018 at the Kindsfater Site

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**388**	**388**	**388**	**388**	**388**	**388**
Vegetation Community Transitions Along Transect	2	2	2	2	2	2
Vegetation Communities Along Transect	2	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	22	33	39	35	39	26
Total Hydrophytic Species	16	19	20	18	23	20
Total Upland Species	6	14	19	17	16	6
Estimated % Total Vegetative Cover	60	60	60	60	65	75
Estimated % Unvegetated	40	40	40	40	35	25
% Transect Length Comprising Hydrophytic Vegetation Communities	100	100	100	100	100	100
% Transect Length Comprising Upland Vegetation Communities	0	0	0	0	0	0
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

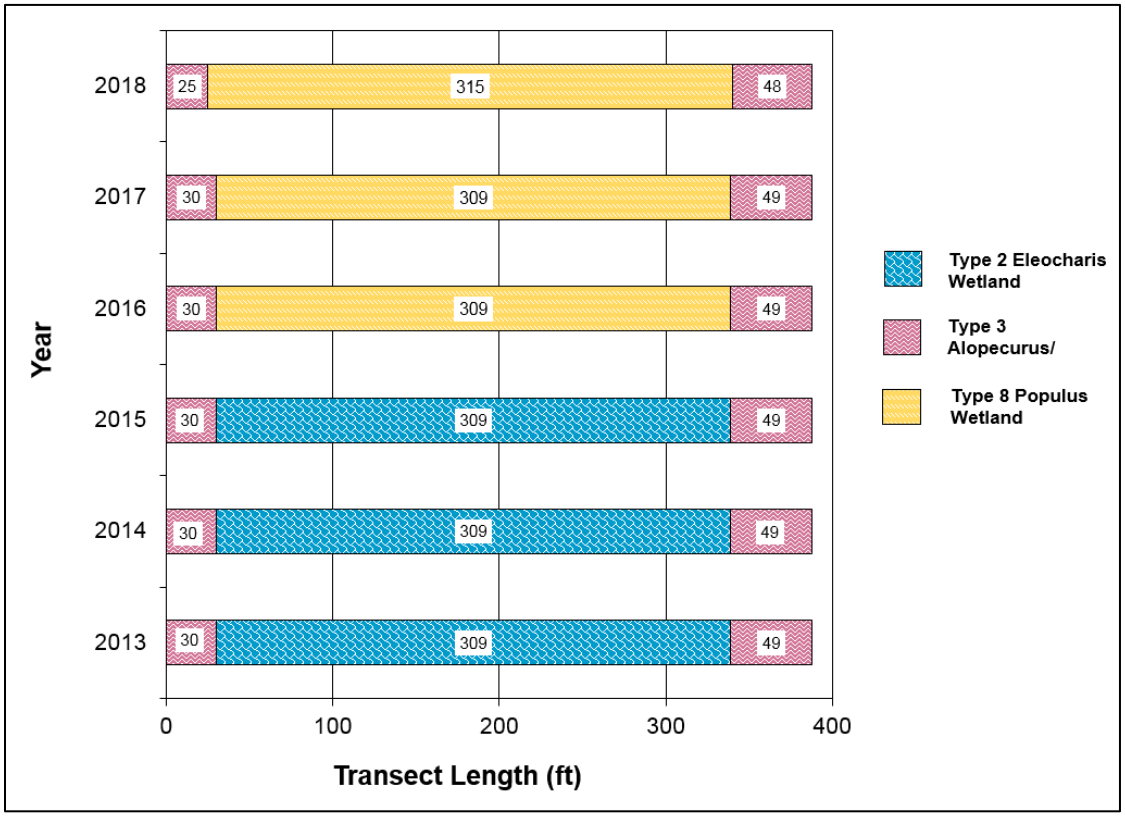

Chart 3-5. Transect Map Showing Community Types on T-2 From Start (0 Foot) to Finish (388 Feet) at the Kindsfater Site From 2013 Through 2018.

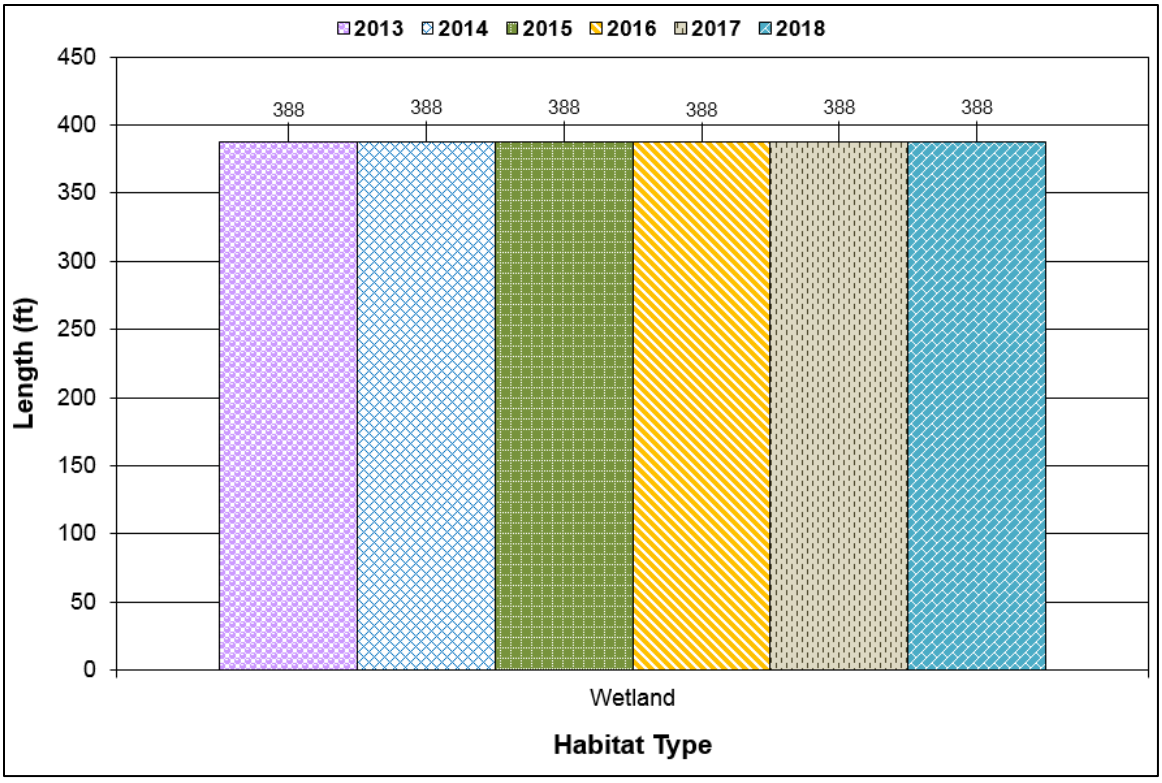

Chart 3-6. Length of Habitat Types Within T-2 From 2013 Through 2018 at the Kindsfater Site.

Data collected on T-3 (Wetland Mitigation Site Monitoring form, Appendix B) are summarized in tabular and graphic formats in Table 3-4 and Charts 3-7 and 3-8, respectively. This 292-foot transect began in preexisting wetland Type 3 – *Alopecurus arundinaceus/Poa palustris*, which continues across the excavated Cell 4 and ends in upland Type 6 – *Elymus trachycaulus/Bromus* spp. Hydrophytic vegetation shifted in 2016 with the transition of Type 2 – *Eleocharis palustris/Bromus* spp. to community Type 3, the overall wetland acreage remained consistent with 2013, 2014, 2015, 2016, and 2017 observations; however, the wetland acreage increased from 90 to 92 percent along the transect during the 2018 survey. A total of 23 species were identified, including 11 hydrophytes and 12 upland species. The estimated total vegetative cover in 2018 was 85 percent with litter and/or bare ground estimated at 15 percent across the transect length.

Table 3-4. Data Summary for T-3 From 2013 Through 2018 at the Kindsfater Site

Monitoring Year	2013	2014	2015	2016	2017	2018
Transect Length (feet)	**292**	**292**	**292**	**292**	**292**	**292**
Vegetation Community Transitions Along Transect	2	2	2	1	1	1
Vegetation Communities Along Transect	3	3	3	2	2	2
Hydrophytic Vegetation Communities Along Transect	2	2	2	1	1	1
Total Vegetative Species	18	26	32	28	31	23
Total Hydrophytic Species	11	18	18	15	19	11
Total Upland Species	7	8	14	13	12	12
Estimated % Total Vegetative Cover	70	70	70	70	75	85
Estimated % Unvegetated	30	30	30	30	25	15
% Transect Length Comprising Hydrophytic Vegetation Communities	89.7	89.7	89.7	89.7	89.7	91.8
% Transect Length Comprising Upland Vegetation Communities	10.3	10.3	10.3	10.3	10.3	8.2
% Transect Length Comprising Unvegetated Open Water	0	0	0	0	0	0
% Transect Length Comprising Mudflat	0	0	0	0	0	0

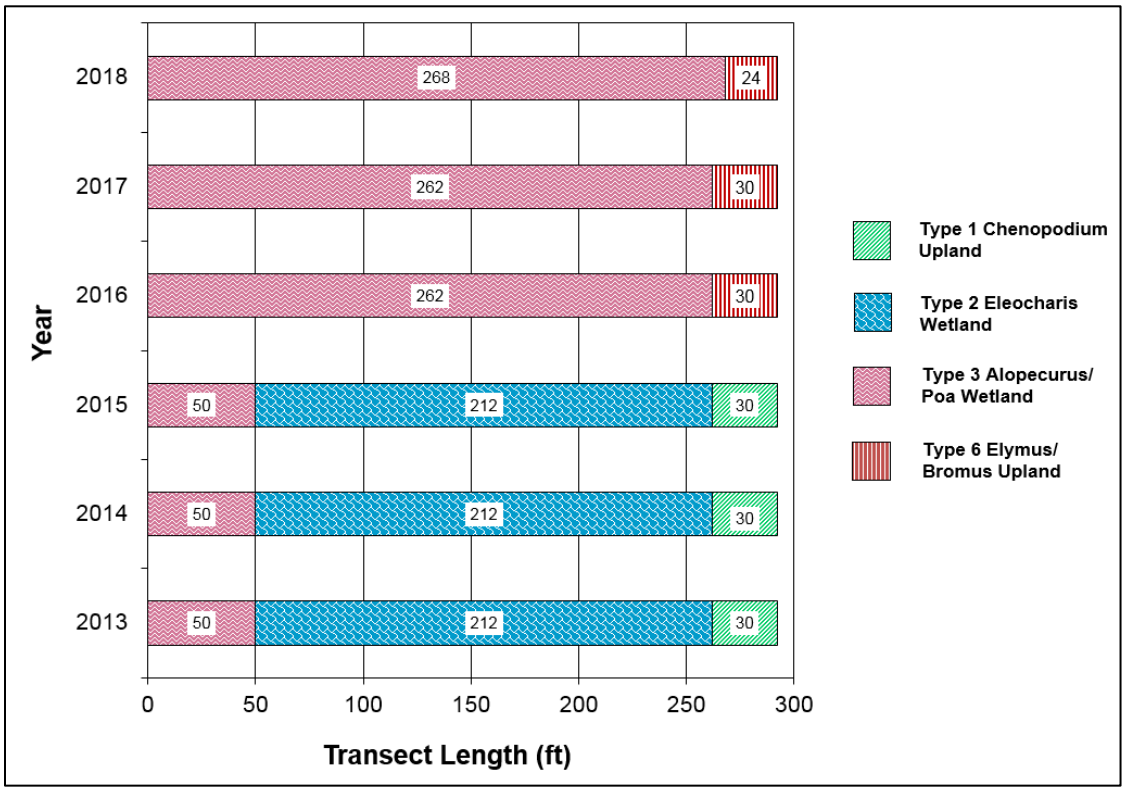

Chart 3-7. Transect Map Showing Community Types on T-3 From Start (0 Foot) to Finish (292 Feet) at the Kindsfater Site From 2013 Through 2018.

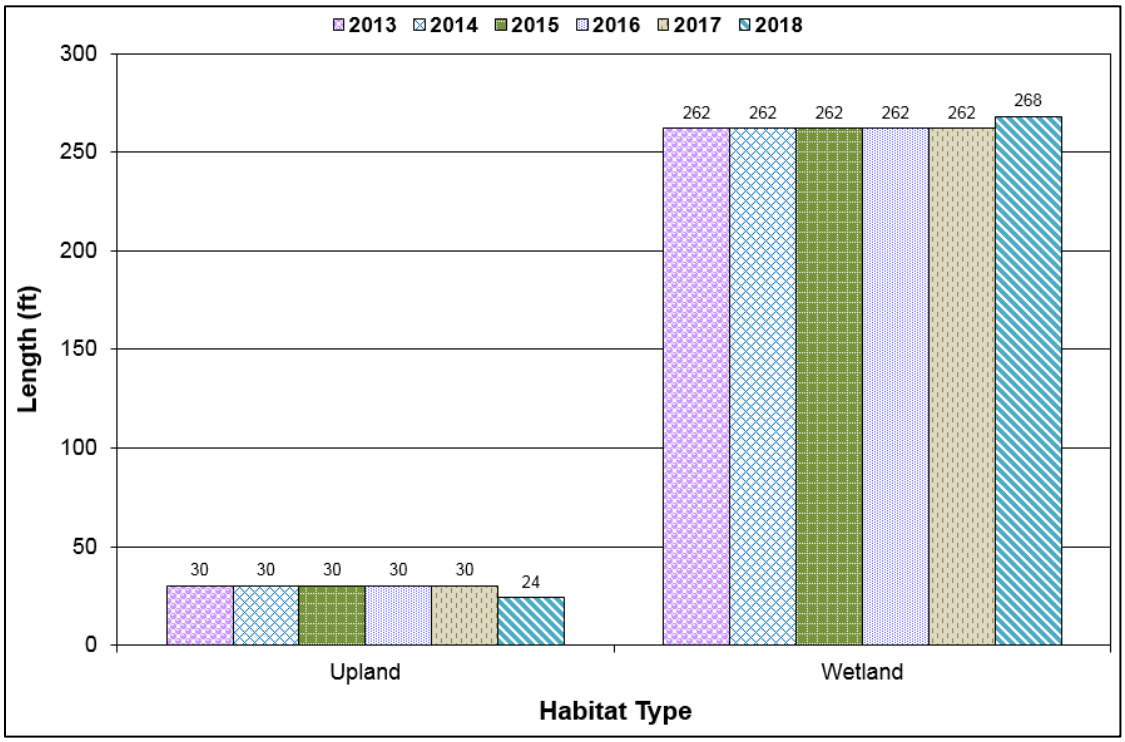

Chart 3-8. Length of Habitat Types Within T-3 From 2013 Through 2018 at the Kindsfater Site.

A total of 24 infestations of Montana-listed Priority 2B noxious weeds were identified and mapped at the Kindsfater site (Figure A-3, Appendix A). Eight infestations of Canada thistle (*Cirsium arvense*), six infestations of leafy spurge (*Euphorbia esula*), six infestations of field bindweed (*Convolvulus arvensis*), three infestation of gypsy flower (*Cynoglossum officinale*) and 1 infestation of spotted knapweed were identified with cover classes that ranged from low (1–5 percent) to high (26–100 percent). Note that the high-cover class percentage was between 26 and 36 percent cover in 2018. Additionally, several infestations of great mullein (*Verbascum thapsus*) and poison hemlock (*Conium maculatum*) plants, which are Yellowstone County-designated noxious weeds, were observed in community Types 6 – *Elymus trachycaulus/Bromus* spp. and 14 – *Elymus* spp./*Bromus* spp. Scotch thistle *(Onopordum acanthium*), which is also a Yellowstone County-designated noxious weed, was observed along the southeastern side of wetland Cell 8 within community Type 3. During the annual 2017 monitoring, one common tansy (*Tanacetum vulgare*) plant, also a state listed noxious weed, was found (and pulled to remove) near the western boundary and property access. During the 2018 annual monitoring, this plant and location were checked, and no additional plants were observed in this area or across the project site.

The extent of weed infestations observed in 2018 does not exceed the success criterion for weed populations of 5 percent site-wide. A weed contractor with MDT treated this site in 2012 before construction. MDT's weed contractor treated the site on July 4, 2018, and concentrated on areas of infestations by Canada thistle, field bindweed, leafy spurge, great mullein, and gypsy-flower. MDT has an ongoing weed-control program for their mitigation sites that includes an annual assessment of weeds that are identified at each location and treatment to contain and control identified populations. Signs that indicate previously conducted weed control were noted during the 2018 monitoring primarily

along the lower terrace but the slope and central portion of the project site (near Cells, 4, 9, 10, and 11) will need additional weed control efforts in 2019.

Two Priority 3 regulated weed species (not Montana-listed noxious weeds)—cheatgrass and Russian olive—were identified across the site with increased cover classes observed since 2014. These plants may not be intentionally spread or sold other than as a contaminant in agricultural projects. Regulated plants have the potential to cause significant negative impacts. The Montana Department of Agriculture (July 2015) recommends research, education, and prevention to minimize the spread of regulated plant species.

A few thousand cuttings and containerized materials were planted in approximately 27 clusters (Figure A-2, Appendix A) around the Kindsfater site. The woody planting zones were generally located around the excavated wetland cells. Each individual cluster was monitored in 2018 with the number of live plants counted and recorded by species. Approximately 11 percent of the observed plantings were alive during the 2018 evaluations, which is a slight increase from 2017 (10 percent) and is likely caused by narrow-leaf willow and eastern cottonwood root sprouts or plant regrowth from the base. Low survival is likely caused by a lack of sufficient moisture. One additional *Rocky Mountain juniper* was also noted in 2018. The planted and surviving species are listed on the Wetland Mitigation Site Monitoring form (Appendix B).

3.3 SOIL

The project site was mapped in the *Web Soil Survey for Yellowstone County Soil Survey* [US Department of Agriculture, 2016]. Five soil series were mapped within the monitoring area and include the Bew silty clay loam, Shoreu gravelly loam, Wanetta clay loam, Larim gravelly loam, and alluvial land (wet). The existing wetlands across the site were located in areas mapped as Bew silty clay loam, Wanetta clay loam, Larim gravelly loam, and alluvial land (mapped along the irrigation canal). The constructed cells were generally mapped in the Bew and Wanetta series. The Bew soils consist of very deep, well-drained, slowly permeable soils that occur on uplands and in valleys. The Wanetta series is a well-drained, moderately permeable loam to gravelly loam. The Bew soil and alluvial land map units are listed on the *Montana Hydric Soils List* [Montana Department of Agriculture, 2015]. The historic gravel mining operations disturbed soils extensively across the site. Soil profiles observed in the test pits provided evidence that the NRCS mapped soil units are not applicable for describing contemporary soil conditions within the Kindsfater mitigation area.

Soil test pits were excavated at eight locations (Figure A-2). DP-1U, DP-1W, DP-2U, and DP2W are located near the southeastern and eastern site boundary, respectfully, while data points DP-3W, DP-3U, DP-4W, and DP-4U are located in the northwestern quarter of the site. The soil profile at DP-1W located in wetland Type 16 – Juncus spp. revealed a very dark brown (10YR 2/2) loam in the upper 4 inches and a very dark grayish brown (10YR 3/2) sandy silt loam below. No hydric soil indicators were observed for DP-1W, likely because of its location in a constructed wetland where soils may be too young to have formed hydric indicators (*Problematic Hydric Soils: Recently Developed Wetlands*) [USACE, 2010]. The soils at DP-2W included a dark grayish brown (10YR 4/2) clay loam with small cobbles located within community Type 8 – *Populus deltoides*. This soil met the hydric soil criteria for hydrogen sulfide odor (A4), which was detected at 6 inches. The soil profile at DP-3W, which is located

in wetland Type 11 – *Phalaris arundinacea*, revealed a dark grayish brown (10YR 4/2), silt loam that lacked hydric soil indicators because of its location in a constructed wetland where soils may be too young to have formed hydric indicators. The soil profile at DP-4W, which is located in wetland Type 10 – *Poa palustris*, revealed a dark grayish brown (10YR 4/2) silty clay loam with 2 percent redox concentrations noted at 8 inches.

Additional data points (DP-3U, DP-4W, and DP-4U) were added in 2016 to supplement the wetland delineation and to meet USACE wetland delineation requirements. The soil profile at DP-1U, which is located in upland Type 4 – *Elaeagnus angustiolia*, exhibited a very dark brown (7.5YR 2/2) silty loam to silty clay loam. No hydric soil indicators were observed at DP-1U. The soil profile at DP-2U, which is located in upland Types 6 and 15, revealed a dark brown (10 YR 3/3) silt loam without redox features and with no hydric soil indicators observed. The soil profile at DP-3U (located in upland Types 4 and 14) revealed a very dark grayish brown (10 YR 3/2), gravelly loam without redox features. The soil profile for DP-4U (also located within upland Types 4 and 14) revealed a very dark grayish brown (10 YR 3/2, silt loam without hydric soil indicators.

3.4 WETLAND DELINEATION

Eight data points were evaluated to confirm the wetland boundary determination in 2018 (Figure A-2, Appendix A). The completed Wetland Determination Data forms are located in Appendix B. DP-1W, DP-2W, DP-3W, and DP-4W are located in areas that were classified as wetlands. The total wetland acreage surveyed within the area in 2018 was 32.4 acres. The delineation confirmed 17.6 acres in preservation areas, 7.1 acres in the restoration areas (reestablishment and rehabilitation), 3.0 acres in the enhancement area, and 4.7 acres of created wetland in the excavated cells; Table 3-5 displays these acreages. Uplands accounted for 83.3acres of the mitigation site.

Table 3-5. Wetland Acres Delineated From 2013 Through 2018 at the Kindsfater Site

Habitat Type	2013 Acreage	2014 Acreage	2015 Acreage	2016 Acreage	2017 Acreage	2018 Acreage
Preservation	21.9	21.3	21.3	20.3	20.5	17.6
Reestablishment (Restoration)	7.9	7.9	7.9	7.8	6.8	6.1
Rehabilitation (Restoration)	0.9	0.9	0.9	0.9	1.0	1.0
Enhancement	3.0	3.0	3.0	3.4	3.0	3.0
Creation	1.8	1.8	1.8	2.0	2.2	4.7
Total Wetland Habitat	**35.5**	**34.9**	**34.9**	**34.4**	**33.4**	**32.4**

3.5 WILDLIFE

A comprehensive list of bird and other wildlife species that were observed directly or indirectly from 2013 through 2018 is presented in Table 3-6 and noted on the Wetland Mitigation Site Monitoring form (Appendix B). Eighteen bird species were identified in 2018, including American robin (*Turdus migratorius*), American goldfinch (*Spinus tristus*), barn swallow (*Hirundo rustica*), cedar waxwing (*Bombycilla cedrorum*), house wren (*Troglodytes aedon*), Hungarian partridge *(Perdix perdix*), killdeer

(*Charadrius vociferus*), lark sparrow (*Chondestes grammacus*), mallard with chicks (*Anas platyrhnchos*), mourning dove (*Zenaida macroura*),northern catbird (*Ailuroedus jobiensis*), red-winged blackbird (*Agelaius phoeniceus*), ring-necked pheasant (*Phasianus colchicus*), tree shallow (*Tachycineta bicolor*), warbling vireo (*Vireo gilvus*), western kingbird (*Tyrannus verticalis*), western wood-peewee (*Contopus sordidulus*), and yellow warbler (*Dendroica petechia*). Three white-tailed deer (*Odocoileus virginianus*) were observed on site in 2018.

Table 3-6. Wildlife Species Observed From 2013 Through 2018 at the Kindsfater Site (Page 1 of 2)

Common Name	Scientific Name
Amphibians	
Boreal Chorus Frog	*Pseudacris maculate*
Plains Spadefoot	*Spea bombifrons*
Northern Leopard Frog	*Rana pipiens*
Birds	
American Robin	***Turdus migratorius***
American Goldfinch	***Spinus tristus***
Barn Swallow	***Hirundo rustica***
Cedar Waxwing	***Bombycilla cedrorum***
Collared Dove	*Streptopelia decaocto*
Common Grackle	*Quiscalus quiscula*
Common Yellowthroat	*Geothlypis trichas*
Double-crested Cormorant	*Phalacrocorax auritus*
Downy Woodpecker	*Picoides pubescens*
Eurasian Collared-Dove	*Streptopelia decaocto*
European Starling	*Sturnus vulgaris*
Gray Catbird	*Dumetella carolinensis*
House Wren	***Troglodytes aedon***
Hungarian Partridge	***Perdix perdix***
Killdeer	***Charadrius vociferus***
Lark Sparrow	***Chondestes grammacus***
Lazuli Bunting	*Passerina amoena*
Mallard	***Anas platyrhynchos***
Mourning Dove	***Zenaida macroura***
Northern Catbird	***Ailuroedus jobiensis***
Northern Flicker	*Colaptes auratus*
Northern Harrier	*Circus cyaneus*
Prairie Falcon	*Falco mexicanus*
Red-tailed Hawk	*Buteo jamaicensis*
Red-winged Blackbird	***Agelaius phoeniceus***
Ring-necked Pheasant	***Phasianus colchicus***
Spotted Sandpiper	*Actitis macularius*

Table 3-6. Wildlife Species Observed From 2013 Through 2018 at the Kindsfater Site (Page 2 of 2)

Common Name	Scientific Name
Birds (Continued)	
Swainson's Hawk	*Buteo swainsoni*
Tree Swallow	***Tachycineta bicolor***
Vesper Sparrow	*Pooecetes gramineus*
Warbling Vireo	***Vireo gilvus***
Western Kingbird	***Tyrannus verticalis***
Western Meadowlark	*Sturnella neglecta*
Western Tanager	*Piranga ludoviciana*
Western Wood-Peewee	***Contopus sordidulus***
White-crowned Sparrow	*Zonotrichia leucophrys*
Yellow Warbler	***Dendroica petechia***
Mammals	
Mule Deer	*Odocoilus hemionus*
White-tailed Deer	***Odocoileus virginianus***
Raccoon (tracks)	*Procyon lotor*

Species that were observed in 2018 are **bolded.**

3.6 FUNCTIONAL ASSESSMENT

The 2008 MDT MWAM [Berglund and McEldowney, 2008] was used to evaluate two general AAs: Created and Existing, as shown in Table 3-7 and Appendix B. The findings of the assessment are described below.

The Existing Wetland AA included 33.1 acres of preexisting wetland habitat identified in the 2012 wetland delineation conducted by MMI. In 2016, the preexisting wetlands acreage was calculated from a dgn file provided by MDT. A shapefile of the credit areas was created in and exported from Autodesk Civil 3D and overlaid with the 2016 delineated wetland boundaries in ArcMap and calculated acreages. Slight shifts in acreage within this AA included 20.3 acres of preservation wetland habitat, 8.7 acres of restoration habitat, and 3.4 acres of enhancement habitat for a total of 32.4 acres. Continued shifts in acreage based on the 2018 field conditions within this AA included 17.6 acres of preservation wetland habitat, 7.1 acres of restoration habitat, and 3.0 acres of enhancement habitat for a total of 27.7 acres. The Existing Wetland AA was rated as a Category III wetland and scored 65 percent of the possible points and 144.04 functional units. This AA received high ratings for short- and long-term surface-water storage, sediment/nutrient/toxicant removal, recreation/education potential, and the 2013 observation of the plains spadefoot (an S3 sensitive species) in its documented primary habitat.

The Created Wetlands AA encompassed 4.7 acres of constructed palustrine, emergent wetlands and included Cells 9, 13, 14, and a portion of Cell 7 and new wetlands along the lower slope. This AA was rated as a Category III wetland with 61 percent of the possible points and a total of 23.02 functional units. Recreational use was reflected in a moderate disturbance rating for the site in 2018. The AA

received a high rating for Montana Natural Heritage Program (MTNHP) species habitat because of the documented primary habitat of the plains spadefoot (an S3 sensitive species) observed in 2013. The AA was also given a high rating for recreation/education potential because access to the site is permitted to the public without permission. In 2018, the hydrophytic vegetation cover continues to increase in the AA, which resulted in a high rating for sediment/nutrient/toxicant removal. The rating for this AA has increased as preferred vegetation cover improves and portions of the site retains wetland hydrology.

3.7 PHOTOGRAPHIC DOCUMENTATION

Photographs taken at photo points 1–12 (PP1–PP12), transect endpoints, and wetland determination data points are provided in Appendix C.

3.8 MAINTENANCE NEEDS

No man-made water-control structures were installed within the Kindsfater site. The perimeter fence that was installed around the site was in good condition at the time of the 2018 investigation. Two bluebird boxes were installed on the site (Figure A-2, Appendix A). The two trees to which the bird boxes had been mounted had fallen over before the 2018 survey, which rendered the boxes unusable. This site appears to be used by a high number of people for a variety of recreational activities.

As noted in the vegetation section of this report, 24 infestations of state-listed Priority 2B noxious weeds were mapped at the Kindsfater site (Figure A-3, Appendix A). Eight infestations of Canada thistle, six infestations of leafy spurge, six infestations of field bindweed, three infestations of gypsy flower, and 1 infestation of spotted knapweed were identified with cover classes that ranged from low (1–5 percent), to high (26 to 36 percent cover). Most of the higher cover noxious weed infestations that were identified in Figure A-3 (Appendix A) occur along the south-facing slope above the lower terrace with field bindweed growing under waist tall grass. A large dense patch of Canada thistle, gypsy-flower, and field bindweed were mapped near the southern property boundary with waist tall grass. The central portion of the project site (near Cells, 4, 9, 10, and 11) was also mapped with low to moderate infestations of noxious weeds. Great mullein and poison hemlock plants (Yellowstone County noxious weeds) were also observed in a few areas across portions of community Type 6 – *Elymus trachycaulus/Bromus* spp., and Type 14 – *Elymus* spp./*Bromus* spp. Scotch thistle plants (also a Yellowstone County noxious weed) were observed along the southeastern side of wetland Cell 8 within community Type 3.

The overall extent of weed infestations observed in 2018 does not exceed the success criterion for weed populations at 5 percent site-wide. A weed contractor with MDT treated this site in 2012 before construction. MDT's weed contractor treated the site on July 4, 2018, and concentrated on areas of infestations by Canada thistle, leafy spurge, field bindweed, great mullein, and gypsy-flower. 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.

Table 3-7. Functions and Values of the Kindsfater Site From 2013 Through 2018

Function and Value Parameters From the 2008 MDT Montana Wetland Assessment Method	2013 AA 1 (Existing Wetlands)	2014 AA 1 (Existing Wetlands)	2015 AA 1 (Existing Wetlands)	2016 AA 1 (Existing Wetlands)	2017 AA 1 (Existing Wetlands)	2018 AA 1 (Existing Wetlands)	2013 AA 2 (Created Wetlands)	2014 AA 2 (Created Wetlands)	2015 AA 2 (Created Wetlands)	2016 AA 2 (Created Wetlands)	2017 AA 2 (Created Wetlands	2018 AA 2 (Created Wetlands)
Listed/Proposed Threatened and Endangered Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
Montana Natural Heritage Program (MTNHP) Species Habitat	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
General Wildlife Habitat	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.5)	Mod (0.5)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Short- and Long-Term Surface-Water Storage	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	Mod (0.6)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.6)
Sediment/Nutrient/Toxicant Removal	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	Mod (0.5)	Mod (0.7)	High (1.0)	High (1.0)	High (1.0)	High (1.0)
Sediment/Shoreline Stabilization	N/'A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Production Export/Food Chain Support	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.8)	Mod (0.8)	Low (0.3)	Low (0.3)	Low (0.3)	Low (0.3)	Mod (0.4)	Low (0.5)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.3)	Low (0.3)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.3)	Low (0.3)
Recreation/Education Potential	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.20)
Actual Points/Possible Points	**4.7/8**	**4.7/8**	**4.7/8**	**4.9/8**	**5.2/8**	**5.2/8**	**3.7/8**	**3.6/8**	**3.9/8**	**4.1/8**	**4.3/8**	**4.9/8**
% of Possible Score Achieved	**59%**	**59%**	**59%**	**61%**	**65%**	**65%**	**46%**	**45%**	**49%**	**51%**	**54%**	**61%**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries (acres)	**33.7**	**33.1**	**33.1**	**32.4**	**31.2**	**27.7**	**1.8**	**1.8**	**1.8**	**2.0**	**2.2**	**4.7**
Functional Units (acreage × actual points)	**158.44**	**155.57**	**155.57**	**152.28**	**162.29**	**144.04**	**6.55**	**6.37**	**7.02**	**8.2**	**9.46**	**23.03**

Two Priority 3 regulated weed species (not Montana-listed noxious weeds)—cheatgrass and Russian olive—were identified across the site with increased cover classes observed since 2014. Regulated plants have the potential to cause significant negative impacts, and these plants may not be intentionally spread or sold other than as a contaminant in agricultural products. The Montana Department of Agriculture (July 2015) recommends research, education, and prevention to minimize the spread of regulated plant species.

3.9 CURRENT CREDIT SUMMARY

Table 3-8 summarizes the current estimated wetland credits based on the USACE-approved credit ratios [USACE, 2005] and the wetland delineation that was completed in June 2018. A total of 32.4 acres were delineated at the Kindsfater site in 2018, including 4.7 acres of creation, 6.1 acres of reestablishment, 1.0 acre of rehabilitation, 3.0 acres of enhancement, and 17.6 acres of wetland preservation. A total of 55 acres, including 22.6 acres of upland buffer, were used to calculate the mitigation credited acres. After applying the USACE-approved ratios to these values, a total of 21.4 acres of mitigation credits have been estimated in 2018, which is well below the targeted 32.7 acres that were anticipated at this site. As shown in Table 1-1, the credit summary has been revised to show the removal of 11.1 acres of planned creation wetland included in the Alternative Bid, which was not constructed and has been subtracted to reduce the anticipated mitigation credit acreage to 32.7. Although 2018 represents the sixth year of monitoring, attaining the full target value of 32.7 credit acres may prove difficult without an increase of groundwater or supplemental water into the mitigation area.

Table 3-9 provides a summary of the site conditions in relation to the established performance standards and success criteria. This site meets the established performance standards except for the success criteria that measures desirable hydrophytic herbaceous plant cover across all the wetlands and the woody plantings survival. All wetlands that were delineated within the Kindsfater site in 2018 met the three criteria outlined in the 1987 Wetland Manual and 2010 GP Regional Supplement. The percent cover by desirable hydrophytic vegetation varied across the wetland sites. Overall, most of the restored, enhanced, created, and preserved wetlands exhibited 80 percent cover by preferred hydrophytic vegetation; however, a few areas that are close to and approaching 80 percent hydrophytic vegetation cover remain. Created wetland areas exhibited less than 5 percent cover from noxious weeds, whereas the upland buffer areas exhibited close to 5 percent cover by noxious weed infestations MDT implements weed-control measures based on the results of field surveys to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site. Woody planting survival was estimated at 11 percent during the 2018 survey, which is well below the 50 percent threshold for success. However, the percentage of volunteer woody species in several areas was estimated at 45 percent with trends toward increasing volunteer woody species. Young aspen seedlings and eastern cottonwood seedlings and saplings were noted in and around the perimeter of wetland Cell 6 as well as narrow-leaf seedlings and saplings within wetland Cell 9. Comprehensive site monitoring has occurred for 6 years, which is the minimum number of monitoring years as determined by the USACE Montana Regulatory Office's review of annual monitoring reports for the site and attaining wetland success criteria.

Table 3-8. Wetland Mitigation Credits Estimated for the Kindsfater Site From 2013 Through 2018

Compensatory Mitigation Type	Mitigation Area Description	Wetland Type[a]	Anticipated Mitigation Surface Area (acres)	USACE Approved Mitigation Ratios	Anticipated Mitigation Credit (acres)	2013 Delineated Acres	2013 Mitigation Credit (acres)	2014 Delineated Acres	2014 Mitigation Credit (acres)	2015 Delineated Acres	2015 Mitigation Credit (acres)	2016 Delineated Acres[b]	2016 Mitigation Credit (acres)	2017 Delineated Acres[b]	2017 Mitigation Credit (acres)	2018 Delineated Acres[b]	2018 Mitigation Credit (acres)
Creation (Establishment)	Wetland Cells 7, 9, 13, & 14	Lacustrine emergent	4.6	1:1	4.6	1.8	1.8	1.8	1.8	1.8	1.8	2.0	2.0	2.2	2.2	4.7	4.7
Restoration (Reestablishment)	Wetland Cells 1–6 and partial Cell 18	Lacustrine emergent and Palustrine emergent, scrub-shrub	14.0	1:1	14.0	7.9	7.9	7.9	7.9	7.9	7.9	7.8	7.8	6.8	6.8	6.1	6.1
Restoration (Rehabilitation)	Areas adjacent to Wetland Cells 1–12	Palustrine emergent, scrub-shrub	9.2	1.5:1	6.1	0.9	0.6	0.9	0.6	0.9	0.6	0.9	0.6	1.0	0.7	1.0	0.7
Enhancement	Wetland Cells 10–12 & Partial Cell 8	Palustrine emergent, scrub-shrub	3.1	3:1	1.0	3.0	1.0	3.0	1.0	3.0	1.0	3.4	1.1	3.0	1.0	3.0	1.0
Preservation	Existing Wetland Areas	Palustrine emergent, scrub-shrub	21.9	4:1	5.5	21.9	5.5	21.3	5.3	21.3	5.3	20.3	5.1	20.5	5.1	17.6	4.4
Upland Buffer	50-foot-wide upland perimeter	N/A	7.3	5:1	1.5	22.9	1.46[c]	22.8	4.56[d]	22.9	4.6[d]	22.6	4.5	22.6	4.5	22.6	4.5
Total			**60.1**		**32.7**	**58.4**	**21.3**	**57.7**	**39.2**	**57.8**	**39.2**	**57.0**	**21.1**	**56.1**	**20.3**	**55.0**	**21.4**

(a) Cowardin et al., 1979.
(b) The 2016–2018 credit areas are derived were from a .dgn file (5034000ENDETZ01.DGN) provided by MDT. A shapefile of the credit areas (MDT_Crediting_polys.shp) was created in Autodesk Civil 3D, exported, laid over the 2018 delineated wetland boundaries in ArcMap, and used to calculate acreages.
(c) Estimated credit acres for upland buffer included the 1.46 acres anticipated in USACE-approved mitigation plan.
(d) Value calculated using GIS.

Table 3-9. Summary of Performance Standards and Success Criteria Compared to Existing Site Conditions (Page 1 of 2)

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	Meet the three parameter criteria for hydrology, vegetation, and soils as outline din 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 the growing season.
Hydric Soil	Hydric soil conditions present or appear to be forming.	Y	The recently constructed wetland complex exhibits weak hydric soil development, including faint redoximorphic concentrations observed within several of the excavated depressions. 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 when wetlands delineated as hydrophytic utilizing technical guidelines.	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	Although several noxious weed infestations have been mapped across this site, these infestations are generally located outside of excavated wetlands. Overall, the estimated noxious weed cover within delineated wetlands is less than 5 percent.
	Hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 80 percent in created wetland areas within 5 years following site construction.	N	The majority of created wetlands exhibited 80 percent hydrophytic vegetation cover during the 2018 monitoring event. However, there are a few cells with improved or increased vegetation cover by hydrophytic vegetation but still do not meet 80 percent cover, this is anticipated to improve in subsequent monitoring years.
Woody Plants	Plantings will be considered successful where they exceed 50 percent survival after 5 years.	N	Approximately 11 percent of the woody plantings observed were alive in 2018, which does not meet the 50 percent survival criteria. However, several wetland cells exhibit at least 45 percent cover by volunteer woody species which are expected to continue expanding across the site. This cover values of volunteer woody species has been included in the success criteria determination for this performance criteria, almost meeting the 50 percent.
Herbaceous Plants	At the conclusion of the monitoring period, ocular coverage of desirable hydrophytic vegetation will be at least 80 percent.	N	There are still areas around two wetland cells where cover by desirable hydrophytic vegetation is less than 80 percent due to rocky soils or drier south facing slopes. Some of these bank slopes were intentionally left as gravel or rock to allow for shorebird (e.g., killdeer and sandpipers) nesting habitat. These areas have showed increased overall vegetation cover but may not meet this criteria in subsequent monitoring years.
Open Water Areas	Open water that is established within the designated wetland cells will be considered successful and creditable.	Y	Seasonal open water was present within 2 of the 3 wetland enhancement cells (Cell 8 and Cell 12). Wetland Cell 10 lacked open water in 2018. Overall water depths ranged from 2 to 5 inches deep. These areas were generally vegetated with various herbaceous and woody hydrophytic species.

Table 3-9. Summary of Performance Standards and Success Criteria Compared to Existing Site Conditions (Page 2 of 2)

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Upland Buffer	Success will be achieved when noxious weeds do not exceed 5 percent cover within the buffer areas on site.	Y	Noxious weed infestations, including field bindweed, leafy spurge, gypsy-flower, spotted knapweed and Canada thistle have been mapped within the site but do not exceed 5 percent. MDT will continue to implement weed control measures to maintain this criteria.
	Any area disturbed within creditable buffer zones must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.	Y	Upland buffers surround wetland areas within the site exhibited greater than 50 percent aerial cover of non-weed species.
Weed Control	Success will be achieved where < 5 percent absolute cover of noxious weed species occurs across the site.	Y	The estimated coverage of noxious weeds within the constructed wetlands is below 5 percent, state-listed noxious weed species across the entire site has been estimated at less than 5 percent absolute cover in 2018.
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.
Monitoring	Monitor the site for a minimum period of five years or longer as determined by the US Army Corps.	Y	Comprehensive site monitoring has been on-going for 6 years.

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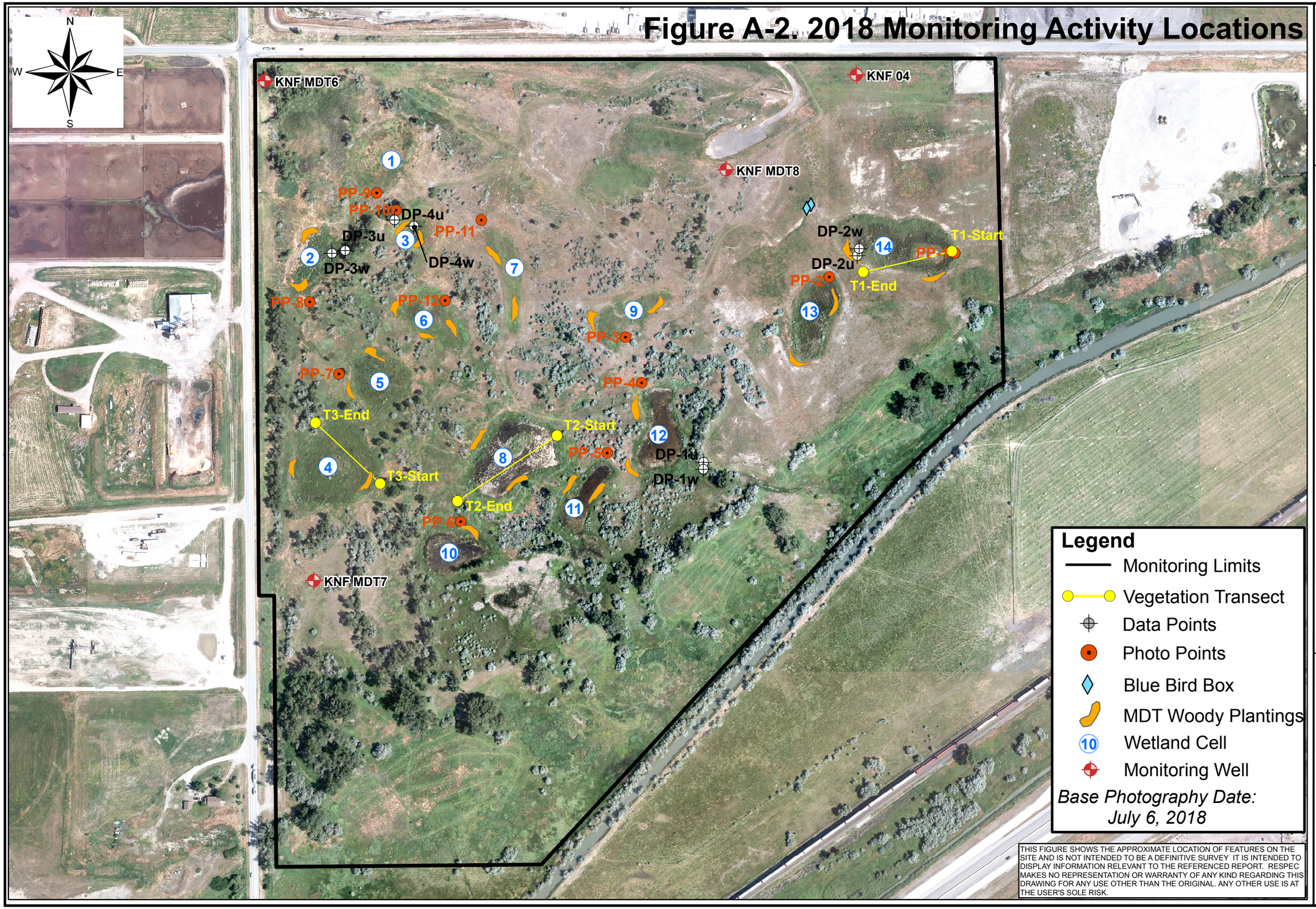
APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

Figure A-2. 2018 Monitoring Activity Locations



Legend

- Monitoring Limits
- Vegetation Transect
- Data Points
- Photo Points
- Blue Bird Box
- MDT Woody Plantings
- Wetland Cell
- Monitoring Well

Base Photography Date: July 6, 2018

THIS FIGURE SHOWS THE APPROXIMATE LOCATION OF FEATURES ON THE SITE AND IS NOT INTENDED TO BE A DEFINITIVE SURVEY IT IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. RESPEC MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

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

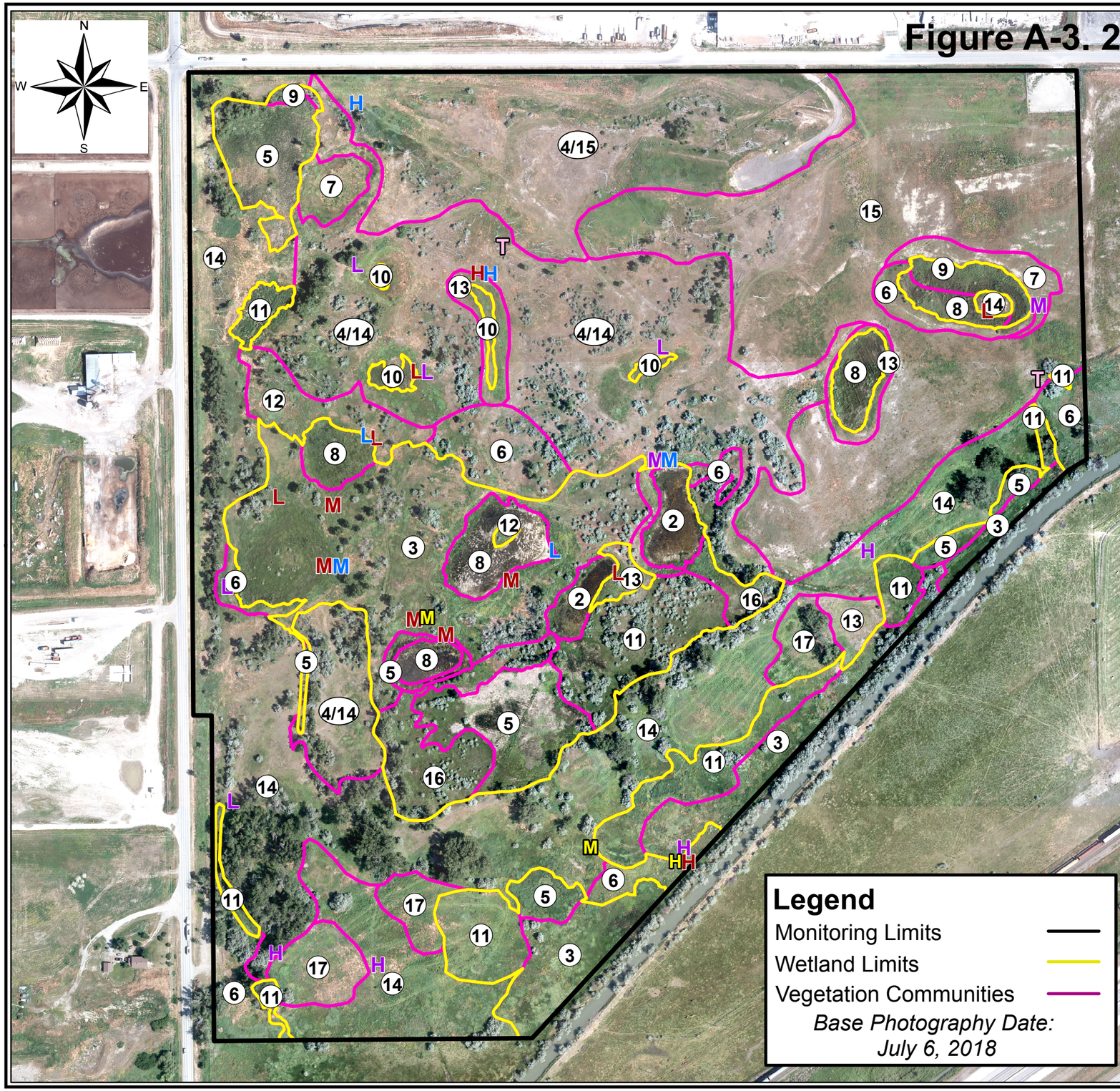
Kindsfater Wetland Mitigation Site
2018 Monitoring Activity Locations

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Kindsfater Wetland\GPS Data\Mains\Monitor2018.mxd

Figure A-3. 2018 Mapped Site Features



Noxious Weeds
- Convolvulus arvensis
- Euphorbia esula
- Cirsium arvense
- Cynoglossum officinale
- Centaurea maculosa

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

Project Area	115.7 acres
Total Wetlands	32.4 acres
Preserved Wetlands	17.6 acres
Enhanced Wetlands	3.0 acres
Re-established Wetlands	6.1 acres
Rehabilited Wetlands	1.0 acres
Created Wetlands	4.7 acres
Upland	83.3 acres

Vegetation Community Types

2. Eleocharis palustris/Bromus spp.
3. Alopecurus arundinaceus/Poa palustris
4. Elaeagnus angustifolia
5. Typha latifolia
6. Elymus trachycaulus/Bromus spp.
7. Bromus tectorum/Agropyron cristatum
8. Populus deltoides
9. Salix exigua
10. Poa palustris
11. Phalaris arundinacea
12. Alopecurus arundinaceus/Poa pratensis
13. Elymus trachycaulus/Elymus repens
14. Elymus spp./Bromus spp.
15. Bromus spp./Nassella viridula
16. Juncus spp.
17. Bromus spp./Poa pratensis

Legend

- Monitoring Limits
- Wetland Limits
- Vegetation Communities

Base Photography Date: July 6, 2018

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

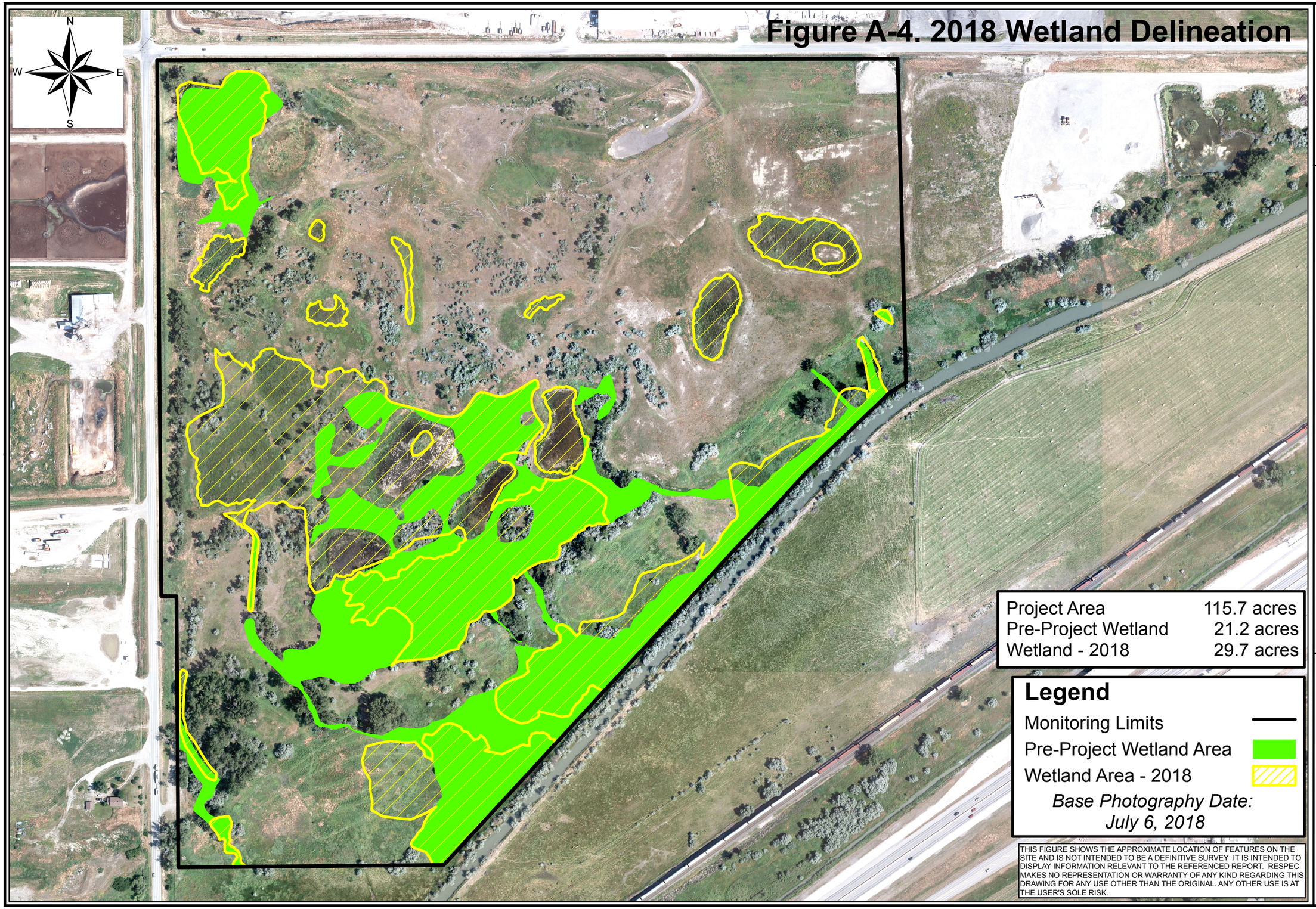
Kindsfater Wetland Mitigation Site
2018 Mapped Site Features

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Kindsfater Wetland\GPS Data\Mains\Veg2018.mxd

Figure A-4. 2018 Wetland Delineation



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

Kindsfater Wetland Mitigation Site
2018 Wetland Delineation

0 125 250 500 750 1,000 1,250 Feet

Project: STPX-0056(56)
Location: Yellowstone Co., Montana
Date: December 2018
Project Manager: M. Traxler
Drawn By: J. Rosenbaum

File: Z:\RESPEC\02895 MDT Monitoring 2016 - 2018\Kindsfater Wetland\GPS Data\Mains\Delin2018.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

RESPEC/MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: **Kindsfater** Project Number: _____
Assessment Date: **June 25, 2018** Person(s) conducting the assessment: **C. Hoschouer, L. Bacon and C. Seibert**
Location: **Laurel, MT** MDT District: **Billings** Milepost: **NA**
Legal Description: T **2S** R **25E** Section **6**
Weather Conditions: **Warm, sunny, 78F** Time of Day: **8 am**
Initial Evaluation Date: **August 22, 2013** Monitoring Year: **4** # Visits in Year: **1**
Size of evaluation area: **115.69 acres** Land use surrounding wetland: **Commercial and agriculture**

HYDROLOGY

Surface Water Source: **Groundwater**
Inundation: **Present** Average Depth: **3** Range of Depths: **2-5 inches**
Percent of assessment area under inundation: **10%**
Depth at emergent vegetation-open water boundary: **0.20 feet**
If assessment area is not inundated then are the soils saturated within 12 inches of surface: **Yes**
Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc.):
Saturation visible on aerial imagery, shallow ponded water in several of the wetland cells and signs of ponded water also noted in several wetland cells - water marks, geomorphic position and drainage patterns.

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

Well Number	Depth	Well Number	Depth	Well Number	Depth

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

COMMENTS / PROBLEMS:
There are several wells within this site that are monitored by the USGS and are included on Figure A-2.

VEGETATION COMMUNITIES

Community Number: **2** Community Title (main spp): **Eleocharis palustris/Bromus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Eleocharis palustris	3=11-20%	Elymus trachycaulus	1 = 1-5%
Juncus balticus	2 = 6-10%	Phalaris arundinacea	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%	Populus deltoides	2 = 6-10%
Bromus arvensis	2 = 6-10%	Typha latifolia	1 = 1-5%
Salix exigua	2 = 6-10%	Scirpus microcarpus	1 = 1-5%
Epilobium ciliatum	1 = 1-5%	Rock/Water	4 = 21-50%

Comments / Problems: **Many other species were recorded representing 1 percent or less. In 2018 continued expansion of Salix and Populus within this community, seasonal ponded water was also noted in two of the depressional wetlands with a dominance of Eleocharis palustris.**

Community Number: **3** Community Title (main spp): **Alopecurus arundinaceus/Poa palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	4 = 21-50%	Pascopyrum smithii	1 = 1-5%
Poa palustris	3 = 11-20%	Carex nebrascensis	1 = 1-5%
Poa pratensis	3 = 11-20%	Populus deltoides	2 = 6-10%
Elymus repens	2 = 6-10%	Sonchus arvensis	1 = 1-5%
Bromus tectorum	2 = 6-10%	Typha latifolia	+ = < 1%
Elymus trachycaulus	2 = 6-10%	Mentha arvensis	+ = < 1%

Comments / Problems: **Existing slightly drier wetland community. Many other species were recorded representing 1 percent of less. Noted young Populus deltoides seedlings along the western boundary and an increase in Poa pratensis along the stream/ditch channel to the south. Juncus spp. (CT 16) and Phalaris arundinacea (CT 11) are replacing some areas previously mapped as CT 3.**

Community Number: **4** Community Title (main spp): **Elaeagnus angustifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Elaeagnus angustifolia	5 = > 50%	Elymus repens	1 = 1-5%
Populus deltoides	2 = 6-10%		
Populus angustifolia	1 = 1-5%		
Elaeagnus commutata	1 = 1-5%		
Elymus trachycaulus	1 = 1-5%		
Bromus tectorum	1 = 1-5%		

Comments / Problems: **Scrub-shrub and forested community interspersed throughout upland community Types 14 and 15.**

Community Number: **5** Community Title (main spp): **Typha latifolia**

Dominant Species	% Cover	Dominant Species	% Cover
Typha latifolia	5 = > 50%	Juncus balticus	1 = 1-5%
Schoenoplectus acutus	2 = 6-10%	Persicaria amphibia	1 = 1-5%
Eleocharis palustris	1 = 1-5%	Schoenoplectus pungens	1 = 1-5%
Marrubium vulgare	1 = 1-5%		
Solanum dulcamara	1 = 1-5%		
Polypogon monspeliensis	1 = 1-5%		

Comments / Problems: **Pre-construction existing wetland community but expanded in 2018.**

VEGETATION COMMUNITIES (continued)

Community Number: **6** Community Title (main spp): **Elymus trachycaulus/Bromus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus trachycaulus	3 = 11-20%	Convolvulus arvensis	1 = 1-5%
Bromus tectorum	3 = 11-20%	Cynoglossum officinale	1 = 1-5%
Poa pratensis	2 = 6-10%	Nassella viridula	1 = 1-5%
Elymus repens	2 = 6-10%	Cirsium arvense	1 = 1-5%
Bromus inermis	2 = 6-10%	Poa compressa	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%	Melilotus officinalis	+ = < 1%

Comments / Problems: **Community generally located along the drier slope between the upper and lower terraces and along the western project boundary. In 2018 noticed a reduction in E. trachycaulus and an increase in E. repens and Bromus inermis (new CT 14) as well as Poa pratensis (CT 17).**

Community Number: **7** Community Title (main spp): **Bromus tectorum/Agropyron cristatum**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	4 = 21-50%	Melilotus officinalis	1 = 1-5%
Agropyron cristatum	2 = 6-10%	Verbena bracteata	1 = 1-5%
Nassella viridula	2 = 6-10%	Bromus japonicus	1 = 1-5%
Artemisia frigida	2 = 6-10%	Convolvulus arvense	+ = < 1%
Medicago sativa	1 = 1-5%	Opuntia polyacantha	+ = < 1%
Marrubium vulgare	1 = 1-5%	Bare ground	2 = 6-10%

Comments / Problems: **Drier upland community type primarily in the southeastern portion of the project area. In 2018, noted a decrease in the cover by Agropyron cristatum.**

Community Number: **8** Community Title (main spp): **Populus deltoides**

Dominant Species	% Cover	Dominant Species	% Cover
Populus deltoides	4 = 21-50%	Juncus balticus	1 = 1-5%
Salix exigua	3 = 11-20%	Juncus gerardii	1 = 1-5%
Poa palustris	2 = 6-10%	Salix lutea	1 = 1-5%
Eleocharis palustris	2 = 6-10%	Carex praegracilis	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%	Elymus trachycaulus	1 = 1-5%
Polypogon monspeliensis	1 = 1-5%	Bare ground/Rock	2 = 6-10%

Comments / Problems: **Natural encroachment of young Populus deltoides seedlings and saplings were the dominant species across several of the depressional wetlands.**

Community Number: **9** Community Title (main spp): **Salix exigua**

Dominant Species	% Cover	Dominant Species	% Cover
Salix exigua	4 = 21-50%	Salix lutea	1 = 1-5%
Populus deltoides	2 = 6-10%	Eleocharis palustris	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%	Typha latifolia	1 = 1-5%
Juncus balticus	2 = 6-10%	Scirpus microcarpus	1 = 1-5%
Poa palustris	2 = 6-10%	Epilobium ciliatum	1 = 1-5%
Schoenoplectus acutus	2 = 6-10%	Elymus trachycaulus	1 = 1-5%

Comments / Problems: **New community type in 2016 and in 2018 has continued to develop within portions of the depressional wetlands.**

VEGETATION COMMUNITIES (continued)

Community Number: **10** Community Title (main spp): **Poa palustris**

Dominant Species	% Cover	Dominant Species	% Cover
Poa palustris	4 = 21-50%	Eleocharis palustris	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Carex nebrascensis	1 = 1-5%
Bromus arvensis	2 = 6-10%	Cirsium arvense	+ = < 1%
Alopecurus arundinaceus	2 = 6-10%	Lactuca serriola	+ = < 1%
Poa pratensis	2 = 6-10%	Polypogon monspeliensis	+ = < 1%
Salix exigua	1 = 1-5%	Phalaris arundinacea	+ = < 1%

Comments / Problems: **Several of the restored wetland cells have converted from Community Type 2 (Eleocharis palustris/Bromus spp.) to a dominance of Poa palustris.**

Community Number: **11** Community Title (main spp): **Phalaris arundinacea**

Dominant Species	% Cover	Dominant Species	% Cover
Phalaris arundinacea	5 = > 50%		
Alopecurus arundinaceus	2 = 6-10%		
Elymus repens	1 = 1-5%		

Comments / Problems: **Noted an increase in this community type in 2018, especially along the lower bench.**

Community Number: **12** Community Title (main spp): **Alopecurus arundinaceus/Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Alopecurus arundinaceus	4 = 21-50%	Elaeagnus angustifolia	2 = 6-10%
Poa pratensis	3 = 11-20%	Agropyron cristatum	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Cirsium arvense	+ = < 1%
Elymus repens	2 = 6-10%		
Bromus tectorum	2 = 6-10%		
Populus deltoides	2 = 6-10%		

Comments / Problems: **A new community type in 2017 primarily along the western project boundary previously Community Type 4/7.**

Community Number: **13** Community Title (main spp): **Elymus trachycaulus/Elymus repens**

Dominant Species	% Cover	Dominant Species	% Cover
Elymus trachycaulus	4 = 21-50%	Poa pratensis	1 = 1-5%
Elymus repens	3 = 11-20%	Salix exigua	1 = 1-5%
Bromus arvensis	2 = 6-10%	Populus deltoides	1 = 1-5%
Bromus tectorum	1 = 1-5%		
Medicago lupulina	1 = 1-5%		
Poa palustris	1 = 1-5%		

Comments / Problems: **A new community type in 2017 along the outer perimeters of depression wetlands, previously Community Type 4/7.**

VEGETATION COMMUNITIES (continued)

Community Number: **14** Community Title (main spp): **Elymus spp./Bromus spp**.

Dominant Species	% Cover	Dominant Species	% Cover
Elymus repens	4 = 21-50%	Elymus lanceolatus	1 = 1-5%
Elymus trachycaulus	2 = 6-10%	Agropyron cristatum	1 = 1-5%
Bromus inermis	2 = 6-10%	Convolvulus arvensis	1 = 1-5%
Bromus tectorum	3 = 11-20%	Artemisia frigida	1 = 1-5%
Bromus japonicus	1 = 1-5%	Nassella viridula	1 = 1-5%
Melilotus officinalis	1 = 1-5%	Pascopyrum smithii	1 = 1-5%

Comments / Problems: **A new community type in 2018 along the southeastern boundary (lower terrace), and across the western and central portion of the project area, previously CT 6 or CT 7.**

Community Number: **15** Community Title (main spp): **Bromus spp./Nassella viridula**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus tectorum	4 = 21-50%	Verbena bracteata	1 = 1-5%
Bromus inermis	2 = 6-10%	Bromus japonicus	1 = 1-5%
Nassella viridula	3 = 11-20%	Convolvulus arvense	+ = < 1%
Agropyron cristatum	2 = 6-10%	Opuntia polyacantha	+ = < 1%
Medicago sativa	2 = 6-10%	Marrubium vulgare	1 = 1-5%
Artemisia dracunculus	2 = 6-10%	Bare ground	2 = 6-10%

Comments / Problems: **A new community type in 2018 noting the increase in Nassella viridula and the reduction of Agropyron cristatum (CT 7).**

Community Number: **16** Community Title (main spp): **Juncus spp.**

Dominant Species	% Cover	Dominant Species	% Cover
Juncus balticus	4 = 21-50%	Typha latifolia	1 = 1-5%
Juncus torreyi	1 = 1-5%	Polypogon monspeliensis	1 = 1-5%
Juncus gerardii	+ = < 1%	Schoenoplectus pungens	1 = 1-5%
Carex nebrascensis	2 = 6-10%	Alopecurus arundinaceus	1 = 1-5%
Solidago canadensis	2 = 6-10%	Epilobium ciliatum	+ = < 1%
Populus deltoides	2 = 6-10%	Mentha arvensis	+ = < 1%

Comments / Problems: **A new community type noted in 2018 where Juncus is replacing small areas of declining Community Type 5 or Community Type 2.**

Community Number: **17** Community Title (main spp): **Bromus spp./Poa pratensis**

Dominant Species	% Cover	Dominant Species	% Cover
Bromus inermis	3 = 11-20%	Alopecurus arundinaceus	1 = 1-5%
Bromus tectorum	3 = 11-20%	Lactuca serriola	1 = 1-5%
Poa pratensis	3 = 11-20%	Elymus trachycaulus	1 = 1-5%
Elymus repens	2 = 6-10%	Cirsium arvense	1 = 1-5%
Pascopyrum smithii	1 = 1-5%	Convolvulus arvense	1 = 1-5%
Bromus arvensis	1 = 1-5%	Bare ground	1 = 1-5%

Comments / Problems: **A new small community type in 2018 along portions of the the lower slope and terrace in the southern portion of the project, formerly Community Type 6.**

Additional Activities Checklist:

☒ Record and map vegetative communities on aerial photograph.

PLANTED WOODY VEGETATION SURVIVAL

Plant Species	Number Originally Planted	Number Observed	Mortality Causes
Cornus alba	130	0	
Crataegus douglasii	50	0	
Juniperus scopulorum	50	2	
Populus spp.	140	42	
Prunus virginiana	50	6	
Rosa woodsii	50	2	
Salix spp.	2800	303	Salix exigua best survival
Shepherdia argentea	50	0	
	3320	355	

Comments / Problems: **Approximately 27 woody planting areas were mapped by MDT in 2013, generally located around the excavated basins. Locations for the planted vegetation are shown on Figure A-2. During the 2018 monitoring, each individual planting group was monitored and live woody plants were counted by species. Approximately 11 percent of the woody plants were alive in 2018, this is a slight increase from 2016 and 2017 likely due to Salix exigua root sprouts or plant regrowth from the base. Mortality has likely been due to lack of hydrology.**

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 25, 2018** Examiner: **C. Hoschouer, C. Seibert, L. Bacon**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **240°** Note: _____

Transect Interval Length: **10 ft (station 0 to 10)**	
Vegetation Community Type: Bromus tectorum/Agropyron cristatum	
Plant Species	**Cover**
Bromus tectorum	4 = 21-50%
Agropyron cristatum	2 = 6-10%
Bromus inermis	2 = 6-10%
Taraxacum officinale	1 = 1-5%
Nassella viridula	1 = 1-5%
Fumaria vaillantii	1 = 1-5%
Medicago lupulina, Melilotus officinale	1 = 1-5%
Tragopogon dubius, Lactuca serriola	1 = 1-5%
Erodium cicutarium	1 = 1-5%
Convolvulus arvensis	2 = 6-10%
Bare ground, litter	3 = 11-20%
Total Vegetative Cover:	80%

Transect Interval Length: **53 ft (station 10 to 63)**	
Vegetation Community Type: Salix exigua	
Plant Species	**Cover**
Salix exigua	4 = 21-50%
Schoenoplectus acutus	2 = 6-10%
Eleocharis palustris	1 = 1-5%
Populus deltoides	3 = 11-20%
Juncus balticus	2 = 6-10%
Poa palustris	1 = 1-5%
Juncus gerardii	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%
Salix spp., Salix lutea	1 = 1-5%
Bromus inermis	1 = 1-5%
Bare ground	1 = 1-5%
Total Vegetative Cover:	95%

Transect Interval Length: **82 ft (station 63 to 145)**	
Vegetation Community Type: Elymus spp./Bromus spp.	
Plant Species	**Cover**
Bromus tectorum	3 = 11-20%
Elymus trachycaulus	3 = 11-20%
Elymus repens	2 = 6-10%
Melilotus officinalis	1 = 1-5%
Medicago lupulina	1 = 1-5%
Bromus inermis	2 = 6-10%
Artemisia frigida	1 = 1-5%
Fumaria vaillantii, Convolvulus arvensis	1 = 1-5%
Nassella viridula	1 = 1-5%
Cirsium arvense, Sporobolus cryptandrus	1 = 1-5%
Helianthus annuus, Centaurium exaltatum, Bromus japonicus, Lactuca serriola, Marrubium vulgare	1 = 1-5%
Bare ground, litter	3 = 11-20%
Total Vegetative Cover:	80%

Transect Interval Length: **95 ft (station 145 to 240)**	
Vegetation Community Type: Populus deltoides	
Plant Species	**Cover**
Populus deltoides	4 = 21-50%
Salix exigua	4 = 21-50%
Eleocharis palustris	1 = 1-5%
Poa palustris	1 = 1-5%
Juncus balticus	1 = 1-5%
Juncus gerardii	1 = 1-5%
Cirsium arvense	1 = 1-5%
Rosa woodsii	1 = 1-5%
Schoenoplectus pungens	1 = 1-5%
Elymus repens	1 = 1-5%
Elymus trachycaulus, Bromus inermis	1 = 1-5%
Bare ground/rock	1 = 1-5%
Total Vegetative Cover:	95%

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 25, 2018** Examiner: **C. Hoschouer, C. Seibert, L. Bacon**
Transect Number: **1** Approximate Transect Length: **300 feet** Compass Direction from Start: **240˚** Note: _____

Transect Interval Length: **60 ft (station 240 to 300)**	
Vegetation Community Type: Elymus trachycaulus/Bromus spp.	
Plant Species	**Cover**
Elymus trachycaulus	3 = 11-20%
Bromus tectorum	3 = 11-20%
Nassella viridula	3 = 11-20%
Bromus inermis	2 = 6-10%
Poa pratensis, Poa compressa	1 = 1-5%
Salix exigua	1 = 1-5%
Lactuca serriola, Erodium cicutarium	1 = 1-5%
Convolvulus arvensis, Cirsium arvense	1 = 1-5%
Melilotus officinalis	1 = 1-5%
Medicago lupulina, Tragopogon dubius	1 = 1-5%
Bare ground, litter	3 = 11-20%
Total Vegetative Cover:	80%

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

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 25, 2018** Examiner: **C. Hoschouer, C. Seibert, L. Bacon**
Transect Number: **2** Approximate Transect Length: **388 feet** Compass Direction from Start: **255**° Note: _____

Transect Interval Length: **25 ft (station 0 to 25)**	
Vegetation Community Type: Alopecurus arundinaceus/Poa palustris	
Plant Species	**Cover**
Alopecurus arundinaceus	3 = 11-20%
Poa palustris	2 = 6-10%
Eleocharis palustris	1 = 1-5%
Populus deltoides	1 = 1-5%
Elaeagnus angustifolia	1 = 1-5%
Agrostis stolonifera	1 = 1-5%
Elymus repens	1 = 1-5%
Bromus inermis	1 = 1-5%
Carex pellita, Salix spp.	1 = 1-5%
Schoenoplectus pungens	2 = 6-10%
Open water	3 = 11-20%
Total Vegetative Cover:	85%

Transect Interval Length: **315 ft (station 25 to 340)**	
Vegetation Community Type: Populus deltoides	
Plant Species	**Cover**
Populus deltoides	3 = 11-20%
Schoenoplectus pungens	3 = 11-20%
Juncus balticus	1 = 1-5%
Eleocharis palustris	2 = 6-10%
Phalaris arundinacea	1 = 1-5%
Salix exigua, Salix spp.	1 = 1-5%
Carex pellita	1 = 1-5%
Alopecurus arundinaceus	1 = 1-5%
Schoenoplectus acutus, Populus angustifolia	1 = 1-5%
Juncus gerardii	1 = 1-5%
Open water	4 = 21-50%
Total Vegetative Cover:	65%

Transect Interval Length: **48 ft (station 340 to 388)**	
Vegetation Community Type: Alopercurus arundinaceus/Poa palustris	
Plant Species	**Cover**
Alopecurus arundinaceus	4 = 21-50%
Poa palustris	3 = 11-20%
Poa pratensis	2 = 6-10%
Conium maculatum	1 = 1-5%
Hordeum jubatum	1 = 1-5%
Cirsium arvense	1 = 1-5%
Sonchus arvensis, Lactuca serriola	1 = 1-5%
Typha latifolia, Carex nebrascensis	1 = 1-5%
Elymus trachycaulus	1 = 1-5%
Juncus balticus	1 = 1-5%
Cynoglossum officinale	+ = < 1%
Bare ground, open water, litter	3 = 11-20%
Total Vegetative Cover:	85%

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: **Kindsfater** Date: **June 25, 2018** Examiner: **C. Hoschouer, C. Seibert, L. Bacon**
Transect Number: **3** Approximate Transect Length: **292 feet** Compass Direction from Start: **290°** Note: _____

Transect Interval Length: **268 ft (station 0 to 268)**	
Vegetation Community Type: Alopecurus arundinaceus/Poa palustris	
Plant Species	**Cover**
Alopecurus arundinaceus	5 = > 50%
Poa palustris	2 = 6-10%
Typha latifolia	1 = 1-5%
Carex utriculata, Carex nebrascensis	1 = 1-5%
Schoenoplectus acutus	1 = 1-5%
Phalaria arundinacea	1 = 1-5%
Sisymbrium loeselii, Cirsium arvense	1 = 1-5%
Populus deltoides, Elaeagnus commutata	1 = 1-5%
Juncus balticus	1 = 1-5%
Poa pratensis, Solidago canadensis	1 = 1-5%
Bare ground, litter	3 = 11-20%
Total Vegetative Cover:	85%

Transect Interval Length: **24 ft (station 268 to 292)**	
Vegetation Community Type: Elymus trachycaulus/Bromus spp.	
Plant Species	**Cover**
Elymus trachycaulus	3 = 11-20%
Bromus tectorum	3 = 11-20%
Schedonorus pratensis	2 = 6-10%
Alopecurus arundinaceus	1 = 1-5%
Bromus inermis	1 = 1-5%
Sisymbrium loeselii, Hordeum jubatum	1 = 1-5%
Poa pratensis	1 = 1-5%
Lactuca serriola	1 = 1-5%
Thlaspi arvense	1 = 1-5%
Convolvulus arvensis	1 = 1-5%
Bare ground, litter	3 = 11-20%
Total Vegetative Cover:	85%

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

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

MDT WETLAND MONITORING – VEGETATION TRANSECT

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

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

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

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

Comments: **A comprehensive species list for each transect interval length was recorded during the June 2018 monitoring. Typically, species with less than 1 percent were not included on the forms but were used to calculate total upland and wetland species for the summary tables.**

PHOTOGRAPHS

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

Photograph Checklist:

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

Location	Photograph Frame #	Photograph Description & Lat/Long	Compass Reading (°)
PP-1	1	Wetland cell 14 45.69342/-108.690247	280
PP-2	1	Wetland cell 13 45.695136/-108.691839	280
PP-3	1	Wetland cell 9 45.694612/-108.69443	0
PP-4	1	Wetland cell 12 45.694935/-108.691902	200
PP-5	1	Wetland cell 11 45.694748/-108.694458	10
PP-6	1	Wetland cell 10 45.694084/-108.694321	150
PP-7	1	Wetland cell 5 45.698065/-108.698065	90
PP-8	1	Wetland cell 2 45.694939/-108.698429	315
PP-9	1	Wetland cell 1 45.694302/-108.698044	90
PP-10	1	Wetland cell 3 45.694847/-108.698418	140
PP-11	1	Wetland cell 7 45.695892/-108.697601	350
PP-12	1	Wetland cell 6 45.694939/-108.696663	230
T-1-S	1	Transect 1 start 45.695357/-108.690285	240
T-1-E	1	Transect 1 end 45.695072/-108.691437	50
T-2-S	1	Transect 2 start 45.693763/-108.695288	225
T-2-E	1	Transect 2 end 45.693184/-208.696573	40
T-3-S	1	Transect 3 start 45.693317/-108.697517	290
T-3-E	1	Transect 3 end 45.693317/-108.698486	110
DP-1w DP-1u		45.413580/-108.413626 45.41363/-108.413678	
DP-2w DP-2u		45.414297/-108.412870 45.414276/-108.413014	
DP-3w DP-3u		45.414272/-108.415480 45.41432/-108.415440	
DP-4w DP-4u		45.414394/-108.414961 45.414436/-108.415050	

Comments / Problems: _____

GPS SURVEYING

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

GPS Checklist:

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

Comments / Problems: _____

WETLAND DELINEATION

(attach COE delineation forms)

At each site conduct these checklist items:

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

Comments / Problems: _____

FUNCTIONAL ASSESSMENT

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

Comments / Problems: _____

MAINTENANCE

Were man-made nesting structure installed at this site? **Yes**
If yes, do they need to be repaired? **Yes**
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? **NA**
If yes, are the structures working properly and in good working order? **NA**
If no, describe the problems below.

Comments / Problems: **Bird boxes need to be repaired**

WILDLIFE

Birds

Were man-made nesting structures installed? **Yes**
If yes, type of structure: **bird boxes** How many? **2**
Are the nesting structures being used? **No**
Do the nesting structures need repairs? **Yes**

Mammals and Herptiles

Mammal and Herptile Species	Number Observed	Indirect Indication of Use			
		Tracks	Scat	Burrows	Other
White-tailed Deer	3	☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	
		☐	☐	☐	

Additional Activities Checklist:
NA Macroinvertebrate Sampling (if required)

Comments / Problems: The trees with the two bird boxes have fallen over.

BIRD SURVEY – FIELD DATA SHEET

Site: **Kindsfater** Date: **6/25/18**
Survey Time: **8 am** to **6 pm**

Bird Species	#	Behavior	Habitat	Bird Species	#	Behavior	Habitat
American Goldfinch	3	FO	UP				
American Robin	5	F	UP				
Barn Swallow	3	FO	UP WM				
Cedar Waxwing	10	FO L	UP SS				
House Wren	2	BD	UP				
Hungarian Partridge	6	F	WM				
Killdeer	4	BD	UP				
Lark Sparrow	2	BD	UP				
Mallard	1	F	MA				
Mourning Dove	3	N L FO	SS UP FO				
Northern Catbird	2	BD	UP				
Red-winged Blackbird	20	L F	MA WM				
Ring-necked Pheasant	3	L	UP				
Tree Swallow	10	FO	UP WM				
Warbling Vireo	3	BD	UP				
Western Kingbird	4	FO	UP				
Western Wood-Peewee	1	BD	UP				
Yellow Warbler	3	F L	FO SS				

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

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

Weather: **Humid, late afternoon temperature in the low 90's degrees.**

Notes: **Mallard with chicks**

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Bench **Local relief (concave, convex, none):** convex **Slope:** 1.0% 0.6 °

Subregion (LRR): LRR F **Lat.:** 45.413631 **Long.:** -108.413678 **Datum:** WGS84

Soil Map Unit Name: Larim gravelly loam, 15 to 35 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 ◉

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:
Upland sample point locatedon the west side of Populus deltoides and Elaeagnus angustifolia in the southeastern portion of the project.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1. Elaeagnus angustifolia	30	☑	66.7%	FACU
2. Populus deltoides	15	☑	33.3%	FAC
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	45		= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0		= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)				
1. Bromus tectorum	20	☑	27.4%	UPL
2. Elymus trachycaulus	5	☐	6.8%	FACU
3. Elymus repens	15	☑	20.5%	FACU
4. Poa pratensis	30	☑	41.1%	FACU
5. Schedonorus pratensis	2	☐	2.7%	FACU
6. Juncus balticus	1	☐	1.4%	FACW
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	73		= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0		= Total Cover	

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

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

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of dominant Species That Are OBL, FACW, or FAC: 20.0% (A/B)

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	1	x 2 =	2	
FAC species	15	x 3 =	45	
FACU species	82	x 4 =	328	
UPL species	20	x 5 =	100	
Column Totals:	118	(A)	475	(B)

Prevalence Index = B/A = 4.025

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Upland vegetation includes a dominance of Bromus tectorum and Poa pratensis, only 20 percent hydrophytic vegetation and a prevalence index score of 4.025.

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

Soil

Sampling Point: DP-1U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-8	7.5YR	2/2	100					Silt Loam	25% cobble 2" or less
8-14	7.5YR	2/2	100					Silty Clay Loam	50% cobble 4" or less

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydric soil indicators were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Soils were dry throughout. No primary or secondary indicators were present.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Terrace **Local relief (concave, convex, none):** concave **Slope:** 0.5% 0.3 °

Subregion (LRR): LRR F **Lat.:** 45.413580 **Long.:** -108.413626 **Datum:** WGS84

Soil Map Unit Name: Larim gravelly loam, 15 to 35 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 ○

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:
Due to disturbed soils this area is classified as a wetland. Sample point is located on the west side of Populus deltoides corridor within a slight concave depression or old channel/ditch.

VEGETATION - Use scientific names of plants

FWS Region: -?-

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1. Populus deltoides	15	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
	15	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Juncus balticus	70	☑	70.0%	FACW
2. Carex nebrascensis	30	☑	30.0%	OBL
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	30	x 1 =	30
FACW species	70	x 2 =	140
FAC species	15	x 3 =	45
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	115 (A)		215 (B)

Prevalence Index = B/A = 1.87

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Hydrophytic vegetation indicators include a dominance of 100% and a prevalence index of 1.87.

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

Soil

Sampling Point: DP-1W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-4	10YR	2/2	100					Loam	
4-12	10YR	3/2	100					Sandy Silt Loam	30% 1-6" cobble
12+	rock								very rocky (streambed)

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

No hydric soil indicators observed. Mitigation site construction may have modified soil profile and if hydrology remains, hydric soils may develop in the future (Indicators for Problematic Hydric Soils- Recently Developed Wetland).

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):	4

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Signs of seasonal water in portions of this wetland. Drains to the south, southeast. One primary indicator and three secondary indicators present. Soils were saturated at 4".

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Slope **Local relief (concave, convex, none):** concave **Slope:** 1.0% 0.6 °

Subregion (LRR): LRR F **Lat.:** 45.414276 **Long.:** -108.413014 **Datum:** WGS84

Soil Map Unit Name: Wanetta clay loam, 0 to 1% 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:
This sample point is located 10 feet south of the wetland sample point on sloped bank.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1. Populus deltoides	5	☑	100.0%	FAC
2.		☐	0.0%	
3.		☐	0.0%	
4.		☐	0.0%	
5.	0	☐	0.0%	
	5	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Bromus tectorum	75	☑	78.1%	UPL
2. Melilotus officinalis	10	☐	10.4%	FACU
3. Bromus inermis	5	☐	5.2%	UPL
4. Tragopogon dubius	1	☐	1.0%	UPL
5. Stipa viridula	5	☐	5.2%	UPL
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	96	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0	
FACW species	0	x 2 =	0	
FAC species	5	x 3 =	15	
FACU species	10	x 4 =	40	
UPL species	86	x 5 =	430	
Column Totals:	101	(A)	485	(B)

Prevalence Index = B/A = 4.802

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:
This sample point is in an upland with a dominance of UPL and FACU vegetation.

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

Soil

Sampling Point: DP-2U

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydric soils were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Soils were dry throughout.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

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

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Excavated depression **Local relief (concave, convex, none):** concave **Slope:** 1.0% 0.6 °

Subregion (LRR): LRR F **Lat.:** 45.414297 **Long.:** -108.412870 **Datum:** WGS84

Soil Map Unit Name: Wanetta clay loam, 0 to 1% 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 ○

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:
Sample point is located within Cell 14.

VEGETATION - Use scientific names of plants

FWS Region: -?-

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1. Populus deltoides	80	☑	100.0%	FAC
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	80	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Schoenoplectus pungens	75	☑	75.0%	OBL
2. Poa palustris	20	☑	20.0%	FACW
3. Juncus balticus	5	☐	5.0%	FACW
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.		☐	0.0%	
7.		☐	0.0%	
8.		☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	75	x 1 =	75
FACW species	25	x 2 =	50
FAC species	80	x 3 =	240
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	180 (A)		365 (B)

Prevalence Index = B/A = 2.028

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

Plot has a dominance of hydrophytic vegetation.

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

Soil

Sampling Point: DP-2W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR	4/2	100					Clay Loam	2" cobbles
6-12	10YR	4/2	100					Clay Loam	4" cobbles

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Hydric soils were present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include the NRCS Field Indicators of Hydric Soils, Version 8.1, 2017. Hydrogen sulfide odor at 6".

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):	3
Saturation Present? (includes capillary fringe)	Yes ◉	No ○	Depth (inches):	0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soils were saturated to the surface and water in the soil pit at 3".

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-3U**

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

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

Subregion (LRR): LRR F **Lat.:** 45.414328 **Long.:** -108.415440 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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 ◉

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:
Upland sample point paired with wetland sample point DP-3W. Located between wetlands.

VEGETATION - Use scientific names of plants

FWS Region: -?-

	Absolute % Cover	Dominant Species? Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0	= Total Cover	
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0	= Total Cover	
Herb Stratum (Plot size: 5 Foot Radius)			
1. Elymus repens	100	☑ 100.0%	FACU
2.	0	☐ 0.0%	
3.	0	☐ 0.0%	
4.	0	☐ 0.0%	
5.	0	☐ 0.0%	
6.	0	☐ 0.0%	
7.	0	☐ 0.0%	
8.	0	☐ 0.0%	
9.	0	☐ 0.0%	
10.	0	☐ 0.0%	
	100	= Total Cover	
Woody Vine Stratum (Plot size: 30 Foot Radius)			
1.	0	☐	
2.	0	☐	
	0	= Total Cover	

% Bare Ground in Herb Stratum

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

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

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

A dominance of Elymus repens.

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

Soil

Sampling Point: DP-3U

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-14	10YR	3/2	100					Loam	gravelly, fibrous loam
14+	10YR	3/2	100						very rocky, 2" and less cobbles 10%

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydric soils were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Soils were dry throughout. No primary or seconday indicators noted.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** DP-3W

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Excavated depression **Local relief (concave, convex, none):** concave **Slope:** 1.0% 0.6 °

Subregion (LRR): LRR F **Lat.:** 45.414272 **Long.:** -108.415480 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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 ○

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:
Wetland data point along the perimeter of Cell 2, a Phalaris arundinacea dominated wetland.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Phalaris arundinacea	85	☑	100.0%	FACW
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	85	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 15

Dominance Test worksheet:

Number of Dominant Species That are OBL, FACW, or FAC: 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	0	x 1 =	0	
FACW species	85	x 2 =	170	
FAC species	0	x 3 =	0	
FACU species	0	x 4 =	0	
UPL species	0	x 5 =	0	
Column Totals:	85	(A)	170	(B)

Prevalence Index = B/A = 2

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

A dominance of hydrophytic vegetation, primarily Phalaris arundinacea. Some bare ground due to loss of annual weedy species.

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

Soil

Sampling Point: DP-3W

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
0-10	10YR	4/2	100					Silt Loam	10% gravels

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

No hydric soil indicators observed. Mitigation site construction may have modified soil profile and if hydrology remains, hydric soils may develop in the future (indicators for Problematic Hydric Soils- Recently Developed Wetland).

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): 2

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soils were saturated at 2 inches. One primary and two secondary indicators observed.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-4U**

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Slope **Local relief (concave, convex, none):** convex **Slope:** 2.0% 1.1 °

Subregion (LRR): LRR F **Lat.:** 45.414436 **Long.:** -108.415050 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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 ◉

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:
Paired with wetland sample point DP-4W. Loacted along the northwestern side of wetland cell 3.

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
5.	0	☐		
	0	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Elymus repens	40	☑	40.0%	FACU
2. Convolvulus arvensis	20	☑	20.0%	UPL
3. Bromus inermis	30	☑	30.0%	UPL
4. Lactuca serriola	10	☐	10.0%	FAC
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	10	x 3 =	30
FACU species	40	x 4 =	160
UPL species	50	x 5 =	250
Column Totals:	100 (A)		440 (B)

Prevalence Index = B/A = 4.4

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ○ No ◉

Remarks:

Elymus repens and Bromus inermis represent the majority of the cover across this data point.

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

Soil

Sampling Point: DP-4U

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	3/2	100					Loam	
3-8	10YR	3/3	100					Silt Loam	5% rocks
8-14	10YR	3/3	100					Silt Loam	high percent rocks

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ○ No ◉

Remarks:

Hydric soils were not present. This data form is revised from Great Plains Regional Supplement Version 2.0 to include NRCS Field Indicators of Hydric Soils, Version 8.1, 2017.

Hydrology

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ○ No ◉

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

Remarks:

Soils were dry to 14 inches. No primary or secondary indicators noted.

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Kindsfater **City/County:** Yellowstone **Sampling Date:** 25-Jun-18

Applicant/Owner: MDT **State:** MT **Sampling Point:** **DP-4W**

Investigator(s): Cindy Hoschouer, Lynn Bacon **Section, Township, Range:** S 6 T 2S R 25E

Landform (hillslope, terrace, etc.): Excavated depression **Local relief (concave, convex, none):** concave **Slope:** 1.0% 0.6 °

Subregion (LRR): LRR F **Lat.:** 45.414394 **Long.:** -108.414961 **Datum:** WGS84

Soil Map Unit Name: Bew silty clay loam, 0 to 1 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 ○

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:
Sampling within a constructed depressional wetland (Cell 3).

VEGETATION - Use scientific names of plants

FWS Region: GP

	Absolute % Cover	Dominant Species?	Rel.Strat. Cover	Indicator Status
Tree Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
3.	0	☐		
4.	0	☐		
	0	= Total Cover		
Sapling/Shrub Stratum (Plot size: 15 Foot Radius)				
1. Populus angustifolia	5	☑	100.0%	FACW
2.	0	☐	0.0%	
3.	0	☐	0.0%	
4.	0	☐	0.0%	
5.	0	☐	0.0%	
	5	= Total Cover		
Herb Stratum (Plot size: 5 Foot Radius)				
1. Poa palustris	50	☑	50.0%	FACW
2. Schoenoplectus acutus	5	☐	5.0%	OBL
3. Eleocharis palustris	30	☑	30.0%	OBL
4. Juncus balticus	15	☐	15.0%	FACW
5.	0	☐	0.0%	
6.	0	☐	0.0%	
7.	0	☐	0.0%	
8.	0	☐	0.0%	
9.	0	☐	0.0%	
10.	0	☐	0.0%	
	100	= Total Cover		
Woody Vine Stratum (Plot size: 30 Foot Radius)				
1.	0	☐		
2.	0	☐		
	0	= Total Cover		

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

	Total % Cover of:	Multiply by:	
OBL species	35	x 1 =	35
FACW species	70	x 2 =	140
FAC species	0	x 3 =	0
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals:	105 (A)		175 (B)

Prevalence Index = B/A = 1.667

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ◉ No ○

Remarks:

A slight decrease in Poa palustris from 2017 but also noticing an increase in other FACW and OBL species.

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

Soil

Sampling Point: DP-4W

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

Depth (inches)	Matrix Color (moist)		%	Redox Features Color (moist)		%	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR	4/2	100						Silty Clay Loam	
8-14	10YR	5/2	98	10YR	4/6	2	RM	M	Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ◉ No ○

Remarks:

Faint mottles at 8 inches, this area has a modified soil profile and hydric soils are developing.

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): 0

Wetland Hydrology Present? Yes ◉ No ○

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

Remarks:

Soils were saturated to the surface.

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Kindsfater **2. MDT Project #:** STPX-0056(56) **3. Control #:** 5034

3. Evaluation Date: 6/25/2018 **4. Evaluator(s):** C. Hoschouer, L. Bacon **5. Wetland/Site #(s):** Kindsfater - created wetland

6. Wetland Location(s): Township 2 S, Range 25 E, Section 6; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: _____

Watershed: 13 - Upper Yellowstone **County:** _ _ Yellowstone _____

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

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

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

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 4.7 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Depressional	Emergent Wetland	Excavated	Seasonal / Intermittent	50
Depressional	Scrub-Shrub Wetland	Excavated	Seasonal / Intermittent	45
Depressional	Aquatic Bed	Excavated	Seasonal / Intermittent	5

Comments: Created wetlands include both emergent, open water (aquatic bed) and developing scrub-shrub classes

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

12. GENERAL CONDITION OF AA

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

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	Moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** The wetland mitigation site was constructed in 2012/2013 and included substantial excavation, modification/rehabilitation to existing wetlands, and revegetation. Based on review of previous data and reports, the preserved wetland areas at higher elevations appear to be losing hydrology with excavated wetland cells retaining hydrology but also drying out. Site was re-evaluated in 2018 specifically for preserved wetlands and for existing wetland areas outside of excavated cells.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of excavated depressional wetland cells within a historic gravel pit/wetland site. Wetland mitigation construction was completed in 2013 and 2018 is the sixth monitoring year for the expanded wetland site. Land use surrounding the AA includes commerical developments, agriculture (grazing), transportation (railroad and interstate), and a shooting range within the 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 one is forested) classes	high	NA	NA	NA
2 (or 1 if forested) classes	---	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Palustrine emergent vegetation, aquatic bed and young palustrine scrub-shrub communities developing.

Wetland/Site #(s): Kindsfater - created wetland

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

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

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

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

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

Sources for documented use (e.g. observations, records): USFWS list for species in Yellowstone County; no habitat specifications/known occurrences

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

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

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

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

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in 2014-2018.

14C. GENERAL WILDLIFE HABITAT RATING

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

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

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

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

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

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

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

Comments: Wildlife rating is expected to increase in subsequent monitoring years.

Wetland/Site #(s): Kindsfater - created wetland

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

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

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

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

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

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

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

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

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

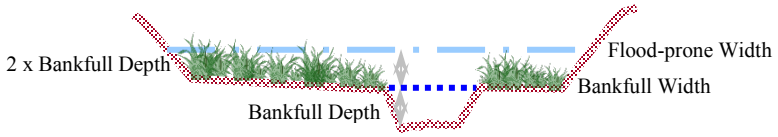
iii. Final Score and Rating: _ **Comments:** No fish habitat within mitigation site; no perennial water

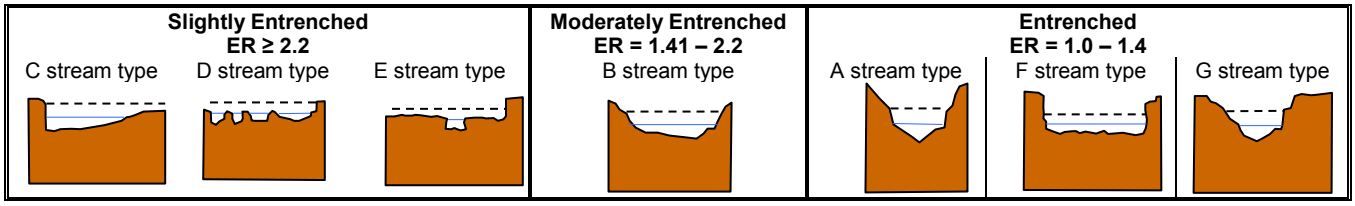
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





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

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

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** Flooding does not occur on the site as groundwater is the primary hyrdology sources; no flooding occurs from in channel or overbank flow.

Wetland/Site #(s): Kindsfater - created wetland

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

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

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

Estimated Maximum Acre Feet of Water Contained in Wetlands within the AA that are Subject to Periodic Flooding or Ponding	☐ **>5 acre feet**			☒ **1.1 to 5 acre feet**			☐ **≤1 acre foot**		
Duration of Surface Water at Wetlands within the AA	☐ **P/P**	☐ **S/I**	☐ **T/E**	☐ **P/P**	☒ **S/I**	☐ **T/E**	☐ **P/P**	☒ **S/I**	☐ **T/E**
Wetlands in AA flood or pond **≥ 5 out of 10 years**	---	---	---	---	.6M	---	---	---	---
Wetlands in AA flood or pond **< 5 out of 10 years**	---	---	---	---	---	---	---	---	---

Comments: Estimated that AA ponds greater than 5 out of 10 years with approximately 4.7 acres inundated to approximatley 0.5 feet.

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

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

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

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

Comments: Isolated depressional wetland cells do not have outlets. Percent cover of wetland vegetation increased to greater than 70%.

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

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

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

Comments: The AA does not occur on a stream bank or drainage. No wave action occurs in depression wetland areas when inundated.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

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

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

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

Wetland/Site #(s): Kindsfater - created wetland

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

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

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = 0.4 ☐ **NO**

iv. Final Score and Rating: .4M **Comments:** Adjacent upland buffer with greater than 30% plant cover.

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

i. Discharge Indicators
- ☐ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☒ Vegetation growing during dormant season/drought.
- ☐ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☐ Wetland contains an outlet, but no inlet.
- ☐ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

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

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

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

Comments: Vegetation observed to be growing following regional drought conditions; gravel substrate in created depressional wetland areas.

14K. UNIQUENESS

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

Replacement Potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland OR plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types AND structural diversity (#13) is high OR contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types OR associations AND structural diversity (#13) is low-moderate		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: _____

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

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

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

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

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Access is permitted without permission with the exception of the police shooting range.

15. GENERAL SITE NOTES: Anticipate higher wildlife ratings in subsequent monitoring years. Wetland acreage is slightly higher in 2018 due to transitioning hydrology and plant communities.

Wetland/Site #(s): Kindsfater - created wetland

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	0	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	4.23	*
C. General Wildlife Habitat	mod 0.70	1.00	3.29	*
D. General Fish Habitat	NA	NA	0	
E. Flood Attenuation	NA	NA	0	
F. Short and Long Term Surface Water Storage	mod 0.60	1.00	2.82	
G. Sediment / Nutrient / Toxicant Removal	high 1.00	1.00	4.70	*
H. Sediment / Shoreline Stabilization	NA	NA	0	
I. Production Export / Food Chain Support	mod 0.50	1.00	2.35	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	3.29	*
K. Uniqueness	low 0.30	1.00	1.41	
L. Recreation / Education Potential (bonus point)	high 0.20		0.94	
Total Points	**4.9**	**8**	**23.03 Total Functional Units**	
Percent of Possible Score 61% (round to nearest whole number)				

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

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

MDT MONTANA WETLAND ASSESSMENT FORM (revised March 2008)

1. Project Name: Kindsfater **2. MDT Project #:** STPX-0056(56) **3. Control #:** 5034

3. Evaluation Date: 6/25/2018 **4. Evaluator(s):** C. Hoschouer, L. Bacon **5. Wetland/Site #(s):** Kindsfater - existing wetland/preservation wetland

6. Wetland Location(s): Township 2 S, Range 25 E, Section 6; Township ___N, Range ___E, Section _____

Approximate Stationing or Roadposts: _____

Watershed: 13 - Upper Yellowstone **County:** _ _ Yellowstone _____

7. Evaluating Agency: RESPEC for MDT

Purpose of Evaluation:

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

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

9. Assessment Area (AA) Size (acre): _____ (visually estimated)
(see manual for determining AA) 27.7 (measured, e.g. GPS)

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

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% OF AA
Slope	Emergent Wetland	Partly Drained	Seasonal / Intermittent	80
Slope	Scrub-Shrub Wetland	Partly Drained	Seasonal / Intermittent	20

Comments: Preservation wetlands are primarily emergent with some scrub-shrub included.

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

12. GENERAL CONDITION OF AA

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

Conditions within AA	Predominant Conditions Adjacent to (within 500 feet of) AA		
	Managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings; and noxious weed or ANVS cover is ≤15%.	Land not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to minor clearing; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.
AA occurs and is managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings; and noxious weed or ANVS cover is ≤15%.	---	---	---
AA not cultivated, but may be moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings; noxious weed or ANVS cover is ≤30%.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density; or noxious weed or ANVS cover is >30%.	---	---	---

Comments (types of disturbance, intensity, season, etc.)**:** The wetland mitigation site was constructed in 2012 and 2013 which consisted of substantial excavation, modification/rehabilitation of existing wetlands, and revegetation. Existing wetlands (pre-construction) were preserved and rehabilitated. Preserved wetland areas at higher elevations appear to be losing hydrology and transitioning into upland communities with some excavated wetland cells retaining hydrology.

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

iii. Provide brief descriptive summary of AA and surrounding land use/habitat: The AA consists of pre-existing slope/depressional wetland areas located within a historic gravel pit/wetland site. Wetland mitigation constructed was completed in early spring 2013 and 2018 is the sixth monitoring year for the expanded wetland site. Land use surrounding the AA includes commercial developments, agriculture (grazing), transportation (railroad and interstate), and a shooting range within the 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 one is forested) classes	---	NA	NA	NA
2 (or 1 if forested) classes	mod	NA	NA	NA
1 class, but not a monoculture	---	←NO	YES→	---
1 class, monoculture (1 species comprises ≥90% of total cover)	---	NA	NA	NA

Comments: Emergent wetland community is dominant with areas of scrub-shrub wetland.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

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

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

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

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

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

Sources for documented use (e.g. observations, records): USFWS list for species in Yellowstone County

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

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

Primary or critical habitat (**list species**) ☒ D ☐ S Plains spadefoot (S3)
Secondary habitat (**list species**) ☐ D ☐ S _____
Incidental habitat (**list species**) ☐ D ☐ S _____
No usable habitat ☐ S

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

Highest Habitat Level	Doc/Primary	Sus/Primary	Doc/Secondary	Sus/Secondary	Doc/Incidental	Sus/Incidental	None
S1 Species Functional Point/Rating	---	---	---	---	---	---	---
S2 and S3 Species Functional Point/Rating	.9H	---	---	---	---	---	---

Sources for documented use (e.g. observations, records): Observed approximately 40 plains spadefoot during the 2013 site investigation; none observed in subsequent site visits.

14C. GENERAL WILDLIFE HABITAT RATING

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

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

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

☒ ***Moderate:*** Based on any of the following [check].
- ☒ observations of scattered wildlife groups or individuals or relatively few species during peak periods
- ☒ common occurrence of wildlife sign such as scat, tracks, nest structures, game trails, etc.
- ☒ adequate adjacent upland food sources
- ☐ interview with local biologist with knowledge of the AA

ii. Wildlife Habitat Features: Working from top to bottom, check appropriate AA attributes in matrix to arrive at rating. Structural diversity is from #13. For class cover to be considered evenly distributed, the most and least prevalent **vegetated** classes must be within 20% of each other in terms of their percent composition of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see manual for further definitions of these terms].

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

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

Evidence of Wildlife Use (i)	**Wildlife Habitat Features Rating (ii)**			
	☐ **Exceptional**	☐ **High**	☒ **Moderate**	☐**Low**
☐ **Substantial**	---	---	---	---
☒ **Moderate**	---	---	.5M	---
☐ **Minimal**	---	---	---	---

Comments: Expect wildlife use/rating to increase for subsequent monitoring years as vegetation becomes more established and weed control efforts are implemented.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

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

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

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

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

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

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

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

ii. Modified Rating: NOTE: Modified score cannot exceed 1.0 or be less than 0.1.

a) Is fish use of the AA significantly reduced by a culvert, dike, or other man-made structure or activity, ***or*** *is the waterbody included on the current final MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support,* ***or*** *do aquatic nuisance plant or animal species (see* ***Appendix E****) occur in fish habitat?* ☐ **YES**, reduce score in **i** by 0.1 = __ or ☒ **N0**

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

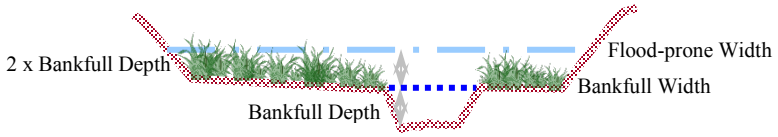
iii. Final Score and Rating: _ **Comments:** No fish habitat within mitigation site; no perennial water

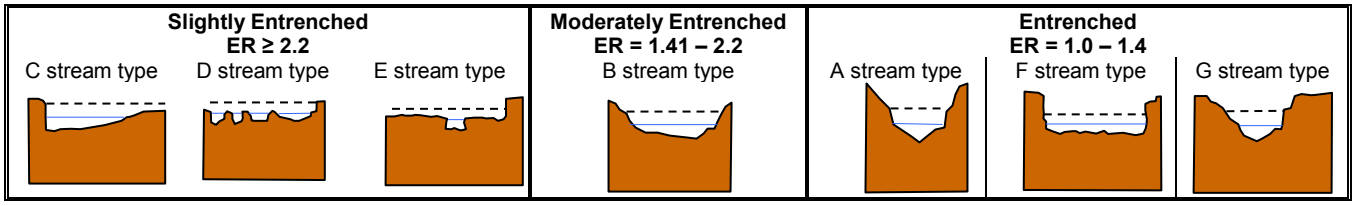
14E. FLOOD ATTENUATION ☒ **NA** (proceed to 14F)

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

Entrenchment Ratio (ER) Estimation (see manual for additional guidance). Entrenchment ratio = (flood-prone width) / (bankfull width).
Flood-prone width = estimated horizontal projection of where 2 X maximum bankfull depth elevation intersects the floodplain on each side of the stream.

_____ / _____ = _____
flood prone width / bankfull width = entrenchment ratio





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

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

ii. Are ≥10 acres of wetland in the AA subject to flooding AND are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA? ☐ YES ☒ NO **Comments:** Wetlands are not subject to flooding via in-channel or overbank flow as there are no waterways on site.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

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

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

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

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

Comments: Estimated that AA ponds greater than 5 out of 10 years with approixmately 25 acres inundated to approximately 0.5 feet.

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

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

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

Sediment, Nutrient, and Toxicant Input Levels within AA	**AA receives or surrounding land use has potential to deliver sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**				**Waterbody is on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants or AA receives or surrounding land use has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.**			
% Cover of Wetland Vegetation in AA	☒ **≥ 70%**		☐ **< 70%**		☐ **≥ 70%**		☐ **< 70%**	
Evidence of Flooding / Ponding in AA	☒ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**	☐ **Yes**	☐ **No**
AA contains **no or restricted outlet**	---	---	---	---	---	---	---	---
AA contains **unrestricted outlet**	.9H	---	---	---	---	---	---	---

Comments: Unrestricted drainage from the bench down to meadow below.

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

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

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

Comments: Wetlands do not occur along stream bank, open water not likely subject to wave action.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

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

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

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

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

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

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

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

Vegetated Upland Buffer: Area with ≥ 30% plant cover, ≤ 15% noxious weed or ANVS cover, AND that is not subjected to periodic mechanical mowing or clearing (unless for weed control).
Is there an average ≥ 50-foot wide vegetated upland buffer around ≥ 75% of the AA's perimeter? ☒ **YES**, add 0.1 to score in **ii** = 0.8 ☐ **NO**

iv. Final Score and Rating: .8H **Comments:** Surface outlet draining wetlands down-slope to meadow below site.

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

i. Discharge Indicators
- ☒ The AA is a slope wetland.
- ☐ Springs or seeps are known or observed.
- ☒ Vegetation growing during dormant season/drought.
- ☒ Wetland occurs at the toe of a natural slope.
- ☐ Seeps are present at the wetland edge.
- ☐ AA permanently flooded during drought periods.
- ☒ Wetland contains an outlet, but no inlet.
- ☐ Shallow water table and the site is saturated to the surface.
- ☐ Other: _____

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

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

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

Comments: Saturation observed in portions of AA during dry season/drought conditions.

14K. UNIQUENESS

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

Replacement Potential	**AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland** OR **plant association listed as "S1" by the MTNHP**			**AA does not contain previously cited rare types** AND **structural diversity (#13) is high** OR **contains plant association listed as "S2" by the MTNHP**			**AA does not contain previously cited rare types** OR **associations** AND **structural diversity (#13) is low-moderate**		
Estimated Relative Abundance (#11)	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☐ Common	☐ Abundant	☐ Rare	☒ Common	☐ Abundant
☐ **Low Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---
☒ **Moderate Disturbance** at AA (#12i)	---	---	---	---	---	---	---	.3L	---
☐ **High Disturbance** at AA (#12i)	---	---	---	---	---	---	---	---	---

Comments: Site is not unique for this area.

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

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

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

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

Known or Potential Recreational or Educational Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	---
Private ownership with general public access (no permission required)	---	---
Private or public ownership without general public access, or requiring permission for public access	---	---

Comments: Access is permitted without permission with the exception of the police shooting range.

15. GENERAL SITE NOTES: Constructed wetland areas were wetter in 2018 compared to 2017 but some areas appear to be losing hydrology and the vegetation communities are transitioning into upland.

Wetland/Site #(s): Kindsfater - existing wetland/preservation wetland

Function & Value Variables	Rating – Actual Functional Points	Possible Functional Points	Functional Units: Actual Points x Estimated AA Acreage	Indicate the Four Most Prominent Functions with an Asterisk
A. Listed / Proposed T&E Species Habitat	low 0.00	1.00	**0**	
B. MT Natural Heritage Program Species Habitat	high 0.90	1.00	**24.93**	*
C. General Wildlife Habitat	mod 0.50	1.00	**13.85**	
D. General Fish Habitat	NA	NA	**0**	
E. Flood Attenuation	NA	NA	**0**	
F. Short and Long Term Surface Water Storage	high 0.90	1.00	**24.93**	*
G. Sediment / Nutrient / Toxicant Removal	high 0.90	1.00	**24.93**	*
H. Sediment / Shoreline Stabilization	NA	NA	**0**	
I. Production Export / Food Chain Support	mod 0.80	1.00	**22.16**	
J. Groundwater Discharge / Recharge	mod 0.70	1.00	**19.39**	*
K. Uniqueness	low 0.30	1.00	**8.31**	
L. Recreation / Education Potential (bonus point)	high 0.20		**5.54**	
Total Points	**5.2**	**8**	**144.04 Total Functional Units**	
Percent of Possible Score 65% (round to nearest whole number)				

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

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; otherwise go to Category IV)
- ☐ Score of 1 functional point for MT Natural Heritage Program Species Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish Habitat; **or**
- ☐ "High" to "Exceptional" ratings for **both** General Wildlife Habitat **and** General Fish/Aquatic Habitat; **or**
- ☐ Score of .9 functional point for Uniqueness; **or**
- ☐ Percent of possible score > 65% (round to nearest whole #).

☒ **Category III Wetland:** (Criteria for Categories I, II, or IV not satisfied)

Category IV Wetland: (Criteria for Categories I or II are not satisfied and all of the following criteria are met; if not go to Category III)
- ☐ "Low" rating for Uniqueness; **and**
- ☐ Vegetated wetland component < 1 acre (do not include upland vegetated buffer); **and**
- ☐ Percent of possible score < 35% (round to nearest whole #).

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

☐ **I** ☐ **II** ☒ **III** ☐ **IV**

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

Kindsfater: Photo Point Photographs

Photo Point: 1. View of eastern edge of Cell 14 looking W
Bearing: 280 degrees Year: 2013

Photo Point: 1. View of eastern edge of Cell 14 looking W
Bearing: 280 degrees Year: 2014

Photo Point: 1. View of eastern edge of Cell 14 looking W
Bearing: 280 degrees Year: 2015

Photo Point: 1. View of eastern edge of Cell 14 looking W
Bearing: 280 degrees Year: 2016

Photo Point: 1. View of eastern edge of Cell 14 looking W
Bearing: 280 degrees Year: 2017

Photo Point: 1. View of eastern edge of Cell 14 looking W
Bearing: 280 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 2. View of western side of Cell 13 looking SW
Bearing: 280 degrees Year: 2013

Photo Point: 2. View of western side of Cell 13 looking SW
Bearing: 280 degrees Year: 2014

Photo Point: 2. View of western side of Cell 13 looking SW
Bearing: 280 degrees Year: 2015

Photo Point: 2. View of western side of Cell 13 looking SW
Bearing: 280 degrees Year: 2016

Photo Point: 2. View of western side of Cell 13 looking SW
Bearing: 280 degrees Year: 2017

Photo Point: 2. View of western side of Cell 13 looking SW
Bearing: 280 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 3. View of southern edge of Cell 9 looking NE
Bearing: 0 degrees Year: 2013

Photo Point: 3. View of southern edge of Cell 9 looking NE
Bearing: 0 degrees Year: 2014

Photo Point: 3. View of southern edge of Cell 9 looking NE
Bearing: 0 degrees Year: 2015

Photo Point: 3. View of southern edge of Cell 9 looking NE
Bearing: 0 degrees Year: 2016

Photo Point: 3. View of southern edge of Cell 9 looking NE
Bearing: 0 degrees Year: 2017

Photo Point: 3. View of southern edge of Cell 9 looking NE
Bearing: 0 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 4. View of Cell 12 looking S
Bearing: 200 degrees Year: 2013

Photo Point: 4. View of Cell 12 looking S
Bearing: 200 degrees Year: 2014

Photo Point: 4. View of Cell 12 looking S
Bearing: 200 degrees Year: 2015

Photo Point: 4. View of Cell 12 looking S
Bearing: 200 degrees Year: 2016

Photo Point: 4. View of Cell 12 looking S
Bearing: 200 degrees Year: 2017

Photo Point: 4. View of Cell 12 looking S
Bearing: 200 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 5. View of Cell 11 looking SW
Bearing: 10 degrees Year: 2013

Photo Point: 5. View of Cell 11 looking SW
Bearing: 10 degrees Year: 2014

Photo Point: 5. View of Cell 11 looking SW
Bearing: 10 degrees Year: 2015

Photo Point: 5. View of Cell 11 looking SW
Bearing: 10 degrees Year: 2016

Photo Point: 5. View of Cell 11 looking SW
Bearing: 10 degrees Year: 2017

Photo Point: 5. View of Cell 11 looking SW
Bearing: 10 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 6. View of western side of Cell 10 looking SW
Bearing: 150 degrees Year: 2013

Photo Point: 6. View of western side of Cell 10 looking SW
Bearing: 150 degrees Year: 2014

Photo Point: 6. View of western side of Cell 10 looking SW
Bearing: 150 degrees Year: 2015

Photo Point: 6. View of western side of Cell 10 looking SW
Bearing: 150 degrees Year: 2016

Photo Point: 6. View of western side of Cell 10 looking SW
Bearing: 150 degrees Year: 2017

Photo Point: 6. View of western side of Cell 10 looking SW
Bearing: 150 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 7. View of western side of Cell 5 looking east
Bearing: 90 degrees Year: 2013

Photo Point: 7. View of western side of Cell 5 looking east
Bearing: 90 degrees Year: 2014

Photo Point: 7. View of western side of Cell 5 looking east
Bearing: 90 degrees Year: 2015

Photo Point: 7. View of western side of Cell 5 looking east
Bearing: 90 degrees Year: 2016

Photo Point: 7. View of western side of Cell 5 looking east
Bearing: 90 degrees Year: 2017

Photo Point: 7. View of western side of Cell 5 looking east
Bearing: 90 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 8. View of western edge of Cell 2 looking NW
Bearing: 315 degrees Year: 2013

Photo Point: 8. View of western edge of Cell 2 looking NW
Bearing: 315 degrees Year: 2014

Photo Point: 8. View of western edge of Cell 2 looking NW
Bearing: 315 degrees Year: 2015

Photo Point: 8. View of western edge of Cell 2 looking NW
Bearing: 315 degrees Year: 2016

Photo Point: 8. View of western edge of Cell 2 looking NW
Bearing: 315 degrees Year: 2017

Photo Point: 8. View of western edge of Cell 2 looking NW
Bearing: 315 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 9. View of Cell 1 looking N
Bearing: 90 degrees Year: 2013

Photo Point: 9. View of Cell 1 looking N
Bearing: 90 degrees Year: 2014

Photo Point: 9. View of Cell 1 looking N
Bearing: 90 degrees Year: 2015

Photo Point: 9. View of Cell 1 looking N
Bearing: 90 degrees Year: 2016

Photo Point: 9. View of Cell 1 looking N
Bearing: 90 degrees Year: 2017

Photo Point: 9. View of Cell 1 looking N
Bearing: 90 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 10. View of northern portion of Cell 3 looking SE
Bearing: 140 degrees Year: 2013

Photo Point: 10. View of northern portion of Cell 3 looking SE
Bearing: 140 degrees Year: 2014

Photo Point: 10. View of northern portion of Cell 3 looking SE
Bearing: 140 degrees Year: 2015

Photo Point: 10. View of northern portion of Cell 3 looking SE
Bearing: 140 degrees Year: 2016

Photo Point: 10. View of northern portion of Cell 3 looking SE
Bearing: 140 degrees Year: 2017

Photo Point: 10. View of northern portion of Cell 3 looking SE
Bearing: 140 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 11. View of Cell 7 looking SE
Bearing: 150 degrees Year: 2013

Photo Point: 11. View of Cell 7 looking SE
Bearing: 150 degrees Year: 2014

Photo Point: 11. View of Cell 7 looking SE
Bearing: 150 degrees Year: 2015

Photo Point: 11. View of Cell 7 looking SE
Bearing: 150 degrees Year: 2016

Photo Point: 11. View of Cell 7 looking SE
Bearing: 150 degrees Year: 2017

Photo Point: 11. View of Cell 7 looking SE
Bearing: 150 degrees Year: 2018

Kindsfater: Photo Point Photographs

Photo Point: 12. View of Cell 6 looking W
Bearing: 230 degrees Year: 2013

Photo Point: 12. View of Cell 6 looking W
Bearing: 230 degrees Year: 2014

Photo Point: 12. View of Cell 6 looking W
Bearing: 230 degrees Year: 2015

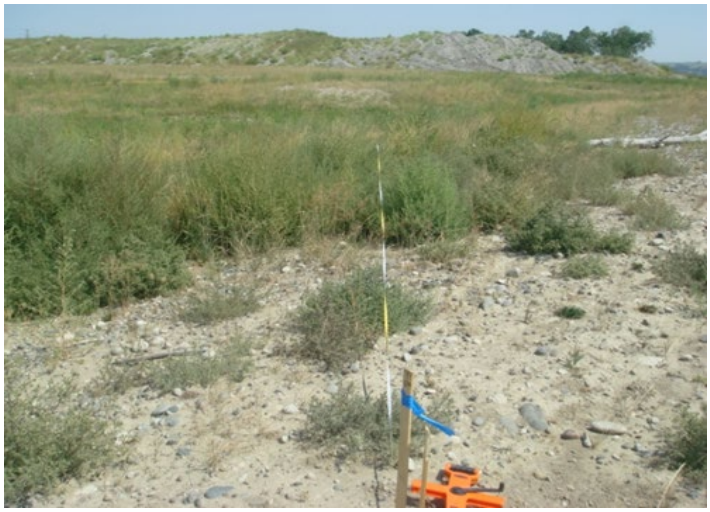
Photo Point: 12. View of Cell 6 looking W
Bearing: 230 degrees Year: 2016

Photo Point: 12. View of Cell 6 looking W
Bearing: 230 degrees Year: 2017

Photo Point: 12. View of Cell 6 looking W
Bearing: 230 degrees Year: 2018

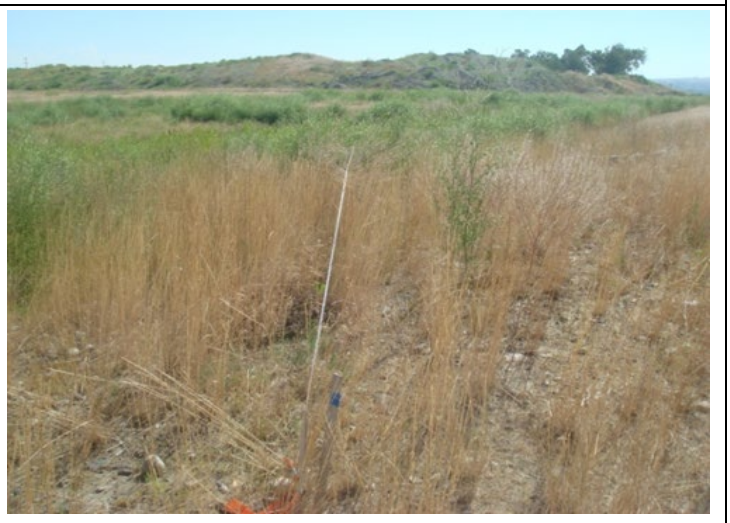
Kindsfater: Transect Photographs

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2013



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2013

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2014



Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2014

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2015

Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2015

Kindsfater: Transect Photographs

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2016

Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2016

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2017

Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2017

Transect 1: Start Location: Wetland Cell 14
Bearing: 240 degrees Year: 2018

Transect 1: End Location: Wetland Cell 14
Bearing: 50 degrees Year: 2018

Kindsfater: Transect Photographs

Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2013

Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2013

Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2014

Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2014

Transect 2: Start Location: Wetland Cell 8
Bearing: 225 degrees Year 2015

Transect 2: End Location: Wetland Cell 8
Bearing: 40 degrees Year 2015

Kindsfater: Transect Photographs

Transect 2: Start
Bearing: 225 degrees
Location: Wetland Cell 8
Year 2016

Transect 2: End
Bearing: 40 degrees
Location: Wetland Cell 8
Year 2016

Transect 2: Start
Bearing: 225 degrees
Location: Wetland Cell 8
Year 2017

Transect 2: End
Bearing: 40 degrees
Location: Wetland Cell 8
Year 2017

Transect 2: Start
Bearing: 225 degrees
Location: Wetland Cell 8
Year 2018

Transect 2: End
Bearing: 40 degrees
Location: Wetland Cell 8
Year 2018

Kindsfater: Transect Photographs

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2013

Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2013

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2014

Transect 3: End Location: Wetland Cell 4
Bearing 290 degrees Year 2014

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2015

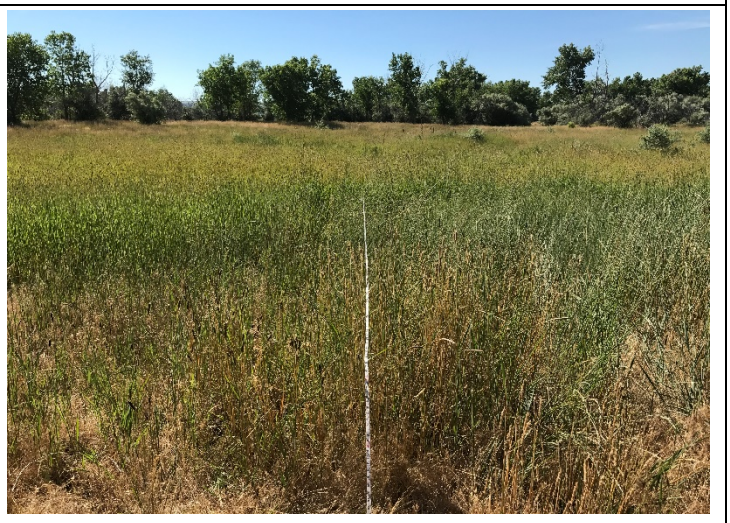
Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2015

Kindsfater: Transect Photographs

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2016

Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2016

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2017



Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2017

Transect 3: Start Location: Wetland Cell 4
Bearing: 290 degrees Year 2018

Transect 3: End Location: Wetland Cell 4
Bearing: 290 degrees Year 2018

Kindsfater: Data Point Photographs

Data Point: DP1W Location: Veg Community 16
Year 2018

Data Point: DP1U Location: Veg Community 4/14
Year 2018

Data Point: DP2W Location: Veg Community 8
Year 2018

Data Point: DP2U Location: Veg Community 15
Year 2018

Data Point: DP3W Location: Veg Community 11
Year 2018

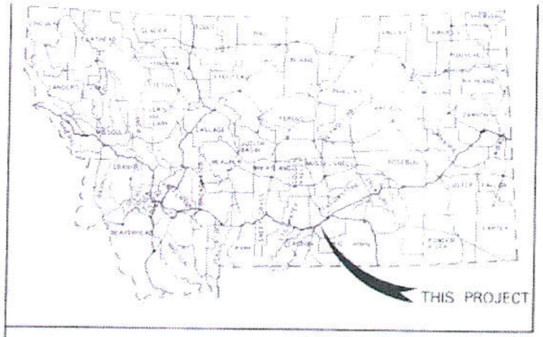
Data Point: DP3U Location: Veg Community 14
Year 2018

Kindsfater: Data Point Photographs

	
Data Point: DP4W Location: Veg Community 10 Year 2018	Data Point: DP4U Location: Veg Community 14 Year 2018

APPENDIX D
PROJECT PLAN SHEETS

MDT Wetland Mitigation Monitoring
Kindsfater
Yellowstone County, Montana

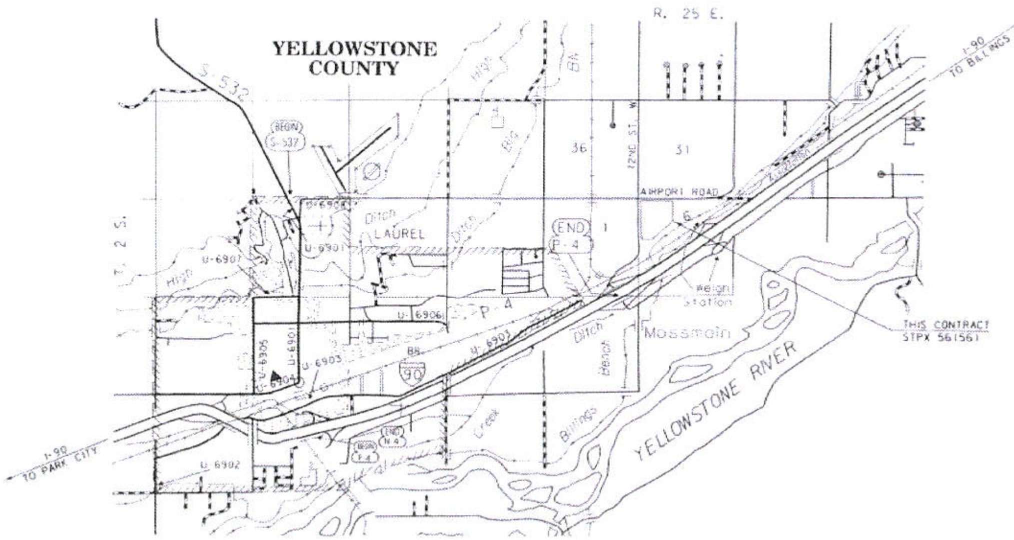


MONTANA DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO. STPX 56(56)
AQUATIC RESOURCES MITIGATION
KINDSFATER WETLAND
YELLOWSTONE COUNTY

LETTING DATE

MORRISON MAIERLE, INC.



PLANS PREPARED BY

MORRISON-MAIERLE, INC
1 ENGINEERING PLACE
P.O. BOX 6147
HELENA, MT 59604
PHONE (406) 442-3050
FAX (406) 442-7862

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS	
R/W & I.C.	
P.E.	

MORRISON-MAIERLE, INC.

DATE 08·29·12

PHILLIP J. FORBES 9112 PE

MONTANA DEPARTMENT OF TRANSPORTATION

RECEIVED

BY: CONSULTANT DESIGN ENGINEER — DATE: August 30, 2012

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED

DIVISION ADMINISTRATOR — DATE

MDT MONTANA DEPARTMENT OF TRANSPORTATION

DESIGNED BY
REVIEWED BY
CHECKED BY

5/29/2012

WETLAND PLANS
UPN NUMBER 5034000

TABLE OF CONTENTS

NOTES

TEMPORARY EROSION AND SEDIMENT CONTROL

REFER TO SECTION 208 OF THE MDT DETAILED DRAWINGS FOR EROSION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES.

ALL INSTALLED TEMPORARY EROSION CONTROL MATERIALS IN OR ADJACENT TO WATERS OF THE U.S. MUST BE COMPOSED AND CONSTRUCTED OF 100% BIODEGRADABLE FIBERS, NETTING AND STITCHING.

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.

WETLANDS

WETLANDS EXIST ADJACENT TO THE ROADWAY AND BEYOND THE PROJECT LIMITS. WETLAND AREAS AND PERMITTED WETLAND IMPACT AREAS WITHIN THE PROJECT LIMITS HAVE BEEN DELINEATED AND ARE SHOWN ON THE PLANS. ANY ACTION IMPACTING WETLAND AREAS WITHOUT THE APPROPRIATE PERMITTING IS THE RESPONSIBILITY OF THE CONTRACTOR.

DELINEATED WETLAND AREAS

PERMITTED WETLAND IMPACTED AREAS

SOILS INFORMATION

THE PLAN SHEETS INCLUDE MONITORING WELL LOCATIONS WHERE SOIL INFORMATION HAS BEEN RECORDED. THE COMPLETE SOIL BORING LOGS FOR THESE LOCATIONS ARE INCLUDED IN THE SPECIAL PROVISIONS. TO OBTAIN ANY ADDITIONAL AVAILABLE INFORMATION, CONTACT THE MDT GEOTECHNICAL SECTION AT (406) 444-6281.

UTILITIES

CALL 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.

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.

COMBINATION SCALE FACTOR

ALL COORDINATES ARE STATE PLANE (SEE CONTROL DIAGRAM). CSF FOR THE PROJECT IS 0.99948695.

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. COORDINATE TABLE ELEVATIONS ARE TO FINISHED GRADE FOLLOWING TOPSOIL PLACEMENT.

MONITORING WELLS

ALL MONITOR WELLS ARE TO BE LEFT IN PLACE UNDISTURBED.

LINEAR & LEVEL DATA

BEARING SOURCE

NAD 83

LEVEL DATUM SOURCE

NAVD 88

BENCH MARKS

SEE CONTROL TRAVERSE ABSTRACT FOR BENCHMARK INFORMATION

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5934000-sht001.sgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	REVIEWED BY				
1		9:59:45 AM OPS USER	CHECKED BY		YELLOWSTONE COUNTY	CSF - 0.99948655 UPN NUMBER 5034000	SHEET 2 OF 25

Q 44 △

CONTROL DIAGRAM

SCALE: 1" = 1,000

THIS PROJECT WAS CONTROLLED USING GPS. TRIMBLE GEOMATIC OFFICE VERISON 1.63 WAS USED FOR THE ADJUSTMENT. THE FOLLOWING WERE HELD FIXED IN THE FINAL WEIGHTED LEAST SQUARES ADJUSTMENT:

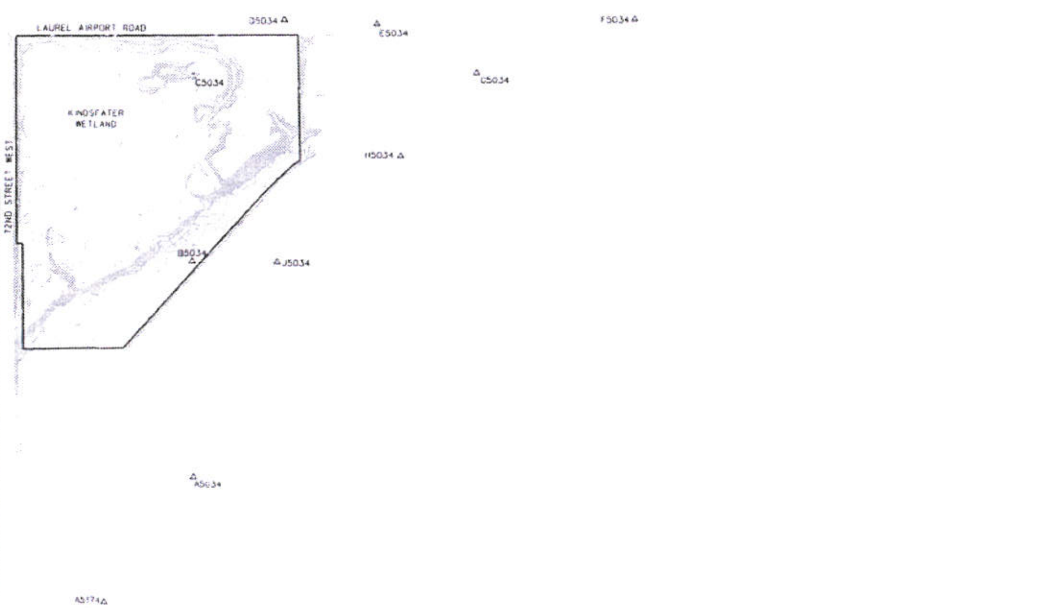
MARK	Y	X	Z
Q 44	X	X	X
A5174	X	X	X
D5174	X	X	X

IN ADDITION, ALL NEW PROJECT MARKS ESTABLISHED IN THIS SURVEY (A5034 THROUGH J5034) WERE CONSTRAINED VERTICALLY, USING THE ORTHOMETRIC HEIGHTS DERIVED FROM DIFFERENTIAL LEVELING.

NOTE: FILE 5034SUCON202.IFT CONTAINS FINAL STATE PLANE COORDINATES OF MARKS IN THE VICINITY OF THIS PROJECT. HORIZONTAL COORDINATES IN THIS FILE ARE INTERNATIONAL FEET AND ELEVATIONS ARE US SURVEY FEET.

ELEVATIONS ARE BASED ON NAVD88 DATUM. THIS DATUM IS APPROXIMATELY 2.64 FEET HIGHER THAN NGVD29 DATUM. HYDRAULICS SHOULD BE AWARE OF THIS IF A DESIGNATED FLOODPLAIN IS INVOLVED. THE GEOID WAS MODELED USING GEOID03.

IN ORDER TO MAINTAIN A RELATIVE ACCURACY OF 1:50000, ONE COMBINATION SCALE FACTOR CAN BE USED FOR THIS PROJECT. THIS COMBINATION SCALE FACTOR IS 0.99948655, AND IS IDENTICAL TO THE CSF USED FOR CN 5174 (MOSSMAIN INTERCHANGE-EAST).
THIS CSF MUST BE USED FOR ALL PICK UP SURVEYS, COORDINATE CALCULATIONS, ETC. AS WELL AS STAKING OF THE PROJECT. ALL MEASURED DISTANCES X CSF=GRID DISTANCE AND GRID DISTANCE OR PLANE DISTANCE/CSF=DISTANCE TO STAKE.



CONTROL MARK ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
A5174	523,803.624	2,172,357.202	3,256.70	FOUND 2" ALUMINUM MDT CAP FLUSH WITH GROUND STAMPED A5174 2006. AT MP 0.1 ON FRONTAGE ROAD (ACCESS TO SHOTGUN WILLIE S), 29' SOUTH OF CENTER LINE OF DITCH BANK
D5174	529,332.412	2,183,147.638	3,232.42	FOUND 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED D5174 2006. AT MP 1.9 ON FRONTAGE ROAD, 31' SOUTH OF CENTERLINE OF FRONTAGE ROAD, 8' WEST OF WITNESS POST IN EAST/WEST FENCE.
A5034	524,852.310	2,173,106.597	3,254.86	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED A5034. ON EAST SIDE OF 72ND STREET APROX. 150 FEET SOUTH OF RAIL ROAD CROSSING AND 20 FEET SOUTH OF CHEVRON SIGN. CAP IS 4.5 FEET EAST OF X MARKED IN GUARDRAIL, 0.4 MILES EAST OF EXIT OVER PASS.
B5034	526,651.762	2,173,080.639	3,286.48	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED B5034 2006. 0.8 MILES EAST OF EXIT OVERPASS. ON EAST SIDE OF 72ND STREET. ACROSS THE ROAD FROM DRIVE WAY, A GATE POST BEARS SOUTHWEST 80.5 FEET. TO THE SOUTHWEST 76.0 FEET IS ANOTHER GATE POST. CAP FALLS 8.6 FEET EAST OF EDGE OF PAVEMENT.
C5034	528,208.189	2,173,072.093	3,297.52	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED C5034 2006. 486 FEET SOUTH OF INTERSECTION TO 72ND AND AIRPORT ROAD. 21.4 FEET TO EDGE OF PAVEMENT. AND 25.2 FEET NORTH EAST OF SIGN POST.
D5034	528,684.449	2,173,841.523	3,295.61	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED D5034 2006. ON SOUTH SIDE OF AIRPORT ROAD. 780 FEET EAST OF INTERSECTION OF AIRPORT ROAD AND 72ND STREET, 16.4 FEET FROM EDGE OF PAVEMENT. A POWER POLE IS 43.2 FEET WEST OF CAP.
E5034	528,653.209	2,174,616.514	3,309.16	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED E5034 2006. ON TOP OF BERM ON SOUTH SIDE OF AIRPORT ROAD, AND ACROSS FROM THE CEMENT PLANT. POWER POLE IS S56°36'W, 71.1 FEET, AND ANOTHER AT N64°E, 92.2 FEET
F5034	528,704.550	2,176,801.405	3,289.05	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED F5034 2006. ON SOUTH SIDE OF AIRPORT ROAD. APROX. 15 FEET WEST OF GATE ON FENCE LINE, 5 FEET NORTH OF FENCE, AND 0.7 MILES EAST OF INTERSECTION TO 72ND STREET AND AIRPORT ROAD.
G5034	528,245.613	2,175,462.622	3,293.63	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED G5034 2006. ON SOUTH SIDE OF AIRPORT ROAD. APROX. 15 FEET WEST OF GATE ON FENCE LINE. 5 FEET NORTH OF FENCE, AND 0.7 MILES EAST OF INTERSECTION TO 72ND STREET AND AIRPORT ROAD.
H5034	527,548.136	2,174,823.935	3,294.80	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED H5034 2006. ON TOP OF SMALL BLUFF 404 FEET EAST OF THE TOP OF SLOPE, AND 71 FEET SOUTH OF THE TOP OF SLOPE LOOKING TOWARD THE RAIL ROAD TRACKS.
J5034	526,653.715	2,173,801.670	3,274.02	SET 2" ALUMINUM CAP FLUSH WITH GROUND STAMPED J5034. ON THE TOP OF A SMALL BLUFF 200 FEET EAST OF SMALL CREEK COMING OUT OF THE MAIN WETLAND AREA. A PATCH OF COTTONWOOD TREES ARE ABOUT 40 FEET SOUTH OF CAP. FROM WHICH YOU CAN SEE A5034. NEAR THE RAIL ROAD TRACKS.
Q 44	533,384.189	2,170,421.056	3,304.07	FOUND NGS BENCH MARK DISC MARKED "Q 44 1931" IN TOP OF CONCRETE MONUMENT PER DATA SHEET.

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\rdthvp01.dgn 9/12/2012 8:55:54 AM CPS - L0150	DESIGNED BY REVIEWED BY CHECKED BY	WETLAND PLANS YELLOWSTONE COUNTY	KINDSFATER WETLAND CSF = 0.99948655 UPN NUMBER 5034000	PROJECT NO. STPX 56(56) SHEET 3 OF 25

SUMMARY

GRADING

STATION	UNCL. EXC (cubic yards*)	UNCL. BORROW (cubic yards*)	EMB. (cubic yards*)	REMARKS
			230	SHOOTING RANGE BERM
	4,710			WETLAND CELL 1
	3,890			WETLAND CELL 2
	3,275			WETLAND CELL 3
	6,670			WETLAND CELL 4
	3,715			WETLAND CELL 5
	4,265			WETLAND CELL 6
	3,560			WETLAND CELL 7
	5,375			WETLAND CELL 8
	4,355			WETLAND CELL 9
	[illegible]			WETLAND CELL 10
	1,660			WETLAND CELL 11
	3,560			WETLAND CELL 12
	985		65	SWALES
TOTAL	49,190		# 295	

* QUANTITIES SHOWN ARE IN-PLACE. NO SHRINK/SWELL FACTORS HAVE BEEN APPLIED
\# FOR INFORMATION ONLY

REVEGETATION

STATION	WETLAND SOIL SALVAGE (cubic yards*)	TOPSOIL SALVAGING & PLACING (cubic yards*)	WETLAND SEEDING – WETLAND (acres)	WETLAND SEEDING – UPLAND (acres)	CONDITION SEEDBED (acres)	TREE & SHRUB PLANTING (lump sum)	REMARKS
						1.0	BASE BID AREA
		50					SHOOTING RANGE BERM**
		750					WETLAND CELL 1
		660					WETLAND CELL 2
		560					WETLAND CELL 3
		1,375					WETLAND CELL 4
		120					WETLAND CELL 5
		860					WETLAND CELL 6
		800					WETLAND CELL 7
		1,790					WETLAND CELL 8
		820					WETLAND CELL 9
		600					WETLAND CELL 10
		540					WETLAND CELL 11
		850					WETLAND CELL 12
		565					SWALES
			28.1		28.1		WETLAND AREAS
TOTAL		10,440	28.1		28.1	1.0***	

* 6-INCH SALVAGE DEPTH
** SALVAGE AND PLACE TOPSOIL FROM THE STOCKPILES ALONG LAUREL AIRPORT ROAD (SEE SPECIAL PROVISIONS)
*** SEE SHEET 5

CONSTRUCTION SURVEY & LAYOUT

STATION FROM	STATION TO	lump sum	REMARKS
		1.0	BASE BID SURVEY
TOTAL		1.0	

SURFACING

	GROSS (linear feet)	NET (linear feet)	* (linear feet)	(linear feet)	FOR	HYDRATED LIME (tons)	AGGREGATE – COVER GRADE 4A (square yards)	AGGREGATE – PLANT MIX BIT. SURF. GRADE D (tons)	AGGREGATE – CRUSHED AGG COURSE (cubic yards)	AGGREGATE – TRAFFIC GRAVEL (cubic yards)	BITUMINOUS MATERIAL – ASPHALT CEMENT PG 64-28 (tons)	BITUMINOUS MATERIAL – SEAL CRS-2P (tons)	AGG TREATMENT – DUST PALLIATIVE (tons)	BIT PAVEMENT REMOVAL (square yards)	REMARKS
									25						EXISTING ACCESS ROAD
TOTAL									25						

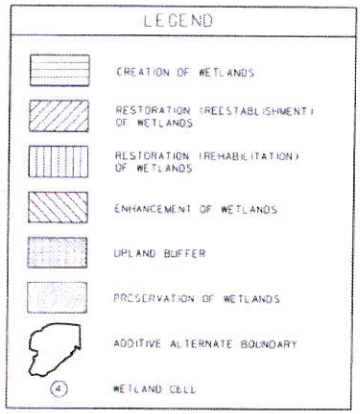
NOTE: SEE ACCESS ROAD SECTION FOR CRUSHED AGGREGATE THICKNESS

FENCING

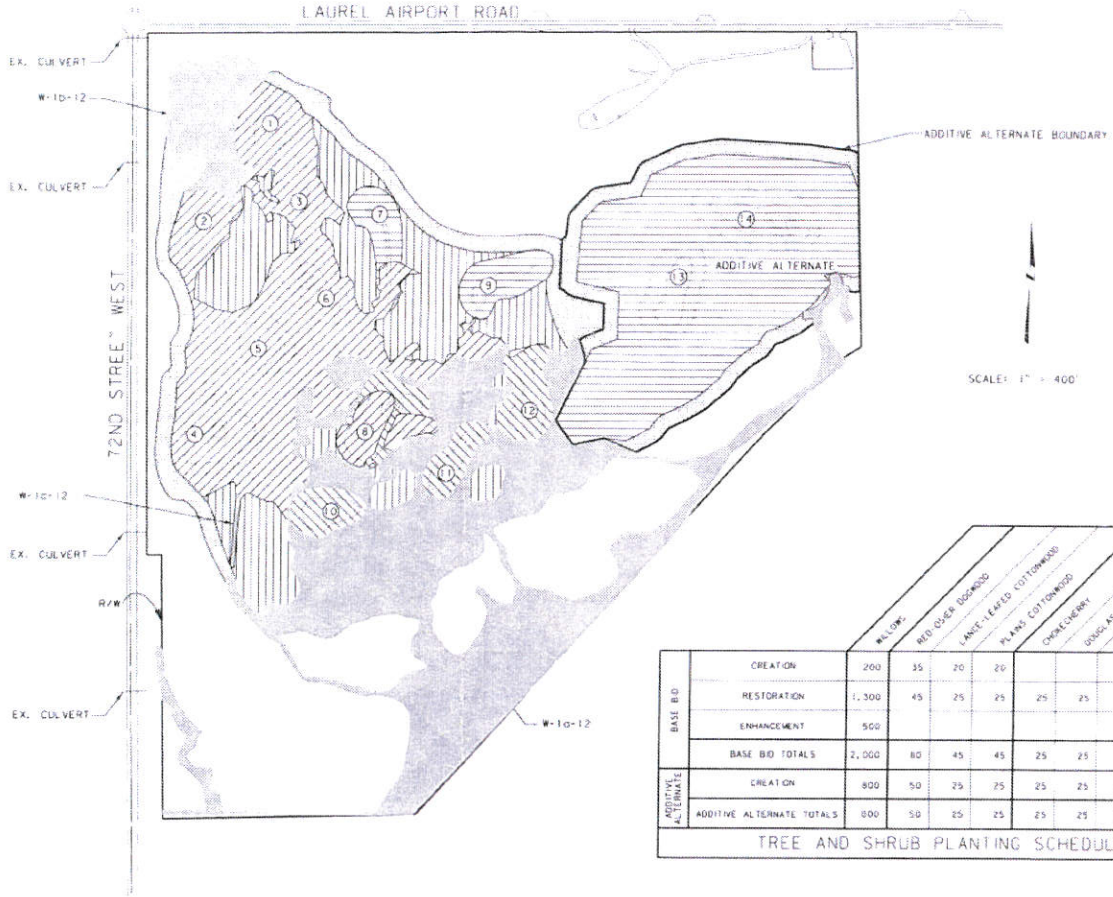
STATION	CHAIN LINK FENCE 4'0" (linear feet)	CHAIN LINK FENCE 5'0" (linear feet)	CHAIN LINK FENCE 6'0" (linear feet)	FARM FENCE (linear feet)	CHAIN LINK PANEL SINGLE (each)	CHAIN LINK PANEL DOUBLE (each)	FARM FENCE PANEL SINGLE (each)	FARM FENCE PANEL DOUBLE (each)	REMOVE FENCE* (linear feet)	CHAIN LINK GATE SINGLE (linear feet)	CHAIN LINK GATE DOUBLE (linear feet)	FARM GATE METAL TYPE G-3 (linear feet)	REMARKS
			1,401		4	11			1,179		24		SHOOTING RANGE
TOTAL			1,401		4	11			-		24		

* FOR INFORMATION ONLY

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\msums01.dgn 9/12/2012 8:56:02 AM CPS - U216	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS / YELLOWSTONE COUNTY	KINDSFATER WETLAND / CSF = 0.99948655 / UPN NUMBER 5034000	PROJECT NO. STPX 56(56) / SHEET 4 OF 25



NOTES:
1. SEE REVEGETATION SPECIAL PROVISION FOR TREE AND SHRUB PLANTINGS AND WETLAND AND UPLAND SEED MIXTURES.
2. PLANT LOCATIONS TO BE DETERMINED IN THE FIELD BY MDT BOTANIST.
3. DO NOT DISTURB EXISTING WETLANDS BEYOND AREAS OF WORK INDICATED IN THE PLANS.

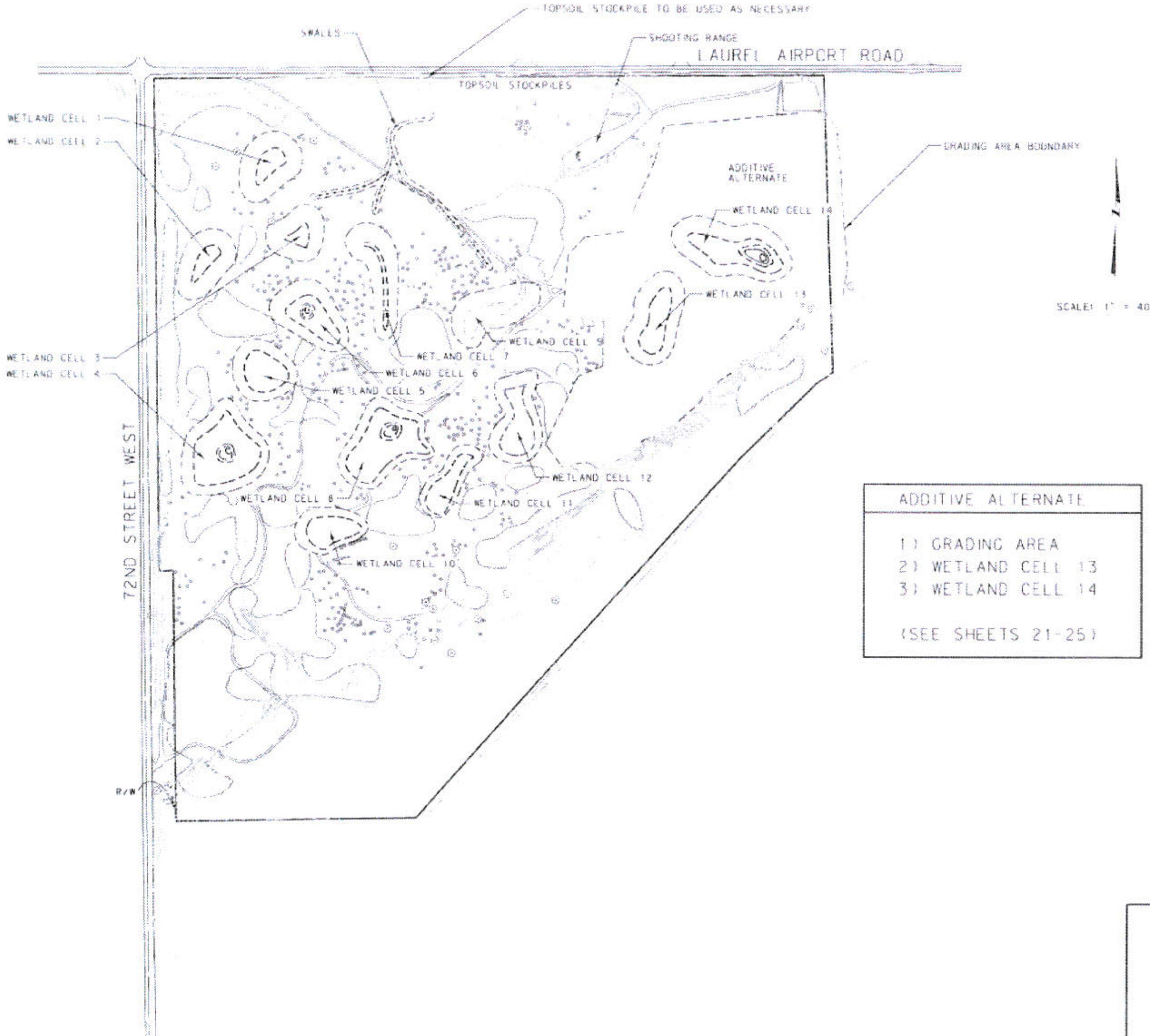


		WILLOW	RED OSIER DOGWOOD	LANCE-LEAFED COTTONWOOD	PLAINS COTTONWOOD	CHOKECHERRY	DOUGLAS HAWTHORN	BUFFALOBERRY	WOOD'S ROSE	ROCKY MOUNTAIN JUNIPER
BASE BID	CREATION	200	35	20	20					
	RESTORATION	1,300	45	25	25	25	25	25	25	25
	ENHANCEMENT	500								
	BASE BID TOTALS	2,000	80	45	45	25	25	25	25	25
ADDITIVE ALTERNATE	CREATION	800	50	25	25	25	25	25	25	25
	ADDITIVE ALTERNATE TOTALS	800	50	25	25	25	25	25	25	25

TREE AND SHRUB PLANTING SCHEDULE

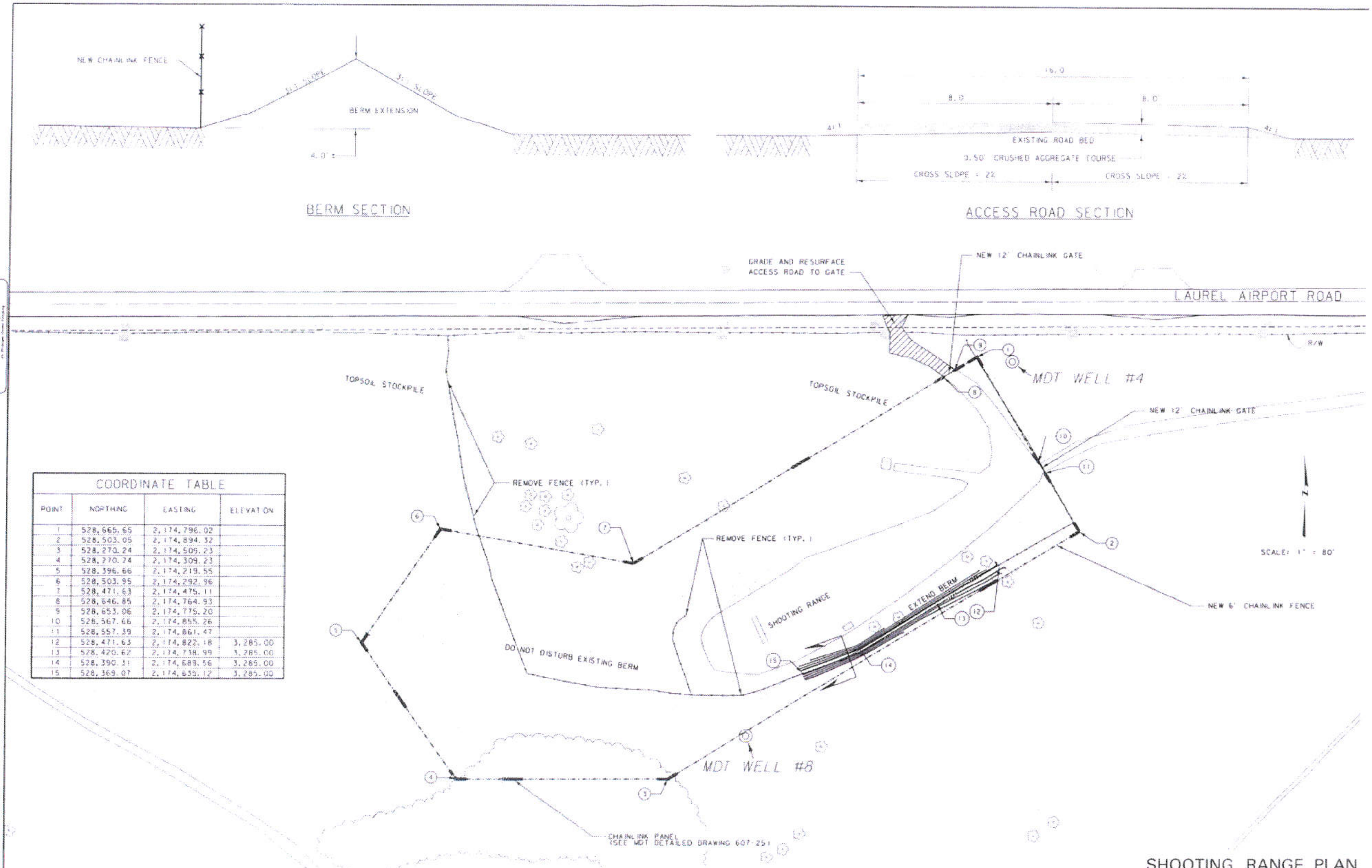
REVEGETATION OVERVIEW

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5634000revegt01.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
2		9/12/2012	DRAWN BY		YELLOWSTONE COUNTY	CSF = 0.99948655 UPN NUMBER 5034000	SHEET 5 OF 26
1		9:58:16 AM CDS 12.1	CHECKED BY				



PROPOSED SITE OVERVIEW

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\sdetz01.dgn 9/12/2012 8:56:22 AM CPS - U2160	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS		KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
			YELLOWSTONE COUNTY		CSF = 0.99948655 / UPN NUMBER 5034000	SHEET 6 OF 25



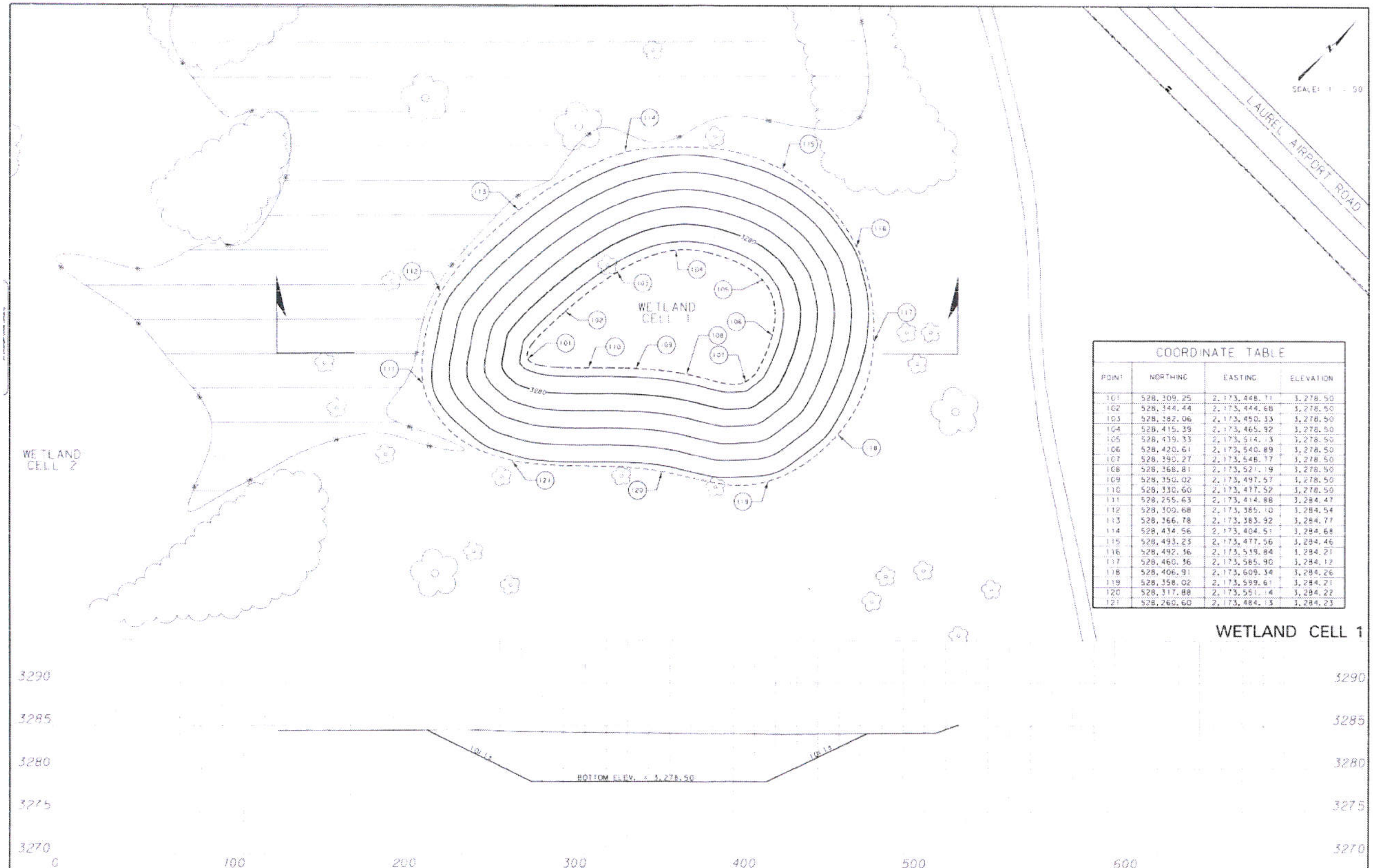
COORDINATE TABLE

POINT	NORTHING	EASTING	ELEVATION
1	528,665.65	2,174,796.02	
2	528,503.05	2,174,894.32	
3	528,270.24	2,174,509.23	
4	528,270.74	2,174,309.23	
5	528,396.66	2,174,219.55	
6	528,503.95	2,174,292.96	
7	528,471.63	2,174,475.11	
8	528,646.85	2,174,764.93	
9	528,653.06	2,174,775.20	
10	528,567.66	2,174,855.26	
11	528,557.39	2,174,861.47	
12	528,471.63	2,174,822.18	3,285.00
13	528,420.62	2,174,738.99	3,285.00
14	528,390.31	2,174,689.56	3,285.00
15	528,369.07	2,174,635.12	3,285.00

SCALE: 1" = 80'

SHOOTING RANGE PLAN

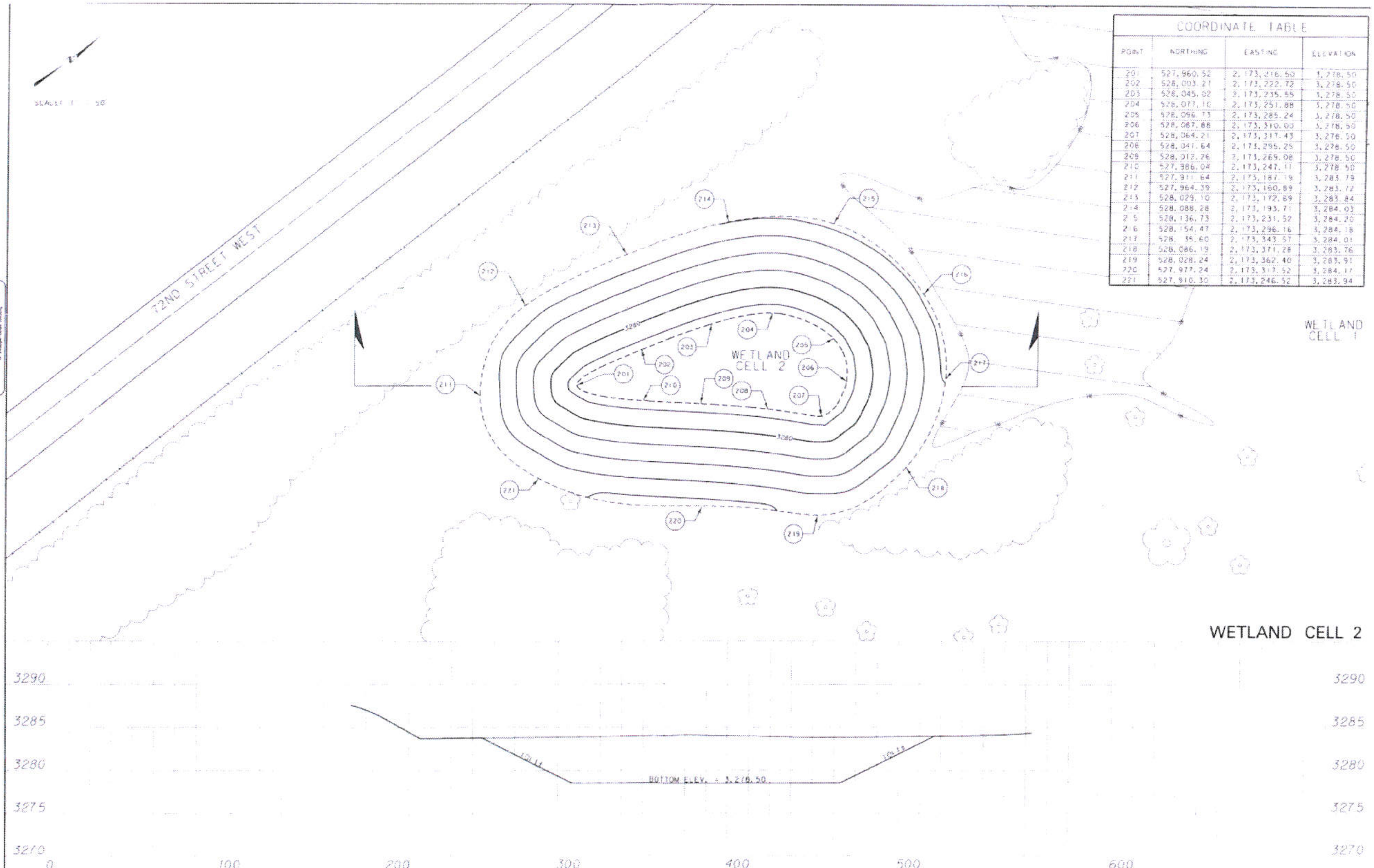
MDT MONTANA DEPARTMENT OF TRANSPORTATION | WETLAND PLANS | YELLOWSTONE COUNTY | KINDSFATER WETLAND | CSF = 0.99948655 | UPN NUMBER 5034000 | PROJECT NO. STPX 56(56) | SHEET 7 OF 25



COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
101	528,309.25	2,173,448.71	3,278.50
102	528,344.44	2,173,444.68	3,278.50
103	528,382.06	2,173,450.33	3,278.50
104	528,415.39	2,173,465.92	3,278.50
105	528,439.33	2,173,514.13	3,278.50
106	528,420.61	2,173,540.89	3,278.50
107	528,390.27	2,173,546.77	3,278.50
108	528,368.81	2,173,521.19	3,278.50
109	528,350.02	2,173,497.57	3,278.50
110	528,330.60	2,173,477.52	3,278.50
111	528,255.63	2,173,414.88	3,284.47
112	528,300.68	2,173,385.10	3,284.54
113	528,366.78	2,173,383.92	3,284.77
114	528,434.56	2,173,404.51	3,284.68
115	528,493.23	2,173,477.56	3,284.46
116	528,492.36	2,173,539.84	3,284.21
117	528,460.36	2,173,585.90	3,284.12
118	528,406.91	2,173,609.34	3,284.26
119	528,358.02	2,173,599.61	3,284.21
120	528,317.88	2,173,551.14	3,284.22
121	528,260.60	2,173,484.13	3,284.23

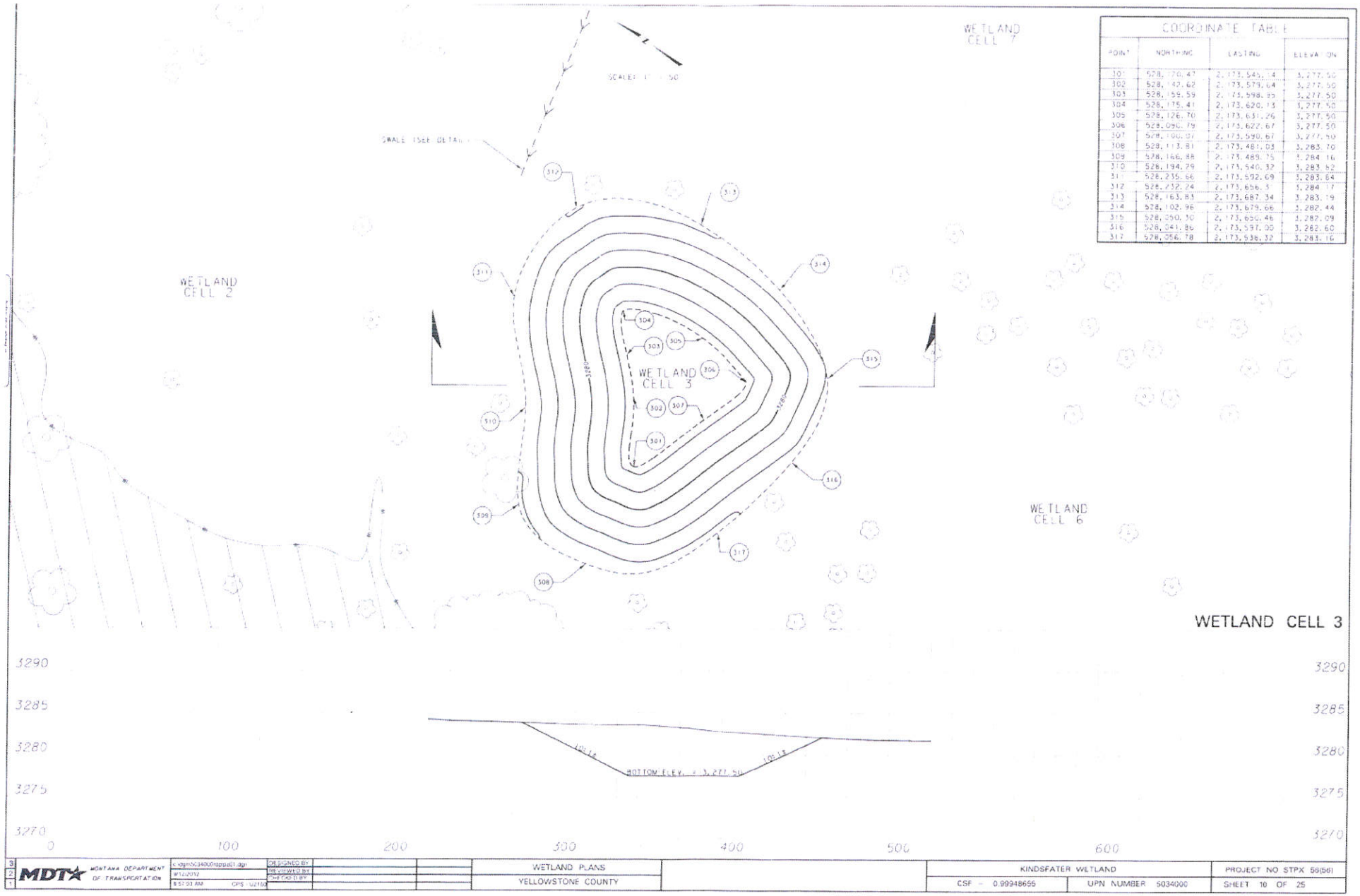
WETLAND CELL 1

MDT MONTANA DEPARTMENT OF TRANSPORTATION	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS	KINDSFATER WETLAND		PROJECT NO. STPX 56(56)
9/12/2012 8:56:53 AM		YELLOWSTONE COUNTY	CSF = 0.99948656	UPN NUMBER 5034000	SHEET 8 OF 25



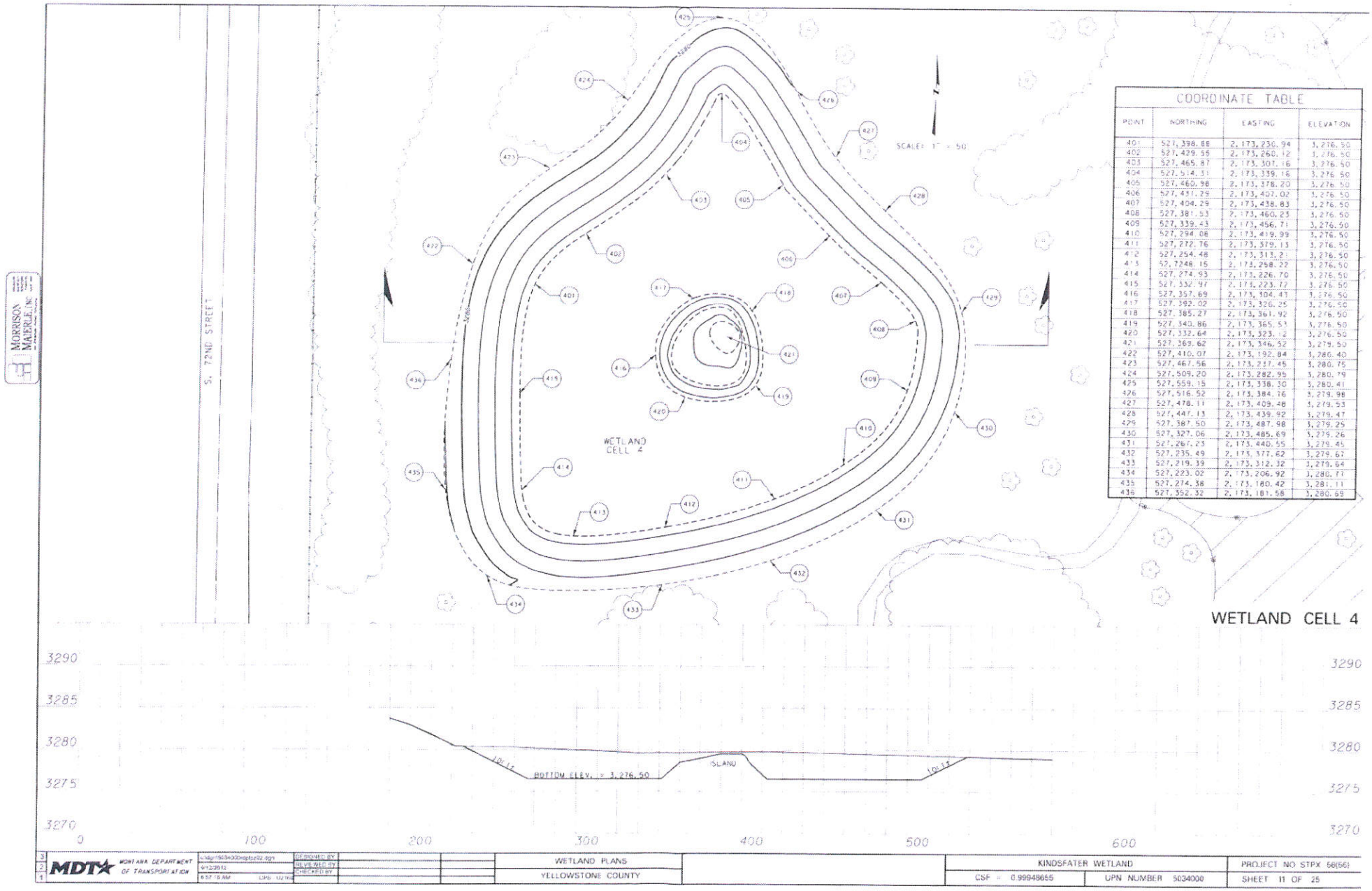
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
201	527,960.52	2,173,216.50	3,278.50
202	528,003.21	2,173,222.72	3,278.50
203	528,045.02	2,173,235.55	3,278.50
204	528,077.10	2,173,251.88	3,278.50
205	528,096.13	2,173,285.24	3,278.50
206	528,087.88	2,173,310.00	3,278.50
207	528,064.21	2,173,317.43	3,278.50
208	528,041.64	2,173,295.25	3,278.50
209	528,012.26	2,173,269.08	3,278.50
210	527,986.04	2,173,247.11	3,278.50
211	527,911.64	2,173,187.19	3,283.79
212	527,964.39	2,173,160.89	3,283.72
213	528,029.10	2,173,172.69	3,283.84
214	528,088.28	2,173,193.71	3,284.03
215	528,136.73	2,173,231.52	3,284.20
216	528,154.47	2,173,296.16	3,284.18
217	528,[illegible]35.60	2,173,343.57	3,284.01
218	528,086.19	2,173,371.28	3,283.76
219	528,028.24	2,173,362.40	3,283.91
220	527,977.24	2,173,317.52	3,284.17
221	527,910.30	2,173,246.52	3,283.94

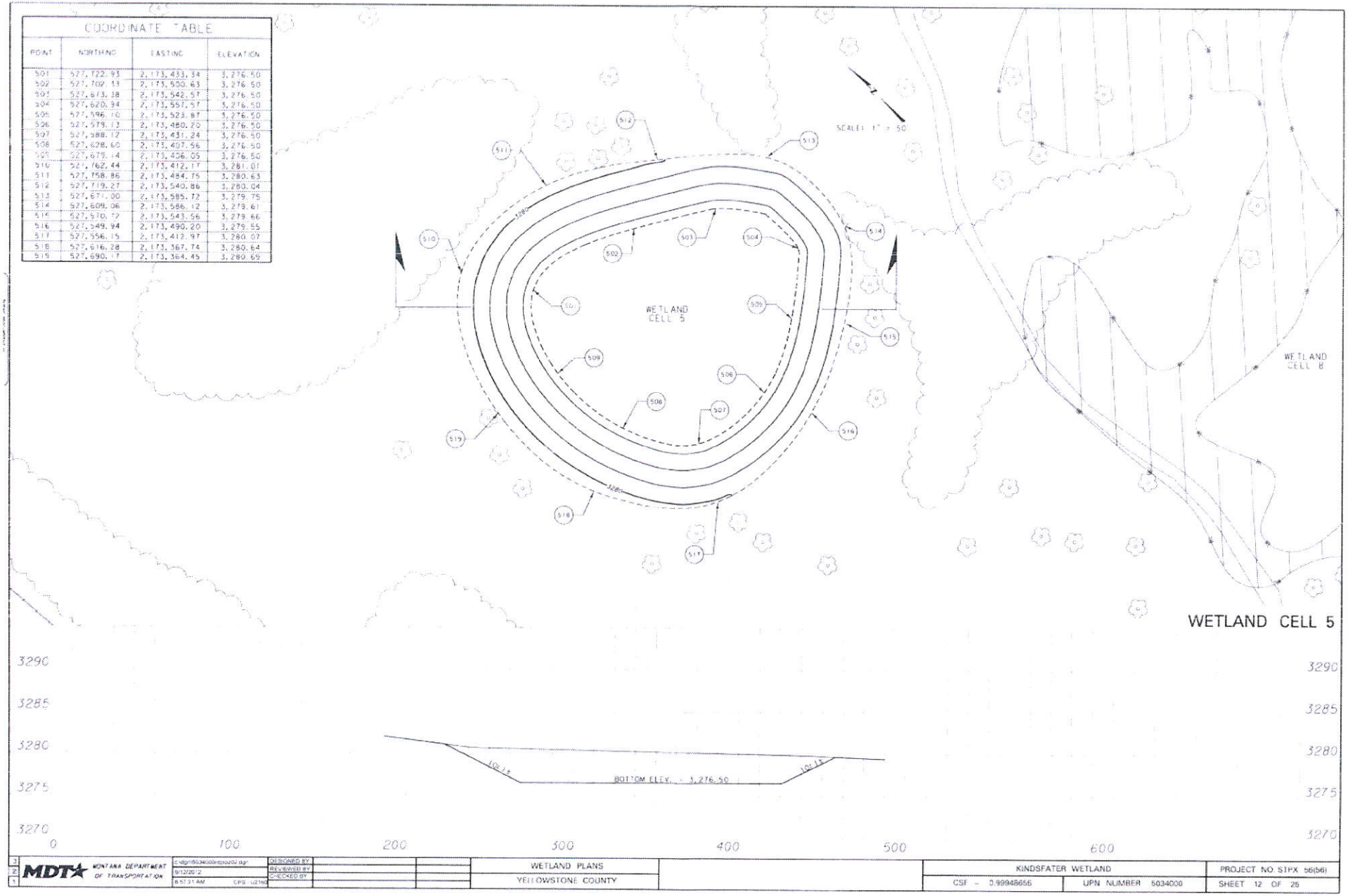
MDT MONTANA DEPARTMENT OF TRANSPORTATION	9/12/2012	WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
		YELLOWSTONE COUNTY	CSF = 0.99948655 · UPN NUMBER 5034000	SHEET 9 OF 25

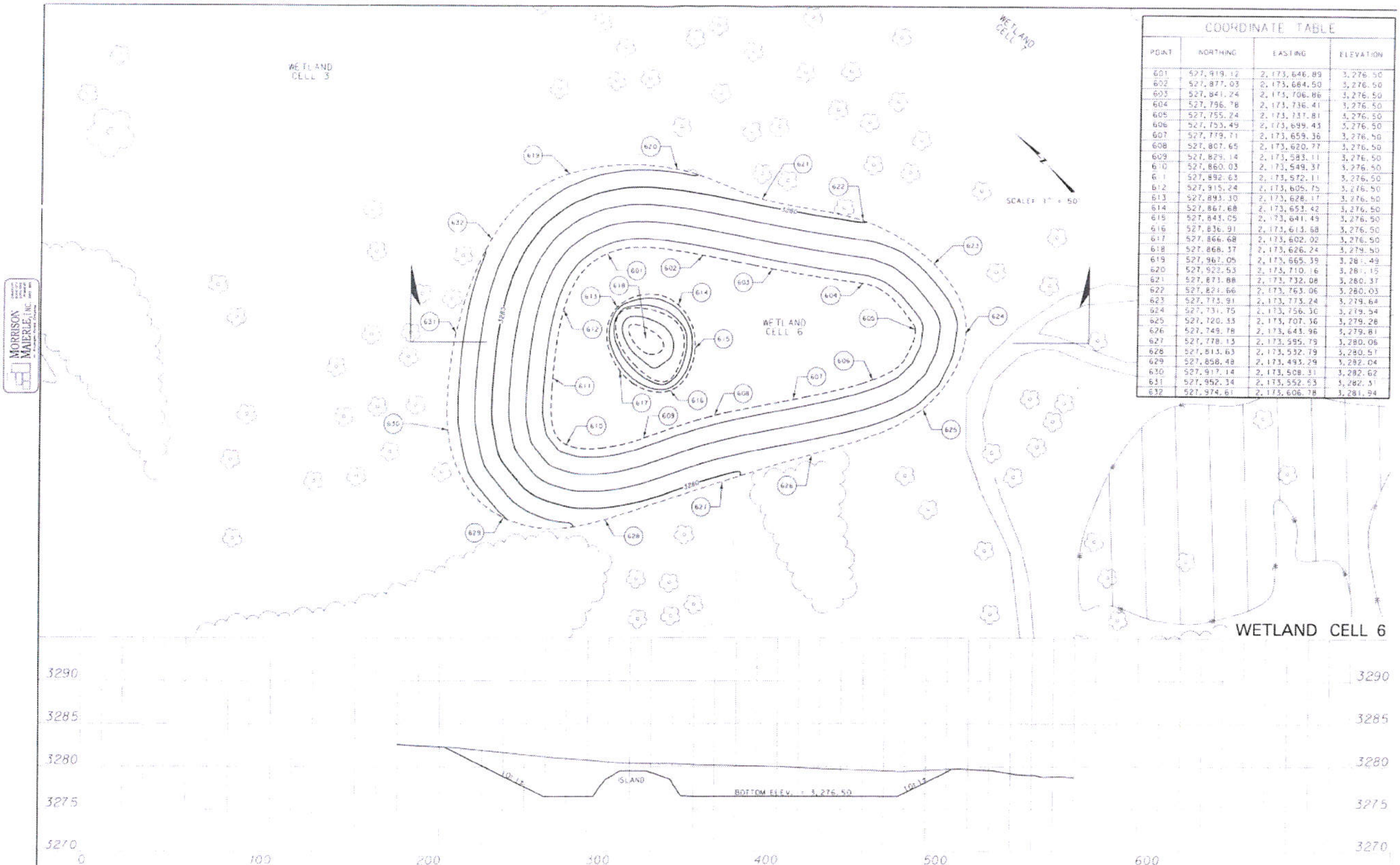


COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
301	528,170.47	2,173,545.14	3,277.50
302	528,147.62	2,173,579.64	3,277.50
303	528,159.55	2,173,598.35	3,277.50
304	528,175.41	2,173,620.15	3,277.50
305	528,126.70	2,173,631.26	3,277.50
306	528,090.79	2,173,622.67	3,277.50
307	528,100.01	2,173,590.61	3,277.50
308	528,113.81	2,173,481.05	3,283.70
309	528,166.88	2,173,489.75	3,284.16
310	528,194.29	2,173,540.32	3,283.62
311	528,235.66	2,173,592.69	3,283.84
312	528,232.24	2,173,656.3	3,284.17
313	528,163.83	2,173,687.34	3,283.19
314	528,102.96	2,173,679.66	3,282.44
315	528,050.30	2,173,630.46	3,282.09
316	528,041.86	2,173,597.00	3,282.60
317	528,056.78	2,173,536.32	3,283.16

3	MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\0034000sppp001.dgn	DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO STPX 56(56)
2		9/12/2012	REVIEWED BY		YELLOWSTONE COUNTY	CSF = 0.99948695 UPN NUMBER 5034000	SHEET 10 OF 25
1		8:57:03 AM OPS \u2160	CHECKED BY				


MORRISON MAIERLE, INC.
S. 72ND STREET
WETLAND CELL 4
SCALE: 1" = 50'
COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
401 | 527,398.88 | 2,173,230.94 | 3,276.50
402 | 527,429.55 | 2,173,260.12 | 3,276.50
403 | 527,465.87 | 2,173,307.16 | 3,276.50
404 | 527,514.31 | 2,173,339.16 | 3,276.50
405 | 527,460.98 | 2,173,378.20 | 3,276.50
406 | 527,431.25 | 2,173,407.02 | 3,276.50
407 | 527,404.25 | 2,173,438.83 | 3,276.50
408 | 527,381.53 | 2,173,460.23 | 3,276.50
409 | 527,339.43 | 2,173,456.71 | 3,276.50
410 | 527,294.08 | 2,173,439.99 | 3,276.50
411 | 527,272.76 | 2,173,379.13 | 3,276.50
412 | 527,254.48 | 2,173,313.2 | 3,276.50
413 | 52,7248.15 | 2,173,258.22 | 3,276.50
414 | 527,274.93 | 2,173,226.70 | 3,276.50
415 | 527,332.97 | 2,173,223.72 | 3,276.50
416 | 527,357.69 | 2,173,304.43 | 3,276.50
417 | 527,392.02 | 2,173,326.25 | 3,276.50
418 | 527,385.27 | 2,173,361.92 | 3,276.50
419 | 527,340.86 | 2,173,365.53 | 3,276.50
420 | 527,332.64 | 2,173,323.12 | 3,276.50
421 | 527,363.62 | 2,173,346.52 | 3,279.50
422 | 527,410.07 | 2,173,192.84 | 3,280.40
423 | 527,467.56 | 2,173,237.45 | 3,280.75
424 | 527,509.20 | 2,173,282.95 | 3,280.79
425 | 527,559.15 | 2,173,338.30 | 3,280.41
426 | 527,516.52 | 2,173,384.76 | 3,279.98
427 | 527,478.11 | 2,173,409.48 | 3,279.53
428 | 527,447.13 | 2,173,439.92 | 3,279.47
429 | 527,387.50 | 2,173,487.98 | 3,279.25
430 | 527,327.06 | 2,173,485.69 | 3,279.26
431 | 527,267.23 | 2,173,440.55 | 3,279.45
432 | 527,235.49 | 2,173,377.62 | 3,279.67
433 | 527,219.39 | 2,173,312.32 | 3,279.64
434 | 527,223.02 | 2,173,206.92 | 3,280.77
435 | 527,274.38 | 2,173,180.42 | 3,281.11
436 | 527,352.32 | 2,173,181.58 | 3,280.69
WETLAND CELL 4
3290
3285
3280
3275
3270
0
100
200
300
400
500
600
TOP OF BANK
BOTTOM ELEV. = 3,276.50
ISLAND
TOP OF BANK
MDT
MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000
PROJECT NO STPX 56(66)
SHEET 11 OF 25

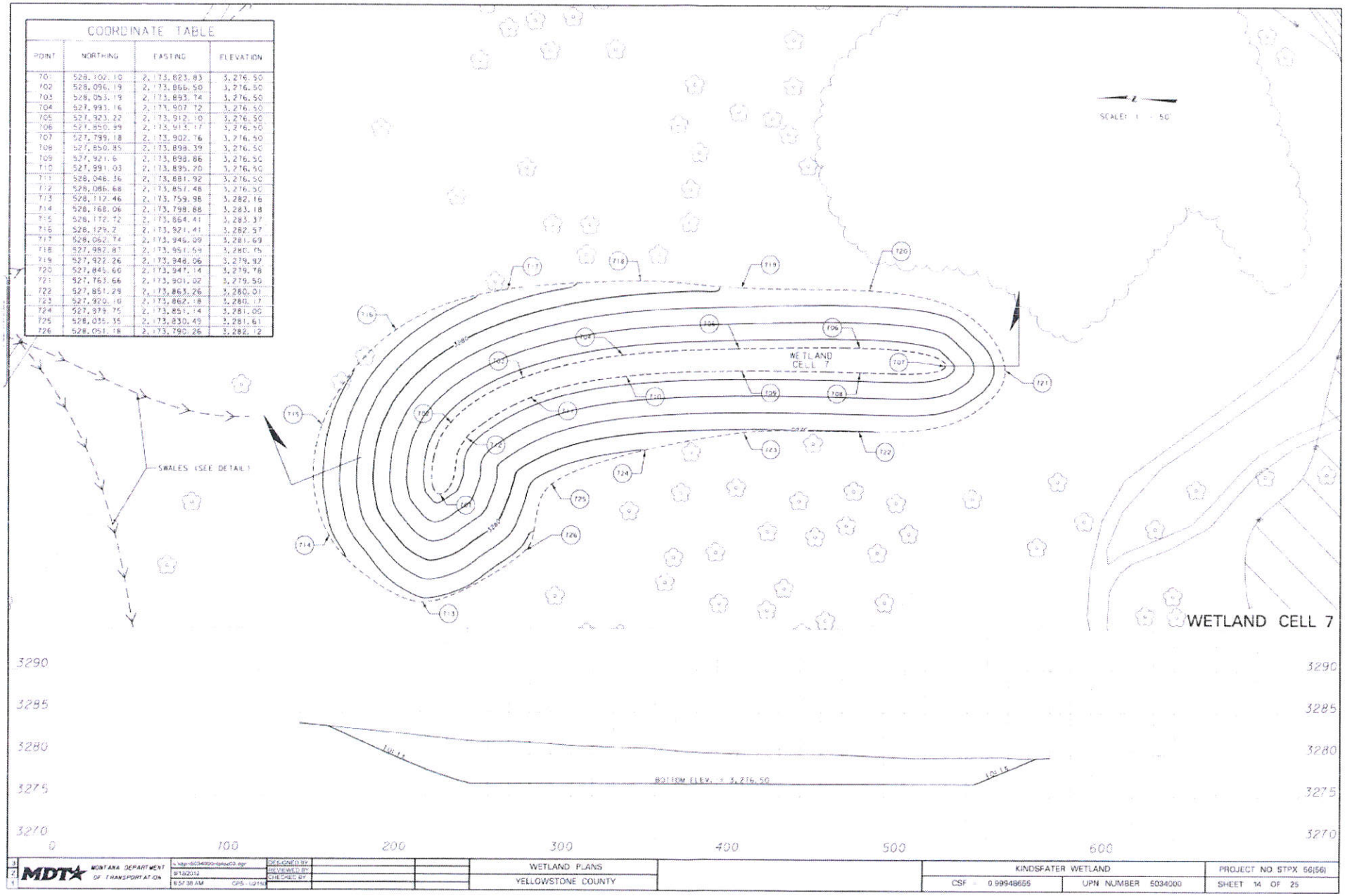

COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
501 | 527,722.93 | 2,173,433.34 | 3,276.50
502 | 527,702.13 | 2,173,550.63 | 3,276.50
503 | 527,673.38 | 2,173,642.57 | 3,276.50
504 | 527,620.34 | 2,173,557.57 | 3,276.50
505 | 527,596.10 | 2,173,523.87 | 3,276.50
506 | 527,579.13 | 2,173,480.20 | 3,276.50
507 | 527,588.17 | 2,173,431.24 | 3,276.50
508 | 527,628.60 | 2,173,457.56 | 3,276.50
509 | 527,679.14 | 2,173,456.05 | 3,276.50
510 | 527,762.44 | 2,173,412.17 | 3,281.01
511 | 527,758.86 | 2,173,484.75 | 3,280.63
512 | 527,719.27 | 2,173,540.86 | 3,280.04
513 | 527,671.30 | 2,173,585.72 | 3,279.75
514 | 527,609.06 | 2,173,586.12 | 3,279.61
515 | 527,570.72 | 2,173,543.56 | 3,279.66
516 | 527,549.94 | 2,173,490.20 | 3,279.55
517 | 527,556.15 | 2,173,412.97 | 3,280.07
518 | 527,616.28 | 2,173,367.74 | 3,280.64
519 | 527,690.17 | 2,173,364.45 | 3,280.69
SCALE: 1" = 50'
WETLAND CELL 5
WETLAND CELL 8
WETLAND CELL 5
3290
3285
3280
3275
3270
0
100
200
300
400
500
600
1Q:1H
BOTTOM ELEV. = 3,276.50
1Q:1H
MDT MONTANA DEPARTMENT OF TRANSPORTATION
9/12/2012
8:57:31 AM
DESIGNED BY
REVIEWED BY
CHECKED BY
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF - 0.99948655
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 12 OF 25



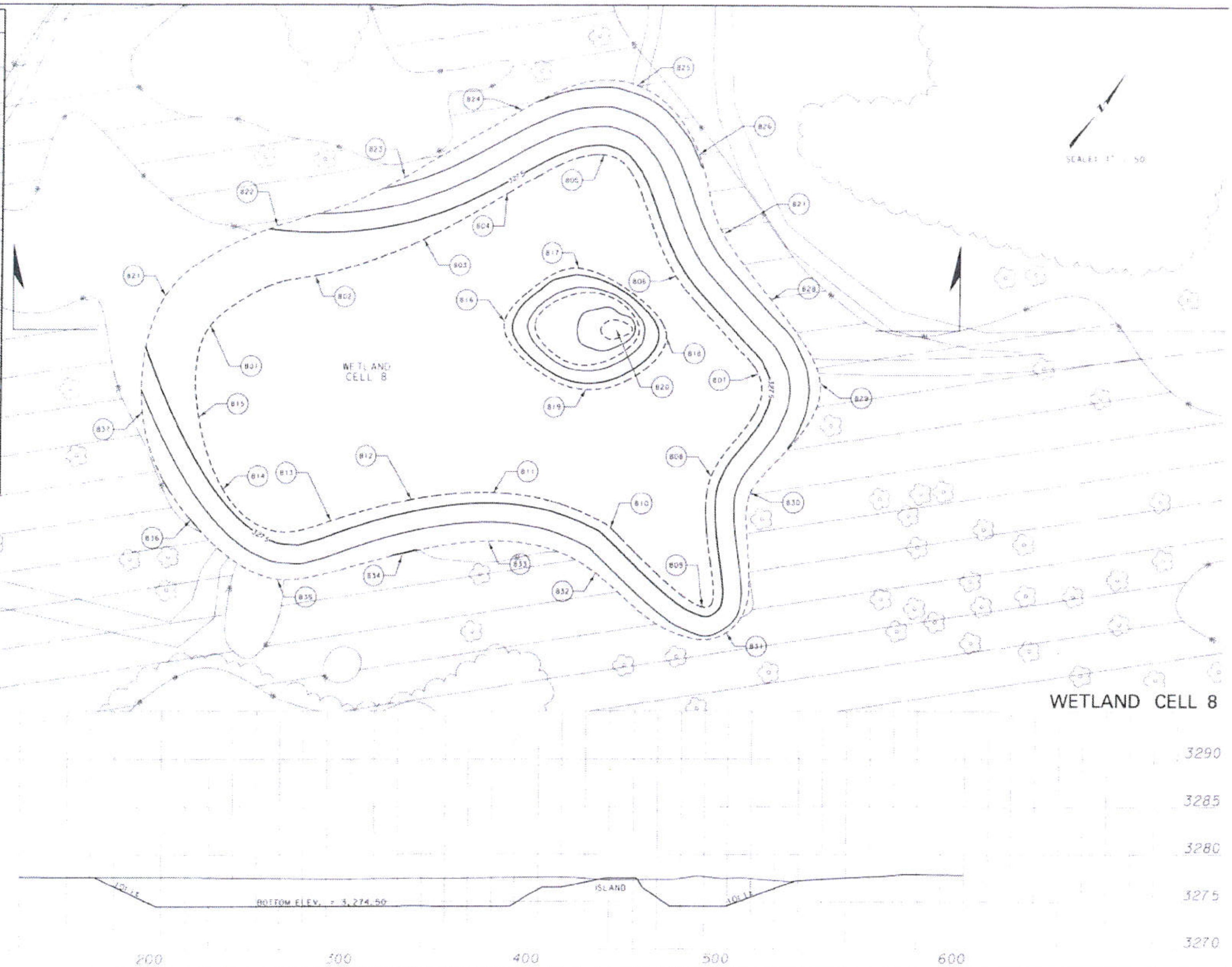
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
601	527,919.12	2,173,646.89	3,276.50
602	527,877.03	2,173,684.50	3,276.50
603	527,841.24	2,173,706.86	3,276.50
604	527,796.78	2,173,736.41	3,276.50
605	527,755.24	2,173,737.81	3,276.50
606	527,753.49	2,173,699.43	3,276.50
607	527,779.71	2,173,659.36	3,276.50
608	527,807.65	2,173,620.77	3,276.50
609	527,829.14	2,173,583.11	3,276.50
610	527,860.03	2,173,549.37	3,276.50
611	527,892.63	2,173,572.11	3,276.50
612	527,915.24	2,173,605.75	3,276.50
613	527,893.30	2,173,628.17	3,276.50
614	527,867.68	2,173,653.42	3,276.50
615	527,843.05	2,173,641.49	3,276.50
616	527,836.91	2,173,613.68	3,276.50
617	527,866.68	2,173,602.02	3,276.50
618	527,868.37	2,173,626.24	3,279.50
619	527,967.05	2,173,665.39	3,281.49
620	527,922.53	2,173,710.16	3,281.15
621	527,873.88	2,173,732.08	3,280.37
622	527,821.66	2,173,763.06	3,280.03
623	527,773.91	2,173,773.24	3,279.64
624	527,731.75	2,173,756.30	3,279.54
625	527,720.33	2,173,707.36	3,279.28
626	527,749.78	2,173,643.96	3,279.81
627	527,778.13	2,173,595.79	3,280.06
628	527,813.63	2,173,532.79	3,280.57
629	527,858.48	2,173,493.29	3,282.04
630	527,917.14	2,173,508.31	3,282.62
631	527,952.34	2,173,552.63	3,282.31
632	527,974.61	2,173,606.78	3,281.94

WETLAND CELL 6

MDT MONTANA DEPARTMENT OF TRANSPORTATION	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS YELLOWSTONE COUNTY	KINDSFATER WETLAND CSF = 0.99948655	PROJECT NO. STPX 56(56)
3/12/2012			UPN NUMBER 5034000	SHEET 13 OF 25


COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
701 | 528,102.10 | 2,173,823.83 | 3,276.50
702 | 528,096.19 | 2,173,866.50 | 3,276.50
703 | 528,053.19 | 2,173,893.74 | 3,276.50
704 | 527,993.16 | 2,173,907.72 | 3,276.50
705 | 527,923.22 | 2,173,912.10 | 3,276.50
706 | 527,850.99 | 2,173,915.17 | 3,276.50
707 | 527,799.18 | 2,173,902.76 | 3,276.50
708 | 527,850.85 | 2,173,898.39 | 3,276.50
709 | 527,921.6 | 2,173,898.86 | 3,276.50
710 | 527,991.03 | 2,173,895.20 | 3,276.50
711 | 528,048.36 | 2,173,881.92 | 3,276.50
712 | 528,086.68 | 2,173,857.48 | 3,276.50
713 | 528,112.46 | 2,173,759.98 | 3,282.16
714 | 528,168.06 | 2,173,798.88 | 3,283.18
715 | 528,172.72 | 2,173,864.41 | 3,283.37
716 | 528,129.2 | 2,173,921.41 | 3,282.57
717 | 528,062.74 | 2,173,946.09 | 3,281.69
718 | 527,982.87 | 2,173,951.59 | 3,280.75
719 | 527,922.26 | 2,173,948.06 | 3,279.92
720 | 527,845.60 | 2,173,947.14 | 3,279.78
721 | 527,763.66 | 2,173,901.02 | 3,279.50
722 | 527,851.29 | 2,173,863.26 | 3,280.01
723 | 527,920.10 | 2,173,862.18 | 3,280.17
724 | 527,979.75 | 2,173,851.14 | 3,281.00
725 | 528,035.35 | 2,173,830.49 | 3,281.61
726 | 528,051.18 | 2,173,790.26 | 3,282.12
SCALE: 1" = 50'
WETLAND CELL 7
SWALES (SEE DETAIL)
WETLAND CELL 7
3290
3285
3280
3275
3270
0
100
200
300
400
500
600
BOTTOM ELEV. = 3,276.50
MDT MONTANA DEPARTMENT OF TRANSPORTATION
9/19/2012
8:57:38 AM
DESIGNED BY
REVIEWED BY
CHECKED BY
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF 0.99948655
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 14 OF 25

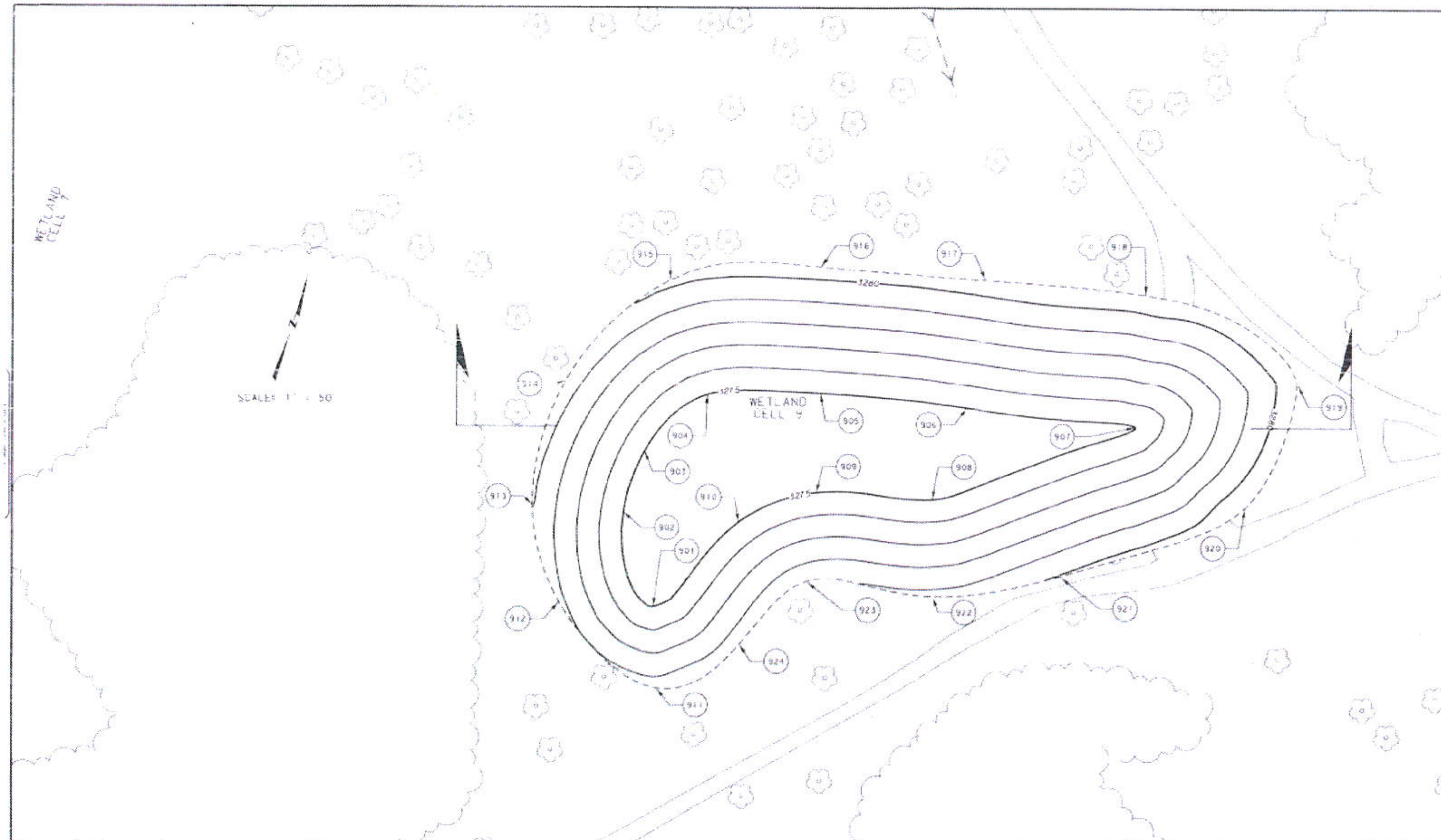
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
801	527,327.08	2,173,764.05	3,274.50
802	527,380.77	2,173,792.98	3,274.50
803	527,429.67	2,173,827.61	3,274.50
804	527,475.21	2,173,848.94	3,274.50
805	527,521.23	2,173,876.25	3,274.50
806	527,493.05	2,173,946.42	3,274.50
807	527,477.91	2,174,012.68	3,274.50
808	527,420.26	2,174,024.45	3,274.50
809	527,362.54	2,174,061.79	3,274.50
810	527,367.31	2,173,998.02	3,274.50
811	527,345.13	2,173,937.23	3,274.50
812	527,316.73	2,173,903.88	3,274.50
813	527,282.69	2,173,876.21	3,274.50
814	527,262.28	2,173,820.35	3,274.50
815	527,284.90	2,173,787.55	3,274.50
816	527,420.55	2,173,888.29	3,274.50
817	527,466.31	2,173,903.26	3,274.50
818	527,464.09	2,173,961.86	3,274.50
819	527,417.56	2,173,944.40	3,274.50
820	527,451.84	2,173,938.26	3,277.50
821	527,325.41	2,173,735.54	3,277.35
822	527,389.60	2,173,761.19	3,277.40
823	527,449.66	2,173,799.91	3,277.75
824	527,514.46	2,173,829.24	3,277.96
825	527,560.42	2,173,870.60	3,278.21
826	527,551.33	2,173,918.28	3,278.13
827	527,525.70	2,173,954.02	3,277.74
828	527,513.33	2,173,995.15	3,277.56
829	527,493.40	2,174,042.15	3,277.59
830	527,425.93	2,174,046.70	3,276.71
831	527,359.07	2,174,080.67	3,276.23
832	527,343.36	2,174,006.22	3,276.69
833	527,323.64	2,173,950.15	3,277.00
834	527,291.13	2,173,916.98	3,277.00
835	527,241.74	2,173,871.93	3,276.90
836	527,239.43	2,173,816.23	3,276.80
837	527,269.72	2,173,762.08	3,277.40



WETLAND CELL 8

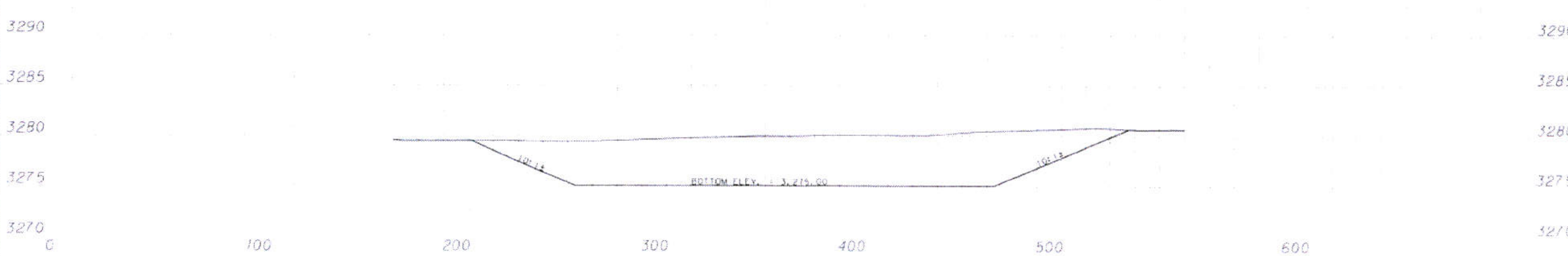
MDT MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND PLANS	KINDSFATER WETLAND		PROJECT NO. STPX 56(56)
YELLOWSTONE COUNTY	CSF = 0.99948655	UPN NUMBER 5034000	SHEET 15 OF 25



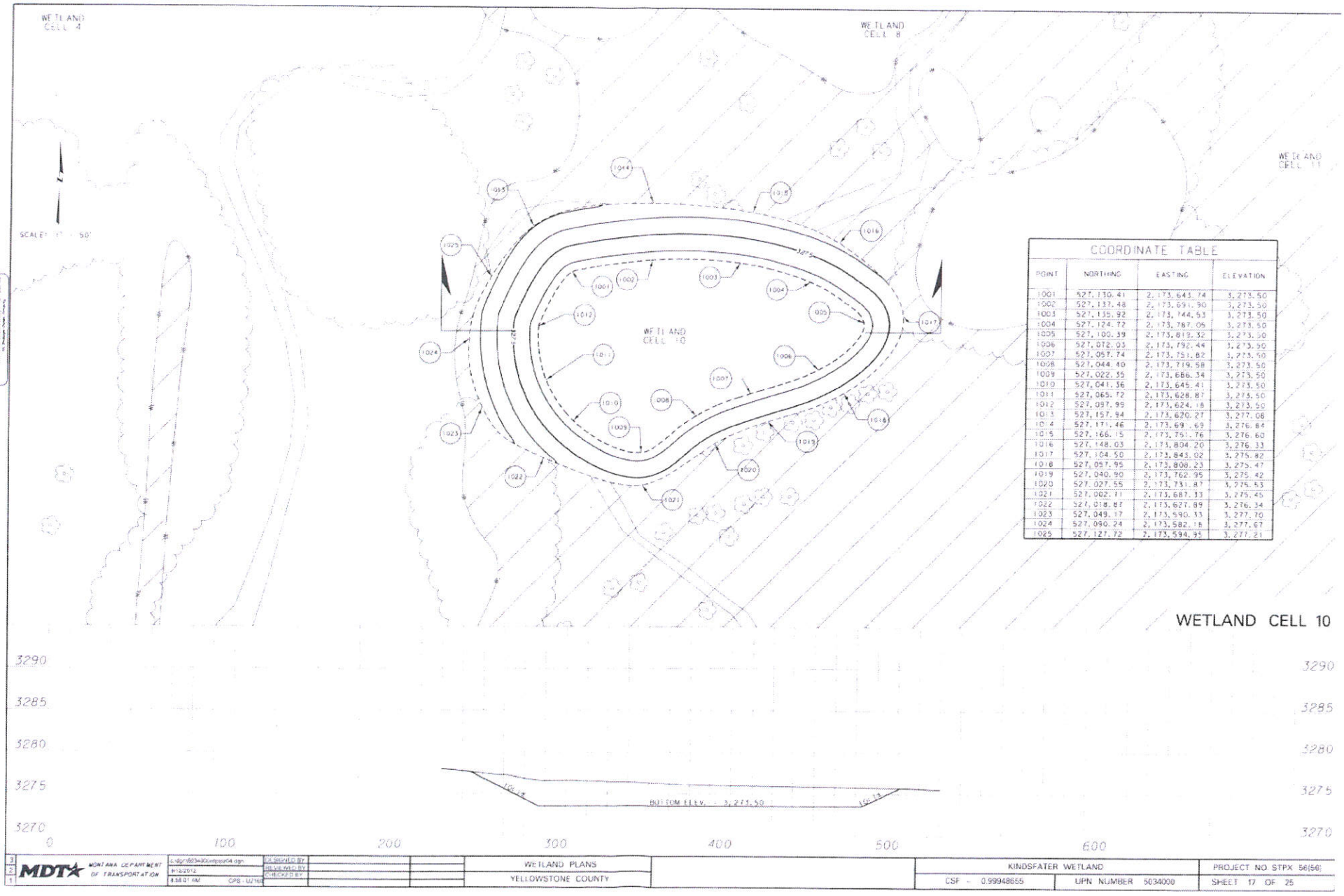
COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
901	527,769.52	2,174,212.42	3,275.00
902	527,806.05	2,174,187.48	3,275.00
903	527,834.60	2,174,188.67	3,275.00
904	527,866.90	2,174,208.15	3,275.00
905	527,882.20	2,174,256.52	3,275.00
906	527,895.25	2,174,320.95	3,275.00
907	527,909.16	2,174,395.63	3,275.00
908	527,851.75	2,174,318.00	3,275.00
909	527,835.47	2,174,261.56	3,275.00
910	527,816.78	2,174,238.07	3,275.00
911	527,735.43	2,174,224.56	3,278.51
912	527,759.15	2,174,171.66	3,278.29
913	527,791.42	2,174,147.58	3,279.05
914	527,854.26	2,174,145.71	3,279.61
915	527,910.34	2,174,177.56	3,280.33
916	527,935.72	2,174,240.64	3,280.53
917	527,951.74	2,174,312.44	3,280.71
918	527,966.41	2,174,383.04	3,280.60
919	527,948.46	2,174,459.94	3,280.78
920	527,889.14	2,174,453.36	3,280.74
921	527,835.81	2,174,383.59	3,280.10
922	527,810.30	2,174,331.06	3,279.36
923	527,800.30	2,174,275.12	3,278.77
924	527,764.82	2,174,254.30	3,278.57

WETLAND CELL 9



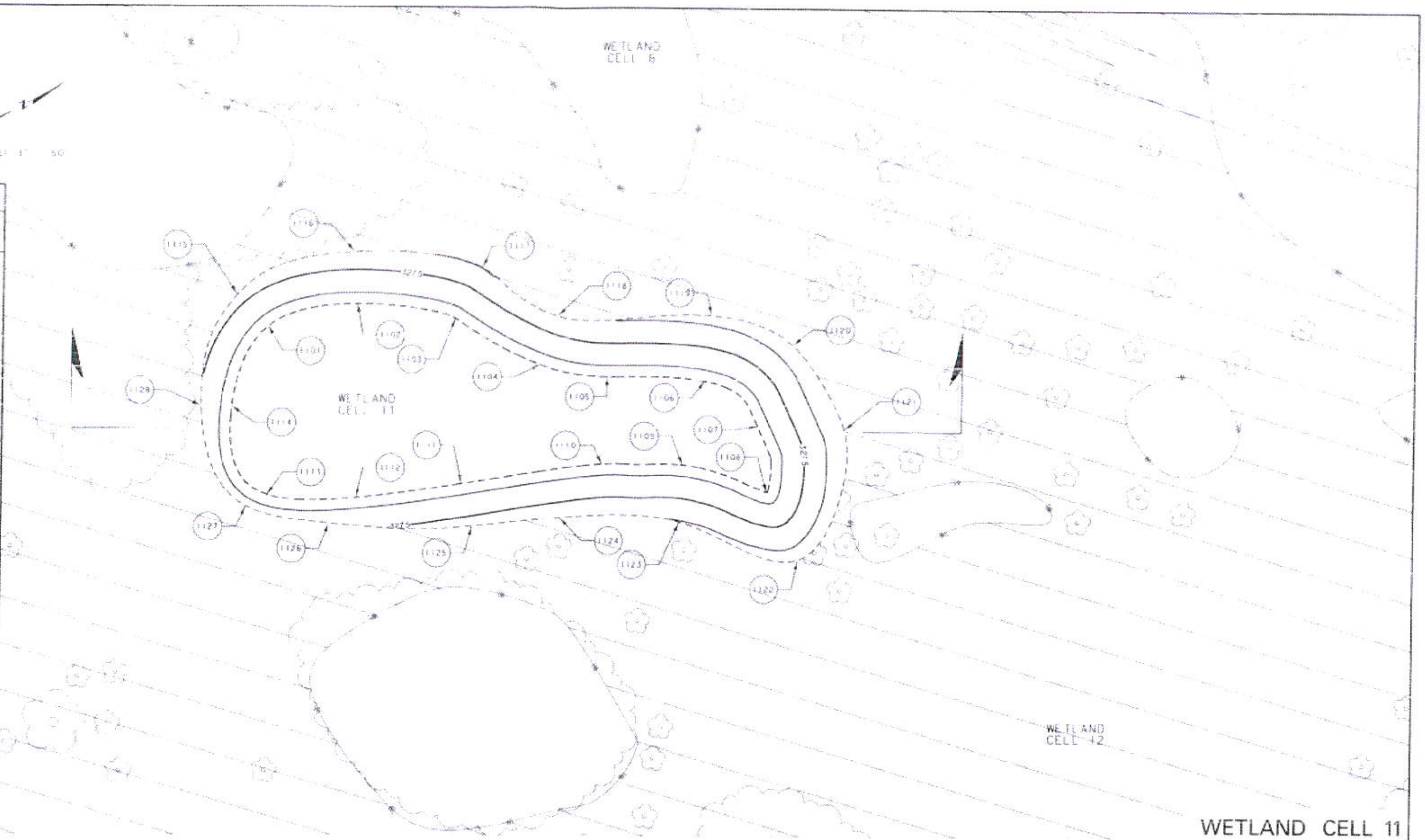
MDT MONTANA DEPARTMENT OF TRANSPORTATION	WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(58)
	YELLOWSTONE COUNTY	CSF = 0.99948655 / UPN NUMBER 5034000	SHEET 16 OF 25

DESIGNED BY / REVIEWED BY / CHECKED BY
9/12/2012

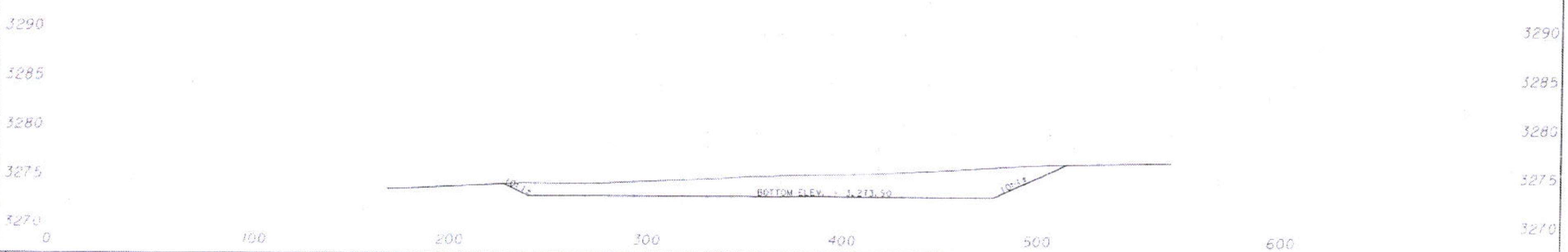

WETLAND CELL 4
WETLAND CELL 8
WETLAND CELL 11
WETLAND CELL 10
SCALE: 1" = 50'
MORRISON MAIERLE, INC.
COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
1001 | 527,130.41 | 2,173,643.74 | 3,273.50
1002 | 527,137.48 | 2,173,691.90 | 3,273.50
1003 | 527,135.92 | 2,173,744.53 | 3,273.50
1004 | 527,124.72 | 2,173,787.05 | 3,273.50
1005 | 527,100.39 | 2,173,813.32 | 3,273.50
1006 | 527,072.03 | 2,173,792.44 | 3,273.50
1007 | 527,057.74 | 2,173,751.82 | 3,273.50
1008 | 527,044.40 | 2,173,719.58 | 3,273.50
1009 | 527,022.35 | 2,173,686.34 | 3,273.50
1010 | 527,041.36 | 2,173,645.41 | 3,273.50
1011 | 527,065.72 | 2,173,628.87 | 3,273.50
1012 | 527,097.99 | 2,173,624.18 | 3,273.50
1013 | 527,157.94 | 2,173,620.27 | 3,277.08
1014 | 527,171.46 | 2,173,691.69 | 3,276.84
1015 | 527,166.15 | 2,173,751.76 | 3,276.60
1016 | 527,148.03 | 2,173,804.20 | 3,276.33
1017 | 527,104.50 | 2,173,843.02 | 3,275.82
1018 | 527,057.95 | 2,173,808.23 | 3,275.47
1019 | 527,040.90 | 2,173,762.95 | 3,275.42
1020 | 527,027.55 | 2,173,731.87 | 3,275.53
1021 | 527,002.71 | 2,173,687.33 | 3,275.45
1022 | 527,018.81 | 2,173,627.89 | 3,276.34
1023 | 527,049.17 | 2,173,590.33 | 3,277.70
1024 | 527,090.24 | 2,173,582.18 | 3,277.67
1025 | 527,127.72 | 2,173,594.95 | 3,277.21
BOTTOM ELEV. = 3,273.50
3290
3285
3280
3275
3270
0
100
200
300
400
500
600
MDT MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF - 0.99948655
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 17 OF 25

COORDINATE TABLE

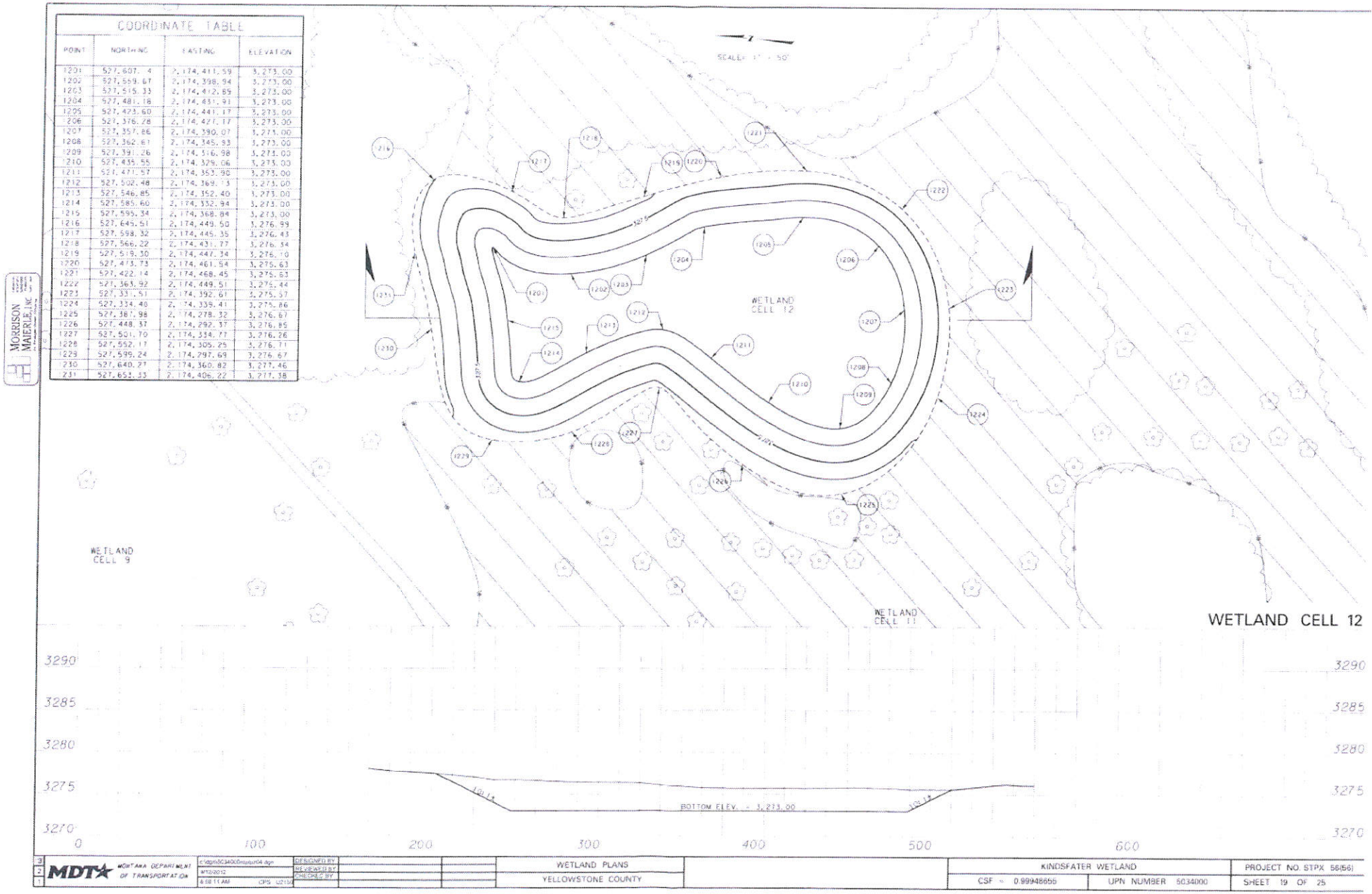
POINT	NORTHING	EASTING	ELEVATION
1101	527,187.29	2,174,050.10	3,273.50
1102	527,227.32	2,174,060.18	3,273.50
1103	527,263.14	2,174,086.79	3,273.50
1104	527,286.77	2,174,122.81	3,273.50
1105	527,310.86	2,174,141.85	3,273.50
1106	527,348.73	2,174,164.38	3,273.50
1107	527,360.41	2,174,193.62	3,273.50
1108	527,350.13	2,174,221.67	3,273.50
1109	527,322.32	2,174,192.81	3,273.50
1110	527,290.45	2,174,175.29	3,273.50
1111	527,230.88	2,174,153.41	3,273.50
1112	527,186.34	2,174,136.54	3,273.50
1113	527,151.72	2,174,116.47	3,273.50
1114	527,156.37	2,174,074.04	3,273.50
1115	527,182.00	2,174,031.03	3,275.47
1116	527,236.68	2,174,038.74	3,275.81
1117	527,284.29	2,174,072.35	3,276.06
1118	527,304.16	2,174,107.41	3,275.82
1119	527,365.1	2,174,139.85	3,276.39
1120	527,391.47	2,174,169.41	3,276.70
1121	527,394.29	2,174,213.37	3,276.94
1122	527,348.00	2,174,255.45	3,276.55
1123	527,308.90	2,174,215.45	3,276.07
1124	527,262.93	2,174,187.76	3,275.61
1125	527,226.08	2,174,172.93	3,275.46
1126	527,169.83	2,174,141.04	3,274.59
1127	527,140.80	2,174,118.76	3,274.38
1128	527,144.37	2,174,067.35	3,274.83

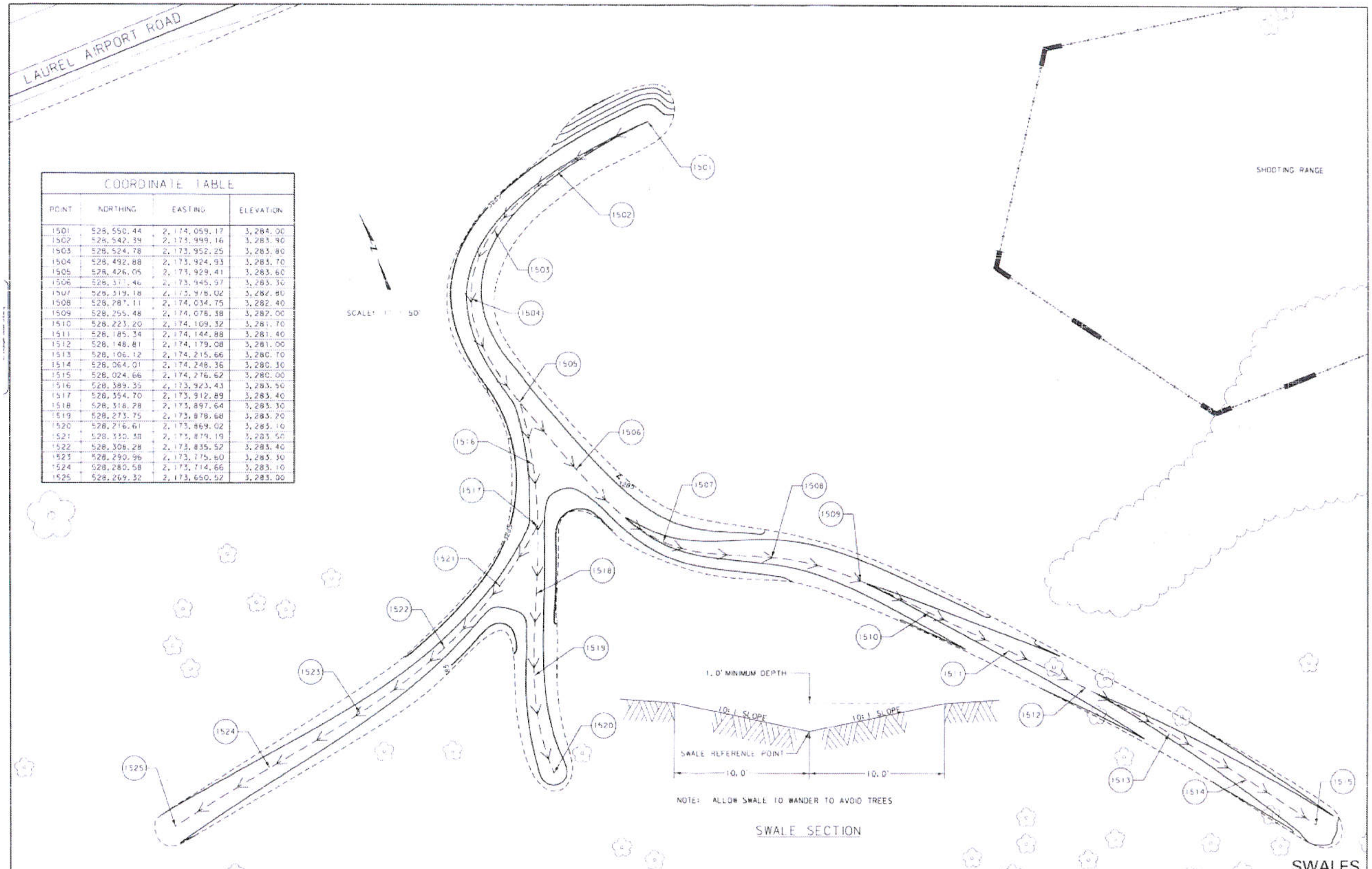


WETLAND CELL 11



MDT MONTANA DEPARTMENT OF TRANSPORTATION	WETLAND PLANS	KINDSFATER WETLAND	PROJECT NO. STPX 56(56)
9/12/2012 8:58:08 AM	YELLOWSTONE COUNTY	CSF = 0.99948655 / UPN NUMBER 5034000	SHEET 18 OF 25


COORDINATE TABLE
POINT | NORTHING | EASTING | ELEVATION
1201 | 527,607.4 | 2,174,411.59 | 3,273.00
1202 | 527,559.67 | 2,174,398.94 | 3,273.00
1203 | 527,515.33 | 2,174,412.85 | 3,273.00
1204 | 527,481.18 | 2,174,431.91 | 3,273.00
1205 | 527,423.60 | 2,174,441.17 | 3,273.00
1206 | 527,376.28 | 2,174,427.17 | 3,273.00
1207 | 527,357.86 | 2,174,390.07 | 3,273.00
1208 | 527,362.61 | 2,174,345.93 | 3,273.00
1209 | 527,391.26 | 2,174,316.98 | 3,273.00
1210 | 527,439.55 | 2,174,329.06 | 3,273.00
1211 | 527,471.57 | 2,174,353.96 | 3,273.00
1212 | 527,502.48 | 2,174,369.13 | 3,273.00
1213 | 527,546.85 | 2,174,352.40 | 3,273.00
1214 | 527,585.60 | 2,174,332.94 | 3,273.00
1215 | 527,595.34 | 2,174,368.84 | 3,273.00
1216 | 527,645.51 | 2,174,449.50 | 3,276.99
1217 | 527,598.32 | 2,174,445.35 | 3,276.43
1218 | 527,566.22 | 2,174,431.77 | 3,276.34
1219 | 527,519.30 | 2,174,447.34 | 3,276.10
1220 | 527,473.73 | 2,174,461.54 | 3,276.63
1221 | 527,422.14 | 2,174,468.45 | 3,276.83
1222 | 527,363.92 | 2,174,449.51 | 3,276.44
1223 | 527,331.51 | 2,174,392.61 | 3,275.57
1224 | 527,334.48 | 2,174,339.41 | 3,275.86
1225 | 527,387.98 | 2,174,278.32 | 3,276.67
1226 | 527,448.37 | 2,174,292.37 | 3,276.85
1227 | 527,501.70 | 2,174,334.77 | 3,276.26
1228 | 527,552.17 | 2,174,305.25 | 3,276.71
1229 | 527,599.24 | 2,174,297.69 | 3,276.67
230 | 527,640.27 | 2,174,360.82 | 3,277.46
231 | 527,652.33 | 2,174,406.22 | 3,277.38
SCALE: 1" = 50'
WETLAND CELL 12
WETLAND CELL 9
WETLAND CELL 11
WETLAND CELL 12
3290
3285
3280
3275
3270
10:1
10:1
BOTTOM ELEV. = 3,273.00
0
100
200
300
400
500
600
MORRISON MAIERLE, INC.
MDT
MONTANA DEPARTMENT OF TRANSPORTATION
DESIGNED BY
DRAWN BY
CHECKED BY
WETLAND PLANS
YELLOWSTONE COUNTY
KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000
PROJECT NO. STPX 56(56)
SHEET 19 OF 25



COORDINATE TABLE

POINT	NORTHING	EASTING	ELEVATION
1501	528,550.44	2,174,059.17	3,284.00
1502	528,542.39	2,173,999.16	3,283.90
1503	528,524.78	2,173,952.25	3,283.80
1504	528,492.88	2,173,924.93	3,283.70
1505	528,426.05	2,173,929.41	3,283.60
1506	528,377.46	2,173,945.97	3,283.30
1507	528,319.18	2,173,978.02	3,282.80
1508	528,287.11	2,174,034.75	3,282.40
1509	528,255.48	2,174,078.38	3,282.00
1510	528,223.20	2,174,109.32	3,281.70
1511	528,185.34	2,174,144.88	3,281.40
1512	528,148.81	2,174,179.08	3,281.00
1513	528,106.12	2,174,215.66	3,280.70
1514	528,064.01	2,174,248.36	3,280.30
1515	528,024.66	2,174,276.62	3,280.00
1516	528,389.35	2,173,923.43	3,283.50
1517	528,354.70	2,173,912.89	3,283.40
1518	528,318.28	2,173,897.64	3,283.30
1519	528,273.75	2,173,878.68	3,283.20
1520	528,216.61	2,173,869.02	3,283.10
1521	528,330.38	2,173,879.19	3,283.50
1522	528,308.28	2,173,835.52	3,283.40
1523	528,290.96	2,173,775.60	3,283.30
1524	528,280.58	2,173,714.66	3,283.10
1525	528,269.32	2,173,650.52	3,283.00

SWALES

MDT MONTANA DEPARTMENT OF TRANSPORTATION

9/12/2012
8:58:23 AM

DESIGNED BY
REVIEWED BY
CHECKED BY

WETLAND PLANS
YELLOWSTONE COUNTY

KINDSFATER WETLAND
CSF = 0.99948655
UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 20 OF 25

ADDITIVE ALTERNATE
TABLE OF CONTENTS

MORRISON MAIERLE, INC.

MDT MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND PLANS
YELLOWSTONE COUNTY

KINDSFATER WETLAND
CSF - 0.99948655 | UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 21 OF 25

SUMMARY

GRADING				
STATION	cubic yards*			REMARKS
	UNCL EXC	UNCL BORROW	EMB	
	297,200			GRADING AREA
	5,665			WETLAND CELL 13
	7,505			WETLAND CELL 14
TOTAL	310,370			

* QUANTITIES SHOWN ARE IN-PLACE. NO SHRINK/SWELL FACTORS HAVE BEEN APPLIED

CONSTRUCTION SURVEY & LAYOUT			
STATION		lump sum	REMARKS
FROM	TO		
		1.0	ADDITIVE ALTERNATE SURVEY
TOTAL		1.0	

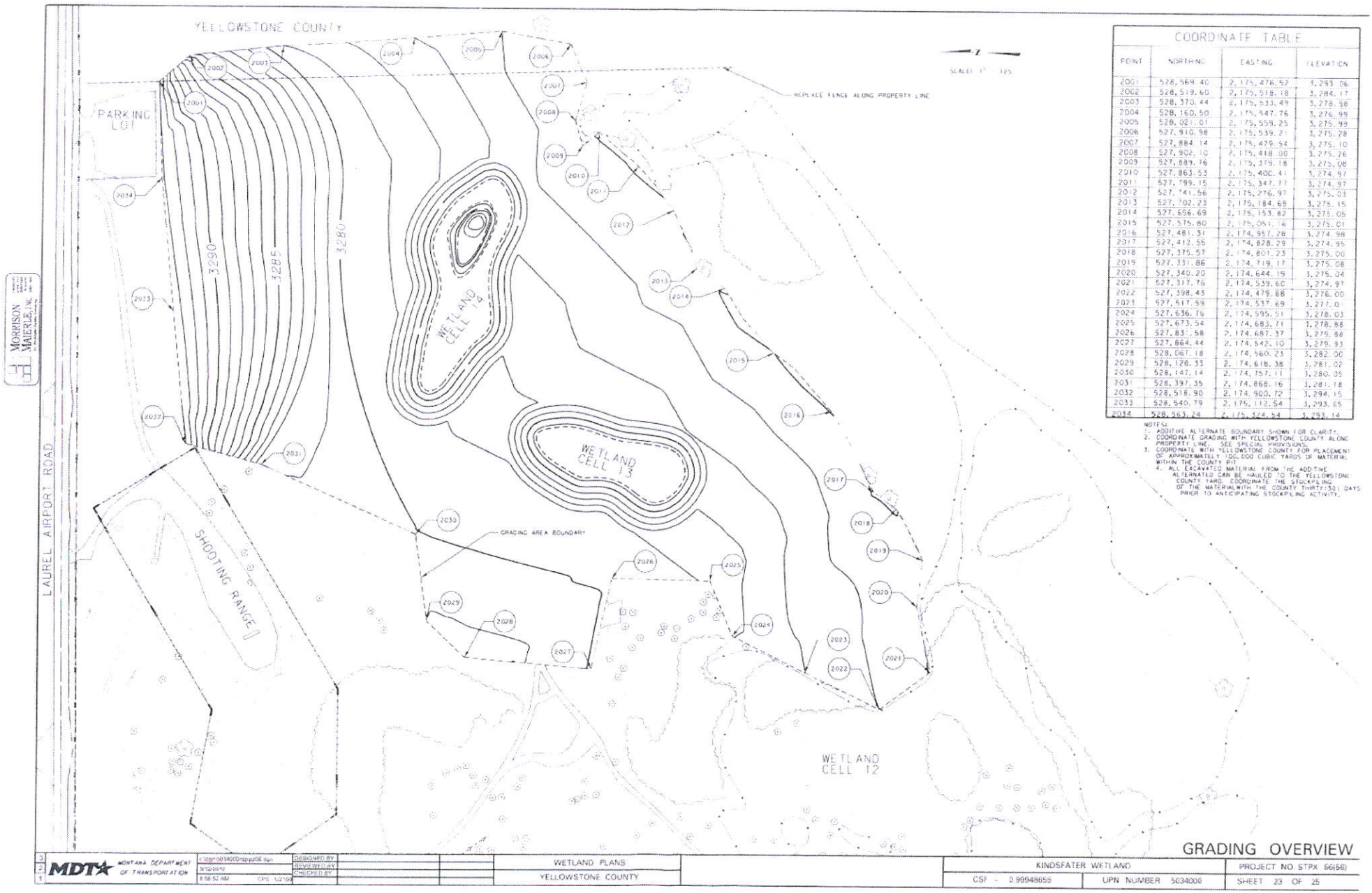
REVEGETATION						
STATION	cubic yards		acres			lump sum	REMARKS
	WETLAND SOIL SALVAGE	TOPSOIL SALVAGING & PLACING	WETLAND SEEDING		CONDITION SEEDBED	TREE & SHRUB PLANTING	
			WETLAND	UPLAND			
						1.0	ADDITIVE ALTERNATE AREA
		7,525	15.9		15.9		GRADING AREA
			1.2		1.2		WETLAND CELL 13
			1.6		1.6		WETLAND CELL 14
TOTAL		7,525	18.7		18.7	1.0*	

* SEE SHEET 5

FENCING													
STATION	linear feet				each				linear feet				REMARKS
	CHAIN LINK FENCE			WILDLIFE FRIENDLY FENCE (TYPE 1-FM)*	CHAIN LINK PANEL		WILDLIFE FRIENDLY FENCE PANEL		REMOVE FENCE**	CHAIN LINK GATE		FARM GATE METAL TYPE G 3	
	4.0'	5.0'	6.0'		SINGLE	DOUBLE	SINGLE	DOUBLE		SINGLE	DOUBLE		
									498				
				99			2	2	1,064				EAST BOUNDARY
TOTAL				99			2	2					

* SMOOTH WIRE
** FOR INFORMATION ONLY

MDT MONTANA DEPARTMENT OF TRANSPORTATION	c:\dgn\5034000\rdsumz01.dgn 9/12/2012 8:54:38 AM CPS - U2160	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS / YELLOWSTONE COUNTY	KINDSFATER WETLAND / CSF = 0.99948655 / UPN NUMBER 5034000	PROJECT NO. STPX 56(56) / SHEET 22 OF 25



COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
2001	528,569.40	2,175,476.52	3,293.06
2002	528,519.60	2,175,518.18	3,284.17
2003	528,370.44	2,175,533.49	3,278.98
2004	528,160.50	2,175,547.76	3,276.99
2005	528,021.01	2,175,559.25	3,275.99
2006	527,910.98	2,175,539.21	3,275.28
2007	527,884.14	2,175,479.54	3,275.10
2008	527,902.10	2,175,418.00	3,275.26
2009	527,889.76	2,175,379.18	3,275.08
2010	527,863.53	2,175,400.41	3,274.97
2011	527,799.15	2,175,347.77	3,274.97
2012	527,741.56	2,175,276.97	3,275.03
2013	527,702.23	2,175,184.69	3,275.15
2014	527,656.69	2,175,153.82	3,275.06
2015	527,575.80	2,175,051.16	3,275.01
2016	527,481.31	2,174,957.28	3,274.98
2017	527,412.55	2,174,828.29	3,274.95
2018	527,375.57	2,174,801.23	3,275.00
2019	527,331.86	2,174,719.17	3,275.08
2020	527,340.20	2,174,644.19	3,275.04
2021	527,317.76	2,174,539.60	3,274.97
2022	527,398.43	2,174,479.88	3,276.00
2023	527,517.59	2,174,537.69	3,277.01
2024	527,636.76	2,174,595.51	3,278.03
2025	527,673.54	2,174,683.71	3,278.88
2026	527,831.58	2,174,687.37	3,279.88
2027	527,864.44	2,174,542.10	3,279.93
2028	528,067.18	2,174,560.23	3,282.00
2029	528,128.33	2,174,618.38	3,281.02
2030	528,147.14	2,174,757.11	3,280.05
2031	528,397.35	2,174,868.16	3,281.18
2032	528,518.90	2,174,900.72	3,294.15
2033	528,540.79	2,175,112.54	3,293.65
2034	528,563.24	2,175,324.54	3,293.14

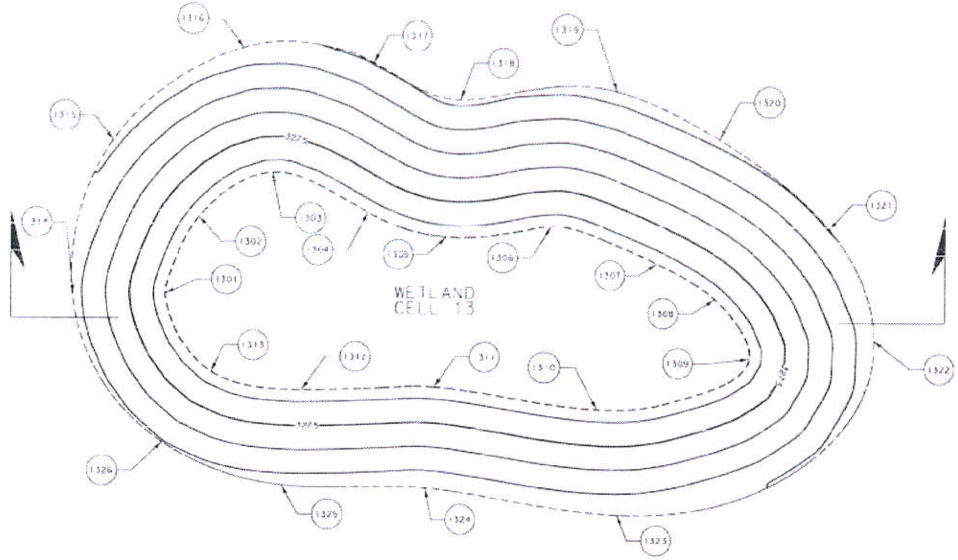
NOTES:
1. ADDITIVE ALTERNATE BOUNDARY SHOWN FOR CLARITY.
2. COORDINATE GRADING WITH YELLOWSTONE COUNTY ALONG PROPERTY LINE. SEE SPECIAL PROVISIONS.
3. COORDINATE WITH YELLOWSTONE COUNTY FOR PLACEMENT OF APPROXIMATELY 100,000 CUBIC YARDS OF MATERIAL WITHIN THE COUNTY PIT.
4. ALL EXCAVATED MATERIAL FROM THE ADDITIVE ALTERNATE CAN BE HAULED TO THE YELLOWSTONE COUNTY YARD. COORDINATE THE STOCKPILING OF THE MATERIAL WITH THE COUNTY THIRTY (30) DAYS PRIOR TO ANTICIPATING STOCKPILING ACTIVITY.

GRADING OVERVIEW

MDT MONTANA DEPARTMENT OF TRANSPORTATION

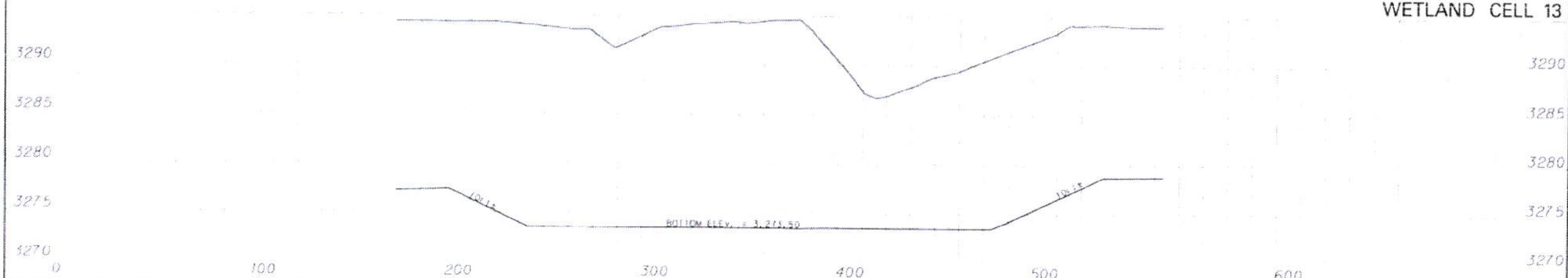
DESIGNED BY		WETLAND PLANS	KINDSFATER WETLAND
REVIEWED BY		YELLOWSTONE COUNTY	CSF - 0.99948655 UPN NUMBER 5034000
CHECKED BY			PROJECT NO. STPX 56(56)
			SHEET 23 OF 25

COORDINATE TABLE			
POINT	NORTHING	EASTING	ELEVATION
1301	527,715.96	2,174,853.61	3,273.50
1302	527,734.74	2,174,823.80	3,273.50
1303	527,767.93	2,174,810.00	3,273.50
1304	527,804.84	2,174,832.35	3,273.50
1305	527,836.29	2,174,847.47	3,273.50
1306	527,880.54	2,174,849.37	3,273.50
1307	527,921.93	2,174,871.47	3,273.50
1308	527,943.98	2,174,890.18	3,273.50
1309	527,954.59	2,174,917.06	3,273.50
1310	527,887.71	2,174,928.58	3,273.50
1311	527,821.75	2,174,909.08	3,273.50
1312	527,766.30	2,174,902.04	3,273.50
1313	527,730.13	2,174,889.06	3,273.50
1314	527,677.68	2,174,848.35	3,277.37
1315	527,703.86	2,174,786.87	3,278.17
1316	527,763.87	2,174,757.32	3,278.75
1317	527,816.54	2,174,771.33	3,279.06
1318	527,851.11	2,174,79 .97	3,279.08
1319	527,916.26	2,174,798.38	3,279.29
1320	527,955.68	2,174,824.48	3,279.24
1321	527,995.56	2,174,868.38	3,278.99
1322	528,007.63	2,174,917.11	3,278.67
1323	527,889.35	2,174,973.03	3,277.71
1324	527,811.71	2,174,949.88	3,277.58
1325	527,751.92	2,174,939.81	3,277.32
1326	527,705.51	2,174,914.87	3,277.04



WETLAND CELL 14

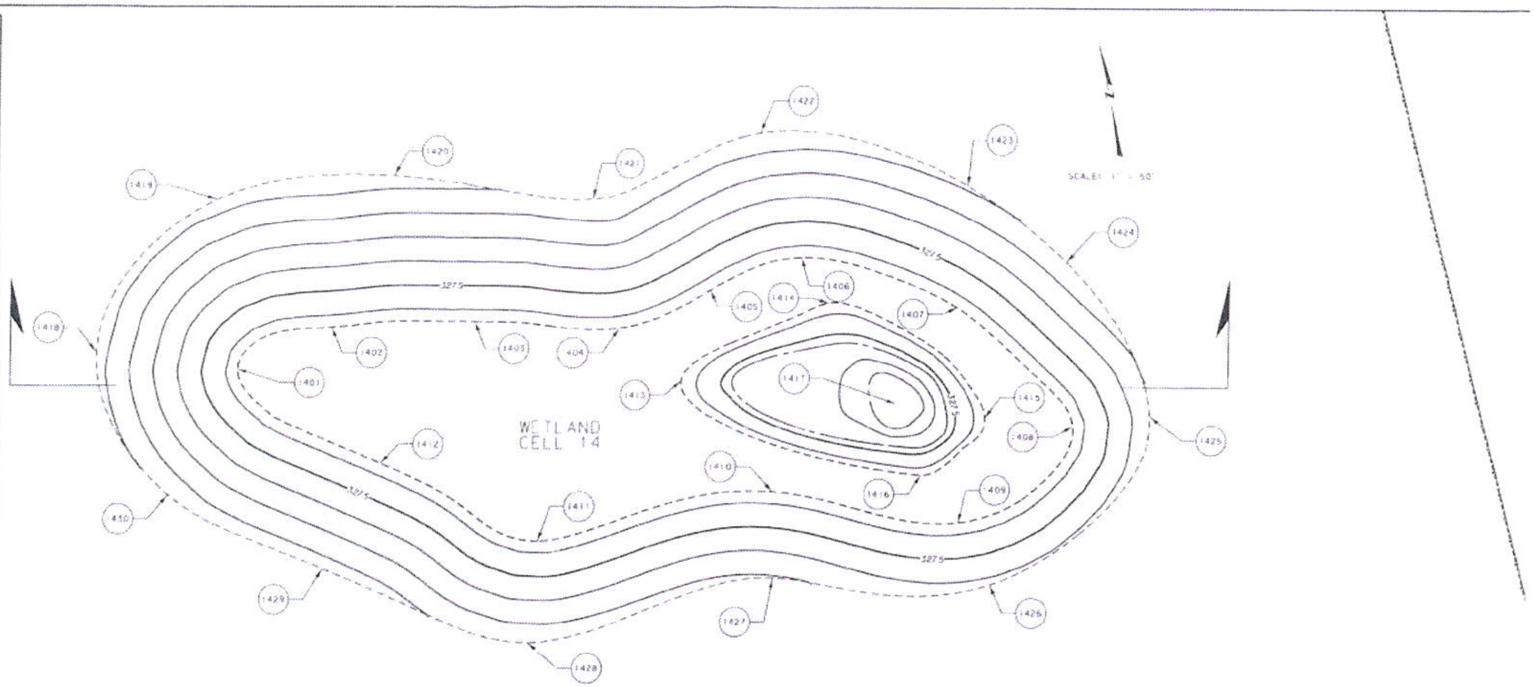
WETLAND CELL 13



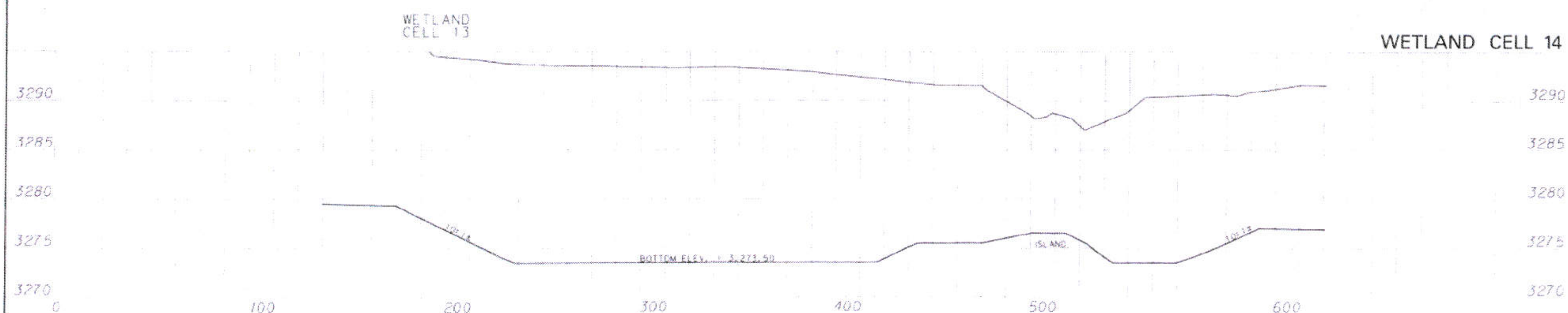
MDT MONTANA DEPARTMENT OF TRANSPORTATION	9/12/2012	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS / YELLOWSTONE COUNTY	KINDSFATER WETLAND / CSF = 0.99948655 / UPN NUMBER 5034000	PROJECT NO. STPX 56(56) / SHEET 24 OF 25

COORDINATE TABLE

POINT	NORTHING	EASTING	ELEVATION
1401	528,131.33	2,174,987.50	3,273.50
1402	528,139.49	2,175,030.04	3,273.50
1403	528,128.65	2,175,089.12	3,273.50
1404	528,112.51	2,175,147.65	3,273.50
1405	528,119.43	2,175,188.90	3,273.50
1406	528,124.46	2,175,229.14	3,273.50
1407	528,089.69	2,175,288.30	3,273.50
1408	528,030.39	2,175,325.76	3,273.50
1409	528,001.48	2,175,269.95	3,273.50
1410	528,031.35	2,175,196.45	3,273.50
1411	528,032.78	2,175,095.48	3,273.50
1412	528,079.39	2,175,038.10	3,273.50
1413	528,085.41	2,175,168.90	3,273.50
1414	528,103.44	2,175,236.16	3,273.50
1415	528,042.05	2,175,290.35	3,273.50
1416	528,024.48	2,175,258.76	3,273.50
1417	528,056.13	2,175,255.20	3,276.50
1418	528,151.51	2,174,930.71	3,279.43
1419	528,202.14	2,174,993.58	3,279.61
1420	528,195.35	2,175,068.75	3,279.41
1421	528,167.63	2,175,148.06	3,278.76
1422	528,178.98	2,175,223.17	3,278.78
1423	528,138.16	2,175,303.63	3,278.20
1424	528,098.17	2,175,337.60	3,277.75
1425	528,027.04	2,175,358.38	3,276.75
1426	527,972.75	2,175,277.66	3,276.34
1427	527,995.60	2,175,188.97	3,277.12
1428	527,991.57	2,175,082.36	3,277.74
1429	528,041.47	2,175,004.53	3,278.35
1430	528,086.21	2,174,947.68	3,278.88



WETLAND CELL 14



MDT MONTANA DEPARTMENT OF TRANSPORTATION	DESIGNED BY / REVIEWED BY / CHECKED BY	WETLAND PLANS	KINDSFATER WETLAND
6/12/2012		YELLOWSTONE COUNTY	CSF = 0.99948655 · UPN NUMBER 5034000

PROJECT NO. STPX 56(56)
SHEET 25 OF 25