Montana Department of Transportation Wetland Mitigation Monitoring Report

JTX – TUNNICLIFF RANCH MITIGATION SITE

Project Overview

MDT Project Number: STPX-STWD (056) UPN# 7286

Watershed: Watershed #14 – Middle Yellowstone

Monitoring Year: 2022

Years Monitored: 7th year of monitoring

Corps Permit Number: NWO-2010-01938-MTH

Monitoring Conducted By: Confluence Consulting Inc

Dates Monitoring Was Conducted: June 15-17, 2022

Purpose of the Approved Project:

The site was constructed to provide 29.63 acres of compensatory wetland mitigation credits for wetland impacts associated with future transportation project-related projects in Watershed #14 – Middle Yellowstone. Construction consisted of excavating a series of 13 cells ranging in size from 0.33 to 1.50 acres. Eight woody planting enclosures, with 1,650 containerized woody plantings, were constructed around the periphery of excavated cells to establish scrub/shrub wetland and riparian habitat.

Site Location:

Latitude: 45.83953 **Longitude:** - 107.59887

County: Big Horn **Nearest Town:** Hardin, MT

Map Included: Figure 1 on page #8.

Mitigation Site Construction Started: Fall/2015 **Construction Ended:** Winter/2016

Dates of Any Recent Corrective or Maintenance Activities (since previous report):

Activity: None **Date:** N/A

Specific recommendations for any additional corrective actions: MDT will continue to work with the landowner, Montana Fish, Wildlife and Parks (MFWP) on weed control so that noxious weed cover remains below the 5% threshold. Four enclosure fences need repair. Three fences were damaged in the lightning-sparked fire that occurred in July 2020 and another fence has a hole and is sagging (See Figure A-3). MDT could consider adaptive management to meet the woody plant performance standard. Two of the bird boxes are no longer present at the site and MDT may want to replace them.

Anticipated Wetland Credit Acres: 29.63

Wetland Credit Acres Generated to Date: 15.78

Previous Monitoring Reports:
https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml

Monitoring Period: 5 years from construction completion or until concurrence by the US Army Corps of Engineers (USACE).

Requirements (from approved mitigation plan, banking instrument, or Department of Army (DA) permit conditions)

Performance Standards: A summary of performance standards established for the JTX – Tunnicliff Ranch site and whether they are being achieved is provided in Table 1.

Table 1. Summary of Performance Standards

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Wetland Characteristics	The three parameter criteria for hydrology, vegetation, and soils are met as outlined in the 1987 Wetland Manual and 2010 Great Plains Regional Supplement.	Y	All 13 excavated cells contain wetlands and meet the wetland hydrology, vegetation, and soil requirements. Wetlands had developed across 11.24 acres of the site in 2022.
Wetland Hydrology	Soil saturation is present for at least 12.5 percent of the growing season.	Y	All 13 excavated cells were saturated near the surface and some contained standing water during the 2022 monitoring event.
Hydric Soil	Hydric soil conditions are present or appear to be forming.	Y	All excavated cells within the mitigation site exhibit hydric soil indicators (e.g., sulfidic odor, depleted matrix, redox dark surface).
	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	Vegetative cover was estimated as 85% across disturbed upland areas and 70-90% across various wetland areas in 2022. Soils on the site are supporting plant cover.
Hydrophytic Vegetation	Wetland plant communities are delineated as hydrophytic by using technical guidelines.	Y	All 13 excavated cells had developed wetland plant communities as of the 2022 monitoring event.
	Noxious weeds do not exceed 5 percent cover.	Y	Noxious weeds were identified in eleven upland locations across the site and noxious weed cover was estimated at 4% in 2022. No noxious weeds were detected within the wetland vegetation communities.
	Hydrophytic vegetation success will include achieving a minimum overall vegetation cover of 70 percent in created wetland areas within 5 years after site construction.	Y	Vegetative cover within the excavated cells ranged from 70-90% and all wetland cells achieved success for this standard in 2022.
Woody Plants	Plantings exceed 50 percent survival after 5 years.	N	Less than 1 percent of the woody plants installed at the site were alive in 2022.

Summary Data

Wetland Delineation – The JXT Tunnicliff mitigation site received higher than average precipitation in the spring of 2022. This increase in water availability following two years of drought resulted in wetland expansion across the site. The shallower water table caused the boundaries at each wetland cell to move outward. A total of 11.24 emergent wetland acres were delineated within 13 wetland cells, which is an increase of 3.06 acres since the 2021 monitoring event.

Before construction, MDT identified two small palustrine emergent wetlands in the southeastern corner of the site and a smaller palustrine emergent wetland along the eastern boundary, which altogether totaled 0.03 acre. These small wetlands were preserved during construction and were identified and mapped during the 2022 monitoring event. No changes were noted from previous years (Figure A-3, Appendix A).

Functional Assessment – The JTX Tunnicliff mitigation site has developed into a Montana Wetland Assessment Method (MWAM) Category III wetland that generated that scored 5.7 points MWAM in 2022 (Table 2; Appendix B). This score corresponds to 64.07 functional Units which is an increase of 19.08 functional units since 2021, owing to the increased wetland acreage observed in 2022 and an increase in T&E species habitat score (Table 6; Appendix B).

Table 2. MWAM Summary for the JTX – Tunnicliff Ranch Site

MWAM Function and Value Parameters	2017	2018	2019	2020	2021	2022
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.1)
MTNHP Species Habitat	Low (0.1)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
General Wildlife Habitat	Mod (0.4)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
General Fish/Aquatic Habitat	N/A	N/A	N/A	N/A	N/A	N/A
Flood Attenuation	Mod (0.5)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)	Mod (0.6)
Short- and Long-Term Surface Water Storage	Mod (0.6)	High (0.9)	High (0.9)	High (0.9)	High (0.9)	High (0.9)
Sediment/Nutrient/Toxicant Removal	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	High (1)	High (1)
Sediment/Shoreline Stabilization	N/A	Mod (0.6)	Mod (0.6)	Mod (0.6)	N/A	N/A
Production Export/Food Chain Support	Mod (0.4)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
Groundwater Discharge/Recharge	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Uniqueness	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)	High (0.2)
Actual Points/Possible Points	**4.0/9**	**5.9/10**	**5.9/10**	**5.9/10**	**5.6/9**	**5.7/9**
% of Possible Score Achieved	**44%**	**59%**	**59%**	**59%**	**62.22%**	**63.33%**
Overall Category	**III**	**III**	**III**	**III**	**III**	**III**

Vegetation **-** All desirable vegetation communities observed within the mitigation site appeared healthy in 2022, and the effects of the previous two years' drought were less noticeable. Wetland plant communities exhibited increased coverage from obligate and FAC-wet species, and the upland plant communities appeared to be growing vigorously. The wet, cloudy spring delayed vegetation growth across the site. Plant height was less than typical for mid-June and reproductive structures had not yet developed on many plants. A total of 72 plant species have been identified at the site over the last 7 years, with two species observed for the first time in 2022 (Table B-1; Appendix B).

Four upland community types and two wetland community types were identified and mapped at the site in 2022 (Figure A-3, Appendix A). Dominant plant species observed within each community are listed on the Wetland Mitigation Site Monitoring form (Appendix B). The majority of the excavated cells have developed wetland communities dominated by *Schoenoplectus spp./Typha latifolia* (i.e. Wetland Type 9). For the past few years, the wetland plant communities in cells 1, 2, 3, and 10 were still becoming established and thus the community type named "transitional wetland". In 2021, the vegetation this community was renamed as Wetland Type 13 (*Hordeum jubatum/Elymus repens*), which reflected the increase in hydrophytic vegetation that has been observed between 2019 and 2021. This trend continued in 2022, and the amount of cover from FAC-wet and obligate species increased

throughout Wetland Type 13 (Appendix B). Additionally, the majority of wetland cell 1 and a portion of cell 10/11 transitioned from Wetland Type 13 to Wetland Type 9 which contains more cover from obligate species (Figure A-3, Appendix A).

The vegetation community types identified on the site in 2022 are as follows:

- Upland Type 6 – *Pascopyrum smithii/Poa pratensis*
- Upland Type 7 – *Schedonorus pratensis*
- Upland Type 8 – *Thinopyrum intermedium*
- Upland Type 12 – *Elaeagnus angustifolia/Thinopyrum intermedium*
- Wetland Type 9 – *Schoenoplectus spp./Typha latifolia*
- Wetland Type 13 –*Hordeum jubatum/Elymus repens*

Vegetation cover was measured along two transects (T-1 and T-2) in 2022 (Figure A-2, Appendix A). T-1 is 792 feet long and intersects plant communities consisting of Upland Type 8 – *Thinopyrum intermedium* and Wetland Type 9 – *Schoenoplectus* spp./*Typha latifolia*. Seventy-seven percent of the transect crossed wetland habitat, which is a 20 percent increase since 2021. Total vegetative cover was 5% less than in 2022, likely due to the late start of the growing season (Table 3).

Table 3. Data Summary for T-1 from 2016 Through 2022 at the JTX – Tunnicliff Ranch Site.

Monitoring Year	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
Transect Length (feet)	**792**	**792**	**792**	**792**	**792**	**792**	**792**
Vegetation Community Transitions Along Transect	1	6	6	5	5	6	4
Vegetation Communities Along Transect	2	2	2	2	2	2	2
Hydrophytic Vegetation Communities Along Transect	0	1	1	1	1	1	1
Total Vegetative Species	10	21	21	21	26	21	27
Total Hydrophytic Species	2	8	9	9	8	9	12
Total Upland Species	8	13	12	12	18	12	15
Estimated % Total Vegetative Cover	75	60	75	95	95	95	90
Estimated % Unvegetated	25	40	25	5	5	5	10
% Transect Length Comprising Hydrophytic Vegetation Communities	0	47	53	56	58	57	77
% Transect Length Comprising Upland Vegetation Communities	100	53	47	44	42	43	23
% Transect Length Comprising Open Water Transitional Wetland	0	0	0	0	0	0	0

T-2 is 900 feet long and intersects Upland Type 8 and Wetland Types 9 and 13. eighty-four percent of the transect crossed wetland habitat in 2022, which is a 30% increase since 2021. The transect contained small amounts standing water along the transect within the wetland cells that it crosses. Total vegetative cover was 5% less in 2022 than in 2021, again likely due to the late start of the growing season (Table 4).

The three small preservation wetlands identified within the monitoring area before site development were not assigned a community type because of their small size (total 0.03 acre). Wetland species associated with these small wetland pockets include creeping meadow foxtail (*Alopecurus arundinaceus*), Baltic rush (*Juncus balticus*), and sedges (*Carex* spp.).

Table 4. Data Summary for T-2 from 2016 Through 2022 at the JTX – Tunnicliff Ranch Site.

Monitoring Year	2016	2017	2018	2019	2020	2021	2022
Transect Length (feet)	**900**	**900**	**900**	**900**	**900**	**900**	**900**
Vegetation Community Transitions Along Transect	1	6	5	5	5	7	8
Vegetation Communities Along Transect	2	3	3	3	3	3	3
Hydrophytic Vegetation Communities Along Transect	0	1	2	2	2	2	2
Total Vegetative Species	12	11	11	11	21	20	21
Total Hydrophytic Species	0	5	6	6	10	11	11
Total Upland Species	12	6	5	5	11	9	10
Estimated % Total Vegetative Cover	60	60	65	85	85	85	80
Estimated % Unvegetated	40	40	35	15	15	15	20
% Transect Length Comprising Hydrophytic Vegetation Communities	0	12	14	14	68	54	84
% Transect Length Comprising Upland Vegetation Communities	100	88	33	33	32	46	16
% Transect Length Comprising Open Water Transitional Wetland	0	0	53	53	0	0	0

Eleven areas containing state-listed Priority 2B noxious weeds were mapped at the JTX – Tunnicliff mitigation site in 2022. All noxious weed infestations were located in the upland buffer areas, however one new population of Russian knapweed (*Acroptilon repens*) in encroaching on the southern end of wetland cell 2 (Figure A-3, Appendix A). Five instances of Russian knapweed (*Acroptilon repens*) were observed and assigned "trace" and "low" cover classes (less than 1% and 1-5% cover respectively), one "low" cover occurrence of houndstongue (*Cynoglossum officinale*), two "trace" and two "low" cover patches of Canada thistle (*Cirsium arvense*), and one "low" cover occurrence of field bindweed (*Convolvulus arvensis*) were also observed (Figure A-3, Appendix A). Noxious weed cover was estimated at 4% across the site. The increase in noxious weed cover is likely a result of isolated occurrences expanding during the recent drought. MDT's ongoing weed control program at the JTX Tunnicliff site has historically been effectively at reducing noxious weed infestations and in subsequent years will continue in cooperation with Montana Fish Wildlife and Parks (MFWP) to prevent increases in noxious weed cover.

Eight woody plant enclosures (PE-1 through PE-8) were monitored for woody plant survival in 2022 by walking and recording live woody stems (Figure A-3 Appendix A). A total of 1,650 containerized woody plants were installed in the eight plant enclosures in 2016. Woody species planted at the site include silver buffalo-berry (*Sheperdia argentea*), Douglas hawthorne (*Crataegus douglasii*), silverberry (*Elaeaganus commutata*), common chokecherry (*Prunus virginiana*), plains cottonwood (*Populus deltoides*), box elder (*Acer negundo*), and bur oak (*Quercus macrocarpa*). Planted woody vegetation survival was estimated at 1% in 2022, with a total of 13 live individuals observed, all contained within PE-6. In July 2020, a lightening sparked grassfire burned approximately 4.5 acres, including approximately half of PE-01 and three quarters of PE-03 (Figure A-3, Appendix A). Any live woody vegetation remaining within PE-01 and PE-03 were destroyed by the fire. Within PE-06, PE-07, and PE-08, numerous volunteer Russian Olive (*Elaeagnus angustifolia)* were observed. Intact wildlife fencing around enclosures was effective in keeping wildlife away from plantings, as no signs of browse were noted in those enclosures.

Hydrology – Groundwater is the primary hydrologic source for wetland development at the JTX-Tunnicliff site, with precipitation as a secondary hydrologic source. Three groundwater monitoring wells

are located within the site, with one of the wells monitored continuously by the US Geologic Survey (USGS, well #455029107355601, and #455016107360402). The 2022 data for these wells indicates that groundwater depths ranged from approximately 4-6.6 feet below the ground surface elevation of 2,835.4 feet between May and September. These wells are located in upland areas, where the ground surface elevation is approximately 3.4 and 5.6 feet above the wetland cell design elevation of 2832.0 feet, for MW-1 and MW-7A respectively. Therefore, the groundwater depths recorded in the monitoring well likely correspond with groundwater depths ranging from approximately 0.78 feet above ground surface to 3.2 feet below the ground surface elevation in the excavated wetland cells (Table 5; USGS 2022a, USGS 2022b).

Table 5. 2022 USGS Groundwater Well Data for the JTX – Tunnicliff Ranch Site.

Date	Mountain Time	Depth to water level, feet below land surface	Approximate depth to groundwater below wetland cell design elevation
2022 discrete water-level measurements for Well #1			
5/4/2022	5:37 pm	3.94	0.54
6/10/2022	7:34 pm	4.40	1.00
7/8/2022	8:10 pm	5.20	1.80
8/4/2022	6:00 pm	6.10	2.70
8/19/2022	6:24 pm	6.61	3.21
2022 discrete water-level measurements for Well #7A			
5/4/2022	5:45 pm	4.82	+0.78
6/10/2022	7:43 pm	5.15	+0.45
7/8/2022	8:24 pm	5.85	0.25
8/19/2022	6:06 pm	7.25	1.65

Small pools of shallow surface water were observed at the site in 2022 but all contained emergent vegetation and thus were not mapped as open water. Hydrologic indicators encountered within excavated wetland cells across the site included water-stained leaves, geomorphic position, a positive FAC-neutral test, salt crust, near surface soil saturation, oxidized rhizospheres on living roots, and a high water table.

Soils – Soil pits were excavated at paired sample plots were for all 10 wetland cells (Figure A-2 – Appendix A). Wetland soil pits were located inside the excavated depressions and upland soil pits were located upslope of and outside of the wetland boundaries. Soil textures within the wetland soil pits ranged from sandy clay to clay. The depleted matrix (F3) hydric soil indicator was observed within every wetland soil pit. Soil textures within upland soil pits ranged from sandy loam to clay. No hydric soil indicators were observed in any of the upland soil pits. Additional field observations for the 20 sample plots are provided in the wetland determination data forms in Appendix B.

A few upland soil pits exhibited redoximorphic features. It is unclear when these features developed, but their presence may indicate that the wetlands are continuing to expand.

Photographs – Photographs were taken at photo points 1–4 (PP1 to PP4), transect endpoints, and data points and are provided in Appendix C, with comparisons between 2022 and the first year of monitoring. Please refer to previous years' monitoring reports for all previous annual photographs (https://www.mdt.mt.gov/publications/brochures/wetland-mitigation.aspx).

Table 6. Wetland Mitigation Credits Estimated for the JTX – Tunnicliff Ranch Site (2016–2020)

Compensatory Mitigation Type	Mitigation Area Description	Wetland Type[(a)]	Anticipated Mitigation Surface Area (acres)	USACE-Approved Mitigation Ratios	Anticipated Mitigation Credit (acres)	2016 Mitigation Credit (acres)	2017 Mitigation Credit (acres)	2018 Mitigation Credit (acres)	2019 Mitigation Credit (acres)	2020 Mitigation Credit (acres)	2021 Mitigation Credit (acres)	2022 Mitigation Credit (acres)	2022 Functional Units
Creation (Establishment)	Depressional wetlands	Palustrine emergent and palustrine scrub/shrub	26.85	1:1	26.85	0	3.86	8.31	8.35	8.62	8.18	11.24	64.07
Creation (Reestablishment)	Woody plant enclosures	Palustrine scrub/shrub	2.73	5:1	0.55	0.5	0.47	0	0	0	0	0	0
Preservation	Pre-project Wetlands	Palustrine Emergent	0.03	1:1	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0
Upland Buffer	100-foot wide upland perimeter	N/A	10.98	5:1	2.2	0	2.66*	2.66*	2.66*	2.66*	2.66*	4.51	0
		Totals	**40.6**		**29.63**	**0.5**	**7.02**	**11.00**	**11.04**	**11.31**	**10.87**	**15.78**	**64.07**

* Upland buffer credits for 2017-2022 were based on the expected number of credits and not calculated based on actual acreages.

Credit Summary – As of June 2022, the JTX – Tunnicliff Ranch site had developed 15.78 mitigation credit acres (Table 6). The site received 11.24 credit-acres for wetland development, which is a 3.06 credit-acre increase from 2021.

The original mitigation credit strategy called for the eight woody plant enclosures to be credited at 5:1 if the enclosures were successful in producing scrub/shrub habitat across the site. With less than 1 percent of the woody plants surviving in 2022, the woody planting credit metric is not being met and no credits have been achieved for these areas. Additional credits from the site include 0.03 acre for preservation of existing wetlands on the site before construction and 4.51 acres of upland buffer credit. Table 6 summarizes the current estimated wetland credits based on the USACE-approved credit ratios (USACE 2005) and the wetland delineation that was completed in June 2022.

Wildlife – Eight bird species were identified at the site in 2022. Six of the eight bird boxes installed at the site are functional and were full of nesting material. Two birdboxes were absent from the site. Two deer and several deer beds were observed at the site.

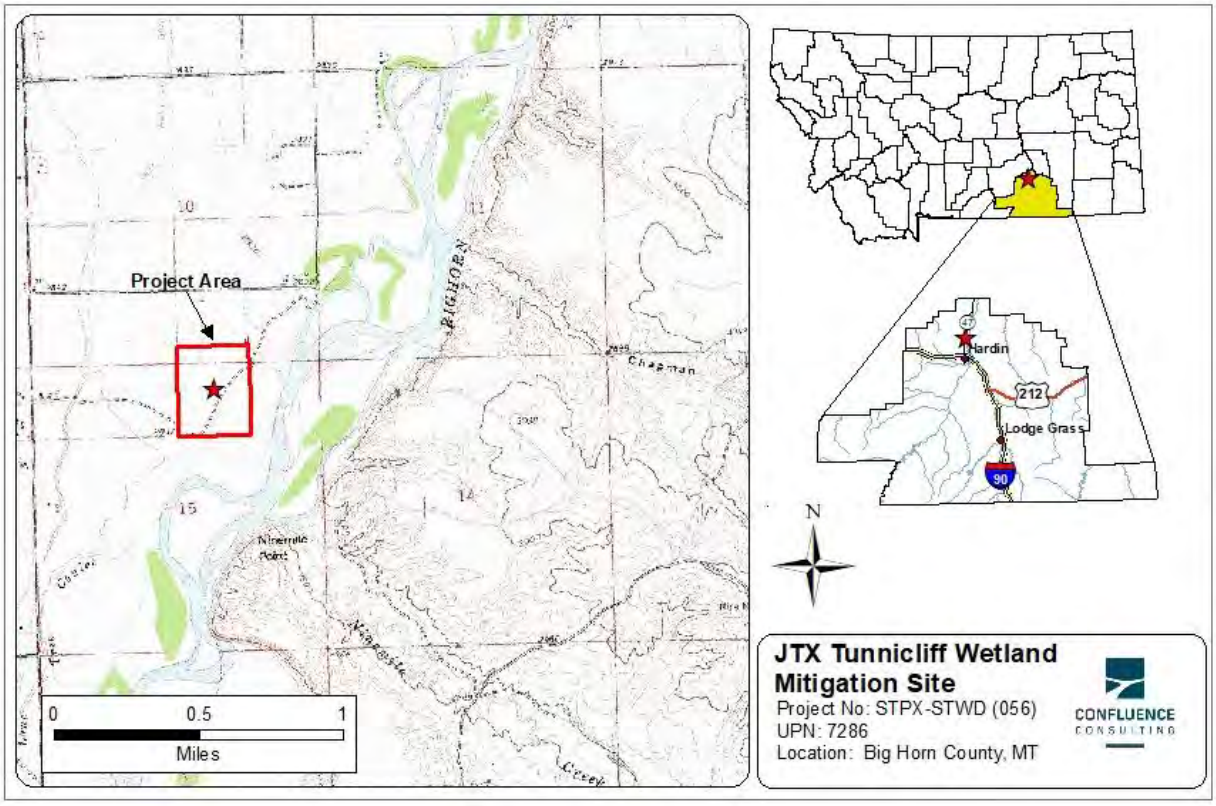
Conclusions

In the seventh year of monitoring, the JTX-Tunnicliff mitigation site met all but one of the established performance standards. Overall, vegetation communities have high amounts of cover, and the wetland areas are becoming well developed. Wetland development is expected to continue without any active management. Noxious weed cover increased 1% between 2021 and 2022 with 2 new infestations and higher cover in a couple pre-existing patches. The total cover is still less than 5% across the site and continues to meet performance standards. As spraying has historically been successful at reducing infestations at the site, it is recommended that MDT continues noxious weed management in subsequent years. The standard which requires that woody plant survival exceeds 50 percent after 5 years has not been met and is unlikely to do so without adaptive management.

While the site is meeting all of the performance standards, the wetlands need to expand by an additional 13.85 acres to meet the anticipated wetland acreage for the project. Under normal climatic circumstances, the wetlands will likely continue to expand across the site and the site may eventually hit goal for the anticipated number of acres.

Maps, Plans, Photos

Figure 1. Site Location Map



Project Area Maps/Figures: See Appendix A (Monitoring Activity Locations; Mapped Site Features; and Wetland Delineation)

Data Forms: See Appendix B (Site Monitoring form, USACE data forms, MWAM forms, and plant list)

Photos: See Appendix C (Photo Points, Paired Sampling Point Photos, and Transect Photos)

Plans: See Appendix D of 2016 Monitoring Report
https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2016_REPORTS/JTX_Tunnicliff.PDF

References

Berglund, J. and R. McEldowney. 2008. *MDT Montana Wetland Assessment Method,* PBS&J Project B43072.00, prepared by Post, Buckley, Schuh, & Jernigan, Helena, MT, for the Montana Department of Transportation, Helena, MT.

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

Federal Geographic Data Committee (FGDC). 2013. *Classification of wetlands and deepwater habitats of the United States*. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, DC.

Fuchs, B. and C. Rignati. 2021. *U.S. Drought Monitor.* National Drought Mitigation Center, University of Nebraska-Lincoln. Accessed October 7, 2021 at *https://droughtmonitor.unl.edu/CurrentMap/StateDroughtMonitor.aspx?MT*

Lesica, P. 2012. *Manual of Montana Vascular Plants,* Brit Press, Fort Worth, TX.

Montana Natural Heritage Program. 2021. *Montana Species of Concern Report*. Montana Natural Heritage Program. Accessed on 1 September 2021 at *http://mtnhp.org/SpeciesOfConcern/?AorP=p*

Natural Resources Conservation Service (NRCS). 2006. *Soil Survey (SSURGO) Database for* [Big Horn County Area, Montana]. Accessed on 2 August 2021 at *http://websoilsurvey.nrcs.usda.gov/*

Natural Resources Conservation Service (NRCS). 2018. *Field Indicators of Hydric Soils in the United States,* Version 8.2. L.M. Vasilas, G.W. Hurt, and J.F. Berkowitz (eds.). USDA, NRCS, in cooperation with the National Technical Committee for Hydric Soils. 55 p.

Smith, R. D., A. Ammann, C. Bartoldus, and M. M. Brinson. 1995. *An Approach for Assessing Wetland Functions Using Hydrogeomorphic Classification, Reference Wetlands, and Functional Indices,* prepared by U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi, for U.S. Army Corps of Engineers, Washington, DC.

U.S. Army Corps of Engineers (USACE). 2005**.** *Montana Mitigation Information*. Accessed on 10 October 2016 at *http://www.nwo.usace.army.mil/Missions/Regulatory-Program/Montana/Mitigation/*

U.S. Army Corps of Engineers (USACE). 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region* (Version 2.0), prepared by U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Environmental Laboratory, Vicksburg, MS.

U.S. Army Corps of Engineers (USACE). 2020. *National Wetland Plant List (Version 3.5),* prepared by U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH.

U.S. Fish and Wildlife Service (USFWS). 2022. *IPaC Resource List.* Environmental Conservation Online System (ECOS). Accessed on September 28, 2022 at *https://ecos.fws.gov/ipac/*

U.S. Geological Survey (USGS). 2022a. *Groundwater for USA. USGS Well 455029107355601.* Accessed on September 28, 2022 at: https://nwis.waterdata.usgs.gov/nwis/gwlevels?site_no=455029107355601&agency_cd=USGS&format=html

U.S. Geological Survey (USGS). 2022b. *Groundwater for USA. USGS Well 455016107360402.* Accessed on January 31, 2023 at: https://waterdata.usgs.gov/nwis/inventory?agency_code=USGS&site_no=455016107360402

APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
JTX – Tunnicliff Ranch
Big Horn County, Montana

PP4
MW-1
T2-End
PP3
PP1
T1-Start
T2-Start
PP2
MW-7A
T1-End

CONFLUENCE CONSULTING

JTX Tunnicliff Wetland Mitigation Site
2022 Monitoring Activity Locations

0 80 160 320 480 640 800 Feet

Project: STPX-STWD (056)

Location: Big Horn Co., Montana

Map Creation Date: 2/1/2023

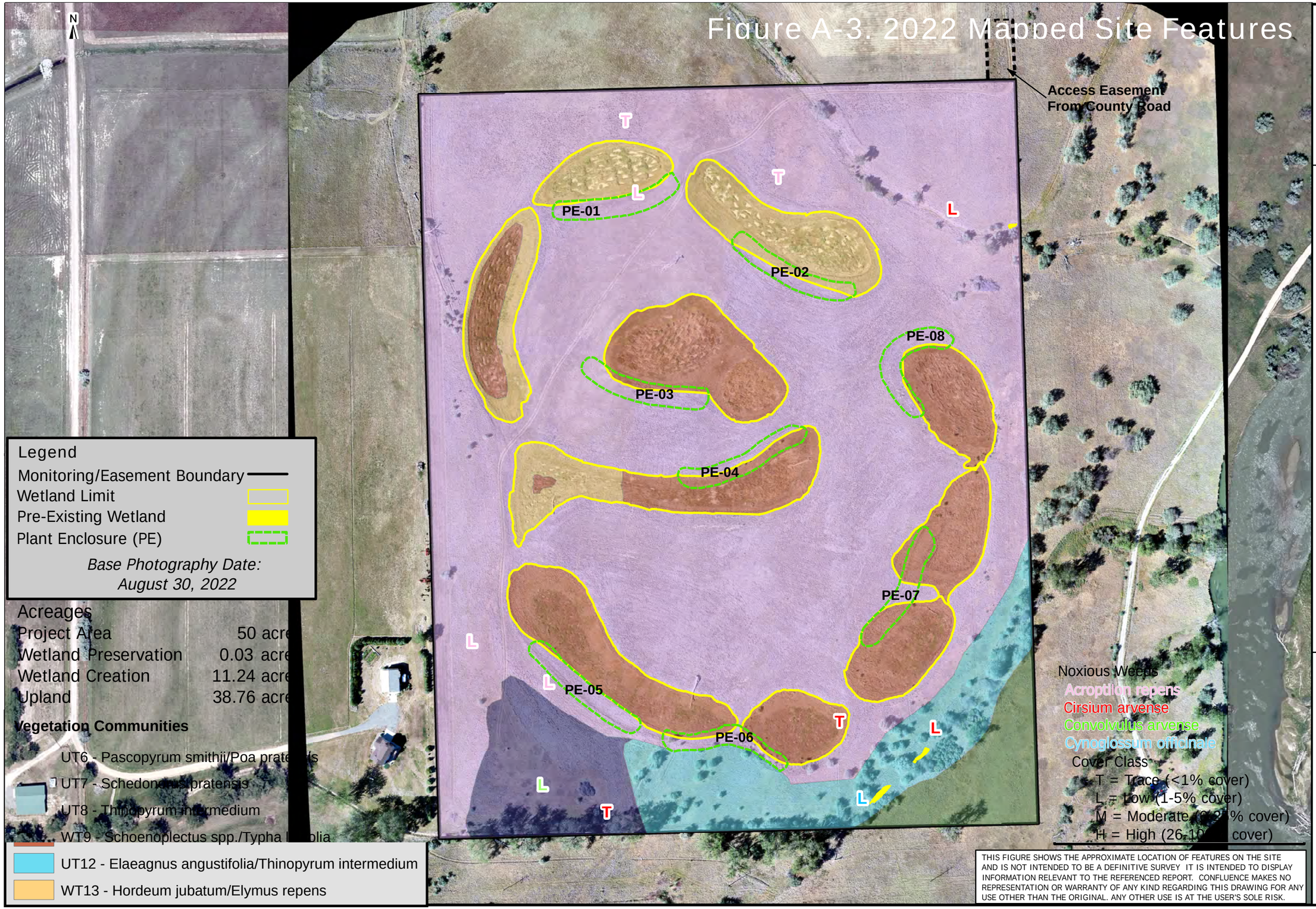
Project Manager: R McEldowney

Drawn By: RJ

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. CONFLUENCE MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

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Figure A-3. 2022 Mapped Site Features



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

CONFLUENCE CONSULTING

JTX Tunnicliff Wetland Mitigation Site

2022 Mapped Site Features

0 80 160 320 480 640 800 Feet

Project:	STPX STWD (056)
Location:	Big Horn Co., Montana
Map Creation Date:	02/1/2023
Project Manager:	R McEldowney
Drawn By:	RJ

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Figure A-4. 2022 Wetland Delineation



Project Area	50.00 acres
Pre-Project Wetland	0.03 acres
Wetland - 2022	11.24 acres
Upland Buffer - 2022	4.51 acres

Legend

- Monitoring/Easement Boundary
- Pre-Existing Wetlands
- Wetland Area - 2022
- Upland Buffer - 2022
- Data Point

Base Photography Date: August 30, 2022

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 CONFLUENCE MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

CONFLUENCE CONSULTING

JTX Tunnicliff Wetland Mitigation Site
2022 Wetland Delineation

0 80 160 320 480 640 800 Feet

Project: STPX-STWD (056)
Location: Big Horn Co., Montana
Map Creation Date: 01/27/2023
Project Manager: R McEldowney
Drawn By: RJ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Tunnicliff\2022\Delin2022_MDT.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
JTX – Tunnicliff Ranch
Big Horn County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: JTX-Tunnicliff Assessment Date/Time 6/16/2022

Person(s) conducting the assessment: R Jones, M Hickey

Weather: Sunny, light wind, 80 degrees Location: Hardin

MDT District: Billings Milepost:

Legal Description: T 1N R 33E Section(s) 15

Initial Evaluation Date: 6/15/2016 Monitoring Year: 7 #Visits in Year: 1

Size of Evaluation Area: 50 (acres)

Land use surrounding wetland:

Rural agriculture, sparsely developed residential areas, Grant Marsh Wildlife Management Area, and Big Horn River Floodplain.

HYDROLOGY

Surface Water Source: Groundwater

Inundation: ☑ Average Depth: 0.5 **(ft)** Range of Depths: 0.2-1 **(ft)**

Percent of assessment area under inundation: 5 %

Depth at emergent vegetation-open water boundary: 0 **(ft)**

If assessment area is not inundated then are the soils saturated within 12 inches of surface: Yes

Other evidence of hydrology on the site (ex. – drift lines, erosion, stained vegetation, etc:

Small amounts of standing water were observed in 2022. All standing water areas contained emergent vegetation and none qualified as "open water".

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
MW-1	4.4
MW-7A	5.15

Additional Activities Checklist:

☐ Map emergent vegetation-open water boundary on aerial photograph.

☑ Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining, etc.)

☐ Use GPS to survey groundwater monitoring well locations, if present.

Hydrology Notes:

Well readings listed above are from USGS readings on 6/10/2022. Both depths are Below Land Surface (BLS).

VEGETATION COMMUNITIES

Site JTX-Tunnicliff

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

Community # 6 **Community Type:** Pascopyrum smithii / Poa pratensis **Acres:** 1.44

Species	Cover class	Species	Cover class
Acroptilon repens	0	Bromus inermis	3
Bromus japonicus	0	Elymus hispidus	3
Elymus repens	1	Galium aparine	3
Lepidium perfoliatum	0	Pascopyrum smithii	3
Poa pratensis	4	Sisymbrium altissimum	4

Comments:

Increase in overall plant cover in 2022, with large increases in weedy annual forbs.

Community # 7 **Community Type:** Schedonorus pratensis / **Acres:** 2.19

Species	Cover class	Species	Cover class
Acroptilon repens	0	Alopecurus pratensis	0
Arctium lappa	0	Asclepias sp.	0
Bromus inermis	1	Bromus japonicus	1
Cirsium arvense	0	Convolvulus arvensis	0
Cynoglossum officinale	0	Dactylis glomerata	1
Elaeagnus angustifolia	0	Elymus hispidus	2
Hordeum jubatum	0	Iva axillaris	0
Poa pratensis	2	Ribes aureum	0
Rosa woodsii	0	Schedonorus pratensis	3
Sisymbrium altissimum	1	Symphoricarpos albus	0
Thlaspi arvense	1	Tragopogon dubius	0

Comments:

Grass dominated upland plant community in the SW portion of the site. Changes in species composition indicate the CT has become less mesic.

Community # 8 **Community Type:** Elymus hispidus / **Acres:** 31.81

Species	Cover class	Species	Cover class
Acroptilon repens	0	Asclepias speciosa	0
Bare Ground	1	Bassia scoparia	0
Bromus arvensis	0	Bromus inermis	1
Bromus japonicus	1	Bromus riparius	0
Bromus tectorum	1	Chenopodium album	1
Convolvulus arvensis	1	Elaeagnus angustifolia	0
Elymus hispidus	5	Elymus repens	2
Equisetum arvense	0	Galium aparine	1
Glycyrrhiza lepidota	1	Grindelia squarrosa	0
Hordeum jubatum	0	Iva axillaris	1
Lepidium perfoliatum	1	Medicago sativa	0
Melilotus officinalis	0	Poa pratensis	1
Poa secunda	0	Schedonorus pratensis	2
Sisymbrium altissimum	1	Sporobolus airoides	0
Taraxacum officinale	1	Thlaspi arvense	0
Xanthium strumarium	0		

Comments:

Upland plant community observed throughout the majority of the mitigation site. Acreage decreased in 2022 due to wetland expansion. Protions of this CT that burned in 202 have recovered well.

Community # 9 **Community Type:** Schoenoplectus spp. / Typha latifolia **Acres:** 7.94

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Alopecurus pratensis	0
Bare Ground	2	Beckmannia syzigachne	0
Bromus arvensis	0	Chenopodium album	0
Chenopodium rubrum	0	Cirsium arvense	0
Distichlis spicata	1	Elaeagnus angustifolia	0
Eleocharis palustris	0	Elymus hispidus	0
Elymus repens	1	Glycyrrhiza lepidota	0
Hordeum jubatum	1	Juncus balticus	2
Juncus torreyi	2	Open Water	2
Puccinellia nuttalliana	2	Rumex crispus	0
Schoenoplectus acutus	1	Schoenoplectus americanus	0
Schoenoplectus maritimus	2	Schoenoplectus pungens	1
Typha angustifolia	2	Typha latifolia	0
Xanthium strumarium	0		

Comments:

Cover from Schoenoplectus spp., Juncus spp. and Puccinellia nuttailliana increased in 2022, and Typha latifolia cover decreased. Open water areas contained enough vegetation to not be mapped seperately.

Community # 12 Community Type: Elaeagnus angustifolia / Elymus hispidus **Acres:** 3.46

Species	Cover class	Species	Cover class
Acroptilon repens	0	Alopecurus arundinaceus	1
Bromus inermis	2	Carex sp.	0
Cirsium arvense	1	Cynoglossum officinale	0
Echinocystis lobata	0	Elaeagnus angustifolia	3
Elymus hispidus	4	Fraxinus pennsylvanica	1
Salix fragilis	0	Shepherdia argentea	1
Symphoricarpos albus	1	Taraxacum officinale	1

Comments:

Upland plant community located in the southern portion of project area; species and cover consistent with previous observations.

Community # 13 Community Type: Hordeum jubatum / Elymus repens **Acres:** 3.3

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Bare Ground	3
Chenopodium album	0	Chenopodium rubrum	0
Distichlis spicata	2	Elaeagnus angustifolia	0
Elymus hispidus	1	Elymus repens	3
Hordeum jubatum	2	Juncus torreyi	1
Puccinellia nuttalliana	2	Schoenoplectus acutus	1
Schoenoplectus maritimus	2	Schoenoplectus pungens	1
Typha angustifolia	1	Typha latifolia	0

Comments:

Community continues to trend toward becoming more hydrophytic and salt tolerant.

Total Vegetation Community Acreage **50.14**

VEGETATION TRANSECTS

Site: JTX-Tunnicliff **Date:** 6/16/2022

Transect Number: 1 **Compass Direction from Start:** 200

Interval Data:

Ending Station 136 **Community Type:** Elymus hispidus /

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus inermis	1
Elymus hispidus	5	Equisetum arvense	0
Iva axillaris	0	Melilotus officinalis	0
Poa pratensis	1	Schedonorus pratensis	2
Taraxacum officinale	2		

Ending Station 577 **Community Type:** Schoenoplectus spp. / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	3	Bare Ground	2
Chenopodium album	0	Chenopodium rubrum	0
Cirsium arvense	0	Elymus hispidus	0
Hordeum jubatum	2	Juncus balticus	1
Juncus torreyi	2	Open Water	1
Schoenoplectus acutus	1	Schoenoplectus maritimus	1
Typha angustifolia	2	Typha latifolia	1
Xanthium strumarium	0		

Ending Station 614 **Community Type:** Elymus hispidus /

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus inermis	0
Elaeagnus angustifolia	1	Elymus hispidus	5
Elymus repens	0	Equisetum arvense	0
Lepidium perfoliatum	0	Poa pratensis	1
Sisymbrium altissimum	1	Taraxacum officinale	0
Xanthium strumarium	0		

Ending Station 784 **Community Type:** Schoenoplectus spp. / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Bare Ground	2
Chenopodium album	1	Elaeagnus angustifolia	0
Elymus repens	2	Glycyrrhiza lepidota	0
Hordeum jubatum	0	Juncus balticus	1
Open Water	1	Schoenoplectus acutus	3
Schoenoplectus maritimus	1	Schoenoplectus pungens	1
Typha angustifolia	1	Typha latifolia	1

Ending Station 792 **Community Type:** Elymus hispidus /

Species	Cover class	Species	Cover class
Bare Ground	2	Bromus riparius	0
Elymus hispidus	4	Elymus repens	0
Iva axillaris	0	Poa secunda	0
Schedonorus pratensis	2		

Transect Notes:

Total vegetation cover was lower than in previous years due to the slow start to the growing season. Hydrophytic vegetation increased along transect and one upland interval was eliminated due to wetlands having connected through expansion.

Transect Number: 2 **Compass Direction from Start:** 330

Interval Data:

Ending Station 172 **Community Type:** Schoenoplectus spp. / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	2	Bare Ground	3
Bromus arvensis	0	Chenopodium album	0
Chenopodium rubrum	0	Eleocharis palustris	0
Elymus repens	1	Hordeum jubatum	2
Juncus balticus	0	Juncus torreyi	1
Puccinellia nuttalliana	0	Schoenoplectus acutus	1
Schoenoplectus maritimus	2	Typha angustifolia	1

Ending Station 251 **Community Type:** Elymus hispidus /

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus arvensis	0
Chenopodium album	0	Elymus hispidus	5
Hordeum jubatum	1	Sisymbrium altissimum	0
Thlaspi arvense	0		

Ending Station 433 **Community Type:** Hordeum jubatum / Elymus repens

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Bare Ground	3
Distichlis spicata	0	Elymus hispidus	2
Elymus repens	3	Hordeum jubatum	1
Juncus torreyi	1	Puccinellia nuttalliana	0
Schoenoplectus acutus	1	Schoenoplectus pungens	0

Ending Station 493 **Community Type:** Elymus hispidus /

Species	Cover class	Species	Cover class
Bare Ground	2	Chenopodium album	1
Elymus hispidus	4	Elymus repens	3
Lepidium perfoliatum	1	Thlaspi arvense	0

Ending Station 726 **Community Type:** Hordeum jubatum / Elymus repens

Species	Cover class	Species	Cover class
Bare ground	5	Distichlis spicata	3
Elymus hispidus	2	Elymus repens	5
Hordeum jubatum	0	Puccinellia nuttalliana	0
Schoenoplectus maritimus	0		

Ending Station 870 **Community Type:** Schoenoplectus spp. / Typha latifolia

Species	Cover class	Species	Cover class
Alopecurus pratensis	2	Bare Ground	3
Chenopodium album	1	Distichlis spicata	1
Elymus repens	2	Hordeum jubatum	3
Juncus torreyi	1	Open Water	1
Puccinellia nuttalliana	1	Schoenoplectus acutus	1
Schoenoplectus maritimus	2	Typha angustifolia	2

Ending Station 891 **Community Type:** Hordeum jubatum / Elymus repens

Species	Cover class	Species	Cover class
Bare Ground	3	Chenopodium album	1
Elymus hispidus	0	Elymus repens	5

Ending Station 900 **Community Type:** Elymus hispidus /

Species	Cover class	Species	Cover class
Bare Ground	1	Bromus japonicus	1
Chenopodium album	0	Elymus hispidus	5
Lepidium perfoliatum	0	Sisymbrium altissimum	0

Transect Notes:

Significant changes along this transect in 2022 associated with wetland expansion and a community type shift from 9 to 13 in wetland cell 1.

PLANTED WOODY VEGETATION SURVIVAL

JTX-Tunnicliff

Planting Type	#Planted	#Alive	Notes
PE-1	0	0	3/4 burned in July 2020. No survival of planted woody vegetation observed
PE-2	0	0	Heavy grass and weedy forb competition has elminated woody vegetation
PE-3	0	0	1/3 burned in 2020, no survival of planted woody vegetation observed
PE-4	0	0	No survival of planted woody vegetation observed
PE-5	0	0	No survival of planted woody vegetation observed
PE-6	13	13	13 plains cottonwood, ~45 volunteer Russian Olives
PE-7	0	0	1 volunteer Russian Olive
PE-8	0	0	No survival of planted woody vegetation observed, 24 volunteer Russian Olive
Total Live	13	13	1% Survival (of original 1650 planted)

Comments

1,650 containerized woody plants were installed in 8 planting areas. All plantings were in 1 gallon containers except for cottonwood which were in 5 gallon containers. Very little survivorship of woody species plantings was observed. Volunteer Russian olive establishment was observed across the site, including several in PE-4, PE-6, and PE-8. The fencing at PE-1 and PE-3 was damaged by a wildfire that occured in July 2020 and needs repair. Fencing repairs are needed for PE-4.

WILDLIFE

Birds

Were man-made nesting structures installed? Yes

If yes, type of structure: Bird boxes

How many? 8

Are the nesting structures being used? Yes

Do the nesting structures need repairs? Yes

Nesting Structure Comments:

Six of the 8 nesting boxes on site were full of nesting material and a wren was observed in on box . Two boxes, one on the west fence line, and one in the southeast corner were absent fro the site in 2022.

Species	#Observed	Behavior	Habitat
Bald Eagle	1	FO	
Cedar Waxwing	1	F	
Grouse	2	LO, FO	
Olive-sided Flycatcher	1	F	
Pelican	15	FO	
Pheasant	4	LO, F	
Red-winged Blackbird	5	LO, F, BP	
Spotted Sandpiper	1	F	

Bird Comments

Four empty ground nests were observed with egg shell fragments.

BEHAVIOR CODES

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

HABITAT CODES

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

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

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
White-tailed Deer	2	No	No	Yes	Burrows = beds

Wildlife Comments:

Cat tracks observed on site and deemed to be domestic.

JTX-Tunnicliff

PHOTOGRAPHS

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

Photograph Checklist:

☐ One photograph for each of the four cardinal directions surrounding the wetland.

☐ At least one photograph showing upland use surrounding the wetland. If more than one upland exists then take additional photographs.

☐ At least one photograph showing the buffer surrounding the wetland.

☐ One photograph from each end of the vegetation transect, showing the transect.

Photo #	Latitude	Longitude	Bearing	Description
DP01u				
DP01w				
DP02u				
DP02w				
DP03u				
DP03w				
DP04u				
DP04w				
DP05u				
DP05w				
DP06u				
DP06w				
DP07u				
DP07w				
DP08u				
DP08w				
DP09u				
DP09w				
DP10u				
DP10w				
PP 1, Photo 2:	45.83945617	-107.5966157	270	PP-1
PP 1, Photo 3:	45.83945617	-107.5966157	220	PP-1
PP 2, Photo 1:	45.83785325	-107.5996803	315	PP-2
PP 2, Photo 2:	45.83785325	-107.5996803	0	PP-2
PP 2, Photo 3:	45.83785325	-107.5996803	45	PP-2
PP 3, Photo 1:	45.83943906	-107.6009084	140	PP-3
PP 3, Photo 2:	45.83943906	-107.6009084	100	PP-3

PP 3, Photo 3:	45.83943906	-107.6009084	45	PP-3
PP 4, Photo 1:	45.84139478	-107.5988983	105	PP-4
PP 4, Photo 2	45.84139478	-107.5988983	160	PP-4
PP 4, Photo 3	45.84139478	-107.5988983	240	PP-4
PP1, Photo 1:	45.83945617	-107.5966157	320	PP-1
Transect 1 end:	45.83765226	-107.5984577	50	T-1 end
Transect 1 start:	45.8392488	-107.5963573	200	T-1 start
Transect 2 end:	45.84089981	-107.6009804	160	T-2 end
Transect 2 start:	45.83844422	-107.6005579	330	T-2 start

Comments:

JTX-Tunnicliff

ADDITIONAL ITEMS CHECKLIST

Hydrology

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

Photos

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

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

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

Wetland Delineation Comments

Wetland boundaries were mapped in the field, not from aerial imagery

Functional Assessments

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

Functional Assessment Comments:

Category III wetland, functional units increased in 2022 due to wetland expansion.

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? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

See planted veg and bird box comments for repairs needed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP01U

Investigator(s): R Jones, M Hickey Section, Township, Range: 10 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 18

Subregion (LRR): LRR E Lat: 45.840935 Long: -107.60093 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP-01w and wetland cell 1.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Elymus hispidus	55	☑	NL
Elymus repens	5	☐	FACU
Lepidium perfoliatum	10	☐	FAC
Thlaspi arvense	10	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 20

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	10	X 3	30
FACU species	15	X 4	60
UPL species	55	X 5	275
Column Totals	80 (A)		365 (B)

Prevalence Index = B/A = 4.56

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

This point is dominated by upland vegetation.

SOIL

Sampling Point: DP01U

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
0-07	2.5Y	4/3	100						Clay Loam	
07-18	2.5Y	4/2	100						Sandy Loam	
18-20	2.5Y	4/2	94	7.5YR	5/8	3	C	M	Sandy Loam	
18-20				7.5YR	4/6	3	C	M		

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators met. Redoximorphic colors are mixed between 7.5YR 4/6 and 7.5YR 5/8 in the lower horizon.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No wetland hydrology indicators were met, but saturation and redoximorphic features were observed at a depth of 18 inches.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP01W

Investigator(s): R Jones, M Hickey Section, Township, Range: 10 1N 33E

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

Subregion (LRR): LRR E Lat: 45.840897 Long: -107.600865 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland contained within wetland cell 1.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	10	☑	FACW
Hordeum jubatum	10	☑	FACW
Puccinellia nuttalliana	5	☐	OBL
Typha angustifolia	5	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 70

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	10	X 1	10
FACW species	20	X 2	40
FAC species	0	X 3	0
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	30 (A)		50 (B)

Prevalence Index = B/A = 1.67

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A positive dominance test and a prevalence index below three provide evidence for the presence of a hydrophytic vegetation community.

SOIL

Sampling Point: DP01W

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
0-05	2.5Y	4/1	75	N	2.5/0	10	D	M	Clay Loam	
0-05	2.5Y	4/1	75	7.5YR	4/5	15	C	M, PL	Clay Loam	
05-15	2.5Y	4/3	100						Sandy Clay	**very cobbly**

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Faint redoximorphic depletions and distinct redoximorphic concentrations common within the depleted matrix. Soil in the lower horizon was very wet and approximately 70% cobbles, and therefore difficult to texture properly, but was likely a sandy clay.

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): 7

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Evidence of wetland hydrology observed in soil saturation to the surface, a depth to the water table of 7 inches, oxidized rhizospheres along living roots, and salt crusts on the soil surface at the data point.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/17/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP02U

Investigator(s): R Jones, M Hickey Section, Township, Range: 10 1N 33E

Landform (hillslope, terrace, etc.): Shoulder slope Local relief (concave, convex, none): Convex Slope (%): 3

Subregion (LRR): LRR E Lat: 45.841442 Long: -107.599449 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP02w and wetland cell 2.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus anomalus	5	☐	NL
Bromus tectorum	10	☐	NL
Distichlis spicata	20	☑	FACW
Elymus repens	20	☑	FACU
Lepidium perfoliatum	10	☐	FAC
Sisymbrium altissimum	10	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 25

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	20 X 2	40
FAC species	10 X 3	30
FACU species	30 X 4	120
UPL species	15 X 5	75
Column Totals	75 (A)	265 (B)

Prevalence Index = B/A = 3.53

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence of a hydrophytic vegetation community present.

SOIL

Sampling Point: DP02U

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
0-02	10YR 4/2	100					Sandy Loam	
02-08	2Y 4/2	100					Sandy Clay Loam	
08-17	10YR 4/2	100					Loamy Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: Soils were observed to be dry all the way to the bottom of the pit, and no hydric soil indicators were met.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP02W

Investigator(s): R Jones, M Hickey Section, Township, Range: 10 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 4

Subregion (LRR): LRR E Lat: 45.841364 Long: -107.599486 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet 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: PEM wetland located within wetland cell 2. Vegetation is problematic due to the dominance of Elymus repens. Wetland determination is based on the presence of hydric soils and wetland hydrology.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bassia scoparia	5	☐	FACU
Elymus repens	75	☑	FACU
Hordeum jubatum	10	☐	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 10

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	10 X 2	20
FAC species	0 X 3	0
FACU species	80 X 4	320
UPL species	0 X 5	0
Column Totals	90 (A)	340 (B)

Prevalence Index = B/A = 3.78

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

Although hydric soil indicators and primary hydrology indicators are present, the vegetation community does not satisfy any of the any hydrophytic vegetation indicator requirements.

SOIL

Sampling Point: DP02W

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
0-08	10YR	4/1	70	7.5YR	3/4	30	C	M,PL	Clay	
0-08	10YR	4/1	70	N	2.5/0	10	C	M,PL	Clay	
08-16	2.5Y	4/2	100						Loamy Sand	**Many cobbles throughout.**

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Many prominent redoximorphic features observed as concentrations and along pore linings within the depleted matrix.

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): 10

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Evidence of wetland hydrology observed in salt crusts and algal mats, as well as saturation at the soil surface and a water table at a depth of 10 inches.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP03U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 3E

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

Subregion (LRR): LRR E Lat: 45.840772 Long: -107.597562 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP03w and wetland cell 3.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus japonicus	5	☐	NL
Elymus hispidus	60	☑	NL
Elymus trachycaulus	15	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 20

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	15 X 4	60
UPL species	65 X 5	325
Column Totals	80 (A)	385 (B)

Prevalence Index = B/A = 4.81

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence for a hydrophytic vegetation community observed.

SOIL

Sampling Point: DP03U

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
0-08	10YR 4/2	100					Sandy Loam	
08-20	10YR 4/2	100					Loamy Sand	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

none

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP03W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 4

Subregion (LRR): LRR E Lat: 45.840758 Long: -107.597704 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 3.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	10	☑	FACW
Elymus repens	15	☑	FACU
Hordeum jubatum	10	☑	FACW
Puccinellia nuttalliana	15	☑	OBL
Schoenoplectus maritimus	1	☐	OBL
Schoenoplectus pungens	1	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 48

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	17	X 1	17
FACW species	20	X 2	40
FAC species	0	X 3	0
FACU species	15	X 4	60
UPL species	0	X 5	0
Column Totals	52 (A)		117 (B)

Prevalence Index = B/A = 2.25

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A prevalence index below three and a positive dominance test provide evidence for the presence of a hydrophytic vegetation community.

SOIL

Sampling Point: DP03W

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
0-07	2.5Y 3/1	80	7.5YR 4/4	20	C	M	Clay Loam	
07-20	2.5Y 4/2	100					Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Common prominent redoximorphic concentrations present within the dark surface layer.

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): 11

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: High water table recorded at a depth of 11 inches after 20 minutes. Soil saturation to the surface, salt crusts, and oxidized rhizospheres along living roots also indicate wetland hydrology at this data point.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP04U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 5

Subregion (LRR): LRR E Lat: 45.839637 Long: -107.597182 Datum: NAD 83

Soil Map Unit Name: Kw: Kyle clay, saline NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP04w and wetland cell 4.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus japonicus	50	☑	NL
Elymus hispidus	8	☐	NL
Lepidium perfoliatum	1	☐	FAC
Schedonorus pratensis	1	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 40

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	1 X 3	3
FACU species	1 X 4	4
UPL species	58 X 5	290
Column Totals	60 (A)	297 (B)

Prevalence Index = B/A = 4.95

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence for a hdrophytic vegetation community observed.

SOIL

Sampling Point: DP04U

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
0-06	10YR 4/2	99	7.5YR 4/4	1	C	M	Clay Loam	
06-14	10YR 4/2	100					Sandy Clay Loam	**Many cobbles throughout.**
14+							Cobble bottom	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators observed. Although the soil meets color requirements for depleted matrix, redoximorphic features only make up 1% of the upper horizon, and therefore are not common enough to qualify for that indicator.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed after careful inspection.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP04W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Undulating Slope (%): 9

Subregion (LRR): LRR E Lat: 45.83976 Long: -107.597107 Datum: NAD 83

Soil Map Unit Name: Kw: Kyle clay, saline NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 4.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	30	☑	FACW
Eleocharis palustris	5	☐	OBL
Iva axillaris	5	☐	FAC
Juncus balticus	10	☐	FACW
Juncus torreyi	25	☑	FACW
Typha angustifolia	5	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 20

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	10	X 1	10
FACW species	65	X 2	130
FAC species	5	X 3	15
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	80 (A)		155 (B)

Prevalence Index = B/A = 1.94

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A positive dominance test and a prevalence index below three indicate the presence of a hydrophytic vegetation community.

SOIL

Sampling Point: DP04W

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
0-08	10YR 4/2	90	5Y 3/4	10	C	M	Sandy Clay Loam	
08-16	2.5Y 4/2	98	7.5YR 3/4	2	C	M	Sandy Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Prominent redoximorphic concentrations common within the depleted matrix.

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

Remarks: Saturation to 2 inches from the soil surface and oxidized rhizospheres along living roots indicate wetland hydrology.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP05U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

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

Subregion (LRR): LRR E Lat: 45.838714 Long: -107.596856 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP05w and wetland cell 5.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	10	☐	UPL
Elymus hispidus	24	☑	NL
Equisetum hyemale	1	☐	FACW
Pascopyrum smithii	5	☐	FACU
Poa pratensis	20	☑	FACU
Schedonorus pratensis	10	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 30

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	1 X 2	2
FAC species	0 X 3	0
FACU species	35 X 4	140
UPL species	34 X 5	170
Column Totals	70 (A)	312 (B)

Prevalence Index = B/A = 4.46

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence for a hydrophytic plant community observed.

SOIL

Sampling Point: DP05U

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
0-07	10YR 4/2	100					Clay Loam	
07-16	2.5Y 4/3	100					Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP05W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 2

Subregion (LRR): LRR E Lat: 45.838791 Long: -107.596972 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 5.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	15	☑	FACW
Elymus hispidus	5	☐	NL
Elymus trachycaulus	5	☐	FACU
Hordeum jubatum	10	☑	FACW
Juncus balticus	15	☑	FACW
Juncus torreyi	10	☑	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 40

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	50 X 2	100
FAC species	0 X 3	0
FACU species	5 X 4	20
UPL species	5 X 5	25
Column Totals	60 (A)	145 (B)

Prevalence Index = B/A = 2.42

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A positive dominance test and a prevalence index below three indicate the presence of a hydrophytic vegetation community.

SOIL

Sampling Point: DP05W

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
0-08	2.5YR 4/2	80	2.5YR 3/6	20	C	M	Sandy Clay Loam	**Fine sand present.**
08-17	10YR 4/2	50	7.5YR 5/8	3	CS	M	Loamy Sand	**47% gravel**

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Prominent redoximorphic concentrations common within the depleted matrix.

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): 12

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Indicators of wetland hydrology include saturation to 12 inches from the soil surface, the point's geomorphic position, and oxidized rhizosperes along living roots.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP06U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 9

Subregion (LRR): LRR E Lat: 45.838072 Long: -107.597386 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP06w and wetland cell 6.

VEGETATION - Use scientific names of plants

Tree Stratum (Plot size (30 Foot Radius))	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum (Plot size (15 Foot Radius))

Elaeagnus angustifolia	10	☑	FACU

Herbaceous Stratum (Plot size (5 Foot Radius))

Elymus hispidus	15	☑	NL
Elymus repens	5	☐	FACU
Poa pratensis	10	☐	FACU
Schedonorus pratensis	40	☑	FACU
Taraxacum officinale	5	☐	FACU

Woody Vine Stratum (Plot size (30 Foot Radius))

Percent Bare Ground 25

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	0 X 3	0
FACU species	70 X 4	280
UPL species	15 X 5	75
Column Totals	85 (A)	355 (B)

Prevalence Index = B/A = 4.18

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence for a hydrophytic vegetation community observed.

SOIL

Sampling Point: DP06U

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
0-05	10YR 4/3	100					Clay Loam	
05-19	10YR 4/2	100					Sandy Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP06W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Undulating Slope (%): 4

Subregion (LRR): LRR E Lat: 45.838124 Long: -107.59746 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet 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: PEM wetland located within wetland cell 6.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	25	☑	FACW
Elymus repens	5	☐	FACU
Hordeum jubatum	10	☑	FACW
Juncus balticus	2	☐	FACW
Juncus torreyi	3	☐	FACW
Poa palustris	10	☑	FACW
Puccinellia nuttalliana	5	☐	OBL
Typha angustifolia	5	☐	OBL
Xanthium strumarium	5	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 30

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	10	X 1	10
FACW species	50	X 2	100
FAC species	5	X 3	15
FACU species	5	X 4	20
UPL species	0	X 5	0
Column Totals	70 (A)		145 (B)

Prevalence Index = B/A = 2.07

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A positive dominance test and a prevalence index below three provide evidence for a hydrophytic vegetation community.

SOIL

Sampling Point: DP06W

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
0-11	2.5Y 4/2	80	2.5YR 4/4	20	C	M, PL	Sandy Clay Loam	**Fine sand present.**
11-16	2.5Y 4/3	85	10YR 4/4	15	C	M	Sandy Loam	**Fine sand present.**

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Prominent redoximorphic concentrations common within the depleted matrix.

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): 5

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Evidence of wetland hydrology observed in oxidized rhizospheres on living roots and saturation present 5 inches from the surface. Depth to the water table was recorded at 16".

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP07U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

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

Subregion (LRR): LRR E Lat: 45.837767 Long: -107.597989 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP07w and wetland cell 7.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Elaeagnus angustifolia	2	☐	FACU
Elymus hispidus	73	☑	NL
Elymus trachycaulus	5	☐	FACU
Schedonorus pratensis	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 25

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	12 X 4	48
UPL species	63 X 5	315
Column Totals	75 (A)	363 (B)

Prevalence Index = B/A = 4.84

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence for a hydrophytic vegetation community observed.

SOIL

Sampling Point: DP07U

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
0-09	10YR 3/2	100					Clay Loam	
~~09-19~~	~~2.5Y 4/3~~	~~100~~					~~Sandy Loam~~	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☐ No ☑

Remarks: No hydric soil indicators observed.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP07W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Toeslope Local relief (concave, convex, none): concave Slope (%): 5

Subregion (LRR): LRR E Lat: 45.837822 Long: -107.598089 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not Mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 7.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Chenopodium album	1	☐	FACU
Cirsium arvense	4	☐	FACU
Elymus repens	10	☑	FACU
Hordeum jubatum	30	☑	FACW
Schoenoplectus maritimus	2	☐	OBL
Typha angustifolia	3	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 50

Dominance Test worksheet

Number of Dominant Species that are OBL, FACW or FAC: 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	5 X 1	5
FACW species	30 X 2	60
FAC species	0 X 3	0
FACU species	15 X 4	60
UPL species	0 X 5	0
Column Totals	50 (A)	125 (B)

Prevalence Index = B/A = 2.50

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A prevalence index below three provides evidence for a hydrophytic vegetation community.

SOIL

Sampling Point: DP07W

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
0-09	10YR 4/1	90	7.5YR 3/6	10	C	M,PL	Sandy Clay Loam	
09-16	2.5Y 4/2	99	7.5YR 3/4	1	C	M	Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Prominent redoximorphic concentrations common and along pore linings within the depleted matrix.

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

Remarks: Evidence of wetland hydrology observed in saturation 2 inches from the surface and oxidized rhizospheres on living roots. Depth to the water table was measured at 13 inches after 10 minutes.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP08U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Hummocky Slope (%): 14

Subregion (LRR): LRR E Lat: 45.838644 Long: -107.600914 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP08w and wetland cell 8/9.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus japonicus	5	☐	NL
Elymus hispidus	75	☑	NL
Poa pratensis	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 15

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	0 X 2	0
FAC species	0 X 3	0
FACU species	5 X 4	20
UPL species	80 X 5	400
Column Totals	85 (A)	420 (B)

Prevalence Index = B/A = 4.94

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No evidence of a hydrophytic vegetation community present.

SOIL

Sampling Point: DP08U

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
0-04	10YR 3/2	100					Clay Loam	
04-10	2.5Y 4/2	98	7.5YR 4/4	2	C	M, PL	Sandy Clay Loam	**Very fine sand throughout.**
10-16	2.5YR 4/3	100					Fine Sandy Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Common prominent redoximorphic concentrations present and along pore linings within the depleted matrix. Presence of redoximorphic features may be indicative of continued wetland expansion.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP08W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Flat Slope (%): 4

Subregion (LRR): LRR E Lat: 45.838668 Long: -107.600691 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 8/9.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Chenopodium rubrum	1	☐	OBL
Elymus repens	12	☑	FACU
Hordeum jubatum	15	☑	FACW
Juncus torreyi	5	☐	FACW
Schoenoplectus maritimus	5	☐	OBL
Typha angustifolia	1	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 60

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	7	X 1	7
FACW species	20	X 2	40
FAC species	0	X 3	0
FACU species	12	X 4	48
UPL species	0	X 5	0
Column Totals	39 (A)		95 (B)

Prevalence Index = B/A = 2.44

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

Evidence of a hydrophytic vegetation community observed in the presence of several obligate wetland species and a prevalence index below three.

SOIL

Sampling Point: DP08W

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
0-02	10YR	3/3	70	2.5Y	4/2	30	C	M	Silt Loam	
02-08	2.5YR	3/2	70	N	2.5/0	20			Fine Sandy Loam	
02-08	2.5YR	3/2	70	2.5YR	3/6	10	C	M	Fine Sandy Loam	
08-12+	2.5Y	4/2	100						Sand	**Horizon contains 90% cobble**

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Distinct redoximorphic concentrations common within the dark surface layer.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 3

Water Table Present? Yes ☑ No ☐ Depth (inches): 5

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Evidence of wetland hydrology observed in 3 inches of surface water within the plot, a high water table at a depth of 5 inches, saturation to the soil surface, and the presence of aquatic invertebrates.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP09U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Hummocky Slope (%): 9

Subregion (LRR): LRR E Lat: 45.839548 Long: -107.600206 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet 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 adjacent to DP09w and wetland cell 10/11. Although marginal hydric soils were observed within the soil pit, the sample point did not contain wetland hydrology or hydrophytic vegetation and therefore is not located within a wetland.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	5	☐	UPL
Bromus japonicus	1	☐	NL
Elymus hispidus	40	☑	NL
Elymus repens	20	☑	FACU
Elymus trachycaulus	20	☑	FACU
Lepidium perfoliatum	1	☐	FAC

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 13

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	1	X 3	3
FACU species	40	X 4	160
UPL species	46	X 5	230
Column Totals	87 (A)		393 (B)

Prevalence Index = B/A = 4.52

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

Due to the high proportions of upland and FACU species, no hydrophytic vegetation indicators are present.

SOIL

Sampling Point: DP09U

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
0-05	10YR 4/2	100					Sandy Clay Loam	
05-16	2.5Y 4/2	99	10YR 4/3	1	C	M	Sandy Loam	**Very faint redox.**
16+							Cobble Bottom	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Few, faint redoximorphic depletions present in the depleted matrix. Presence of redoximorphic features may be indicative of continued wetland expansion.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP09W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Convex Slope (%): 4

Subregion (LRR): LRR E Lat: 45.839463 Long: -107.600228 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 10/11.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Distichlis spicata	20	☑	FACW
Elymus repens	5	☐	FACU
Juncus balticus	10	☑	FACW
Schoenoplectus pungens	5	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 60

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	5	X 1	5
FACW species	30	X 2	60
FAC species	0	X 3	0
FACU species	5	X 4	20
UPL species	0	X 5	0
Column Totals	40 (A)		85 (B)

Prevalence Index = B/A = 2.13

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

A positive dominance test and a prevalence index below 3 indicate the presence of hydrophytic vegetation.

SOIL

Sampling Point: DP09W

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
0-03	10YR	3/1	88	N	2.5/0	5	D	M	Sandy Loam	
0-03	10YR	3/1	88	7.5YR	4/4	7	C	M	Sandy Loam	
03-16	2.5Y	4/1	100						Loamy Sand	**Many cobbles throughout.**

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Requirements for redox dark surface indicator met, with the exception of thickness. Surface is 3" thick, as opposed to the required 4".

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): 8

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Evidence of wetland hydrology present in soil saturation to the surface, a water table depth at 8 inches, and oxidized rhizospheres on living roots.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP10U

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Hummocky Slope (%): 2

Subregion (LRR): LRR E Lat: 45.839807 Long: -107.598504 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: Upland sample point adjacent to DP10w and wetland cell 12/13. Although hydric soils were observed within the soil pit, the sample point did not contain wetland hydrology or hydrophytic vegetation and therefore is not located within a wetland.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Elymus hispidus	75	☑	NL
Poa pratensis	10	☐	FACU
Schedonorus pratensis	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 10

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	15	X 4	60
UPL species	75	X 5	375
Column Totals	90 (A)		435 (B)

Prevalence Index = B/A = 4.83

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☐ NO ☑

Remarks:

No hydrophytic vegetation indicators observed.

SOIL

Sampling Point: DP10U

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					Clay Loam	
10-22	2.5Y 5/2	90	7.5YR 4/4	10	C	M	Clay Loam	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Prominent redoximorphic concentrations common within the depleted matrix.Presence of redoximorphic features may be indicative of continued wetland expansion.

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes ☐ No ☑

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

Remarks: No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: JTX Tunnicliff City/County: Big Horn Sampling Date: 6/16/2022

Applicant/Owner: MDT State: Montana Sampling Point: DP10W

Investigator(s): R Jones, M Hickey Section, Township, Range: 15 1N 33E

Landform (hillslope, terrace, etc.): Floodplain Local relief (concave, convex, none): Concave Slope (%): 5

Subregion (LRR): LRR E Lat: 45.839866 Long: -107.59856 Datum: NAD 83

Soil Map Unit Name: Hh: Haverson and Lohmiller soils, wet NWI classification: Not mapped

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

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

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

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

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

Remarks: PEM wetland located within wetland cell 12/13.

VEGETATION - Use scientific names of plants

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	10	☑	FACW
Eleocharis palustris	2	☐	OBL
Elymus repens	5	☐	FACU
Hordeum jubatum	10	☑	FACW
Typha angustifolia	5	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 68

Dominance Test worksheet

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

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

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

Prevalence Index worksheet

Total % Cover of:		Multiply by:	
OBL species	7	X 1	7
FACW species	20	X 2	40
FAC species	0	X 3	0
FACU species	5	X 4	20
UPL species	0	X 5	0
Column Totals	32 (A)		67 (B)

Prevalence Index = B/A = 2.09

Hydrophytic Vegetation Indicators

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

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

Hydrophytic Vegetation Present? Yes ☑ NO ☐

Remarks:

Evidence of hydrophytic vegetation includes a positive dominance test and a prevalence index below three.

SOIL

Sampling Point: DP10W

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
0-07	2.5Y 4/2	90	7.5YR 4/6	10	C	M	Sandy Loam	
~~07-12~~	~~2.5YR 4/2~~	~~95~~	~~7.5YR 5/8~~	~~5~~	~~CS~~		~~Gravelly Sand~~	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks: Distinct redoximorphic concentrations common within the depleted matrix. Digging below 12" not feasible due to sand collapsing in from the pit wall and filling in the hole.

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): 4

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

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Evidence of wetland hydrology visible in soil saturation to the surface, a high water table at a depth of 4 inches, and salt crusts at the sample point.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name JTX-Tunnicliff **2. MDT project#** STPP STWD (056) **Control#** 9680000

3. Evaluation Date 6/18/2021 **4. Evaluators** R. Jones, M. Hickey **5. Wetland/Site# (s)** JTX Tunnicliff

6. Wetland Location(s): **T** 1N **R** 33E **Sec1** 10 **T** 1N **R** 33E **Sec2** 15

Approx Stationing or Mileposts NA

Watershed 14 - Middle Yellowstone **Watershed/County** Bighorn

7. Evaluating Agency CCI for MDT

8. Wetland size acres 11.24

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 11.24

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

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

11. Estimated Relative Abundance Abundant

12. General Condition of AA

i. Disturbance: (use matrix below to determine [circle] appropriate response – see instructions for Montana-listed noxious weed and aquatic nuisance vegetation species (**ANVS**) lists)

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

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

Vegetation in AA well established. Burn area has recovered well two years following fire.

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

Convolvulus arvensis, Cynoglossum officinale, Cirsium arvense, Acroptilon repens arvense, Acroptilon repens, and Cynoglossum officinale.

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

Fishing Acess Site, large parcel homesites, ranching.

13. Structural Diversity: (based on number of "Cowardin" ***vegetated*** classes present [do not include unvegetated classes], see #10 above)

Existing # of "Cowardin" Vegetated Classes in AA	Initial Rating	Is current management preventing (passive) existence of additional vegetated classes?		Modified Rating
>=3 (or 2 if 1 is forested) classes	H	NA	NA	NA
2 (or 1 if forested) classes	M	NA	NA	NA
1 class, but not a monoculture	M	<NO	YES>	L
1 class, monoculture (1 species comprises>=90% of total cover)	L	NA	NA	NA

Comments: Site contains multiple PEM wetlands.

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species)	○ D ○ S	
Secondary habitat (list Species)	○ D ○ S	
Incidental habitat (list species)	○ D ◉ S	black-footed ferret
No usable habitat	☐ S	

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

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

Sources for documented use USFWS T&E list for Big Horn County

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

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

Primary or critical habitat (list species)	◉ D ◉ S	
Secondary habitat (list Species)	◉ D ○ S	Bur oak (S2) documented on site in 2017.
Incidental habitat (list species)	○ D ◉ S	Great Blue Heron (S3)
No usable habitat	☐ S	

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

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

Sources for documented use Suitable great blue heron habitat

14C. General Wildlife Habitat Rating:

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

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

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

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

- ☐ few or no wildlife observations during peak use periods
- ☐ little to no wildlife sign
- ☐ sparse adjacent upland food sources
- ☐ interviews with local biologists with knowledge of the AA

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

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

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

Structural diversity (see #13)	High								Moderate								Low			
Class cover distribution (all vegetated classes)	Even				Uneven				Even				Uneven				Even			
Duration of surface water in ≥ 10% of AA	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A	P/P	S/I	T/E	A
Low disturbance at AA (see #12i)	E	E	E	H	E	E	H	H	E	H	H	M	E	H	M	M	E	H	M	M
Moderate disturbance at AA (see #12i)	H	H	H	H	H	H	H	M	H	H	M	M	H	M	M	L	H	M	L	L
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Several deer beds, and a few deer observed in 2022.

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

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

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

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

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

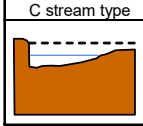
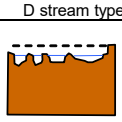
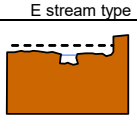
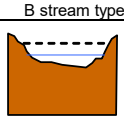
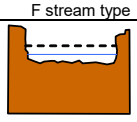
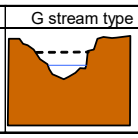
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

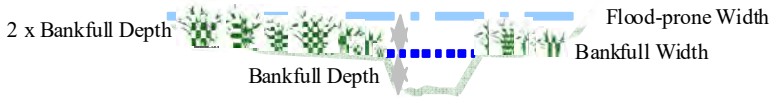
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within AA.

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

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

Estimated or Calculated Entrenchment (Rosgen 1994, 1996)	Slightly entrenched - C, D, E stream types			Moderately entrenched – B stream type			Entrenched-A, F, G stream types		
% of flooded wetland classified as forested and/or scrub/shrub	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1H	.9H	.6M	.8H	.7M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.8H	.5M	.7M	.6M	.4M	.3L	.2L	.1L

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



Floodprone width 700 / **Bankfull width** 250 = **Entrenchment ratio** 2.8

ii. Are ≥10 acres of wetland in the AA subject to flooding **AND** are man-made features which may be significantly damaged by floods located within 0.5 mile downstream of the AA (check)? **Y** ◯ **N** ◉

Comments: AA subject to periodic flooding from Bighorn River, although flows in the river are controlled by a dam. Entrenchment ratio estimated from aerial photo interpretation and not measured in field. River is C-Type.

14F. Short and Long Term Surface Water Storage: (Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow. If no wetlands in the AA are subject to flooding or ponding, click ☐ **NA** here and proceed to 14G.)

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

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding	>5 acre feet			1.1 to 5 acre feet			≤1 acre foot		
Duration of surface water at wetlands within the AA	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Wetlands in AA flood or pond **≥ 5 out of 10 years**	1H	.9H	.8H	.8H	.6M	.5M	.4M	.3L	.2L
Wetlands in AA flood or pond **< 5 out of 10 years**	.9H	.8H	.7M	.7M	.5M	.4M	.3L	.2L	.1L

Comments: Due to the depth of the excavated cells relative to the surrounding uplands, this site is capable of providing a large amount of surface water storage.

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

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

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with potential to deliver levels of sediments, nutrients, or compounds at levels such that other functions are not substantially impaired. Minor sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.				Waterbody on MDEQ list of waterbodies in need of TMDL development for "probable causes" related to sediment, nutrients, or toxicants **or** AA receives or surrounding land use with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding / ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1H	.8H	.7M	.5M	.5M	.4M	.3L	.2L
AA contains **unrestricted outlet**	.9H	.7M	.6M	.4M	.4M	.3L	.2L	.1L

Comments: AA has potential to receive sediment/nutrients/toxicants from surface or groundwater.

14H Sediment/Shoreline Stabilization: (Applies only if AA occurs on or within the banks or a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body which is subject to wave action. If 14H does not apply, click ☑ **NA** here and proceed to 14I.)

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

*% Cover of **wetland** streambank or shoreline by species with stability ratings of ≥6 (see **Appendix F**).*	*Duration of surface water adjacent to rooted vegetation*		
	Permanent / Perennial	Seasonal / Intermittent	Temporary / Ephemeral
≥ 65%	1H	.9H	.7M
35-64%	.7M	.6M	.5M
< 35%	.3L	.2L	.1L

Comments: Small amounts of surface water present in 2022, but not enough to create wave action.

14I. Production Export/Food Chain Support:

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

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

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

A	Vegetated component >5 acres						Vegetated component 1-5 acres						Vegetated component <1 acre					
B	High		Moderate		Low		High		Moderate		Low		High		Moderate		Low	
C	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
P/P	1H	.7M	.8H	.5M	.6M	.4M	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.6M	.6M	.4M	.3L	.2L
S/I	.9H	.6M	.7H	.4M	.5M	.3L	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.5M	.5M	.3L	.3L	.2L
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L		.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .5M

Comments: Adjacent upland buffer with greater than 30% plant cover and less than 5% noxious weed cover.

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

i. Discharge Indicators

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

ii. Recharge Indicators

- ☑ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other:

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

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

Comments: The site was designed to have excavated wetland cells that utilize a high groundwater table as the primary hydrologic source.

14K. Uniqueness:

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

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: Wetland type is common in the Bighorn River floodplain.

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

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

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

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

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

Comments:

Site owned by MFWP and part of larger Grant Marsh WMA property.

General Site Notes

In 2022, the site rebounded from the drought effects observed in previous two years and the wetlands expanded significantly.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): JTX Tunnicliff

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0.00	☐
B. MT Natural Heritage Program Species Habitat	M	.6	1	6.74	☐
C. General Wildlife Habitat	M	.7	1	7.87	☑
D. General Fish Habitat	NA	0	0	0.00	☐
E. Flood Attenuation	M	.6	1	6.74	☐
F. Short and Long Term Surface Water Storage	H	.9	1	10.12	☑
G. Sediment/Nutrient/Toxicant Removal	H	1	1	11.24	☑
H. Sediment/Shoreline Stabilization	NA	0	0	0.00	☐
I. Production Export/Food Chain Support	M	.5	1	5.62	☐
J. Groundwater Discharge/Recharge	M	.7	1	7.87	☑
K. Uniqueness	M	.4	1	4.50	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	2.25	☐
Totals:		5.6	9	62.94	
Percent of Possible Score			**62.22** %		

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

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

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

☑

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

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined above)

I | II | **III** | IV

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
JTX – Tunnicliff Ranch
Big Horn County, Montana

JTX Tunnicliff: 2022 Photo Point Photographs



Photo Point: 1 Location: Looking NW at Cell 4
Bearing: 320 degrees Year: 2016



Photo Point: 1 Location: Looking NW at Cell 4
Bearing: 320 degrees Year: 2022



Photo Point: 1 Location: Looking west across property
Bearing: 270 degrees Year: 2016



Photo Point: 1 Location: Looking west across property
Bearing: 270 degrees Year: 2022



Photo Point: 1 Location: Looking SW at Cell 5
Bearing: 220 degrees Year: 2016



Photo Point: 1 Location: Looking SW at Cell 5
Bearing: 220 degrees Year: 2022

JTX Tunnicliff: 2022 Photo Point Photographs



Photo Point: 2 Location: Looking NW at Cell 9
Bearing: 315 degrees Year: 2016



Photo Point: 2 Location: Looking NW at Cell 9
Bearing: 315 degrees Year: 2022



Photo Point: 2 Location: Looking North at Cell 8/9
Bearing: 0 degrees Year: 2016



Photo Point: 2 Location: Looking North at Cell 8/9
Bearing: 0 degrees Year: 2022



Photo Point: 2 Location: Looking NE at Cell 8
Bearing: 45 degrees Year: 2016



Photo Point: 2 Location: Looking NE at Cell 8
Bearing: 45 degrees Year: 2022

JTX Tunnicliff: 2022 Photo Point Photographs



Photo Point: 3 Location: Looking SE at Cell 13
Bearing: 140 degrees Year: 2016



Photo Point: 3 Location: Looking SE at Cell 13
Bearing: 140 degrees Year: 2022



Photo Point: 3 Location: Looking East at Cell 13
Bearing: 100 degrees Year: 2016



Photo Point: 3 Location: Looking East at Cell 13
Bearing: 100 degrees Year: 2022



Photo Point: 3 Location: W side of property Looking NE
Bearing: 45 degrees Year: 2016



Photo Point: 3 Location: W side of property Looking NE
Bearing: 45 degrees Year: 2022

JTX Tunnicliff: 2022 Photo Point Photographs



Photo Point: 4 Location: Looking East at Cell 3
Bearing: 105 degrees Year: 2016



Photo Point: 4 Location: Looking East at Cell 3
Bearing: 105 degrees Year: 2022



Photo Point: 4 Location: Looking South at Cell 3
Bearing: 160 degrees Year: 2016



Photo Point: 4 Location: Looking South at Cell 3
Bearing: 160 degrees Year: 2022



Photo Point: 4 Location: Looking West at Cell 2
Bearing: 240 degrees Year: 2016



Photo Point: 4 Location: Looking West at Cell 2
Bearing: 240 degrees Year: 2022

JTX Tunnicliff: 2022 Transect Photographs



Transect 1: Start Location: SE corner of property
Bearing: 230 degrees Year: 2016



Transect 1: Start Location: SE corner of property
Bearing: 230 degrees Year: 2022



Transect 1: End Location: SE corner of property
Bearing: 50 degrees Year: 2016



Transect 1: End Location: SE corner of property
Bearing: 50 degrees Year: 2022



Transect 2: Start Location: West side of property
Bearing: 350 degrees Year: 2016



Transect 2: Start Location: West side of property
Bearing: 350 degrees Year: 2022

JTX Tunnicliff: 2022 Transect and Data Point Photographs



Transect 2: End
Bearing: 170 degrees
Location: West side of property
Year: 2016



Transect 2: End
Bearing: 170 degrees
Location: West side of property
Year: 2022



Data Point: DP01w
Location: Cell 1
Year: 2022



Data Point: DP01u
Location: Cell 1
Year: 2022



Data Point: DP02w
Location: Cell 2
Year: 2022



Data Point: DP02u
Location: Cell 2
Year: 2022

JTX Tunnicliff: 2022 Transect and Data Point Photographs



Data Point: DP03w Location: Cell 3
Year: 2022



Data Point: DP03u Location: Cell 3
Year: 2022



Data Point: DP04w Location: Cell 4
Year: 2022



Data Point: DP04u Location: Cell 4
Year: 2022



Data Point: DP05w Location: Cell 5
Year: 2022



Data Point: DP05u Location: Cell 5
Year: 2022

JTX Tunnicliff: 2022 Transect and Data Point Photographs



Data Point: DP06w Location: Cell 6
Year: 2022



Data Point: D06u Location: Cell 6
Year: 2022



Data Point: DP07w Location: Cell 7
Year: 2022



Data Point: DP07u Location: Cell 7
Year: 2022



Data Point: DP08w Location: Cell 8/9
Year: 2022



Data Point: DP08u Location: Cell 8/9
Year: 2022

JTX Tunnicliff: 2022 Transect and Data Point Photographs



Data Point: DP09w Location: Cell 10/11
Year: 2022



Data Point: DP09u Location: Cell 10/11
Year: 2022



Data Point: DP10w Location: Cell 12/13
Year: 2022



Data Point: DP10u Location: Cell 12/13
Year: 2022