SILICON MOUNTAIN MITIGATION SITE

Project Overview

MDT Project Number: STPX 47 (024) 56 UPN# 5034

Watershed: Watershed #2 – Upper Clark Fork of the Columbia River

Monitoring Year: 2021

Years Monitored: 7th year of monitoring

Corps Permit Number: NWO-2012-01822-MTH

Stream Protection Act (SPA) Number: MDT-R2-74-201

Monitoring Conducted By: Confluence Consulting Inc

Dates Monitoring Was Conducted: June 29-30, 2021

Purpose of the Approved Project:

The Silicon Mountain wetland mitigation project was developed cooperatively by the Montana Department of Transportation (MDT) and Butte – Silver Bow County (BSBC) to provide MDT with 11.45 acres of compensatory wetland mitigation credits and 12,369 stream mitigation credits for wetland and stream impacts associated with Butte Silver Bow County's Silicon Tech Park and Port bridge/road realignment project and impacts associated with future Montana Department of Transportation (MDT) project-related wetland and stream impacts in Watershed #2 – Upper Clark Fork River. The mitigation project is intended to: (a) establish 6.77 acres of emergent and scrub/shrub wetland by excavating and creating six wetland cells; (b) protect 10.06 acres of existing emergent and scrub/shrub wetland; (c) restore upland, wetland, and riparian areas that were impacted by the new bridge/roadway alignment via seeding and planting of mostly native graminoids, shrubs, and trees; (d) restore and reconstruct approximately 3,250 linear feet of the Sand Creek channel to its historic natural condition; and (e) relocate and restore approximately 650 linear feet of the Sand Creek channel on 2.04 acres of privately owned property south of the MDT bridge/road realignment project.

Site Location:

Latitude: 45.998489 **Longitude:** –112.662948

County: Butte Silver Bow **Nearest Town:** Rocker, MT

Map Included: Figure 1 on page #10

Mitigation Site Construction Started: 2013 **Construction Ended:** 2015

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

Activity: Weed Spraying **Date:** October 2021 **Specific recommendations for any additional corrective actions:** Weed treatment will continue in 2022.

Anticipated Wetland Credit Acres: 11.45

Wetland Credit Acres Generated to Date: 12.99

Anticipated Stream Credits: 12,369.50

Stream Credits Generated to Date: 12,369.50

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, associated success criteria, and 2021 achievement status for the Silicon Mountain site 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 Regional Supplement.	Y	Areas that are identified as wetland habitat within the mitigation site meet the three parameter criteria.
Wetland Hydrology	Soil saturation is present for at least 12.5 percent of the growing season.	Y	Areas that are identified as wetland habitat within the mitigation site exhibit soil saturation for at least 12.5 percent of the growing season.
Hydric Soil	Hydric soil conditions are present or appear to be forming.	Y	Hydric soil characteristics have developed throughout all constructed wetlands.
	Soil is sufficiently stable to prevent erosion.	Y	Disturbed soil is stable and generally does not exhibit signs of erosion.
	Soil is able to support plant cover.	Y	Plant cover is establishing well within developed wetlands.
Hydrophytic Vegetation	Success is achieved where combined absolute cover of facultative or wetter species is ≥ 70 percent.	Y	Established wetland cells support 70 percent or greater cover of hydrophytic vegetation (OBL, FACW, and FAC).
	State-listed noxious weeds do not exceed 10 percent absolute cover.	Y	Montana state-listed noxious weeds are estimated at 2 percent absolute cover within wetland areas.
Channel-Restoration Success	Revegetation along the new Sand Creek channel corridor will be considered successful when banks are vegetated with a majority of deep-rooting riparian and wetland herbaceous and woody plant species.	Y	The majority of stream bank vegetation along the constructed Sand Creek channel corridor is dominated by vegetation communities with stability ratings greater than or equal to 6.
	The intent of the stream restoration is to allow for the stream to naturally migrate within the floodplain and to allow it to freely move and stabilize itself within the site.	Y	The stream has plenty of space within the floodplain for natural migration. The stream currently appears to be stable with no lateral adjustment observed after construction.
Stream Bank Vegetation	Banks are vegetated with a majority of deep-rooting riparian plant species that have root-stability indexes ≥ 6.	Y	The majority of stream bank vegetation along the constructed Sand Creek channel corridor is dominated by vegetation communities with stability ratings greater than or equal to 6.
Open Water	The project is intended to provide seasonal open water during the spring and early summer within excavated depressions. As the growing season progresses and the groundwater levels recede, vegetation is expected to germinate within the majority of the depressions. Open water with submerged and/or floating vegetation will, therefore, be considered successful and creditable.	Y	In 2021, wetland Cells 2, 3, and a portion of 4 exhibited rooted hydrophytic vegetation and evidence of seasonal open water earlier in the spring. Wetland Cells 1, 5, the northern portion of 4, and portion of WL-13 appear to support perennial inundation and exhibit an aquatic macrophyte community.

Performance Standards	Success Criteria	Criteria Achieved Y/N	Discussion
Upland Buffer	Noxious weeds do not exceed 10 percent cover within upland buffer area.	Y	Noxious weed cover is approximately 2 percent within the upland buffer.
	Any area that was disturbed within the creditable buffer zone must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.	Y	Disturbed areas have established greater than 50 percent cover by non-noxious weed species.
Weed Control	Control measures will be based on annual monitoring of the site to determine weed species and the degree of infestation within the site; control measures based on the monitoring results will be implemented by MDT to minimize and/or eliminate the intrusion of state-listed noxious weed species within the site.	Y	State-listed noxious weed species across the site have been monitored and mapped during each post-construction monitoring event. Noxious weeds were sprayed in October 2021 by MDT's contractor. The contractor was scheduled to spray the site in July, but due to Stage 2 fire restrictions on state lands, it was delayed until the fall. MDT administers on-going weed-control efforts and will continue, as needed, to reduce existing noxious weed infestations. Montana state-listed noxious weeds are estimated at 4 percent absolute cover across the entire site.

Summary Data

Wetland Delineation –The total wetland acreage delineated in 2021, including pre-existing wetland areas, was 18.07 acres (Table 2; Appendix A), which is an increase of 2.38 acres since 2020. The delineation confirmed 8.42 acres of established wetland in and adjacent to the excavated cells and stream channel, and 9.7 acres in the preserved wetland areas (Table 2). In 2020, the USACE (N. Green, personal communication, May 6, 2020) provided guidance on open water, defining it as "areas of open water of any depth with less than 5% rooted emergent vegetation, no vegetation, submerged non-rooted vegetation, and/or submerged vegetation rooted in the substrate that does not extend above the water surface." In accordance with this recent USACE guidance, open water accounted for 3.24 acres of the mitigation site in 2021 (Table 2). Mudflat was observed for the first time at this site in 2021, in areas within preserved wetland cell 13 that were mapped as open water in 2020. The increase in total wetland acreage observed in 2021 is primarily a result of newly developed wetland areas adjacent to wetland cells 1, 2, and the Sand Creek channel. Uplands accounted for approximately 26.85 acres of the mitigation site and the remaining 1.7 acres are represented by the restored Sand Creek channel (Figure A-3, Appendix A).

Table 2. Upland, Wetland & Aquatic Habitat Acreage Delineated at the Silicon Mountain Site From 2016 to 2021

Habitat Type	2016 Acreage	2017 Acreage	2018 Acreage	2019 Acreage	2020 Acreage	2021 Acreage
Uplands	**31.80**	**31.30**	**30.50**	**30.10**	**28.96**	**26.85**
Total Wetland & Aquatic Habitat	**18.30**	**18.80**	**19.60**	**20.00**	**21.14**	**23.25**
Establishment (Creation)	6.30	6.30	7.10	7.50	6.04	8.42
Preservation	10.30	10.80	10.80	10.80	9.65	9.65
Open Water					3.75	3.24
Mudflat					0.00	0.24
Stream Channel	1.70	1.70	1.70	1.70	1.70	1.70

Project Area = 50.10 Acres

Vegetation – A total of 178 plant species have been identified at the site from 2015 through 2021, including one new species in 2021, thread-leaved sedge (*Carex filifolia*). Vegetation communities were identified by species composition and dominance. The following eight wetland and six upland community types were identified and mapped at the mitigation site in 2021:

- Upland Type 2 – *Descurainia sophia*/*Thlaspi arvense*
- Upland Type 3 – *Bromus inermis*/*Poa pratensis*
- Upland Type 5 – *Elymus repens*/*Bromus inermis*
- Upland Type 10 – *Artemisia tridentata*/*Poa* spp.
- Upland Type 13 – *Leymus cinereus*/*Elymus trachycaulus*
- Upland Type 15 – *Poa pratensis*/*Elymus repens*
- Wetland Type 4 – *Carex* spp./*Juncus balticus*
- Wetland Type 7 – Open Water/Aquatic Macrophytes
- Wetland Type 8 – *Salix exigua*/*Juncus balticus*
- Wetland Type 9 – *Juncus balticus*/*Elymus repens*
- Wetland Type 11 – *Typha latifolia*
- Wetland Type 14 – *Eleocharis palustris*/*Deschampsia caespitosa*
- Wetland Type 16 – *Juncus balticus*/*Eleocharis palustris*
- Wetland Type 17 – *Salix* spp.

The community composition for each community type (CT) is provided in full detail on the Wetland Mitigation Site Monitoring form (Appendix B), and the community boundaries shown on Figure A-3 (Appendix A). A small portion of upland CT 13 remains the primary CT observed in a newly established wetland area within and surrounding wetland cell 6 in the western part of the project area. Upland CT 13 will be reevaluated in this newly established wetland area and split into a new wetland CT during the 2022 monitoring event.

Vegetation cover was measured along two belt transects (T-1 and T-2) in 2021 (Figure A-2, Appendix A). Photographs of the transect end points are provided in Appendix C. Table 3 summarizes the data for T-1 from 2016 through 2021. T-1 is 564 feet long and intersects CT 3, 11, 13, and 16. Hydrophytic vegetation accounted for 86 percent of the transect in 2021. There was no change in transect intervals, total cover, and minimal change in species presence and their associated cover classes between 2020 and 2021. In 2021, areas observed as shallow standing water within CT 11 along this transect in 2020, were instead saturated to the ground surface.

Table 3. Data Summary for T-1 From 2016 Through 2021 at the Silicon Mountain Site

Monitoring Year	2016	2017	2018	2019	2020	2021
Transect Length (feet)	**564**	**564**	**564**	**564**	**564**	**564**
Vegetation Community Transitions Along Transect	6	6	6	6	6	6
Vegetation Communities Along Transect	4	4	5	5	4	4
Hydrophytic Vegetation Communities Along Transect	2	2	2	2	2	2
Total Vegetative Species	48	54	42	43	47	46
Total Hydrophytic Species	26	33	28	31	35	35
Total Upland Species	22	21	14	12	12	11
Estimated % Total Vegetative Cover	90	90	90	93	93	93

Monitoring Year	2016	2017	2018	2019	2020	2021
Estimated % Unvegetated	10	10	10	7	7	7
% Transect Length Comprising Hydrophytic Vegetation Communities	81.3	86.0	86.0	86.0	86.0	86.0
% Transect Length Comprising Upland Vegetation Communities	18.7	14.0	14.0	14.0	14.0	14.0
% Transect Length Comprising Open Water	0.0	0.0	0.0	0.0	0.0	0.0
% Transect Length Comprising Mudflat	0.0	0.0	0.0	0.0	0.0	0.0

Table 4 summarizes the data for T-2 from 2016 through 2021. T-2 is 219 feet long and intersects vegetation community Types 3, 11, 14, and 15. Hydrophytic vegetation accounted for 90 percent of the transect in 2021 which is consistent with observations in 2018 through 2020. Total upland species observed along the transect, decreased minimally during the 2021 monitoring event. Total cover increased by 2 percent in 2021, which included an increase in Baltic rush (*Juncus balticus*) observed within CT 11 and 14.

Table 4. Data Summary for T-2 From 2016 Through 2021 at the Silicon Mountain Site

Monitoring Year	2016	2017	2018	2019	2020	2021
Transect Length (feet)	**219**	**219**	**219**	**219**	**219**	**219**
Vegetation Community Transitions Along Transect	2	2	2	3	3	3
Vegetation Communities Along Transect	3	3	3	4	4	4
Hydrophytic Vegetation Communities Along Transect	1	1	1	2	2	2
Total Vegetative Species	21	47	27	35	37	35
Total Hydrophytic Species	10	24	17	19	26	26
Total Upland Species	11	23	10	16	11	9
Estimated % Total Vegetative Cover	45	55	72	87.5	85	87
Estimated % Unvegetated	55	45	28	12.5	15	13
% Transect Length Comprising Hydrophytic Vegetation Communities	88.1	88.1	90.9	90.4	89.5	89.5
% Transect Length Comprising Upland Vegetation Communities	11.9	11.9	9.1	9.6	10.5	10.5
% Transect Length Comprising Open Water	0.0	0.0	0.0	0.0	0.0	0.0
% Transect Length Comprising Mudflat	0.0	0.0	0.0	0.0	0.0	0.0

Priority 2B noxious weeds identified within the Silicon Mountain mitigation site included spotted knapweed (*Centaurea stoebe*), leafy spurge (*Euphorbia esula*), and Canada thistle (*Cirsium arvense*). These infestation areas, ranging from trace to moderate cover classes, were mapped in 2021 and are shown on Figure A-3 in Appendix A. Common tansy (*Tanacetum vulgare*), butter-and-eggs (*Linaria vulgaris*), and Russian knapweed (*Acroptilon repens*), were also observed as isolated individuals in several locations across the site, but were not mapped. Weed control efforts have been effective in decreasing weed infestations from 2020 to 2021. MDT has an ongoing weed-control program, which included weed spraying by contractors in early June 2021, prior to the late June 2021 monitoring event. The site is currently achieving success criteria established for noxious weed cover within wetland and upland buffer areas.

MDT planted an estimated 30,000 willow cuttings and 350 containerized shrubs and trees along the stream banks of the Sand Creek channel, in riparian areas, and in small clusters around the perimeter of the excavated wetland cells. An estimated 17 percent of the containerized woody plantings had survived through the 2021 survey, consistent with that observed in 2020. An estimated 85 percent of the installed willow cuttings had survived; young shoots arising from the installed cuttings ranged from 12 to

60 inches in length. The willow cuttings were healthy and robust, with no signs of insect damage or disease observed.

Hydrology – During the 2021 investigation, the average depth of surface water across the site was estimated at 0.5 feet with a range of depths from 0.1 to 4 feet. Open water, totaling 3.24 acres, was present and mapped within constructed Cells 1, 4, and 5 and preserved wetland cell 13. Soils were saturated to the surface within Cells 2 and 3. In 2021, surface soil cracks were present within constructed Cell 6, but no saturation or surface water was observed during the monitoring event. Flowing water was present in the entire length of the Sand Creek channel. Groundwater monitoring by the US Geological Survey (USGS) from 2016 through 2020 indicates increasing groundwater levels across the site. May 2019 and 2020 water levels were the highest recorded to date, at 0.63-ft and 0.85-ft below land surface, respectively. Monitoring efforts in 2021 show groundwater levels in a portion of the site at 1.01 to 2.81 feet below the land surface elevation of 5,347 feet from April through September (Table 5) [USGS, 2021]. The 2021 data indicate groundwater levels at the site, between April and September, were on average slightly lower than 2019 and 2020, higher than 2016 and 2017, and similar to groundwater levels observed in 2018 [USGS, 2021].

Table 5. 2021 USGS Groundwater Well Data for the Silicon Mountain Site

2021 Discrete water-level measurements		
Date	Time Mountain Time	Depth to water level, feet below land surface
4/5/2021	8:38 am	2.23
5/24/2021	10:02 am	1.01
8/26/2021	6:32 pm	2.81

Soils – Paired soil pits were excavated at seven locations (14 pits) to determine the extent of hydric and upland soil development across the site in 2021 (Appendices A and B). Soil textures within wetland test pits ranged from mucky peat to coarse sand to silty clay. Hydric soil indicators were observed in all but two wetland test pits and included depleted matrix, redox dark surface, and hydrogen sulfide. The wetland test pits (i.e., DP02w and DP03w) that lacked hydric soil indicators exhibited hydrologic indicators, including surface water, soil saturation, high water table, oxidized rhizospheres on living roots, geomorphic position, and passing the FAC-neutral test; all dominant plant species were OBL and FACW, and the wetland boundary had an abrupt edge.

Soil textures within upland test pits ranged from loamy sand to sandy clay. No hydric soil indicators were observed in any of the upland test pits. Additional field observations for the 14 data points are provided in the USACE wetland determination data forms in Appendix B.

In 2017, there were a few rills noted on the southern slope of wetland Cell 5, north of the constructed bike path, which resulted in sediment deposition. In 2020 and 2021, perennial vegetation was established within and adjacent to the erosion, and the rills appeared inactive.

Photographs – Seven wetland photo points and ten stream photo points were initially established in the project area in 2015 (PP-1 to PP-17; Figure A-2, Appendix A). Photographs of all surveyed channel cross sections, wetland determination data points, and vegetation transect endpoints (T-1 and T-2) are provided in Appendix C, with comparison between 2021 and the first year of monitoring. The locations of these photographs are illustrated on Figure A-2 in Appendix A. Please refer to previous years' monitoring reports for all previous annual photographs (https://www.mdt.mt.gov/publications/brochures/wetland_mitigation.shtml).

Functional Assessment – The 2008 Montana Wetland Assessment Method (MWAM) form [Berglund and McEldowney, 2008] was used to evaluate the site in 2020 (Table 6; Appendix B). Four distinct

Assessment Areas (AA) were evaluated at the site in 2021 and include AA1 – Established Wetland Cells 2, 3, and 4; AA2 – Established Wetland Cells 1 and 5; AA3 – Preservation Wetlands; and AA4 – Established Wetland Cell 6. AA1 – Established Wetland Cells 2, 3, and 4 are classified as Category II wetlands and received high ratings for General Wildlife Habitat, Sediment/Shoreline Stabilization, Production Export/Food Chain Support, and Recreation/Education Potential. AA2 – Established Wetland Cells 1 and 5 are classified as Category II wetlands and received an exceptional rating for Production Export/Food Chain Support and high ratings for General Wildlife Habitat, Short- and Long-Term Surface-Water Storage, Sediment/Shoreline Stabilization, Groundwater Discharge/Recharge, and Recreation/Education Potential. AA3 – Preservation Wetlands were also classified as Category II wetlands and received high ratings for General Wildlife Habitat, Short- and Long-Term Surface-Water Storage, and Groundwater Discharge/Recharge, and Recreation/Education Potential. AA4 was rated as a Category III wetland. Functional unit credits, based on the mitigation credit acreage for the site in 2021, is provided in Table 9.

Table 6. Montana Wetland Assessment Method Summary for the Silicon Mountain Site

Function and Value Parameters From the 2008 Montana Wetland Assessment Method	**2021 AA 1 (Established Wetland Cells 2, 3, and 4)**	**2021 AA 2 (Established Wetland Cells 1 and 5)**	**2021 AA3 (Preservation Wetlands)**	**2021 AA4 (Established Wetland Cell 6)**
Listed/Proposed Threatened & Endangered (T&E) Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)	Low (0.0)
Montana Natural Heritage Program Species (MTNHP) Habitat	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.5)
General Wildlife Habitat	High (0.9)	High (0.9)	High (0.9)	Mod (0.4)
General Fish/Aquatic Habitat	NA	NA	NA	NA
Flood Attenuation	NA	NA	NA	NA
Short- and Long-Term, Surface-Water Storage	Mod (0.6)	High (0.8)	High (0.8)	Low (0.3)
Sediment/Nutrient/Toxicant Removal	High (1.0)	Mod (0.7)	Mod (0.7)	Mod (0.7)
Sediment/Shoreline Stabilization	Mod (0.6)	High (1.0)	Mod (0.7)	Low (0.2)
Production Export/Food Chain Support	High (0.9)	Exceptional (1.0)	Mod (0.6)	Mod (0.4)
Groundwater Discharge/Recharge	Mod (0.7)	High (1.0)	High (1.0)	Mod (0.7)
Uniqueness	Mod (0.5)	Mod (0.6)	Mod (0.4)	Low (0.3)
Recreation/Education Potential (bonus points)	High (0.2)	High (0.2)	High (0.2)	NA
Actual Points/Possible Points	**5.9/9**	**6.7/9**	**6.2/9**	**3.5/9**
% of Possible Score Achieved	**66%**	**74%**	**69%**	**39%**
Overall Category	**II**	**II**	**II**	**III**
Total Acreage of Assessed Wetlands Within Site Boundaries	**3.9**	**6.3**	**11.0**	**0.44**

Wildlife – Eighteen bird species were identified in 2021 at the Silicon Mountain site and included several wetland-dependent species. In addition to the bird observations, white-tailed deer, a mountain cottontail rabbit, and a common garter snake were also observed (Appendix B).

Stream Monitoring – The annual cross section survey of the Sand Creek reconstructed channel revealed horizontal and vertical change since 2020. Cross sections 5 and 7 exhibited downcutting of the thalweg, both surveyed at 0.6-foot lower than in 2020. Cross sections 4 and 7 exhibited minor aggradation and point bar growth in 2021. Cross Section 6 showed the most noticeable shifts from previous years, but in

2021 appeared nearly consistent with the 2020 survey (see Cross Section figures in Appendix D). The section aggraded in 2019 and 2020, while it exhibited scouring in 2017 and 2018. Cross Section 7 (just downstream) appears to serve as the hydraulic control for the reach immediately upstream, likely due to the similar bed elevation and aggradation witnessed in Cross Section 6 in previous years. These annual fluctuations are likely the result of varied relative magnitude in annual spring runoff. Anecdotal evidence suggests that 2017 and 2018 were large runoff years, 2019 and 2021 were smaller runoff years, and 2020 of greater magnitude than 2019 and 2021. Large runoff years generally appear to induce more substantial scouring of pools, and low runoff years generally appear to promote relatively more aggradation.

In 2021, all 16 belt transects monitored along Sand Creek exhibited vegetation communities with stability ratings of 6 or greater, which successfully meets the site's performance criterion. Willow species, including yellow willow (*Salix lutea*), narrow-leaf willow (*Salix exigua*), and Pacific willow (*Salix lasiandra*), represent the dominant community type identified along the stream bank transects. Dominant herbaceous species observed within the willow dominated communities included red-tinge bulrush (*Scripus microcarpus*), Nebraska sedge (*Carex nebrascensis*), and Northwest Territory sedge (*Carex utriculata*). The willows continue to increase in height and width along the stream banks, with minor shifts in species dominance observed during the 2021 monitoring event.

Credit Summary – Stream Credits

The goal of the stream mitigation component of the Silicon Mountain project includes restoring approximately 4,300 linear feet of Sand Creek, with 3,900 linear feet considered creditable based on location and design. The project is expected to generate a total of 12,369.50 stream mitigation credits, as shown in Table 7. To date, the project is meeting the two success criteria established for stream mitigation components of the project. Stream cross sections for 2021 are provided in Appendix D and are compared to previous years' monitoring.

Table 7. 2021 Stream Mitigation Credits for the Silicon Mountain Site

Mitigation Reach	Linear Feet	Sum of Mitigation Factors[(a)]	Mitigation Credits
Reach 1	3,250.00	3.20	10,400.00
Reach 2	650.00	3.03	1,969.50
Total	**3,900.00**		**12,369.50**

(a) From Table 7 of *Silicon Mountain Aquatic Resource Mitigation Plan, Watershed #2 – Upper Clark Fork of the Columbia River, Butte-Silver Bow County, MT* [Confluence Consulting, Inc., 2013].

Credit Summary – Wetland Credits

In 2021, a total of 32.35 acres were delineated at the Silicon Mountain site, including 8.42 acres of wetland establishment, 9.65 acres of wetland preservation, 10.80 acres of upland buffer, 3.24 acres of open water, and 0.24 acres of mudflat (Table 8).

Applying the USACE-approved ratios to these values, a total of 12.99 acres of mitigation credit are estimated for 2021 (Table 8), which is 1.54 acres greater than the targeted 11.45 acres anticipated at this site. This is the first year the site has not only met but exceeded the anticipated mitigation credit acres.

Table 8. Summary of Wetland Mitigation Credits at the Silicon Mountain Site from 2017 through 2021

Compensatory Mitigation Type	Mitigation Area Description	Wetland Type[b]	Anticipated Mitigation Surface Area (acres)	USACE-Approved Mitigation Ratios	Anticipated Mitigation Credit (acres)	2017 Delineated Acres	2017 Mitigation Credit (acres)	2018 Delineated Acres	2018 Mitigation Credit (acres)	2019 Delineated Acres	2019 Mitigation Credit (acres)	2020 Delineated Acres	2020 Mitigation Credit (acres)	2021 Delineated Acres	2021 Mitigation Credit (acres)
Establishment (Creation)	Wetland Cells 1, 2, 3, 4, 5 & 6	Palustrine Emergent, Aquatic Bed	6.77	1:1	6.77	6.30	6.30	7.10	7.10	7.5	7.5	6.04	6.04	8.42	8.42
Preservation	Existing Wetland Areas	Palustrine Emergent, Scrub-Shrub	10.06	4:1	2.52	10.8	2.7	10.8	2.7	10.8	2.5	9.65	2.41	9.65	2.41
Upland Buffer	50-Foot-Wide Upland Perimeter	N/A	10.80	5:1	2.16	10.80	2.16	10.80	2.16	10.8	2.16	10.80	2.16	10.80	2.16
Open Water[a]	Wetland Cells 1, 4, 5, & 13	Lacustrine/ Palustrine Aquatic Bed	TBD[a]	TBD[a]	TBD[a]	N/A	N/A	N/A	N/A	N/A	N/A	3.75	TBD[a]	3.24	TBD[a]
Mudflat[a]	Preserved Wetland Cell 13	Palustrine Aquatic Bed	TBD[a]	TBD[a]	TBD[a]	N/A	N/A	N/A	N/A	N/A	N/A		TBD[a]	0.24	TBD[a]
Totals			**27.6**		**11.45**	**27.90**	**11.16**	**28.7**	**11.96**	**29.10**	**12.16**	**30.24**	**10.61**	**32.35**	**12.99**

(a) Mitigation ratios and crediting for Open Water and Mudflat are To Be Determined (TBD).

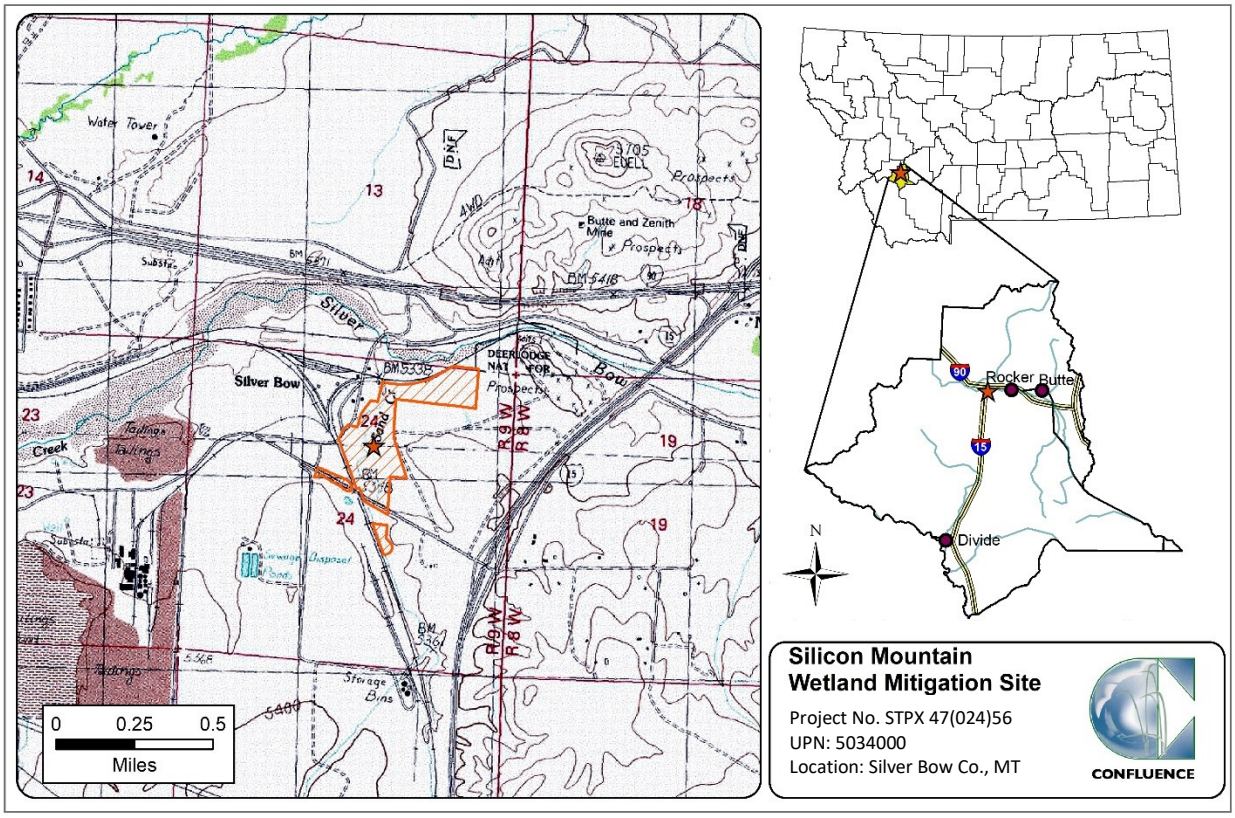
(b) [FGDC, 2013]

Table 9. 2021 Functional Unit Credits at the Silicon Mountain Site

Mitigation Area Description	2021 Delineated Acres	Ratio	2021 Mitigation Credit Acres	MWAM Actual Points (see Table 6)	Functional Units
Wetland Cell 1 (Establishment)	3.21	1:1	3.21	6.7	21.51
Wetland Cell 2 (Establishment)	1.93	1:1	1.93	5.9	11.39
Wetland Cell 3 (Establishment)	0.67	1:1	0.67	5.9	3.95
Wetland Cell 4 (Establishment)	1.26	1:1	1.26	5.9	7.43
Wetland Cell 5 (Establishment)	0.66	1:1	0.66	6.7	4.42
Wetland Cell 6 (Establishment)	0.44	1:1	0.44	3.5	1.54
Preservation	9.65	4:1	2.41	6.2	14.94
Upland Buffer	10.80	5:1	2.16	N/A	N/A
Functional Unit Credits (Mitigation Credit Acres × Actual Points)					**65.18**

Maps, Plans, Photos

Figure 1. Site Location Map



Project Area Maps/Figures: See Appendix A (Figure A-2 – 2021 Monitoring Activity Locations; Figure A-3 – 2021 Mapped Site Features; Figure A-4 – 2021 Wetland Credit Areas; and Figure A-5 – 2021 Wetland Delineation)

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

Plant List: See Appendix B (Table B-1)

Photos: See Appendix C

Channel Cross Sections: See Appendix D

Plans: See Appendix D of 2015 Monitoring Report
https://www.mdt.mt.gov/other/webdata/external/planning/wetlands/2015_REPORTS/2015_Silicon_Mountain_FINAL.PDF

Conclusions

Based on the results of the seventh year of monitoring, the mitigation site continues to develop into a diverse stream and wetland ecosystem. The site is meeting all established performance criteria and has exceeded the anticipated mitigation credit acreage, as documented in Tables 1 and 8, respectively. Wetland cells are developing as intended and wetland acreage continues to increase with each successive monitoring event. The Sand Creek channel is dynamic and continues to develop. Willow cuttings installed along the banks of Sand Creek are doing well and streambanks are stable with thriving woody vegetation communities. At this time, no remedial actions are necessary because the site has continued to develop as intended.

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.

Confluence Consulting, Inc., 2013. *Silicon Mountain Aquatic Resource Mitigation Plan, Watershed #2 – Upper Clark Fork of the Columbia River, Silver Bow County, MT,* CCI Project No. MDT.006, prepared by Confluence Consulting, Inc., Bozeman, 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.

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 October 2021 at *http://mtnhp.org/SpeciesOfConcern/?AorP=p*

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.

Natural Resources Conservation Service (NRCS). 2021. *Soil Survey (SSURGO) Database for* [Silver Bow County Area, Montana]. Accessed on 1 October 2021 at *http://websoilsurvey.nrcs.usda.gov/*

US 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: Western Mountains, Valleys, Coasts 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). 2018. *National Wetland Plant List (Version 3.4),* prepared by U.S. Army Corps of Engineers, U.S. Army Engineer Research and Development Center, Cold Regions Research and Engineering Laboratory, Hanover, NH.

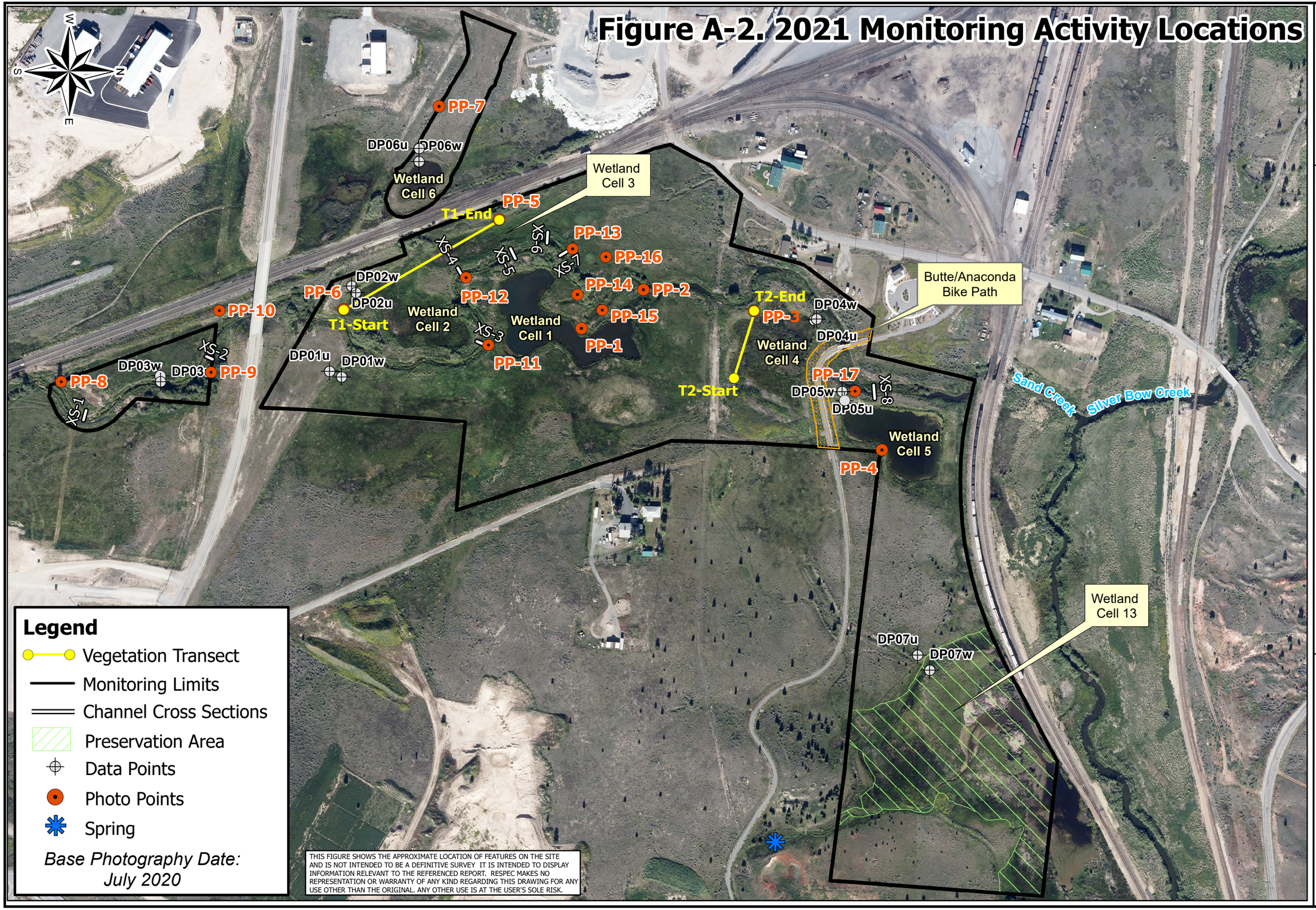
U.S. Fish and Wildlife Service (USFWS). 2021. *IPaC Resource List.* Environmental Conservation Online System (ECOS). Accessed on 1 October 2021 at *https://ecos.fws.gov/ipac/*

U.S. Geological Survey (USGS). 2021. *National Water Information System, USGS Water Resources, Groundwater Levels for USA: Water Levels.* USGS Site No. 455959112394201, 02No8W24DDCC01 SIL-01. Silver Bow County, Montana. Accessed on 15 January 2022 at *https://nwis.waterdata.usgs.gov/nwis/gwlevels/?site_no=455959112394201.*

APPENDIX A
PROJECT AREA MAPS

MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

Figure A-2. 2021 Monitoring Activity Locations



Legend

- Vegetation Transect
- Monitoring Limits
- Channel Cross Sections
- Preservation Area
- Data Points
- Photo Points
- Spring

Base Photography Date: July 2020

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

CONFLUENCE
consulting incorporated

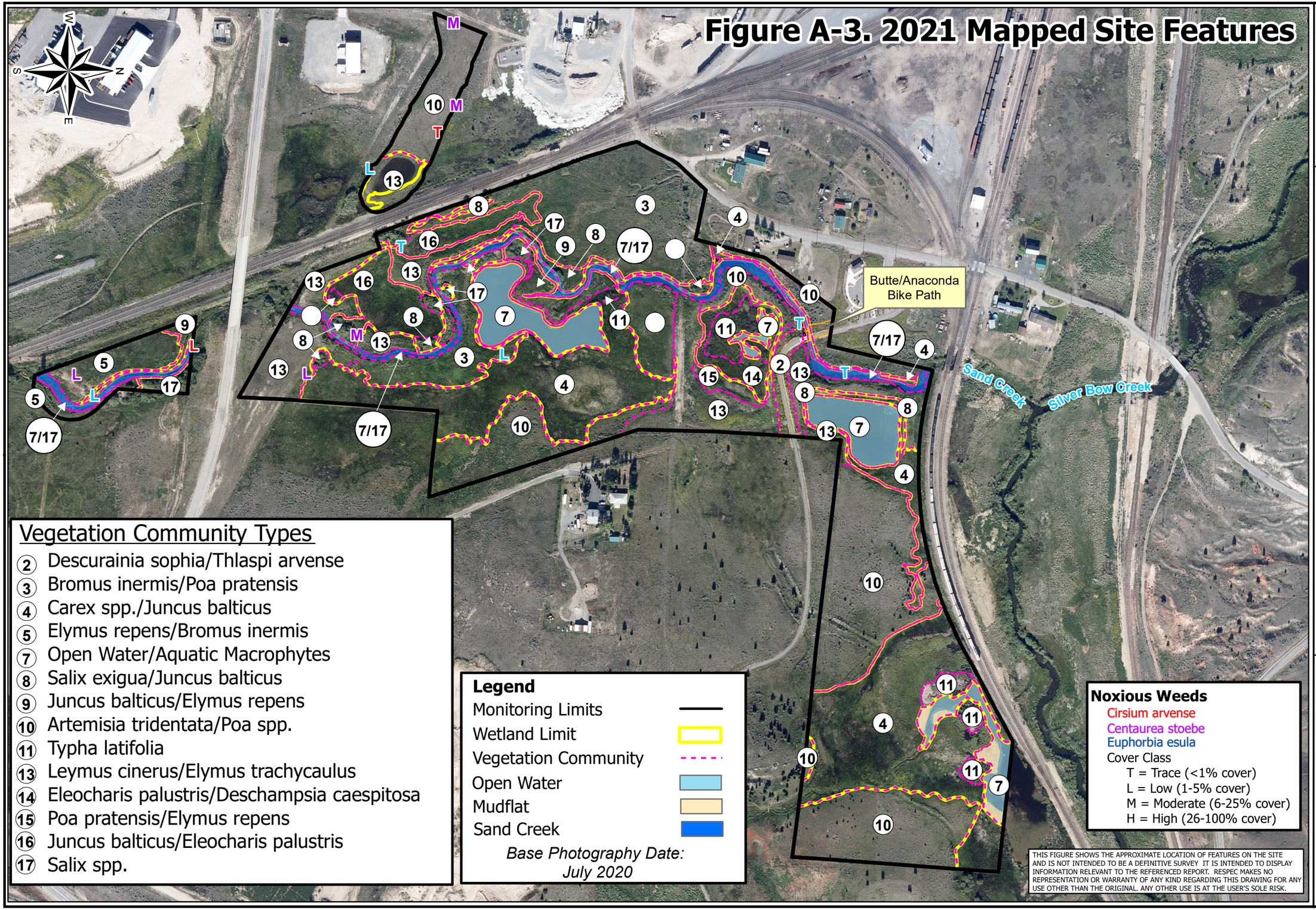
Silicon Mountain Mitigation Site
2021 Monitoring Activity Locations

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

Project:	STPX 47 (024) 56
Location:	Silver Bow Co., Montana
Date:	September 2021
Project Manager:	R McEldowney
Drawn By:	RQ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Silicon Mountain\2021\Monitor2021_MDT.mxd

Figure A-3. 2021 Mapped Site Features



Vegetation Community Types

2. Descurainia sophia/Thlaspi arvense
3. Bromus inermis/Poa pratensis
4. Carex spp./Juncus balticus
5. Elymus repens/Bromus inermis
7. Open Water/Aquatic Macrophytes
8. Salix exigua/Juncus balticus
9. Juncus balticus/Elymus repens
10. Artemisia tridentata/Poa spp.
11. Typha latifolia
13. Leymus cinerus/Elymus trachycaulus
14. Eleocharis palustris/Deschampsia caespitosa
15. Poa pratensis/Elymus repens
16. Juncus balticus/Eleocharis palustris
17. Salix spp.

Legend

- Monitoring Limits
- Wetland Limit
- Vegetation Community
- Open Water
- Mudflat
- Sand Creek

Base Photography Date: July 2020

Noxious Weeds

- Cirsium arvense
- Centaurea stoebe
- Euphorbia esula

Cover Class

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

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

CONFLUENCE
consulting incorporated

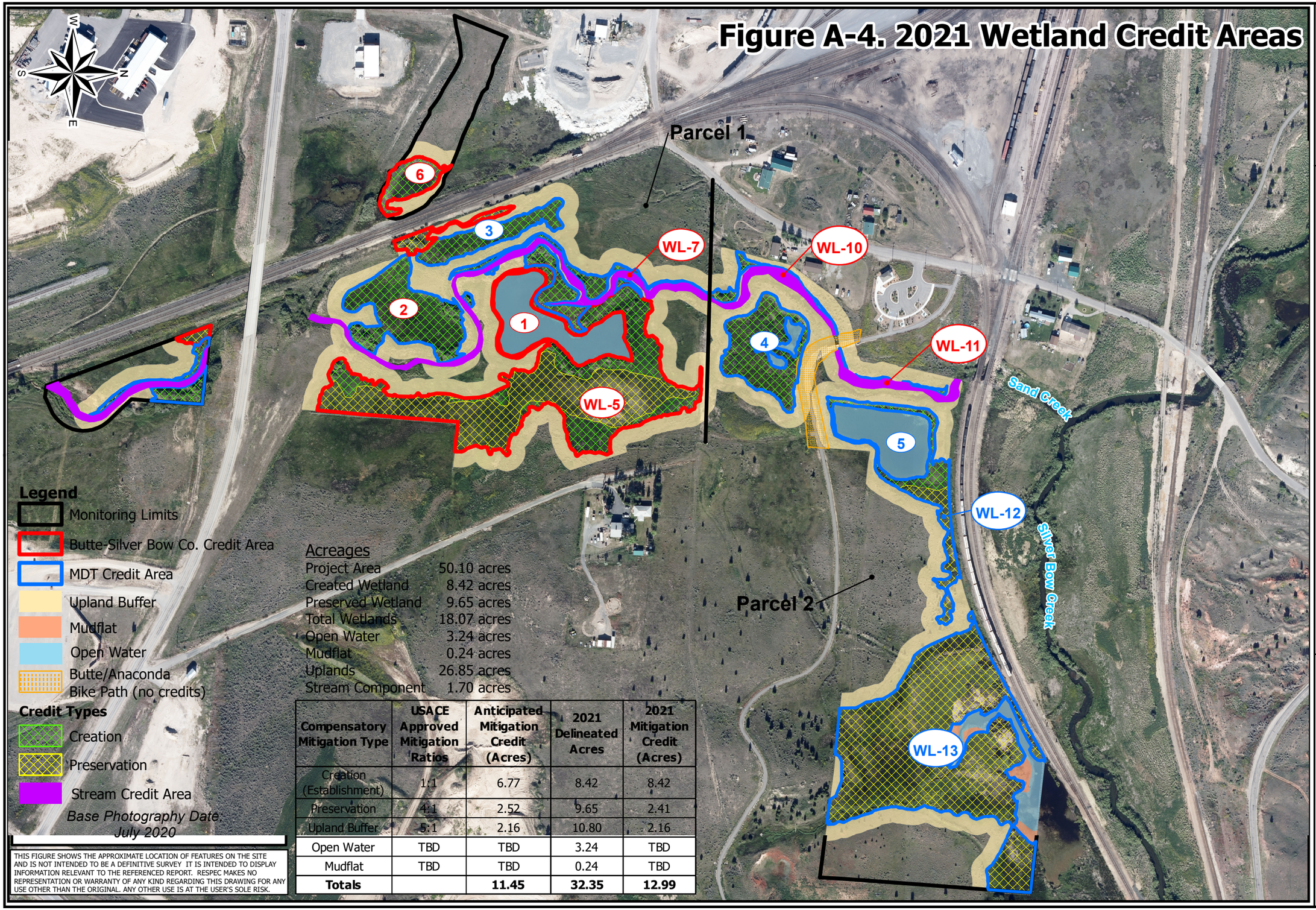
Silicon Mountain Mitigation Site
2021 Mapped Site Features

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

Project: STPX 47 (024) 56
Location: Silver Bow Co., Montana
Date: September 2021
Project Manager: R McEldowney
Drawn By: RQ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Silicon Mountain\2021\Veg2021_MDT.mxd

Figure A-4. 2021 Wetland Credit Areas



Legend

- Monitoring Limits
- Butte-Silver Bow Co. Credit Area
- MDT Credit Area
- Upland Buffer
- Mudflat
- Open Water
- Butte/Anaconda Bike Path (no credits)

Credit Types

- Creation
- Preservation
- Stream Credit Area

Base Photography Date: July 2020

Acreages

Project Area	50.10 acres
Created Wetland	8.42 acres
Preserved Wetland	9.65 acres
Total Wetlands	18.07 acres
Open Water	3.24 acres
Mudflat	0.24 acres
Uplands	26.85 acres
Stream Component	1.70 acres

Compensatory Mitigation Type	USACE Approved Mitigation Ratios	Anticipated Mitigation Credit (Acres)	2021 Delineated Acres	2021 Mitigation Credit (Acres)
Creation (Establishment)	1:1	6.77	8.42	8.42
Preservation	4:1	2.52	9.65	2.41
Upland Buffer	5:1	2.16	10.80	2.16
Open Water	TBD	TBD	3.24	TBD
Mudflat	TBD	TBD	0.24	TBD
Totals		**11.45**	**32.35**	**12.99**

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

CONFLUENCE
consulting incorporated

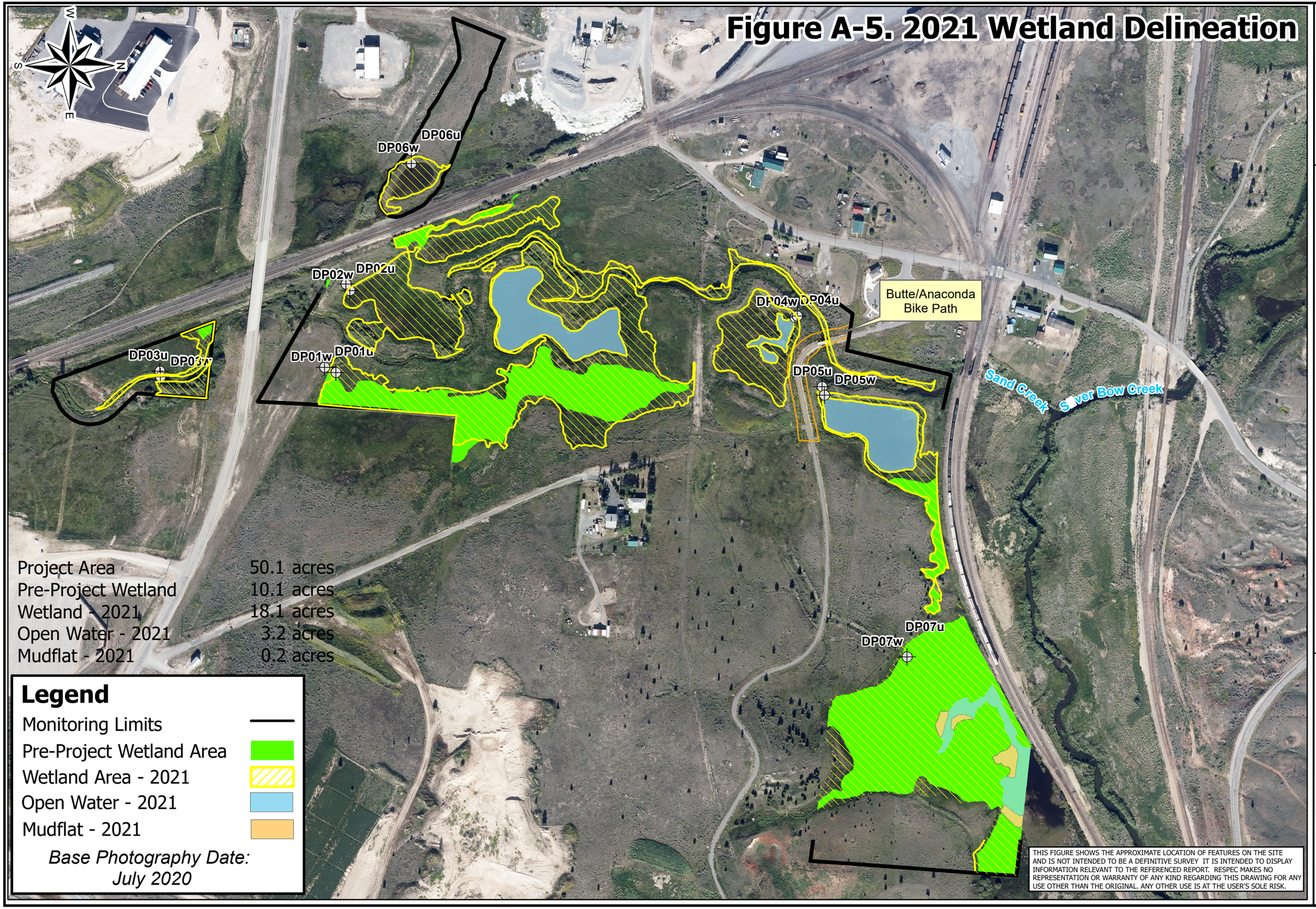
Silicon Mountain Mitigation Site
2021 Wetland Credit Areas

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

Project: STPX 47 (024) 56
Location: Silver Bow Co., Montana
Date: September 2021
Project Manager: R McEldowney
Drawn By: RQ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Silicon Mountain\2021\CreditAcres2021_MDT.mxd

Figure A-5. 2021 Wetland Delineation



Project Area	50.1 acres
Pre-Project Wetland	10.1 acres
Wetland - 2021	18.1 acres
Open Water - 2021	3.2 acres
Mudflat - 2021	0.2 acres

Legend

- Monitoring Limits
- Pre-Project Wetland Area
- Wetland Area - 2021
- Open Water - 2021
- Mudflat - 2021

Base Photography Date: July 2020

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

CONFLUENCE
consulting incorporated

Silicon Mountain Mitigation Site
2021 Wetland Delineation

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

Project:	STPX 47 (024) 56
Location:	Silver Bow Co., Montana
Date:	September 2021
Project Manager:	R McEldowney
Drawn By:	RQ

File: X:\Project\MDT Wetland Mitigation 2\Mains\Silicon Mountain\2021\Delin2021_MDT.mxd

APPENDIX B
MONITORING FORMS

MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: Silicon Mountain Assessment Date/Time 6/29/2021

Person(s) conducting the assessment: R Quire, R Jones, S Weyant

Weather: 85 degrees, sunny, clear Location: 5 miles west of Butte

MDT District: Butte Milepost: MP 119 on I-15

Legal Description: T 3N R 9E Section(s) 24

Initial Evaluation Date: 6/23/2015 Monitoring Year: 7 #Visits in Year: 1

Size of Evaluation Area: 50.1 (acres)

Land use surrounding wetland:

Mix of commercial (railroad), residential, and parkland (bikeway)

HYDROLOGY

Surface Water Source: Sand Creek and a well defined spring.

Inundation: ☑ Average Depth: 0.5 **(ft)** Range of Depths: 0.1-4 **(ft)**

Percent of assessment area under inundation: 15 %

Depth at emergent vegetation-open water boundary: 0.3 **(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:

Wetland soil pits had a high water table and/or were saturated within the upper 12 inches. A positive FAC-neutral test, geomorphic position, surface soil cracks, and sulfidic odor were also observed.

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)

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:

Two wells onsite that remained after construction are monitored by USGS. Open water was present >90 percent of wetland Cells 1 and 5. Shallow ponded water was present across ~50 percent of Cell 4. Soils were saturated to surface in cells 2 and 3. Flowing water was present in the entire length of the Sand Creek channel.

VEGETATION COMMUNITIES

Site Silicon Mountain

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

Community # 2 **Community Type:** Descurainia sophia / Thlaspi arvense **Acres:** 0.4

Species	Cover class	Species	Cover class
Agropyron cristatum	1	Artemisia tridentata	1
Bassia scoparia	2	Bromus tectorum	2
Camelina microcarpa	2	Descurainia sophia	2
Elymus trachycaulus	1	Lepidium perfoliatum	2
Leymus cinereus	1	Pascopyrum smithii	1
Thlaspi arvense	3		

Comments:

Upland community composed of mostly early successional, non-native species commonly found on disturbed landscapes. In 2021 this community type was mapped along the Butte/Anaconda bike path. Minimal change in species richness and cover were observed here between 2020 and 2021. Thlaspi arvense remains the dominant species in this community.

Community # 3 **Community Type:** Bromus inermis / Poa pratensis **Acres:** 7.5

Species	Cover class	Species	Cover class
Achillea millefolium	1	Agrostis stolonifera	1
Alopecurus arundinaceus	0	Artemisia tridentata	1
Astragalus cicer	1	Bare Ground	1
Bromus inermis	4	Centaurea stoebe	0
Cirsium arvense	0	Deschampsia caespitosa	0
Elymus repens	3	Elymus trachycaulus	2
Juncus balticus	0	Koeleria macrantha	1
Leymus cinereus	2	Melilotus officinalis	1
Phalaris arundinacea	0	Poa palustris	1
Poa pratensis	3	Poa secunda	1
Potentilla anserina	0	Schedonorus pratensis	1
Solidago gigantea	0	Sonchus arvensis	1
Thlaspi arvense	1	Trifolium hybridum	1

Comments:

Upland community. In 2021, acreage decreased from 8.4 to 7.5 acres. This upland CT was replaced by wetland CT 9 and 17 just west of wetland cell 1, in a newly delineated wetland area. Both Bromus inermis and Poa pratensis had decreased in these new wetland areas, and were replaced by a dominance of Juncus balticus, Elymus repens, and Salix spp.

Community # 4 Community Type: Carex spp. / Juncus balticus **Acres:** 11.37

Species	Cover class	Species	Cover class
Calamagrostis canadensis	1	Carex aquatilis	2
Carex nebrascensis	3	Carex praticola	1
Carex utriculata	2	Cirsium arvense	0
Deschampsia caespitosa	2	Juncus balticus	4
Mentha arvensis	1	Poa palustris	1
Poa pratensis	2	Potentilla anserina	2
Typha latifolia	1		

Comments:

Existing wetland community. In 2021, CT4 and corresponding wetland boundary expanded by 0.4 acres, primarily along the northwestern project boundary, west and adjacent to Sand Creek.

Community # 5 Community Type: Elymus repens / Bromus inermis **Acres:** 1.29

Species	Cover class	Species	Cover class
Astragalus cicer	1	Bromus inermis	3
Bromus tectorum	1	Cirsium arvense	0
Descurainia sophia	1	Elymus repens	4
Elymus trachycaulus	1	Juncus balticus	3
Leymus cinereus	1	Pascopyrum smithii	2
Poa pratensis	1	Potentilla anserina	1
Salix exigua	1		

Comments:

Upland community south of the road alignment and overpass. This upland CT decreased by 0.35 acres in 2021 due to shift in species dominance, from Bromus inermis to Juncus balticus and Salix spp. Increased wetland acreage and wetland CT 9 and 17 replaced portions of this CT in 2021.

Community # 7 Community Type: Open Water / Aquatic macrophytes **Acres:** 5.19

Species	Cover class	Species	Cover class
Algae, green	3	Beckmannia syzigachne	1
Eleocharis palustris	1	Juncus balticus	1
Lemna minor	1	Mudflat	1
Open Water	5	Typha latifolia	2

Comments:

Within created wetland cells 1, 4, 5, preserved wetland cell 13 in the NE of portion of project area, and within the stream channel. This CT was not observed in created wetland cell 6 in 2021, now replaced by CT 13. In 2021, less than 5% of this community was represented by mudflat, likely a result of the extreme drought much of the state experienced during the 2021 growing season.

Community # 8 Community Type: Salix exigua / Juncus balticus **Acres:** 0.93

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alopecurus arundinaceus	2
Calamagrostis canadensis	1	Carex nebrascensis	2
Carex pellita	2	Carex utriculata	2
Cicuta douglasii	1	Eleocharis palustris	2
Glyceria striata	1	Hordeum jubatum	1
Juncus balticus	3	Mentha arvensis	1
Salix exigua	4	Salix geyeriana	1
Salix lasiandra	1	Salix lutea	1
Scirpus microcarpus	1		

Comments:

Existing wetland west of wetland cell 2. In 2018 - 2020 observed along the northwest and southwest sides of wetland cell 5. In 2021, this CT increased by 0.49-acre, east of wetland cell 2 and south of road alignment and overpass, replacing portions of CT 13 and 5.

Community # 9 Community Type: Juncus balticus / Elymus repens **Acres:** 1.05

Species	Cover class	Species	Cover class
Bromus inermis	1	Cirsium arvense	0
Elymus repens	3	Epilobium ciliatum	0
Geum macrophyllum	0	Hordeum jubatum	0
Juncus balticus	5	Poa palustris	1
Poa pratensis	3	Potentilla anserina	1
Rumex crispus	0	Salix exigua	1
Solidago gigantea	1	Symphyotrichum lanceolatum	1
Thlaspi arvense	1		

Comments:

In previous years, this wetland community was observed in a small wetland area in the parcel south of the bridge. It expanded minimally in 2020, and then in 2021 acreage of this CT increased from 0.07 to 1.05 acres.

This wetland CT replaced upland CT 3 just west of wetland cell 1, in a newly delineated wetland area. Bromus inermis had decreased substantially in these new wetland areas, and was replaced by a dominance of Juncus balticus, Elymus repens, and Salix spp.

Community # 10 **Community Type:** Artemisia tridentata / Poa spp. **Acres:** 11.64

Species	Cover class	Species	Cover class
Artemisia tridentata	3	Astragalus agrestis	1
Bromus inermis	1	Ericameria nauseosa	1
Hesperostipa comata	1	Juniperus scopulorum	2
Koeleria macrantha	1	Leymus cinereus	1
Pascopyrum smithii	3	Poa pratensis	2
Poa secunda	3	Pseudoroegneria spicata	0
Symphyotrichum falcatum	2		

Comments:

Upland shrubland. In 2021, acreage decreased by 0.41-acre. Replaced by wetland CT 4 in newly delineated wetland areas located near the northeast and northwest project boundary.

Community # 11 **Community Type:** Typha latifolia / **Acres:** 1.35

Species	Cover class	Species	Cover class
Alisma plantago-aquatica	0	Alopecurus aequalis	0
Beckmannia syzigachne	1	Calamagrostis canadensis	1
Carex nebrascensis	1	Cyrtorhyncha cymbalaria	1
Deschampsia caespitosa	1	Eleocharis palustris	2
Glyceria grandis	1	Juncus balticus	1
Juncus bufonius	1	Juncus effusus	1
Mentha arvensis	1	Mud Flats	1
Open Water	3	Poa palustris	0
Potentilla anserina	1	Ranunculus sceleratus	0
Salix lasiandra	0	Salix lutea	1
Schoenoplectus tabernaemont	2	Scirpus microcarpus	1
Typha latifolia	5		

Comments:

In 2018, a portion of wetland cell 4 transitioned to a dominance of Typha latifolia. In 2019 CT 11 increased in size across wetland cell 4, replacing portions of CT 14. In 2020, expanded CT11 in existing wetland WL-13 at northeast project boundary. In 2021, CT 11 decreased by 0.12-acre in wetland cell 4, replaced by wetland CT 14.

Community # 13 **Community Type:** Leymus cinereus / Elymus trachycaulus **Acres:** 6.13

Species	Cover class	Species	Cover class
Astragalus cicer	1	Bare Ground	1
Bromus inermis	1	Camelina microcarpa	0
Cirsium arvense	1	Elymus repens	1
Elymus trachycaulus	3	Epilobium ciliatum	0
Euphorbia esula	0	Festuca ovina	1
Hordeum jubatum	1	Juncus balticus	1
Lepidium draba	0	Leymus cinereus	4
Melilotus officinalis	1	Poa palustris	1
Poa pratensis	2	Poa secunda	1
Potentilla anserina	0	Silene latifolia	0
Sonchus arvensis	0	Thlaspi arvense	1
Trifolium longipes	1		

Comments:

Community dominated by FAC graminoids, located in upland areas around wetland cells 4 and 5. Also located in area delineated as wetland in and around cell 6.

Community # 14 **Community Type:** Eleocharis palustris / Deschampsia caespitosa **Acres:** 0.61

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alopecurus aequalis	1
Beckmannia syzigachne	1	Deschampsia caespitosa	3
Eleocharis palustris	3	Epilobium ciliatum	1
Hordeum jubatum	1	Juncus balticus	2
Mentha arvensis	1	Open Water	1
Persicaria amphibia	1	Poa palustris	1
Potentilla anserina	1	Sonchus arvensis	0
Typha latifolia	1		

Comments:

Located in wetland cell 4.

Community # 15 Community Type: Poa pratensis / Elymus repens **Acres:** 0.28

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Astragalus cicer	1
Bare Ground	2	Bromus inermis	2
Elymus repens	3	Elymus trachycaulus	2
Epilobium ciliatum	0	Festuca ovina	1
Hordeum jubatum	0	Leymus cinereus	2
Linum lewisii	1	Poa palustris	1
Poa pratensis	4	Puccinellia nuttalliana	1
Thlaspi arvense	1	Trifolium hybridum	1

Comments:

Located east of wetland cell 4, on the upland slope above the cell.

Community # 16 Community Type: Juncus balticus / Eleocharis palustris **Acres:** 1.86

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alopecurus aequalis	1
Alopecurus arundinaceus	1	Alopecurus pratensis	1
Bare Ground	1	Beckmannia syzigachne	2
Carex aquatilis	1	Carex nebrascensis	1
Carex pellita	0	Cicuta douglasii	1
Cyrtorhyncha cymbalaria	1	Deschampsia caespitosa	2
Eleocharis palustris	3	Elymus repens	0
Epilobium ciliatum	1	Glyceria grandis	1
Glyceria striata	1	Hordeum jubatum	1
Juncus balticus	0	Juncus balticus	4
Juncus bufonius	1	Juncus effusus	1
Mentha arvensis	1	Open Water	2
Phalaris arundinacea	1	Plantago major	0
Poa palustris	1	Poa pratensis	0
Potentilla anserina	1	Salix bebbiana	0
Salix exigua	0	Salix lasiandra	1
Sonchus arvensis	0	Symphyotrichum ciliatum	1
Trifolium longipes	1	Typha latifolia	1

Comments:

Located in wetland cells 2 and 3.

Community # 17 **Community Type:** Salix spp. / **Acres:** 0.45

Species	Cover class	Species	Cover class
Alnus incana	1	Carex pellita	1
Carex utriculata	1	Juncus balticus	1
Salix bebbiana	2	Salix boothii	2
Salix exigua	4	Salix geyeriana	2
Salix lutea	2		

Comments:

Added in 2019. In 2020 and 2021, development of planted/volunteer willows and alder on the edges of wetland cells 1 and 3 has continued. In 2021, this CT increased by 0.4-acre in newly delineated wetland areas west of cell 1, north of cell 2, and south of the road alignment and overpass.

Total Vegetation Community Acreage **50.1**

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

VEGETATION TRANSECTS

Site: Silicon Mountain Date: 6/29/2021

Transect Number: 1 **Compass Direction from Start:** 322

Interval Data:

Ending Station 15 **Community Type:** Leymus cinereus / Elymus trachycaulus

Species	Cover class	Species	Cover class
Astragalus cicer	1	Bare Ground	2
Cirsium arvense	1	Elymus repens	1
Elymus trachycaulus	3	Epilobium ciliatum	0
Festuca ovina	1	Juncus balticus	1
Leymus cinereus	4	Poa pratensis	2
Poa secunda	2	Silene latifolia	0
Sonchus arvensis	1	Thlaspi arvense	0

Ending Station 31 **Community Type:** Juncus balticus / Eleocharis palustris

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Bare Ground	1
Cyrtorhyncha cymbalaria	1	Deschampsia caespitosa	2
Eleocharis palustris	3	Epilobium ciliatum	1
Juncus balticus	4	Juncus bufonius	0
Juncus effusus	1	Mentha arvensis	1
Poa palustris	1	Potentilla anserina	1
Sonchus arvensis	1	Sonchus arvensis	1
Typha latifolia	1		

Ending Station 64 **Community Type:** Typha latifolia /

Species	Cover class	Species	Cover class
Beckmannia syzigachne	0	Cyrtorhyncha cymbalaria	0
Deschampsia caespitosa	1	Eleocharis palustris	3
Glyceria grandis	0	Juncus balticus	2
Juncus bufonius	1	Juncus effusus	2
Open Water	1	Poa palustris	1
Salix lasiandra	0	Scirpus microcarpus	1
Typha latifolia	4		

Ending Station 264 **Community Type:** Juncus balticus / Eleocharis palustris

Species	Cover class	Species	Cover class
Alopecurus arundinaceus	1	Alopecurus pratensis	1
Bare Ground	2	Beckmannia syzigachne	0
Carex nebrascensis	1	Carex pellita	1
Deschampsia caespitosa	1	Eleocharis palustris	3
Elymus repens	2	Glyceria grandis	1
Hordeum jubatum	1	Juncus balticus	4
Juncus effusus	2	Phalaris arundinacea	1
Plantago major	0	Poa palustris	1
Potentilla anserina	2	Salix bebbiana	0
Salix lasiandra	0	Typha latifolia	1

Ending Station 300 **Community Type:** Leymus cinereus / Elymus trachycaulus

Species	Cover class	Species	Cover class
Bare Ground	2	Bromus inermis	3
Camelina microcarpa	1	Elymus repens	2
Elymus trachycaulus	2	Euphorbia esula	1
Juncus balticus	1	Lepidium draba	0
Leymus cinereus	4	Poa pratensis	2
Thlaspi arvense	1	Trifolium longipes	1

Ending Station 535 **Community Type:** Juncus balticus / Eleocharis palustris

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alopecurus arundinaceus	2
Bare Ground	2	Carex aquatilis	2
Carex nebrascensis	2	Cyrtorhyncha cymbalaria	1
Deschampsia caespitosa	2	Eleocharis palustris	2
Epilobium ciliatum	0	Glyceria striata	0
Hordeum jubatum	1	Juncus balticus	4
Mentha arvensis	1	Phalaris arundinacea	1
Poa palustris	1	Poa pratensis	1
Potentilla anserina	1	Salix exigua	0
Symphyotrichum ciliatum	1	Typha latifolia	0

Ending Station 564 **Community Type:** Bromus inermis / Poa pratensis

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Alopecurus arundinaceus	1
Bare Ground	1	Bromus inermis	4
Elymus repens	1	Elymus trachycaulus	1
Phalaris arundinacea	0	Poa palustris	1
Poa pratensis	3	Potentilla anserina	1
Sonchus arvensis	1	Trifolium hybridum	2

Transect Notes:

Less OW observed within CT 11 along this transect, soil mostly saturated to surface in areas previously observed as OW in 2020. No change in transect intervals, minimal change in species presence and cover since 2020. Increase in Alopecurus arundinaceus observed across wetland CTs along transect.

Transect Number: 2 **Compass Direction from Start:** 288

Interval Data:

Ending Station 10 **Community Type:** Poa pratensis / Elymus repens

Species	Cover class	Species	Cover class
Agrostis stolonifera	0	Astragalus cicer	2
Bare Ground	3	Bromus inermis	2
Elymus repens	2	Elymus trachycaulus	1
Festuca ovina	1	Hordeum jubatum	1
Leymus cinereus	1	Linum lewisii	0
Poa palustris	1	Poa pratensis	3
Puccinellia nuttalliana	0	Trifolium hybridum	1

Ending Station 42 **Community Type:** Eleocharis palustris / Deschampsia caespitosa

Species	Cover class	Species	Cover class
Agrostis stolonifera	1	Alopecurus aequalis	0
Beckmannia syzigachne	0	Deschampsia caespitosa	2
Eleocharis palustris	3	Epilobium ciliatum	0
Hordeum jubatum	1	Juncus balticus	4
Mentha arvensis	1	Open Water	0
Persicaria amphibia	0	Poa palustris	2
Potentilla anserina	2	Sonchus arvensis	1
Typha latifolia	0		

Ending Station 206 **Community Type:** Typha latifolia /

Species	Cover class	Species	Cover class
Alopecurus aequalis	1	Beckmannia syzigachne	0
Calamagrostis canadensis	2	Carex nebrascensis	1
Deschampsia caespitosa	1	Eleocharis palustris	4
Juncus balticus	2	Mentha arvensis	1
Mud Flats	1	Open Water	0
Potentilla anserina	2	Ranunculus sceleratus	1
Salix lutea	1	Schoenoplectus tabernaem	1
Typha latifolia	3		

Ending Station 219 **Community Type:** Bromus inermis / Poa pratensis

Species	Cover class	Species	Cover class
Agrostis stolonifera	2	Bare Ground	2
Bromus inermis	3	Centaurea stoebe	1
Cirsium arvense	0	Deschampsia caespitosa	1
Elymus repens	1	Juncus balticus	1
Leymus cinereus	1	Poa pratensis	2
Poa secunda	1	Potentilla anserina	0
Sonchus arvensis	1	Thlaspi arvense	1

Transect Notes:

Less OW observed within CT 11 along this transect than previously observed in 2020. No change in transect intervals, minimal change in species presence and cover since 2020. Increase in Juncus balticus observed within CT 14 and 11 along this transect.

PLANTED WOODY VEGETATION SURVIVAL

Silicon Mountain

Planting Type	#Planted	#Alive	Notes
Alnus incana		5	
Salix eriocephala		14	
Salix exigua		16	
Salix geyeriana		13	
Sheperdia argentea		10	

Comments

An estimated 350 containerized trees and shrubs were part of the original planting. During the 2015 monitoring a total of 47 live shrubs were noted; in 2016, 2017 and 2018 a total of 44 live shrubs were identified. During the July 2019 through June 2021 monitoring events an additional 14 trees and shrubs were counted, increasing the total to 58 live containerized plants.

Silicon Mountain

WILDLIFE

Birds

Were man-made nesting structures installed? No

If yes, type of structure: _____

How many? _____

Are the nesting structures being used? No

Do the nesting structures need repairs? No

Nesting Structure Comments:

Species	#Observed	Behavior	Habitat
American Coot	4	L	
American Coot Chicks	8	L	
American Crow	1		
American Kestrel	1		
American White Pelican	6	FO	
Black-billed Magpie	3	FO, N	
Black-capped Chickadee	2	L	
Blue-winged Teal	1	FO, L	
Cliff Swallow	20	F, FO, L	
Common Yellowthroat	2	L	
Great Blue Heron	2	FO	
Killdeer	16	F, L	
Mallard	2		
Mourning Dove	1	L	
Northern Pintail	1	L	
Red-winged Blackbird	23	F, FO, L, N	
Ruddy Duck	10	F, L	
Song Sparrow	1	L	
Yellow-headed Blackbird	15	FO, L	

Bird Comments

American coots observed as mating pairs with chicks. Two young magpies observed in nest at site.

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
Common Gartersnake	1	No	No	No	
Mountain Cottontail	1	No	No	No	
White-tailed Deer	2	No	No	No	

Wildlife Comments:

Site is used by a diversity of bird and wildlife species.

Silicon Mountain

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	45.997345	-112.661444		
DP01w	45.997448	-112.661383		
DP02u	45.997505	-112.662509		
DP02w	45.997543	-112.662431		
DP03u	45.99589	-112.661309		
DP03w	45.995897	-112.661236		
DP04u	46.00151	-112.662337		
DP04w	46.001489	-112.662318		
DP05u	46.001754	-112.661451		
DP05w	46.001778	-112.661345		
DP06u	45.998036	-112.664236		
DP06w	45.998041	-112.664075		
DP07u	46.002492	-112.658244		
DP07w	46.002602	-112.658063		
PP01				West side of wetland cell 1
PP02				Outside wetland cell 1
PP03				West side of wetland cell 4
PP04				East side of constructed wetland cell 5
PP05				North end of T-1, constructed wetland cell 3
PP06				South end of T-1, constructed wetland cell 3
PP07				Cell 6, west side of tracks, south of overpass
PP08				Southern edge of cell 6 - upstream end
PP09				Northern edge of cell 6 - downstream end
PP10				West side of wetland cell 3
PP11				Sand Creek
PP12				Sand Creek

PP13	Sand Creek
PP14	Headcut
PP15	Headcut
PP16	Headcut
PP17	Northern end of Sand Creek
T-1-E	West side of cell 2
T-1-S	South end of wetland cell 2
T-2-E	West side of cell 4
T-2-S	East side of wetland cell 4

Comments:

Silicon Mountain

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

The total wetland acreage delineated in 2021, including pre-existing wetland areas, was 18.1 acres, which is an increase of 2.4 acres since 2020.

Functional Assessments

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

Functional Assessment Comments:

Created Wetland Cells 1 and 5; Cells 2, 3, and 4; and Preservation Wetlands were classified as Category II wetlands. Cell 6 rated as Category III wetland.

Maintenance

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

If yes, do they need to be repaired?

If yes, describe the problems below and indicate if any actions were taken to remedy the problems

Were man-made structures built or installed to impound water or control water flow

into or out of the wetland? No

If yes, are the structures in need of repair?

If yes, describe the problems below.

N/A

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/30/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP01u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.997345 Long: -112.661444 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple 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 located upslope of wetland boundary and DP01w.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Artemisia tridentata	2	☑	NL

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	5	☐	UPL
Centaurea stoebe	2	☐	NL
Elymus spicatus	20	☑	NL
Festuca ovina	15	☑	UPL
Pascopyrum smithii	15	☑	FACU
Tragopogon dubius	1	☐	NL

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: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 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	45 X 5	225
Column Totals	60 (A)	285 (B)

Prevalence Index = B/A = 4.75

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:
BG/litter=40%. Data 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)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-02	10YR 4/2	100					Sandy Clay Loam	
02-11	10YR 4/2	100					Loamy Sand	
11-13	7.5YR 2.5/1	95	10YR 4/3	5	C	M	Loam	
13+							Rock bottom.	**Rock 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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 evidence of 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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 – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/30/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP01w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.997448 Long: -112.661383 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple NWI classification: PEM

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

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

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

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

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

Remarks:
PSS depressional wetland sample point.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Salix exigua	30	☑	FACW

Herbaceous Stratum Plot size (5 Foot Radius)

Carex pellita	10	☑	OBL
Elymus trachycaulus	2	☐	FAC
Euphorbia esula	5	☐	NL
Juncus balticus	10	☑	FACW
Lactuca serriola	10	☑	FACU
Poa pratensis	3	☐	FAC
Potentilla anserina	30	☑	OBL
Silene latifolia	3	☐	NL
Sisymbrium altissimum	2	☐	FACU
Symphyotrichum ciliatum	3	☐	FACW
Taraxacum officinale	2	☐	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: 4 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 80 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	40 X 1	40
FACW species	43 X 2	86
FAC species	5 X 3	15
FACU species	14 X 4	56
UPL species	8 X 5	40
Column Totals	110 (A)	237 (B)

Prevalence Index = B/A = 2.15455

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:
BG/litter=10%. Salix exigua contributes approximately 10% of cover in herb stratum. Evidence of hydrophytic vegetation includes passing the dominance test and a prevalence index less than or equal to 3.0.

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)	Matrix %	Redox Features Color (moist)	Redox Features %	Type[1]	Loc[2]	Texture	Remarks
0-04	10YR 4/2	100					Silty Clay Loam	
04-08	10YR 4/2	91	7.5YR 2.5/1	7	C	M	Silty Clay	
			7.5YR 3/4	2	C	M		
08-11	10YR 5/3	100					Coarse Sand	
11-15	7.5YR 2.5/1	95	7.5YR 4/6	5	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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☑ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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.

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☑ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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:

Evidence of wetland hydrology includes a positive FAC-Neutral test and geomorphic position. Distinct redoximorphic concentrations common within the depleted matrix, indicating evidence of hydrology within the soil profile. Soil very moist.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP02u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.997505 Long: -112.662509 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple 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 located upslope of wetland boundary and DP02w.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Astragalus cicer	2	☐	NL
Festuca ovina	30	☑	UPL
Leymus cinereus	20	☑	FAC

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: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	0	X 2	0
FAC species	20	X 3	60
FACU species	0	X 4	0
UPL species	32	X 5	160
Column Totals	52	(A)	220 (B)

Prevalence Index = B/A = 4.23077

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:
BG/litter=48%. Data point is dominated by upland vegetation.

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
0-03	10YR 4/2	100					Sandy Clay Loam	
03-09	10YR 4/3	100					Sandy Clay	
09-13	10YR 5/3	100					Loamy Sand	
13+							Rock bottom	**Rock 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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 evidence of 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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 – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP02w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.997543 Long: -112.662431 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple 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 depressional wetland within constructed wetland cell 2.

VEGETATION - Use scientific names of plant

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

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Agrostis stolonifera	5	☐	FAC
Eleocharis palustris	20	☑	OBL
Juncus balticus	25	☑	FACW
Lactuca serriola	5	☐	FACU

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 45

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	20	X 1	20
FACW species	25	X 2	50
FAC species	5	X 3	15
FACU species	5	X 4	20
UPL species	0	X 5	0
Column Totals	55 (A)		105 (B)

Prevalence Index = B/A = 1.90909

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:
BG/litter=45%. Vegetation dominated by hydrophytic species. Evidence of hydrophytic vegetation includes passing the rapid test, passing the dominance test, and a prevalence index less than or equal to 3.0.

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
0-05	7.5YR 2.5/1	100					Sandy Clay Loam	
05-13	7.5YR 4/3	92	7.5YR 2.5/2	8	C	M,PL	Sandy Clay Loam	
13+							Rock bottom	**Rock 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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 matrix. Although no hydric soil indicators were observed during the site visit, wetland hydrology was present, all dominant plant species were OBL and/or FACW, and the wetland boundary was abrupt (1987 COE Wetland Delineation Manual).

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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:

Evidence of wetland hydrology includes soils saturated to surface, high water table, oxidized rhizospheres on living roots, geomorphic position, and a positive FAC-Neutral test.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP03u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.99589 Long: -112.661309 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple NWI classification: PEM

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

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

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

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

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

Remarks:
Upland sample point located on terrace above DP03w and stream channel.

VEGETATION - Use scientific names of plant

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

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	25	☑	UPL
Elymus repens	20	☑	FAC
Euphorbia esula	1	☐	NL
Juncus balticus	3	☐	FACW
Leymus cinereus	1	☐	FAC

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	3	X 2	6
FAC species	21	X 3	63
FACU species	0	X 4	0
UPL species	26	X 5	130
Column Totals	50 (A)		199 (B)

Prevalence Index = B/A = 3.98

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:
BG/litter=50%. Data point is dominated by upland vegetation.

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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:

Although 1% redoximorphic concentrations were observed in the matrix, there was no evidence of hydric soil indicators, wetland hydrology, or hydrophytic vegetation.

☐ ☐ ☐
☐
☐ ☐ ☐
☐ ☐ ☐
☐ ☐ ☐
☐ ☐ ☐
☐ ☐ ☐
☐ ☐ ☐
☐ ☐ ☐
☐ ☐ ☐
☐

☐ ☑
☐ ☑
☐ ☑ ☐ ☑

Soil slightly moist. No evidence of wetland hydrology observed.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP03w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.995897 Long: -112.661236 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple NWI classification: PEM

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

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

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

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

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

Remarks:
PSS riverine wetland. Sample point located in active floodplain adjacent to Sand Creek channel.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Salix exigua	30	☑	FACW
Salix lasiandra	10	☑	FACW

Herbaceous Stratum Plot size (5 Foot Radius)

Agrostis stolonifera	3	☐	FAC
Carex nebrascensis	1	☐	OBL
Carex pellita	15	☑	OBL
Carex utriculata	10	☑	OBL
Cyrtorhyncha cymbalaria	2	☐	OBL
Epilobium ciliatum	2	☐	FACW
Geum macrophyllum	1	☐	FAC
Glyceria striata	5	☐	OBL
Mentha arvensis	1	☐	FACW
Scirpus microcarpus	5	☐	OBL
Veronica americana	1	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 29

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	39 X 1	39
FACW species	43 X 2	86
FAC species	4 X 3	12
FACU species	0 X 4	0
UPL species	0 X 5	0
Column Totals	86 (A)	137 (B)

Prevalence Index = B/A = 1.59302

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:
BG/shallow ponded water=29%. Salix exigua and Salix lasiandra contribute approximately 25% of cover within herb stratum. Evidence of hydrophytic vegetation includes passing the rapid test, passing the dominance test, and a prevalence index less than or equal to 3.0.

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
0-02	7.5YR 4/2	100					Loamy Sand	
02-12	10YR 5/3	100					Coarse Sand	
12+							Rock	**Rock 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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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:

Although no hydric soil indicators were observed, wetland hydrology was present, all dominant plant species were OBL and/or FACW, and the wetland boundary had an abrupt edge (1987 COE Wetland Delineation Manual).

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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☑ No ☐ Depth (inches): 1

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 includes geomorphic position, a positive FAC-Neutral test, soils saturated to surface, a high water table, and 1" of surface water.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP04u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

Landform (hillslope, terrace, etc.): Mound Local relief (concave, convex, none): convex Slope (%): 27

Subregion (LRR): LRR E Lat: 46.00151 Long: -112.662337 Datum: NAD 83

Soil Map Unit Name: 58B: Varney-Anaconda loams, 0-4% slopes, moderately impacted 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 located on mound above excavated wetland cell 4.

VEGETATION - Use scientific names of plant

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

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	5	☐	UPL
Bromus tectorum	2	☐	NL
Elymus trachycaulus	5	☐	FAC
Hordeum jubatum	3	☐	FAC
Leymus cinereus	40	☑	FAC
Pascopyrum smithii	15	☑	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: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	0	X 2	0
FAC species	48	X 3	144
FACU species	15	X 4	60
UPL species	7	X 5	35
Column Totals	70 (A)		239 (B)

Prevalence Index = B/A = 3.41429

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:
BG/litter=30%. Data point is dominated by upland vegetation.

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
0-02	10YR 3/2	100					Sandy Clay Loam	
02-07	10YR 3/2	100					Sandy Loam	
07-11	10YR 3/2	97	10YR 4/4	3	C	M	Sandy Clay Loam	
11-16	10YR 4/1	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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 evidence of 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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. Soil dry.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP04w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 46.001489 Long: -112.662318 Datum: NAD 83

Soil Map Unit Name: 58B: Varney-Anaconda loams, 0-4% slopes, moderately impacted 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 depressional wetland. Sample point located in constructed wetland cell 4.

VEGETATION - Use scientific names of plant

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

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Beckmannia syzigachne	2	☐	OBL
Carex pellita	2	☐	OBL
Eleocharis palustris	73	☑	OBL
Hordeum jubatum	2	☐	FAC
Potentilla anserina	1	☐	OBL
Sonchus arvensis	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: 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	78	X 1	78
FACW species	0	X 2	0
FAC species	2	X 3	6
FACU species	5	X 4	20
UPL species	0	X 5	0
Column Totals	85	(A)	104 (B)

Prevalence Index = B/A = 1.22353

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:
BG/litter=15%. Evidence of hydrophytic vegetation includes passing the rapid test, passing the dominance test, and a prevalence index less than or equal to 3.0.

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	7.5YR 2/1	83	7.5YR 2.5/2	10	C	M	Sandy Loam	
			N 2.5/0	7	C	M		**Gleyed concentrations.**
08-12	2.5Y 3/2	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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☑ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 gleyed concentrations common within the 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

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

Water Table Present? Yes ☑ No ☐ Depth (inches): 9

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 includes geomorphic position, soils saturated to surface, high water table, and a positive FAC-Neutral test.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP05u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 46.001754 Long: -112.661451 Datum: NAD 83

Soil Map Unit Name: 58B: Varney-Anaconda loams, 0-4% slopes, moderately impacted 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 located on mound above wetland cell 5.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Artemisia tridentata	5	☑	NL

Herbaceous Stratum Plot size (5 Foot Radius)

Bromus inermis	30	☑	UPL
Elymus repens	5	☐	FAC
Euphorbia esula	2	☐	NL
Juncus balticus	5	☐	FACW
Leymus cinereus	5	☐	FAC
Thlaspi arvense	3	☐	UPL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 45

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	5 X 2	10
FAC species	10 X 3	30
FACU species	0 X 4	0
UPL species	40 X 5	200
Column Totals	55 (A)	240 (B)

Prevalence Index = B/A = 4.36364

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:
BG/litter=45%. Data point is dominated by upland vegetation.

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 evidence of 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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 – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP05w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 46.001778 Long: -112.661345 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple 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/PSS depressional wetland. Sample point located within wetland cell 5.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Salix exigua	10	☑	FACW
Salix lutea	3	☑	OBL

Herbaceous Stratum Plot size (5 Foot Radius)

Calamagrostis stricta	1	☐	FACW
Carex nebrascensis	2	☐	OBL
Carex pellita	3	☐	OBL
Eleocharis palustris	30	☑	OBL
Juncus balticus	15	☑	FACW
Mentha arvensis	1	☐	FACW
Potentilla anserina	3	☐	OBL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 45

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	41 X 1	41
FACW species	27 X 2	54
FAC species	0 X 3	0
FACU species	0 X 4	0
UPL species	0 X 5	0
Column Totals	68 (A)	95 (B)

Prevalence Index = B/A = 1.39706

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:
BG/litter=45%. Evidence of hydrophytic vegetation includes passing the rapid test, passing the dominance test, and a prevalence index less than or equal to 3.0.

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)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type[1]	Redox Features Loc[2]	Texture	Remarks
0-05	N 2.5/0	100					Sandy Clay Loam	
05-09	10YR 3/1	100					Loamy Sand	
09-12	2.5Y 3/2	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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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:

Sulfidic odor 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

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

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 include sulfidic odor, high water table, soils saturated to surface, geomorphic position, and a positive FAC-Neutral test.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP06u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.998036 Long: -112.664236 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple 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 located on hillside above DP06w.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Artemisia tridentata	10	☑	NL
Ericameria nauseosa	5	☑	NL

Herbaceous Stratum Plot size (5 Foot Radius)

Elymus spicatus	5	☐	NL
Festuca ovina	10	☑	UPL
Leymus cinereus	5	☐	FAC
Pascopyrum smithii	10	☑	FACU

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: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 0 % (A/B)

Prevalence Index worksheet

Total % Cover of:		Multiply by:
OBL species	0 X 1	0
FACW species	0 X 2	0
FAC species	5 X 3	15
FACU species	10 X 4	40
UPL species	30 X 5	150
Column Totals	45 (A)	205 (B)

Prevalence Index = B/A = 4.55556

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:
BG/litter=60%. Artemisia tridentata and Ericameria nauseosa contribute 10% of cover within herb stratum. Data point is dominated by upland vegetation.

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
0-03	7.5YR 2.5/1	100					Loamy Sand	
03-09	2.5Y 4/2	100					Loamy Sand	**Gravelly, hard.**
09+							Gravels	**Gravel 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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 evidence of 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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 – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP06w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 45.998041 Long: -112.664075 Datum: NAD 83

Soil Map Unit Name: 12A: Riverrun, occasionaly flooded-Mannixlee, frequently flooded comple 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 depressional wetland. Sample point located within constructed wetland cell 6.

VEGETATION - Use scientific names of plant

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

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Elymus trachycaulus	5	☐	FAC
Hordeum jubatum	10	☐	FAC
Poa palustris	5	☐	FAC
Polygonum aviculare	15	☑	FAC
Rumex salicifolius	20	☑	FACW

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 45

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 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	0	X 1	0
FACW species	20	X 2	40
FAC species	35	X 3	105
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	55 (A)		145 (B)

Prevalence Index = B/A = 2.63636

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:
BG/litter=45%. Evidence of hydrophytic vegetation includes passing the dominance test and a prevalence index less than or equal to 3.0.

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 along pore linings and 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)
- ☑ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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:

Evidence of wetland hydrology includes surface soil cracks, oxidized rhizospheres on living roots, geomorphic position, and a positive FAC-Neutral test. Soil moist.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP07u

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 46.002492 Long: -112.658244 Datum: NAD 83

Soil Map Unit Name: 58B: Varney-Anaconda loams, 0-4% slopes, moderately impacted 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 located on terrace upslope of wetland boundary and DP07w.

VEGETATION - Use scientific names of plant

Tree Stratum Plot size (30 Foot Radius)

	Absolute % Cover:	Domiant Species?	Indicator Status

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Artemisia tridentata	1	☐	NL
Ericameria nauseosa	5	☑	NL
Juniperus scopulorum	10	☑	NL

Herbaceous Stratum Plot size (5 Foot Radius)

Carex praegracilis	5	☐	FACW
Elymus trachycaulus	5	☐	FAC
Juncus balticus	5	☐	FACW
Linum lewisii	3	☐	NL
Pascopyrum smithii	20	☑	FACU
Poa compressa	10	☐	FACU
Stipa viridula	12	☑	NL

Woody Vine Stratum Plot size (30 Foot Radius)

Percent Bare Ground 35

Dominance Test worksheet

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 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	5	X 3	15
FACU species	30	X 4	120
UPL species	31	X 5	155
Column Totals	76 (A)		310 (B)

Prevalence Index = B/A = 4.07895

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:
BG/litter=35%. Juniperus scopulrum contributes 5% cover within herb stratum. Data point is dominated by upland vegetation.

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

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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 evidence of 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

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 – Western Mountains, Valleys, and Coast Region

Project/Site: Silicon Mountain Wetland Mitigation Site City/County: Silver Bow Sampling Date: 6/29/2021

Applicant/Owner: MDT State: Montana Sampling Point: DP07w

Investigator(s): R Quire, S Weyant, R Jones Section, Township, Range: S 24 T 3N R 9W

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

Subregion (LRR): LRR E Lat: 46.002602 Long: -112.658063 Datum: NAD 83

Soil Map Unit Name: 11A: Mannixlee-Bonebasin complex, 0-4% slopes, frequently flooded NWI classification: PEM

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

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

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

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

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

Remarks:
PEM depressional wetland. Sample point located within preserved wetland cell 13.

VEGETATION - Use scientific names of plant

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

Sapling/Shrub Stratum Plot size (15 Foot Radius)

Herbaceous Stratum Plot size (5 Foot Radius)

Alopecurus arundinaceus	25	☑	FAC
Calamagrostis canadensis	5	☐	FACW
Carex pellita	10	☐	OBL
Carex utriculata	20	☑	OBL
Juncus balticus	15	☑	FACW

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: 3 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 % (A/B)

Prevalence Index worksheet

Total % Cover of:			Multiply by:
OBL species	30	X 1	30
FACW species	20	X 2	40
FAC species	25	X 3	75
FACU species	0	X 4	0
UPL species	0	X 5	0
Column Totals	75 (A)		145 (B)

Prevalence Index = B/A = 1.93333

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:
BG/litter=25%. Evidence of hydrophytic vegetation includes passing the dominance test and a prevalence index less than or equal to 3.0.

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
0-05	7.5YR 2.5/1	100					Mucky Peat	
05-17	N 2.5/0	30					Clay Loam	**Mixed matrix. Gleyed.**
05-17	5GY 2.5/1	70					Clay Loam	**Mixed matrix. Gleyed.**

[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)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ 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:

Sulfidic odor 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)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☑ Hydrogen Sulfide Odor (C1)
- ☑ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☑ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☑ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

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

Water Table Present? Yes ☑ No ☐ Depth (inches): 12

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 include oxidized rhizospheres on living roots, high water table, soils saturated to surface, sulfidic odor, geomorphic position, and a positive FAC-Neutral test.

MDT Montana Wetland Assessment Form (revised March 2008

1. Project name Silicon Mountain Wetland Mitigation Site **2. MDT project#** STPX 47(024)56 **Control#** 5034000

3. Evaluation Date 10/1/2021 **4. Evaluators** R Quire, R Jones, S Weyant, B Trudgeon **5. Wetland/Site# (s)** Created Cell 6

6. Wetland Location(s): T 3N **R** 9W **Sec1** 24 **T** **R** **Sec2**

Approx Stationing or Mileposts N/A

Watershed 2 - Upper Clark Fork **Watershed/County** Silver Bow

7. Evaluating Agency CCI for MDT

8. Wetland size acres 0.44

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 0.44

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Aquatic Bed	Excavated	Seasonal/Intermittent	5
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	95

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)

2018 was the first year that water was observed within the excavated portion of wetland cell 6. This cell was dry in 2019 and 2021, while open water to 2 feet deep was observed during the 2020 monitoring event. Wetland Cell 6 is within the old road alignment, the construction in the cell included excavation, regrading and revegetation. The surrounding upland/wetland area is stable and well vegetated with seeded perennial grasses and forbs, along with an expansion of native, existing desirable species.

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

Cirsium arvense and Euphorbia esula

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

The AA consists of a depressional wetland and upland buffer at the bottom of a gentle hillslope. Land use surrounding the AA includes commercial developments and transportation (railroad tracks and highway).

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

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

Comments: Palustrine emergent, Palustrine Aquatic Bed

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use USFWS, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☐ S

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

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

Sources for documented use MTNHP

14C. General Wildlife Habitat Rating:

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

Low

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

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

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

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

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

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

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

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

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**

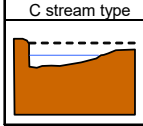
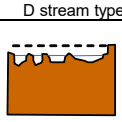
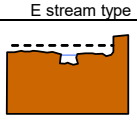
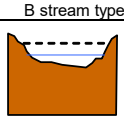
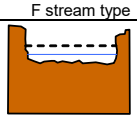
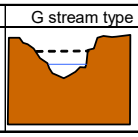
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

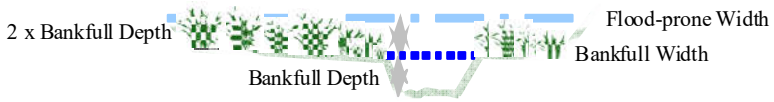
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within AA.

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

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

Comments: AA subject to flooding is less than 10 acres. Depressional wetland restricts discharge or drainage to the east toward the railroad tracks.

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: This wetland is subject to ponding from precipitation, upland surface flow, and potentially seasonally high groundwater.

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: Minimal sedimentation observed in bottom of wetland in 2021.

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: This small wetland is likely subject to wave action as long as surface or ponded water is present.

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 1-5 acres																	
B							High		Moderate		Low							
C							Yes	No	Yes	No	Yes	No						
P/P				.5M	.6M	.4M		.6M				.3L		.6M	.6M		.3L	
S/I	.9H			.4M	.5M			.5M				.2L		.5M	.5M		.3L	
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .4M

Comments: There is a 50-foot buffer around the wetland.

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: Seasonally high groundwater

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: Wetland with seasonal surface water supported by runoff and precipitation, and likely seasonally high groundwater.

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: Wetlands of this type are abundant in the area but have low disturbance in comparison to others impacted by land manageme

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 is very close to active railroad tracks and currently difficult to access unless you walk in from the west side. Unlikely this site will be used for recreation or education.

General Site Notes

It will be interesting to see the continued development of created cell 6 with time and the continued improvement of wildlife and wetland habitat.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Created Cell 6

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	.5	1	0.22	☑
C. General Wildlife Habitat	M	.4	1	0.18	☑
D. General Fish Habitat	NA	0	0	0.00	☐
E. Flood Attenuation	NA	0	0	0.00	☐
F. Short and Long Term Surface Water Storage	L	.3	1	0.13	☐
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	0.31	☑
H. Sediment/Shoreline Stabilization	L	.2	1	0.09	☐
I. Production Export/Food Chain Support	M	.4	1	0.18	☐
J. Groundwater Discharge/Recharge	M	.7	1	0.31	☑
K. Uniqueness	L	.3	1	0.13	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0.00	☐
Totals:		3.5	9	1.54	
Percent of Possible Score			**38.89** %		

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

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

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

☑

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

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

MDT Montana Wetland Assessment Form (revised March 2008

1. Project name Silicon Mountain Wetland Mitigation Site | **2. MDT project#** STPX 47(024)56 | **Control#** 5034000

3. Evaluation Date 10/1/2021 | **4. Evaluators** R Quire, R Jones, S Weyant, B Trudgeon | **5. Wetland/Site# (s)** Created Cells 1 and 5

6. Wetland Location(s): **T** 3N **R** 9W **Sec1** 24 **T** **R** **Sec2**

Approx Stationing or Mileposts N/A

Watershed 2 - Upper Clark Fork | **Watershed/County** Silver Bow

7. Evaluating Agency CCI for MDT

8. Wetland size acres 6.3

Purpose of Evaluation

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

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 6.3

How assessed: Measured e.g. by GPS

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Aquatic Bed	Excavated	Permanent/Perennial	39
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	56
Depressional	Scrub-Shrub Wetland	Excavated	Seasonal/Intermittent	5

11. Estimated Relative Abundance Common

12. General Condition of AA

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

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

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

This is year 7 (2021) following construction; wetland cells 1 and 5 have established desirable perennial grass, forb, and shrub cover, with minimal annual and perennial weeds present. The level of disturbance has declined, the site has stabilized with increasing cover by perennial species. Rills and gullies noted in 2019-2020 between the bike path and wetland cell 5 are still present but perennial grasses are establishing on these erosive features.

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

Linaria vulgaris and Euphorbia esula

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

The mitigation site is composed of two separate wetland cells (1 & 5) that are designed to intercept groundwater, and appear to have a more perennial water source. They have no surface connection to one another. Cell 1 drains into Sand Creek, but is upslope/outside of Sand Creek's active floodplain area, and so is not subject to overbank flooding. The AA also includes the emergent and scrub-shrub wetland that has developed surrounding constructed cells 1 and 5.

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: Palustrine Aquatic Bed (w/ less than 5% emergent vegetation), Palustrine emergent, Palustrine scrub-shrub

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use USFWS, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☐ S

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

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

Sources for documented use MTNHP

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	H	H	M	E	H	M	M				
Moderate disturbance at AA (see #12i)									H	H	M	M	H	M	M	L				
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Moderate wildlife use but exceptional and diverse wildlife habitat features.

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**

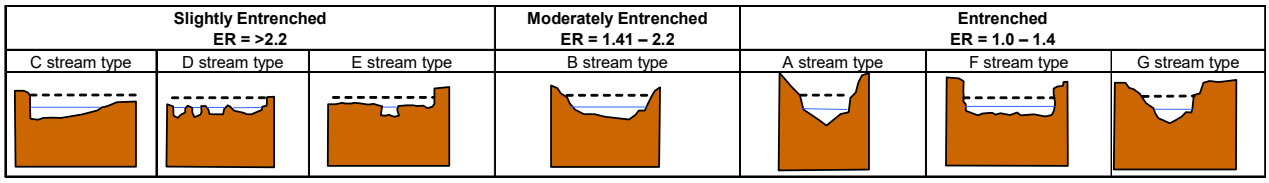
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

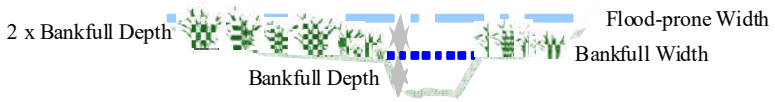
iii. Final Score and Rating: 0 NA **Comments:** Cell 1 drains into Sand Creek, but is upslope/outside of Sand Creek's active floodplain area; no fish have been observed and are not suspected in AA.

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





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

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

Comments: Wetland cells impound water restricting return to Sand Creek. Cells 1 and 5 are upslope/outside of Sand Creek's active floodplain area, and not subject to overbank flooding.

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: (2.47 created acres of perennial depressional aquatic bed) x (average 1 ft. ponding/flow at high water) = 2.47 acre feet

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

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

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

Comments: The surrounding land use has the potential to deliver sediments and nutrients through influx of 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: Vegetation with a rating of 6 or greater include Typha latifolia, Juncus balticus, Eleocharis palustris, Carex nebrascensis, and Salix spp., which surrounds aquatic beds as emergent/scrub-shrub wetland.

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		Yes	No	Yes	No	Yes	No			Yes		Yes	
P/P				.5M	.6M	.4M		.6M				.3L		.6M	.6M		.3L	
S/I	.9H			.4M	.5M			.5M				.2L		.5M	.5M		.3L	
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M		.2L			.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** 1 E

Comments: Vegetated component increased by 1.4 acres in 2021.

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: Wetland mitigation cells with perennial water that intercept groundwater.

14K. Uniqueness:

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

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: AA does not contain rare types and structural diversity is considered high following 2021 site visit.

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:

Mitigation site with public ownership, public access, and potential for educational use. Site is being used for educational studies by students at MSU and Montana Tech.

General Site Notes

The open water attracts a variety of waterfowl and other bird species, and adds habitat complexity promoting an increase in plant and animal diversity. This increased diversity represents a valuable educational resource for scientists, teachers, students, and conservation groups.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Created Cells 1 and 5

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	.5	1	3.15	☐
C. General Wildlife Habitat	H	.9	1	5.67	☑
D. General Fish Habitat	NA	0	0	0.00	☐
E. Flood Attenuation	NA	0	0	0.00	☐
F. Short and Long Term Surface Water Storage	H	.8	1	5.04	☑
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	4.41	☐
H. Sediment/Shoreline Stabilization	H	1	1	6.30	☐
I. Production Export/Food Chain Support	E	1	1	6.30	☑
J. Groundwater Discharge/Recharge	H	1	1	6.30	☑
K. Uniqueness	M	.6	1	3.78	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	1.26	☐
Totals:		6.7	9	42.21	
Percent of Possible Score			**74.44** %		

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

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

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

☐

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

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

MDT Montana Wetland Assessment Form (revised March 2008

1. Project name Silicon Mountain Wetland Mitigation Site **2. MDT project#** STPX 47(024)56 **Control#** 5034000

3. Evaluation Date 10/1/2021 **4. Evaluators** R Quire, R Jones, S Weyant, B Trudgeon **5. Wetland/Site# (s)** Created Cells 2, 3, 4

6. Wetland Location(s): T 3N **R** 9W **Sec1** 24 **T** **R** **Sec2**

Approx Stationing or Mileposts N/A

Watershed 2 - Upper Clark Fork **Watershed/County** Silver Bow

7. Evaluating Agency CCI for MDT

8. Wetland size acres 3.9

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 3.9

☐ **Mitigation Wetlands: pre-construction**

How assessed: Measured e.g. by GPS

☑ **Mitigation Wetlands: post construction**

☐ **Other**

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Emergent Wetland	Excavated	Seasonal/Intermittent	92
Depressional	Aquatic Bed	Excavated	Permanent/Perennial	5
Depressional	Scrub-Shrub Wetland	Excavated	Seasonal/Intermittent	3

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)

There has been a high level of disturbance due to site construction, and trail and bridge construction prior to 2015. The site has since recovered and is considered stable. The area surrounding the site is primarily rural, but there are roads, a residence, and some commercial activity nearby.

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

Euphorbia esula, Centaurea stoebe, and Cirsium arvense

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

The AA consists of wetland cells constructed to intercept groundwater. It's composed of the wetland cells 2, 3,and 4 that have a more seasonal/intermittent water regime, with the exception of some perennial open water present within cell 4. Sand Creek is not included in this AA because the berms surrounding the cells do not allow the creek to access these areas. The surrounding area comprises low rolling hills dominated by sagebrush and graminoids.

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: Palustrine Emergent, Palustrine Scrub-Shrub, Palustrine Aquatic Bed (less than 5% vegetation cover)

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use USFWS, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☐ S

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

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

Sources for documented use MTNHP

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	H	H	M	E	H	M	M				
Moderate disturbance at AA (see #12i)									H	H	M	M	H	M	M	L				
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Moderate wildlife use and exceptional wildlife habitat features ratings.

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**

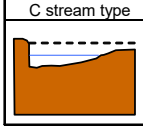
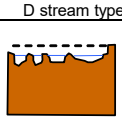
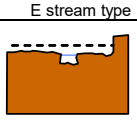
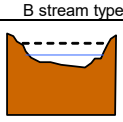
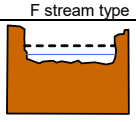
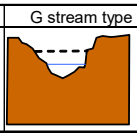
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

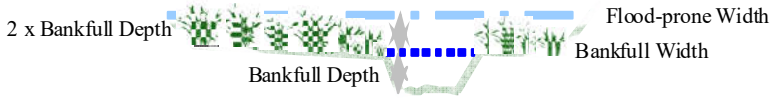
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within AA.

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

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

Comments: AA is less than 10 acres and all cells not subject to flooding via in-channel or overbank flow.

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

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

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

Comments: Wetland cells intercept groundwater seasonally and are less than 5 acres.

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: Cells have the potential to receive compounds through groundwater inputs.

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: Wave action is likely across a portion of these wetland cells at times. Vegetation includes Juncus balticus, Typha latifolia, Eleocharis palustris, and Salix spp. with ratings of 6 or greater.

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 1-5 acres																	
B							High		Moderate		Low							
C							Yes	No	Yes	No	Yes	No						
P/P				.5M	.6M	.4M		.6M				.3L		.6M	.6M		.3L	
S/I	.9H			.4M	.5M			.5M				.2L		.5M	.5M		.3L	
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M	.5M	.2L	.3L	.1L	.6M	.4M	.4M	.2L	.2L	.1L

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

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

Comments: Cells contain a subsurface outlet; have vegetated buffers.

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: Mitigation cells designed to intercept shallow groundwater aquifer.

14K. Uniqueness:

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

Replacement potential	AA contains fen, bog, warm springs or mature (>80 yr-old) forested wetland **or** plant association listed as "S1" by the MTNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high **or** contains plant association listed as "S2" by the MTNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1H	.9H	.8H	.8H	.6M	.5M	.5M	.4M	.3L
Moderate disturbance at AA (#12i)	.9H	.8H	.7M	.7M	.5M	.4M	.4M	.3L	.2L
High disturbance at AA (#12i)	.8H	.7H	.6M	.6M	.4M	.3L	.3L	.2L	.1L

Comments: AA doesn't contain rare types and structural diversity is high.

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 is a mitigation area that could be used for education purposes, has general public access and public ownership. Used for educational studies by students at MSU and Montana Tech.

General Site Notes

Wetland acreage increased in 2021 by 0.5-acre.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Created Cells 2, 3, 4

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	.5	1	1.95	☐
C. General Wildlife Habitat	H	.9	1	3.51	☑
D. General Fish Habitat	NA	0	0	0.00	☐
E. Flood Attenuation	NA	0	0	0.00	☐
F. Short and Long Term Surface Water Storage	M	.6	1	2.34	☐
G. Sediment/Nutrient/Toxicant Removal	H	1	1	3.90	☑
H. Sediment/Shoreline Stabilization	M	.6	1	2.34	☐
I. Production Export/Food Chain Support	H	.9	1	3.51	☑
J. Groundwater Discharge/Recharge	M	.7	1	2.73	☑
K. Uniqueness	M	.5	1	1.95	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	0.78	☐
Totals:		5.9	9	23.01	
Percent of Possible Score			**65.56** %		

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

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

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

☐

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

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

MDT Montana Wetland Assessment Form (revised March 2008

1. Project name Silicon Mountain Wetland Mitigation Site | **2. MDT project#** STPX 47(024)56 | **Control#** 5034000

3. Evaluation Date 7/1/2021 | **4. Evaluators** R Quire, R Jones, S Weyant, B Trudgeon | **5. Wetland/Site# (s)** Preservation

6. Wetland Location(s): **T** 3N **R** 9W **Sec1** 24 **T** **R** **Sec2**

Approx Stationing or Mileposts N/A

Watershed 2 - Upper Clark Fork **Watershed/County** Silver Bow

7. Evaluating Agency CCI for MDT

8. Wetland size acres 11

Purpose of Evaluation

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

How assessed: Measured e.g. by GPS

9. Assesssment area (AA) size (acres) 11

How assessed: Measured e.g. by GPS

10. Classification of Wetland and Aquatic Habitats in AA

HGM Class (Brinson)	Class (Cowardin)	Modifier (Cowardin)	Water Regime	% of AA
Depressional	Aquatic Bed		Permanent/Perennial	8
Depressional	Emergent Wetland		Seasonal/Intermittent	35
Depressional	Scrub-Shrub Wetland		Seasonal/Intermittent	2
Depressional	Emergent Wetland		Permanent/Perennial	55

11. Estimated Relative Abundance Common

12. General Condition of AA

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

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

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

The wetland mitigation site was constructed in 2014 which consisted of substantial excavation to create new wetlands and channel re-alignment/restoration. In 2016 the area surrounding the presereved wetlands was disturbed as a result of the new trail and bridge. In 2021, disturbed areas surrounding the preserved wetland areas were stable and well vegetated with seeded perennial grasses and forbs along with the expansion of native, desirable species.

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

Cirsium arvense and Linaria vulgaris

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

The AA consists of pre-existing depressional wetlands located adjacent to Sand Creek and south of Silver Bow Creek. Land use surrounding the AA includes commercial developments, agriculture (grazing/pasture), transportation (railroad and highway) and private residences.

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: Palustrine Emergent, Palustrine Scrub-Shrub, Palustrine Aquatic Bed (less than 5% vegetation cover)

SECTION PERTAINING to FUNCTIONS VALUES ASSESSMENT

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

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

Primary or critical habitat (list species) ◉ D ◉ S

Secondary habitat (list Species) ◉ D ◉ S

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☑ S

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

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

Sources for documented use USFWS, MTNHP

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 Hoary bat (S3), Preble's shrew (S3)

Incidental habitat (list species) ◉ D ◉ S

No usable habitat ☐ S

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

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

Sources for documented use MTNHP

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	H	H	M	E	H	M	M				
Moderate disturbance at AA (see #12i)									H	H	M	M	H	M	M	L				
High disturbance at AA (see #12i)	M	M	M	L	M	M	L	L	M	M	L	L	M	L	L	L	L	L	L	L

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

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

Comments Moderate wildlife use but a diversity of wildlife habitat features.

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**

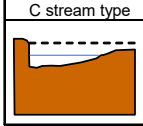
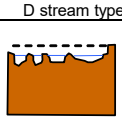
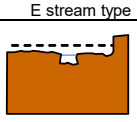
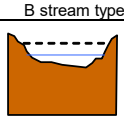
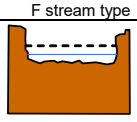
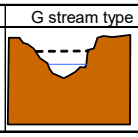
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in* ***i*** *or* ***iia*** *above:*
Modifed Rating

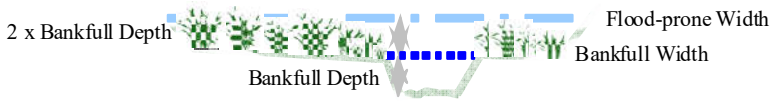
iii. Final Score and Rating: 0 NA **Comments:** No fish habitat within AA.

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 _____ / **Bankfull width** _____ = **Entrenchment ratio** _____

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

Comments: AA not subject to flooding via in-channel or overbank flow.

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

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

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

Comments: ~65% of preservation wetlands have permanent/perennial water regime (10.8 acre x 0.65=7.02 acres), average 1 foot standing/flowing water during high water events (7.02 acresx 1 foot= 7.02 acre feet).

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

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

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

Comments: Evidence of flooding or ponding in the preservation wetlands.

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: Preservation wetlands in the far eastern portion of the site include a shoreline with standing water. Vegetation includes a mix of Typha latifolia, Carex utriculata and Juncus balticus.

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		Yes	No	Yes	No	Yes	No			Yes		Yes	
P/P					.6M	.4M		.6M				.3L		.6M	.6M		.3L	
S/I	.9H			.4M	.5M			.5M				.2L		.5M	.5M		.3L	
T/E/A	.8H	.5M	.6M	.3L	.4M	.2L	.7H	.4M		.2L			.6M	.4M	.4M	.2L	.2L	.1L

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .6M

Comments: Well-vegetated upland buffer around greater than 75 percent of the AA's perimeter.

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: Most of the preserved wetlands intercept shallow subsurface groundwater; the large wetland in the NE corner intercepts shallow groundwater and is fed by surface water from a spring that flows out of a subsurface aquifer.

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: Wetlands common in the area, low disturbance in comparison to others impacted by land mgmt; structural diversity high.

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:

Mitigation site with public ownership, public access, and potential for educational use. Site is being used for educational studies by students at MSU and Montana Tech.

General Site Notes

Inundation and saturation levels were lower across the preservation wetlands in 2021 as compared to 2020 due to the severe drought conditions experienced across the region during the late spring and summer seasons.

FUNCTION & VALUE SUMMARY & OVERALL RATING FOR WETLAND/SITE #(S): Preservation

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	.5	1	5.50	☐
C. General Wildlife Habitat	H	.9	1	9.90	☑
D. General Fish Habitat	NA	0	0	0.00	☐
E. Flood Attenuation	NA	0	0	0.00	☐
F. Short and Long Term Surface Water Storage	H	1	1	11.00	☑
G. Sediment/Nutrient/Toxicant Removal	M	.7	1	7.70	☑
H. Sediment/Shoreline Stabilization	M	.7	1	7.70	☐
I. Production Export/Food Chain Support	M	.6	1	6.60	☐
J. Groundwater Discharge/Recharge	H	1	1	11.00	☑
K. Uniqueness	M	.6	1	6.60	☐
L. Recreation/Education Potential (bonus points)	H	.2	NA	2.20	☐
Totals:		6.2	9	68.20	
Percent of Possible Score			**68.89** %		

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

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

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

☐

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

OVERALL ANALYSIS AREA RATING:
(check appropriate category based on the criteria outlined

I	II	III	IV

Table B-1. Silicon Mountain Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Achillea millefolium	Common Yarrow	FACU
Agoseris glauca	Pale Goat Chicory	FAC
Agropyron cristatum	Crested Wheatgrass	UPL
Agrostis stolonifera	Spreading Bent	FAC
Algae, green	Algae, green	N/A
Alisma plantago-aquatica	European Water-Plantain	OBL
Alllium cernuum	Nodding Onion	FACU
Alnus incana	Speckled Alder	FACW
Alopecurus aequalis	Short-Awn Meadow-Foxtail	OBL
Alopecurus arundinaceus	Creeping Meadow-Foxtail	FAC
Alopecurus pratensis	Field Meadow Foxtail	FAC
Alyssum alyssoides	Pale or Yellow Alyssum	UPL
Alyssum desestorum	Dwarf Alyssum	UPL
Antennaria neglecta	Field Pussytoes	FACU
Artemisia campestris	Pacific Wormwood	FACU
Artemisia frigida	Fringed Sage	UPL
Artemisia ludovicinana	White Sagebrush	FACU
Artemisia tridentata	Big Sagebrush	UPL
Astragalus agrestis	Cock's-Head/Purple Milkvetch	FACW
Astragalus bisulcatus	Two-Grooved Milkvetch	UPL
Astragalus cicer	Chickpea Milkvetch	UPL
Astragalus miser	Milkvetch	UPL
Bassia scoparia	Mexican-Fireweed	FAC
Beckmannia syzigachne	American Slough Grass	OBL
Bidens cernua	Nodding Burr-Marigold	OBL
Bromus inermis	Smooth Brome	UPL
Bromus japonicus	Japanese Brome	UPL
Bromus tectorum	Cheatgrass	UPL
Calamagrostis canadensis	Bluejoint	FACW
Camelina microcarpa	Little-Pod False Flax	FACU
Cardaria draba	Whitetop	UPL
Carex aquatilis	Leafy Tussock Sedge	OBL
Carex filifolia	**Thread-leaved Sedge**	**UPL**
Carex nebrascensis	Nebraska Sedge	OBL
Carex pellita	Woolly Sedge	OBL
Carex praegracilis	Clustered Field Sedge	FACW
Carex praticola	Northern Meadow Sedge	FACW
Carex simulata	Analogue Sedge	OBL

Table B-1. Silicon Mountain Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Carex utriculata	Northwest Territory Sedge	OBL
Catabrosa aquatica	Water Whorl Grass	OBL
Centaurea stoebe	Spotted Knapweed	UPL
Chaenactis douglasii	Douglas's Dustymaiden	UPL
Chenopodium album	Lamb's-Quarters	FACU
Cicuta douglasii	Western Water-Hemlock	OBL
Cirsium arvense	Canadian Thistle	FAC
Cirsium foliosum	Elk Thistle	FAC
Cirsium scariosum	Meadow Thistle	FAC
Collomia linearis	Narrow-Leaf Mountain-Trumpet	FACU
Crepis runcinata	Fiddleleaf Hawk's Beard	FACU
Crepis tectorum	Narrowleaf Hawksbeard	UPL
Cyrtorhyncha cymbalaria	Alkali Buttercup	OBL
Dasiphora fruticosa	Golden-Hardhack	FAC
Deschampsia caespitosa	Tufted Hair Grass	FACW
Descurainia richardsonii	Western Tansy Mustard	UPL
Descurainia sophia	Herb Sophia	UPL
Distichlis spicata	Coastal/Inland Saltgrass	FACW
Eleocharis palustris	Common Spike-Rush	OBL
Elymus canadensis	Nodding Wild Rye	FAC
Elymus lanceolatus	Streamside Wild Rye	FACU
Elymus repens	Creeping Wild Rye	FAC
Elymus trachycaulus	Slender Wild Rye	FAC
Epilobium ciliatum	Fringed Willowherb	FACW
Equisetum arvense	Field Horsetail	FAC
Equisetum laevigatum	Smooth Scouring-Rush	FACW
Ericameria nauseosa	Rubber Rabbitbrush	UPL
Erigeron sp.	Fleabane	N/A
Erysimum inconspicuum	Small-flowered Wallflower	UPL
Euphorbia esula	Leafy Spurge	UPL
Festuca ovina	Sheep Fescue	UPL
Filago arvenvis	Field Cudweed	UPL
Geum macrophyllum	Large-Leaf Avens	FAC
Glyceria grandis	American Manna Grass	OBL
Glyceria striata	Fowl Manna Grass	OBL
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Gutierrezia sarothrae	Matchbrush	UPL
Hesperostipa comata	Needle-and-Thread	UPL

Table B-1. Silicon Mountain Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Heterotheca villosa	Hairy Golden Aster	UPL
Hordeum brachyantherum	Meadow Barley	FACW
Hordeum jubatum	Fox-Tail Barley	FAC
Hyoscyamus niger	Black Henbane	UPL
Ionactis alpina	Crag Aster	UPL
Iris missouriensis	Rocky Mountain Iris	FACW
Juncus balticus	Baltic Rush	FACW
Juncus bufonius	Toad Rush	FACW
Juncus effusus	Lamp Rush	FACW
Juncus longistylis	Long-Style Rush	FACW
Juncus mertensianus	Mertens' Rush	OBL
Juniperus scopulorum	Rocky Mountain Juniper	UPL
Koeleria macrantha	Prairie Junegrass	UPL
Lemna minor	Common Duckweed	OBL
Lepidium campestre	Field Pepper-grass	UPL
Lepidium perfoliatum	Clasping Pepperwort	FACU
Leymus cinereus	Great Basin Wild Rye	FAC
Linaria vulgaris	Butter-and-Eggs	UPL
Linum lewisii	Prairie Flax	UPL
Lupinus sericeus	Silky Lupine	UPL
Madia glomerata	Mountain Tarplant	FACU
Medicago lupulina	Black Medic	FACU
Melilotus officinalis	Yellow Sweet-Clover	FACU
Mentha arvensis	American Wild Mint	FACW
Mimulus guttatus	Seep Monkey-Flower	OBL
Myosotis laxa	Bay Forget-Me-Not	OBL
Nasturtium officinale	Watercress	OBL
Orthocarpus tenuifolius	Thin-leaved Owl's-clover	UPL
Oxytropis deflexa	Pendant-pod Locoweed	FACU
Pascopyrum smithii	Western-Wheat Grass	FACU
Penstemon eriantherus	Fuzzy-Tongue Penstemon	UPL
Penstemon nitidus	Wax-leaf Beardtongue	UPL
Penstemon procerus	Pincushion Beardtongue	FAC
Penstemon strictus	Rocky Mountain Penstemon	UPL
Peritoma serrulata	Rocky Mountain Beeplant	FACU
Persicaria amphibia	Water Smartweed	OBL
Phacelia hastata	Silverleaf Scorpion-weed	UPL
Phalaris arundinacea	Reed Canary Grass	FACW
Phleum pratense	Common Timothy	FAC

Table B-1. Silicon Mountain Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Phlox muscoides	Moss Phlox	UPL
Plantago eriopoda	Red-Wooly or Redwool Plantain	FACW
Plantago major	Great Plantain	FAC
Poa ampla (= P. secunda, P. junicifolia)	Big Bluegrass	FACU
Poa compressa	Flat-stem Bluegrass	FACU
Poa palustris	Fowl Blue Grass	FAC
Poa pratensis	Kentucky Blue Grass	FAC
Poa secunda	Curly Blue Grass	FACU
Polemonium pulcherrimum	Showy Jacob's-ladder	UPL
Polygonum aviculare	Yard Knotweed	FAC
Polypogon monspeliensis	Annual Rabbit's Foot Grass	FACW
Potentilla anserina	Silverweed	OBL
Potentilla gracilis	Graceful Cinquefoil	FAC
Pseudoroegneria spicata	Bluebunch Wheatgrass	UPL
Puccinellia distans	Spreading Alkali Grass	FACW
Puccinellia nuttalliana	Nuttall's Alkali Grass	FACW
Pyrrocoma integrifolia	Goldenweed	UPL
Ranunculus sceleratus	Cursed Buttercup	OBL
Ranunculus sp.	Buttercup	N/A
Ribes aureum	Golden Currant	FAC
Ribes irriguum	Idaho Gooseberry	UPL
Rorippa palustris	Bog Yellow Cress	OBL
Rumex crispus	Curly Dock	FAC
Rumex salicifolius	Willow Dock	FACW
Salix bebbiana	Gray Willow	FACW
Salix boothii	Booth's Willow	FACW
Salix exigua	Narrow-Leaf Willow	FACW
Salix geyerianna	Geyer Willow	FACW
Salix lasiandra	Pacific Willow	FACW
Salix lutea (=S. eriocephala)	Yellow Willow	OBL
Schedonorus pratensis	Meadow False Rye Grass	FACU
Schoenocrambe linifolia	Plains Mustard	UPL
Schoenoplectus tabernaernaemontani	Soft-Stem Club-Rush	OBL
Scirpus microcarpus	Red-Tinge Bulrush	OBL
Shephardia argentea	Silver Buffalo-Berry	FACU
Silene latifolia	White Cockle/Campion	UPL
Sisymbrium altissimum	Tall Hedge-Mustard	FACU

Table B-1. Silicon Mountain Wetland Mitigation Site. Comprehensive Vegetation Species List 2015-2021

Scientific Name	Common Name	WMVC Indicator Status[(1)]
Sisymbrium loeselii	Smallpod Tumble Mustard	UPL
Sisyrinchium montanum	Strict Blue-eyed Grass	FAC
Solidago canadensis	Canadian Goldenrod	FACU
Solidago gigantea	Late Goldenrod	FACW
Sonchus arvensis	Field Sow-Thistle	FACU
Sphaeralcea coccinea	Scarlet Globemallow	UPL
Stachys pilosa	Hairy Hedge-Nettle	FACW
Stellaria longipes	Long-Stalk Starwort	FACW
Symphyotrichum ascendens	Western American-Aster	FACU
Symphyotrichum ciliatum	Alkali American-Aster	FACW
Symphyotrichum falcatum	Rough White Prairie American-Aster	FACU
Symphyotrichum lanceolatum	White Panicled American-Aster	OBL
Tanacetum vulgare	Common Tansy	FACU
Taraxacum officinale	Common Dandelion	FACU
Thlaspi arvense	Field Pennycress	UPL
Tragopogon dubius	Meadow Goat's-beard	UPL
Trifolium hybridum	Alsike Clover	FAC
Trifolium longipes	Long-Stalk Clover	FAC
Trifolium pratense	Red Clover	FACU
Trifolium repens	White Clover	FAC
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Valeriana edulis	Tobacco-Root	FAC
Verbascum thapsus	Great Mullein	FACU
Veronica americana	American Brooklime or Speedwell	OBL
Veronica anagallis-aquatica	Blue Water Speedwell	OBL
Veronica arvensis	Corm Speedwell	FACU

[1] 2018 NWPL (USACE 2018)

New species identified in 2021 are **bolded.**

APPENDIX C
PROJECT AREA PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

Silicon Mountain: Photo Point Photographs



Photo Point: 1. Photo 1: View of western edge of cell 1 looking NW. Bearing: 333 degrees Year: 2015



Photo Point: 1. Photo 1: View of western edge of cell 1 looking NW. Bearing: 333 degrees Year: 2021



Photo Point: 1. Photo 2: View of central portion of cell 1 looking NE. Bearing: 26 degrees Year: 2015



Photo Point: 1. Photo 2: View of central portion of cell 1 looking NE. Bearing: 26 degrees Year: 2021



Photo Point: 1. Photo 3: View of central portion of cell 1 looking E. Bearing: 86 degrees Year: 2015



Photo Point: 1. Photo 3: View of central portion of cell 1 looking E. Bearing: 86 degrees Year: 2021

Silicon Mountain: Photo Point Photographs



Photo Point: 1. Photo 4: View of southern end of cell 1 looking SE. Bearing: 166 degrees Year: 2015



Photo Point: 1. Photo 4: View of southern end of cell 1 looking SE. Bearing: 166 degrees Year: 2021



Photo Point: 1. Photo 5: View of western side of cell 1 looking SW. Bearing: 202 degrees Year: 2015



Photo Point: 1. Photo 5: View of western side of cell 1 looking SW. Bearing: 202 degrees Year: 2021



Photo Point: 2. Photo 1: View of Sand Creek channel looking NE. Bearing: 40 degrees Year: 2015



Photo Point: 2. Photo 1: View of Sand Creek channel looking NE. Bearing: 40 degrees Year: 2021

Silicon Mountain: Photo Point Photographs



Photo Point: 2. Photo 2: View outside cell 1 looking east. Bearing: 86 degrees Year: 2015



Photo Point: 2. Photo 2: View outside cell 1 looking east. Bearing: 86 degrees Year: 2021



Photo Point: 2. Photo 3: View of eastern portion of cell 1 looking SE. Bearing: 113 degrees Year: 2015



Photo Point: 2. Photo 3: View of eastern portion of cell 1 looking SE. Bearing: 113 degrees Year: 2021



Photo Point: 3. Photo 1: View of western edge of cell 4 looking NW. Bearing: 314 degrees Year: 2015



Photo Point: 3. Photo 1: View of western edge of cell 4 looking NW. Bearing: 314 degrees Year: 2021

Silicon Mountain: Photo Point Photographs



Photo Point: 3. Photo 2: View of western side of cell 4 looking N. Bearing: 343 degrees Year: 2015



Photo Point: 3. Photo 2: View of western side of cell 4 looking N. Bearing: 343 degrees Year: 2021



Photo Point: 3. Photo 3: View across center of cell 4 looking NW. Bearing: 66 degrees Year: 2015



Photo Point: 3. Photo 3: View across center of cell 4 looking NW. Bearing: 66 degrees Year: 2021



Photo Point: 3. Photo 4: View of southern side of cell 4 looking SE. Bearing: 114 degrees Year: 2015



Photo Point: 3. Photo 4: View of southern side of cell 4 looking SE. Bearing: 114 degrees Year: 2021

Silicon Mountain: Photo Point Photographs



Photo Point: 4. Photo 1: View of southern side of cell 5 looking SW. Bearing: 220 degrees Year: 2015



Photo Point: 4. Photo 1: View of southern side of cell 5 looking SW. Bearing: 220 degrees Year: 2021



Photo Point: 4. Photo 2: View across SE portion of cell 5 looking W. Bearing: 268 degrees Year: 2015



Photo Point: 4. Photo 2: View across SE portion of cell 5 looking W. Bearing: 268 degrees Year: 2021



Photo Point: 4. Photo 3: View across center of cell 5 looking NW. Bearing: 321 degrees Year: 2015



Photo Point: 4. Photo 3: View across center of cell 5 looking NW. Bearing: 321 degrees Year: 2021

Silicon Mountain: Photo Point Photographs



Photo Point: 4. Photo 4: View of eastern side of cell 5 looking N. Bearing: 24 degrees Year: 2015



Photo Point: 4. Photo 4: View of eastern side of cell 5 looking N. Bearing: 24 degrees Year: 2021



Photo Point: 4. Photo 5: View of eastern side of cell 5 looking NE. Bearing: 56 degrees Year: 2015



Photo Point: 4. Photo 5: View of eastern side of cell 5 looking NE. Bearing: 56 degrees Year: 2021



Photo Point: 5. Photo 1: View of north end of cell 3 looking SE. Bearing: 145 degrees Year: 2015



Photo Point: 5. Photo 1: View of north end of cell 3 looking SE. Bearing: 145 degrees Year: 2021

Silicon Mountain: Photo Point Photographs



Photo Point: 5. Photo 2: View of north end of cell 3 looking NW. Bearing: 345 degrees Year: 2015



Photo Point: 5. Photo 2: View of north end of cell 3 looking NW. Bearing: 345 degrees Year: 2021



Photo Point: 6. Photo 1: View of south end of cell 2 looking NW. Bearing: 326 degrees Year: 2015



Photo Point: 6. Photo 1: View of south end of cell 2 looking NW. Bearing: 326 degrees Year: 2021



Photo Point: 6. Photo 2: View of southeast side of cell 2 looking N. Bearing: 352 degrees Year: 2015



Photo Point: 6. Photo 2: View of southeast side of cell 2 looking N. Bearing: 352 degrees Year: 2021

Silicon Mountain: Photo Point and Stream Photographs



Photo Point: 7. Photo 1: View of cell 6 looking east. Bearing: 95 degrees Year: 2015



Photo Point: 7. Photo 1: View of cell 6 looking east. Bearing: 95 degrees Year: 2021



Photo Point: 8. Photo 1: View of the south end of Sand Creek looking SW. Bearing: 213 degrees Year: 2015



Photo Point: 8. Photo 1: View of the south end of Sand Creek looking SW. Bearing: 213 degrees Year: 2021



Photo Point: 8. Photo 2: View across southern portion of Sand Creek looking NE. Bearing: 28 degrees Year: 2015



Photo Point: 8. Photo 2: View across southern portion of Sand Creek looking NE. Bearing: 28 degrees Year: 2021

Silicon Mountain: Stream Point Photographs



Photo Point: 9. Photo 1: View of Sand Creek downstream of PP-8 looking SE. Bearing: 148 degrees Year: 2015



Photo Point: 9. Photo 1: View of Sand Creek downstream of PP-8 looking SE. Bearing: 148 degrees Year: 2021



Photo Point: 9. Photo 2: View of Sand Creek downstream of PP-9 looking N. Bearing: 220 degrees Year: 2015



Photo Point: 9. Photo 2: View of Sand Creek downstream of PP-9 looking N. Bearing: 220 degrees Year: 2021



Photo Point: 10. Photo 1: View of the channel/slopes under overpass looking NW. Bearing: 312 degrees Year: 2015



Photo Point: 10. Photo 1: View of the channel/slopes under overpass looking NW. Bearing: 312 degrees Year: 2021

Silicon Mountain: Stream Point Photographs



Photo Point: 10. Photo 2: View of Sand Creek looking NE Bearing: 66 degrees Year: 2015



Photo Point: 10. Photo 2: View of Sand Creek looking NE Bearing: 66 degrees Year: 2021



Photo Point: 11. Photo 1: View of Sand Creek looking SE. Bearing: 144 degrees Year: 2015



Photo Point: 11. Photo 1: View of Sand Creek looking SE. Bearing: 144 degrees Year: 2021



Photo Point: 11. Photo 2: View of stream x-section 3 looking S. Bearing: 178 degrees Year: 2015



Photo Point: 11. Photo 2: View of stream x-section 3 looking S. Bearing: 178 degrees Year: 2021

Silicon Mountain: Stream Point Photographs



Photo Point: 11. Photo 3: View downstream of stream x-section 3 looking NW. Bearing: 300 degrees Year: 2015



Photo Point: 11. Photo 3: View downstream of stream x-section 3 looking NW. Bearing: 300 degrees Year: 2021



Photo Point: 12. Photo 1: View SW across stream x-section 4. Bearing: 216 degrees Year: 2015



Photo Point: 12. Photo 1: View SW across stream x-section 4. Bearing: 216 degrees Year: 2021



Photo Point: 12. Photo 2: View W across stream x-section 4. Bearing: 284 degrees Year: 2015



Photo Point: 12. Photo 2: View W across stream x-section 4 Bearing: 284 degrees Year: 2021

Silicon Mountain: Stream Point Photographs



Photo Point: 12. Photo 3: View west across Sand Creek channel. Bearing: 270 degrees Year: 2015



Photo Point: 12. Photo 3: View west across Sand Creek channel. Bearing: 270 degrees Year: 2021



Photo Point: 12. Photo 4: View NW of stream x-section 4. Bearing: 348 degrees Year: 2015



Photo Point: 12. Photo 4: View NW of stream x-section 4. Bearing: 348 degrees Year: 2021



Photo Point: 13. Photo 1: View SE of stream x-section 7. Bearing: 153 degrees Year: 2015



Photo Point: 13. Photo 1: View SE of stream x-section 7. Bearing: 153 degrees Year: 2021

Silicon Mountain: Stream Point Photographs



Photo Point: 13. Photo 2: View NE of stream x-section 7.
Bearing: 341 degrees Year: 2015



Photo Point: 13. Photo 2: View NE of stream x-section 7.
Bearing: 341 degrees Year: 2021



Photo Point: 14. Photo 1: View of middle headcut looking south. Bearing: 178 degrees Year: 2015



Photo Point: 14. Photo 1: View of middle headcut looking south. Bearing: 178 degrees Year: 2021



Photo Point: 15. Photo 1: View of the eastern headcut looking S. Bearing: 189 degrees Year: 2015



Photo Point: 15. Photo 1: View of the eastern headcut looking S. Bearing: 189 degrees Year: 2021

Silicon Mountain: Stream Point Photographs



Photo Point: 16. Photo 1: View of western headcut looking west. Bearing: 210 degrees Year: 2015



Photo Point: 16. Photo 1: View of western headcut looking west. Bearing: 210 degrees Year: 2021



Photo Point: 17. Photo 1: View of Sand Creek channel looking W. Bearing: 157 degrees Year: 2015



Photo Point: 17. Photo 1: View of Sand Creek channel looking W. Bearing: 157 degrees Year: 2021



Photo Point: 17. Photo 2: View of Sand Creek channel looking N. Bearing: 356 degrees Year: 2015



Photo Point: 17. Photo 2: View of Sand Creek channel looking N. Bearing: 356 degrees Year: 2021

Silicon Mountain: Transect Photographs



Transect 1: Start
Bearing: 305 degrees
Location: South end cell 2
Year: 2015



Transect 1: Start
Bearing: 305 degrees
Location: South end cell 2
Year: 2021



Transect 1: End
Bearing: 177 degrees
Location: West end of cell 2
Year: 2015



Transect 1: End
Bearing: 177 degrees
Location: West end of cell 2
Year: 2021

Silicon Mountain: Transect Photographs



Transect 2: Start Location: E side of cell 4, look west
Bearing: 285 degrees Year: 2015



Transect 2: Start Location: East side of cell 4, look west
Bearing: 285 degrees Year: 2021



Transect 2: End Location: SW side of cell 4, look east
Bearing:106 degrees Year: 2015



Transect 2: End Location: SW side of cell 4, look E
Bearing: 106 degrees Year: 2021

Silicon Mountain: Data Points



Data Point: DP01w
Location: Veg Comm 4 in SE corner of project area.
Year: 2021



Data Point: DP01u
Location: Veg Comm 13 in SE corner of project area.
Year 2021



Data Point: DP02w
Location: Wetland cell 2
Year: 2021



Data Point: DP02u
Location: Veg Comm 13
Year: 2021



Data Point: DP03w
Location: Floodplain along Sand Creek.
Year: 2021



Data Point: DP03u
Location: Terrace above Sand Creek.
Year: 2021

Silicon Mountain: Data Points



Data Point: DP04w Location: Constructed wetland cell 4. Year: 2021



Data Point: DP04u Location: Veg Comm 10. Year: 2021



Data Point: DP05w Location: Constructed wetland cell 5. Year: 2021



Data Point: DP05u Location: Veg Comm 13 Year: 2021



Data Point: DP06w Location: Constructed wetland cell 6. Year: 2021



Data Point: DP06u Location: Veg Comm 10. Year: 2021

Silicon Mountain: Data Points



Data Point: DP07w 13. Location: Preserved wetland cell Year: 2021



Data Point: DP07u Location: Veg Comm 10. Year: 2021

Silicon Mountain: Cross-Section Photographs



Cross-section 1: At center looking upstream.
Year: 2017



Cross-section 1: At center looking upstream.
Year: 2021



Cross-section 1: At center looking downstream.
Year: 2017



Cross-section 1: At center looking downstream.
Year: 2021



Cross-section 2: At center looking upstream.
Year: 2017



Cross-section 2: At center looking upstream.
Year: 2021

Silicon Mountain: Cross-Section Photographs



Cross-section 2: At center looking downstream.
Year: 2017



Cross-section 2: At center looking downstream.
Year: 2021



Cross-section 3: At center looking upstream.
Year: 2017



Cross-section 3: At center looking upstream.
Year: 2021



Cross-section 3: At center looking downstream.
Year: 2017



Cross-section 3: At center looking downstream.
Year: 2021

Silicon Mountain: Cross-Section Photographs



Cross-section 4: At center looking upstream.
Year: 2017



Cross-section 4: At center looking upstream.
Year: 2021



Cross-section 4: At center looking downstream.
Year: 2017



Cross-section 4: At center looking downstream.
Year: 2021



Cross-section 5: At center looking upstream.
Year: 2017



Cross-section 5: At center looking upstream.
Year: 2021

Silicon Mountain: Cross-Section Photographs



Cross-section 5: At center looking downstream.
Year: 2017



Cross-section 5: At center looking downstream.
Year: 2021



Cross-section 6: At center looking upstream.
Year: 2017



Cross-section 6: At center looking upstream.
Year: 2021



Cross-section 6: At center looking downstream.
Year: 2017



Cross-section 6: At center looking downstream.
Year: 2021

Silicon Mountain: Cross-Section Photographs



Cross-section 7: At center looking upstream.
Year: 2017



Cross-section 7: At center looking upstream.
Year: 2021



Cross-section 7: At center looking downstream.
Year: 2017



Cross-section 7: At center looking downstream.
Year: 2021



Cross-section 8: At center looking upstream.
Year: 2017



Cross-section 8: At center looking upstream.
Year: 2021

Silicon Mountain: Cross-Section Photographs



Cross-section 8: At center looking downstream.
Year: 2017

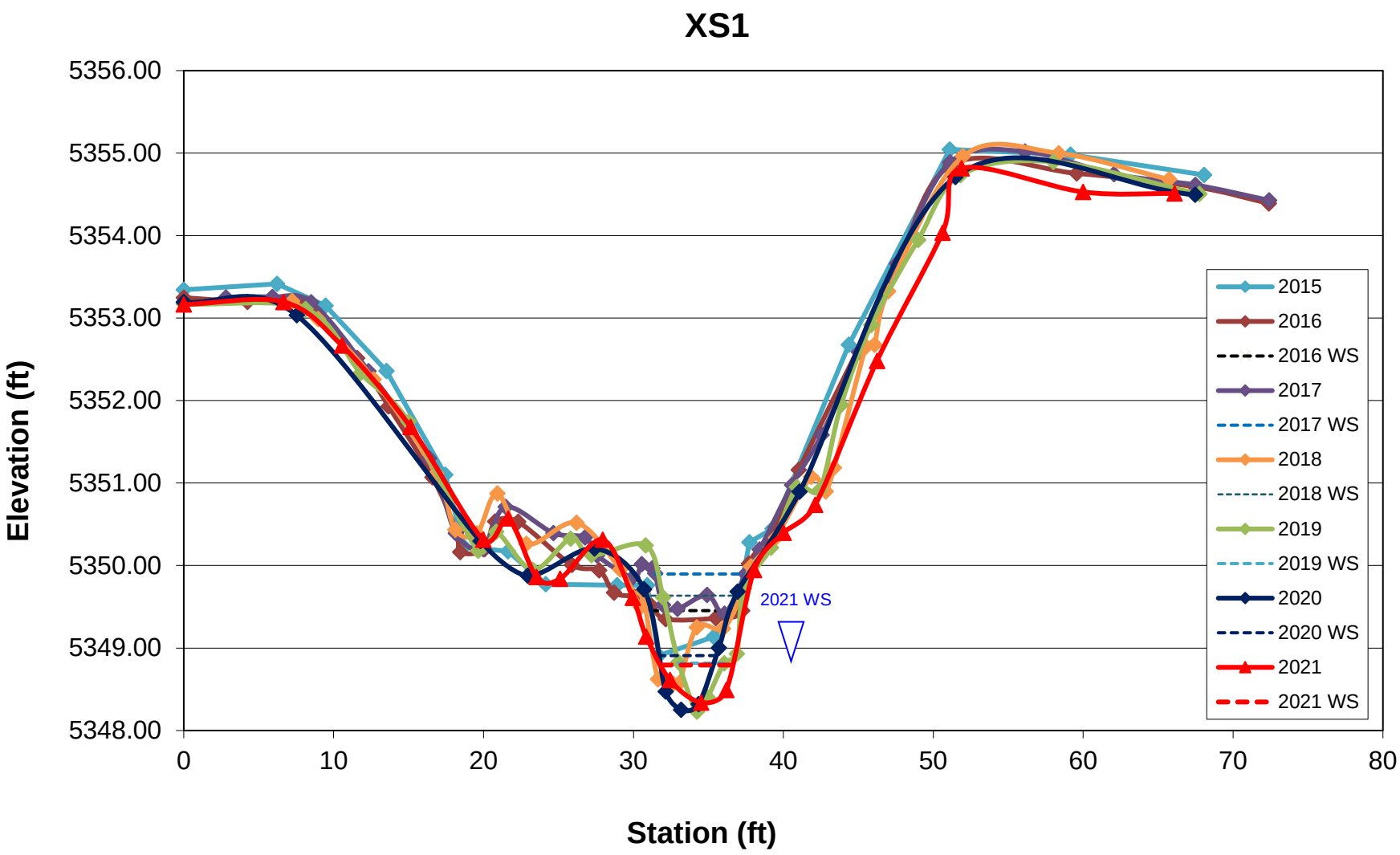


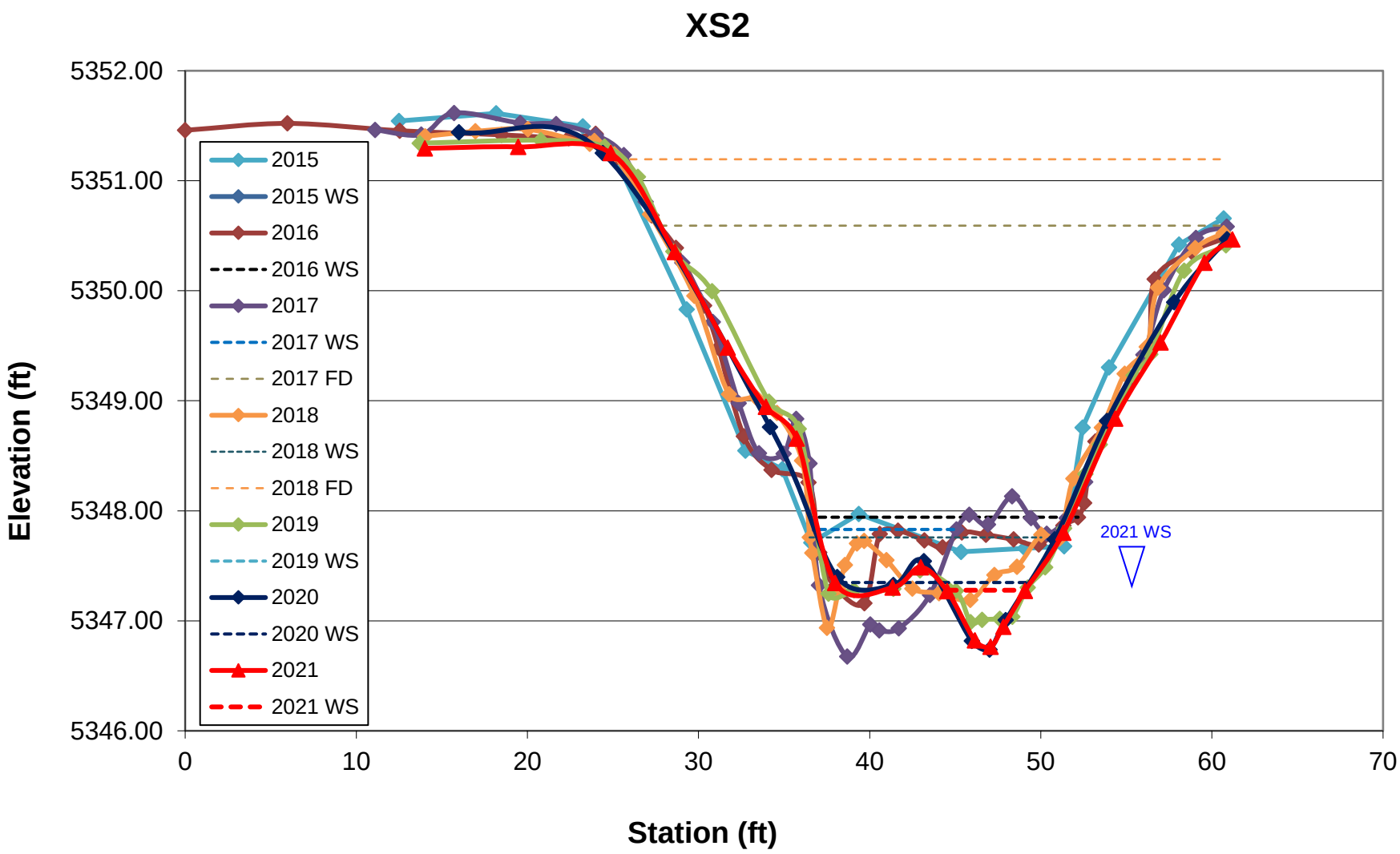
Cross-section 8: At center looking downstream.
Year: 2021

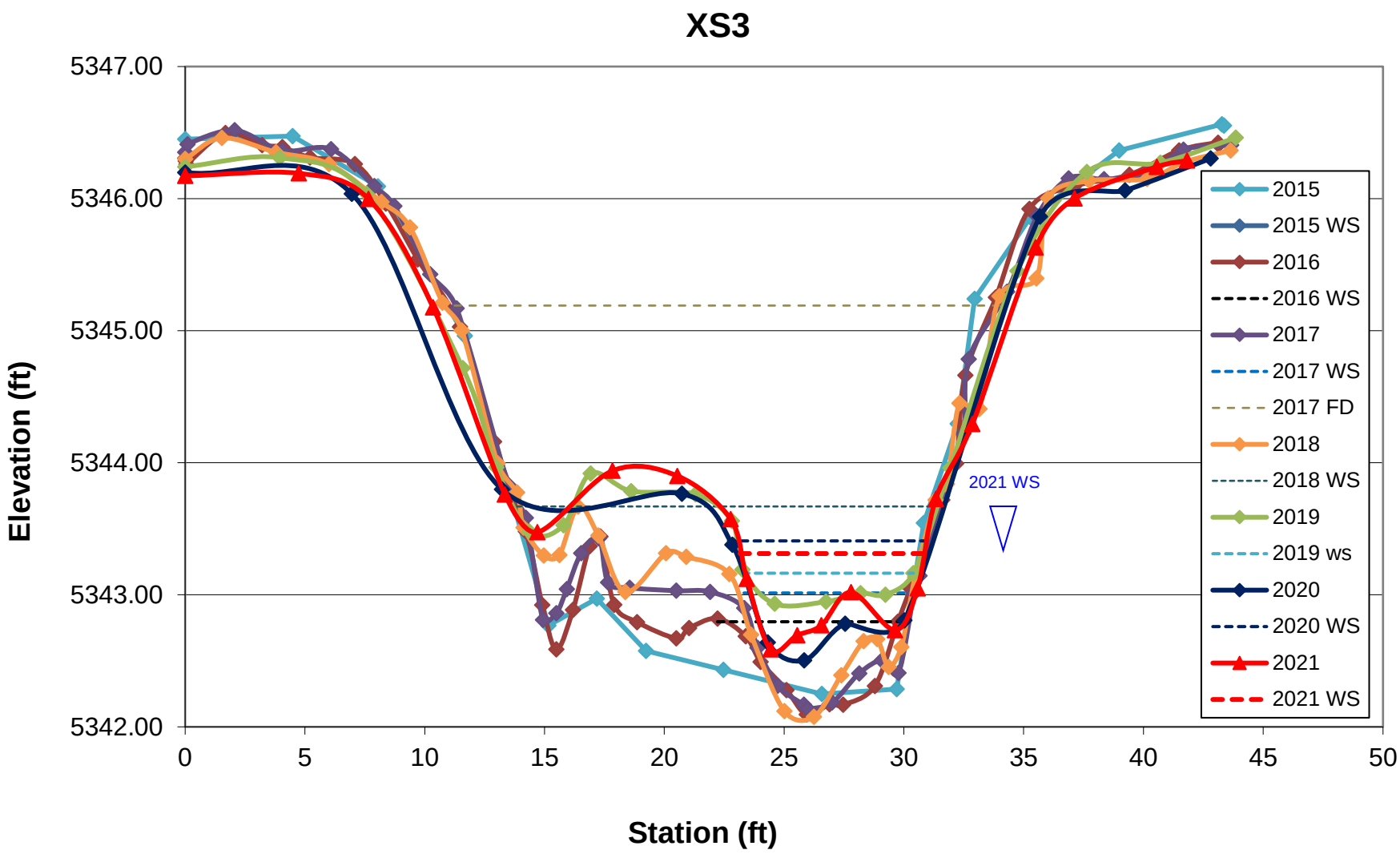
APPENDIX D

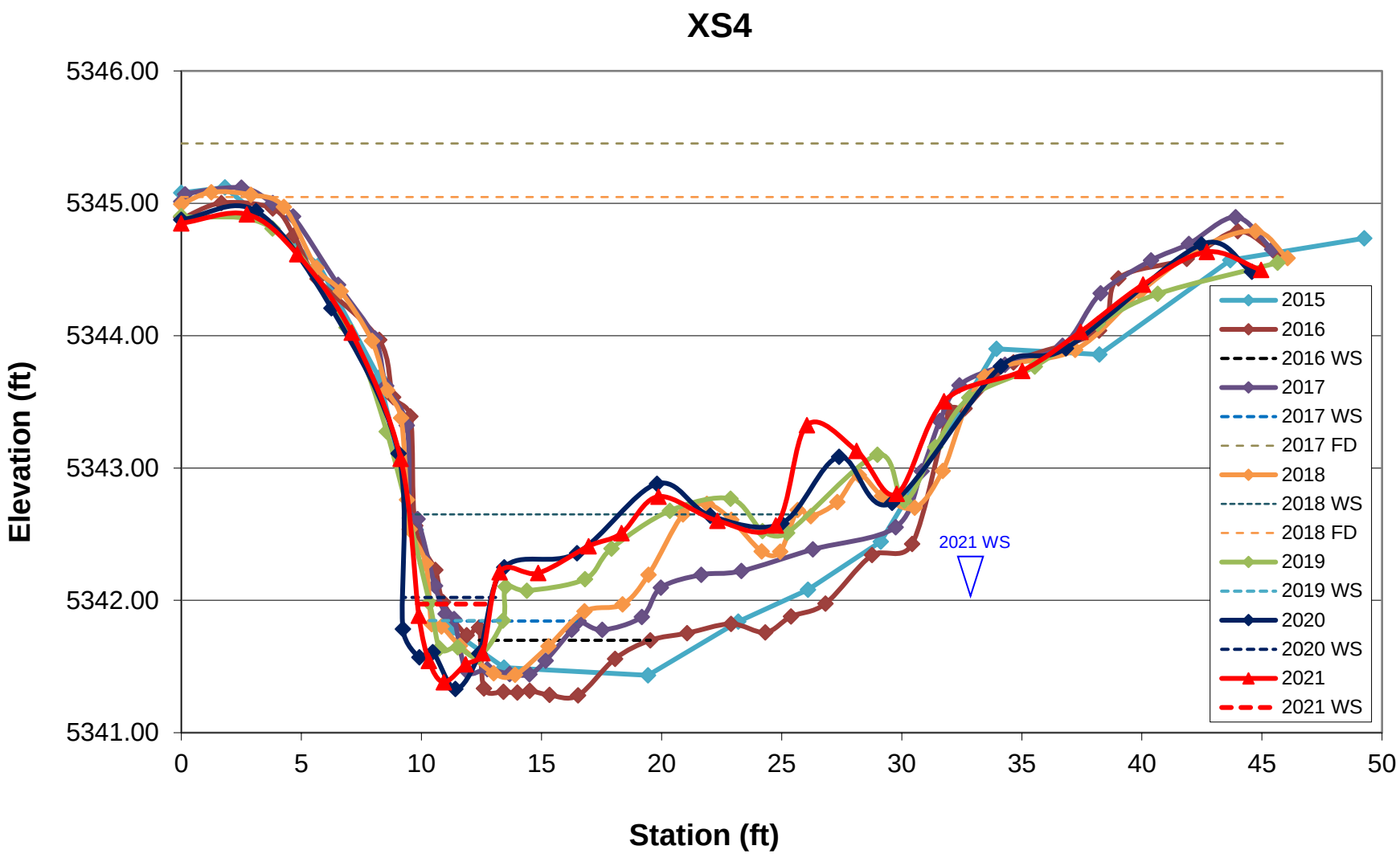
Surveyed Stream Cross Sections

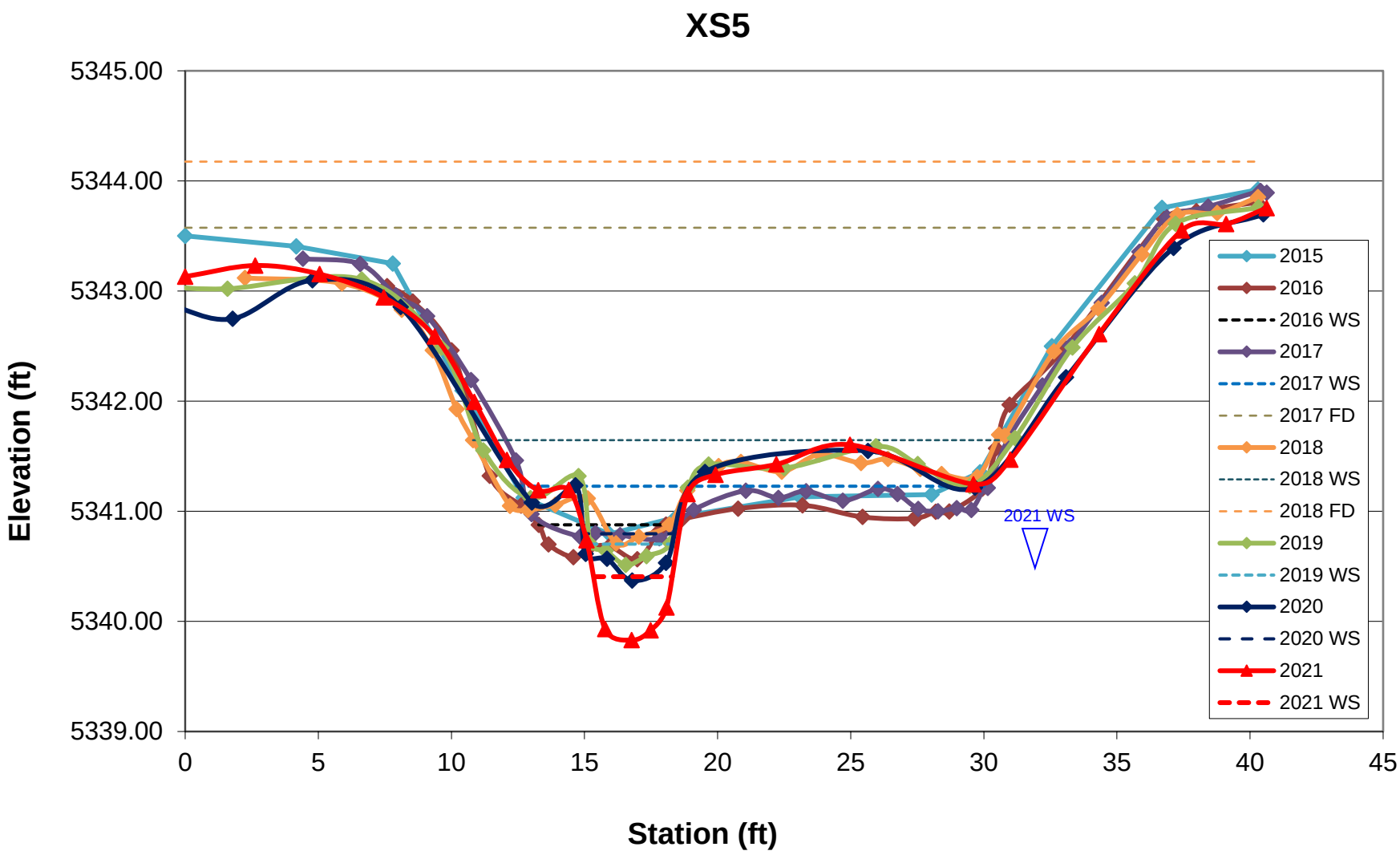
MDT Wetland Mitigation Monitoring
Silicon Mountain
Butte Silver Bow County, Montana

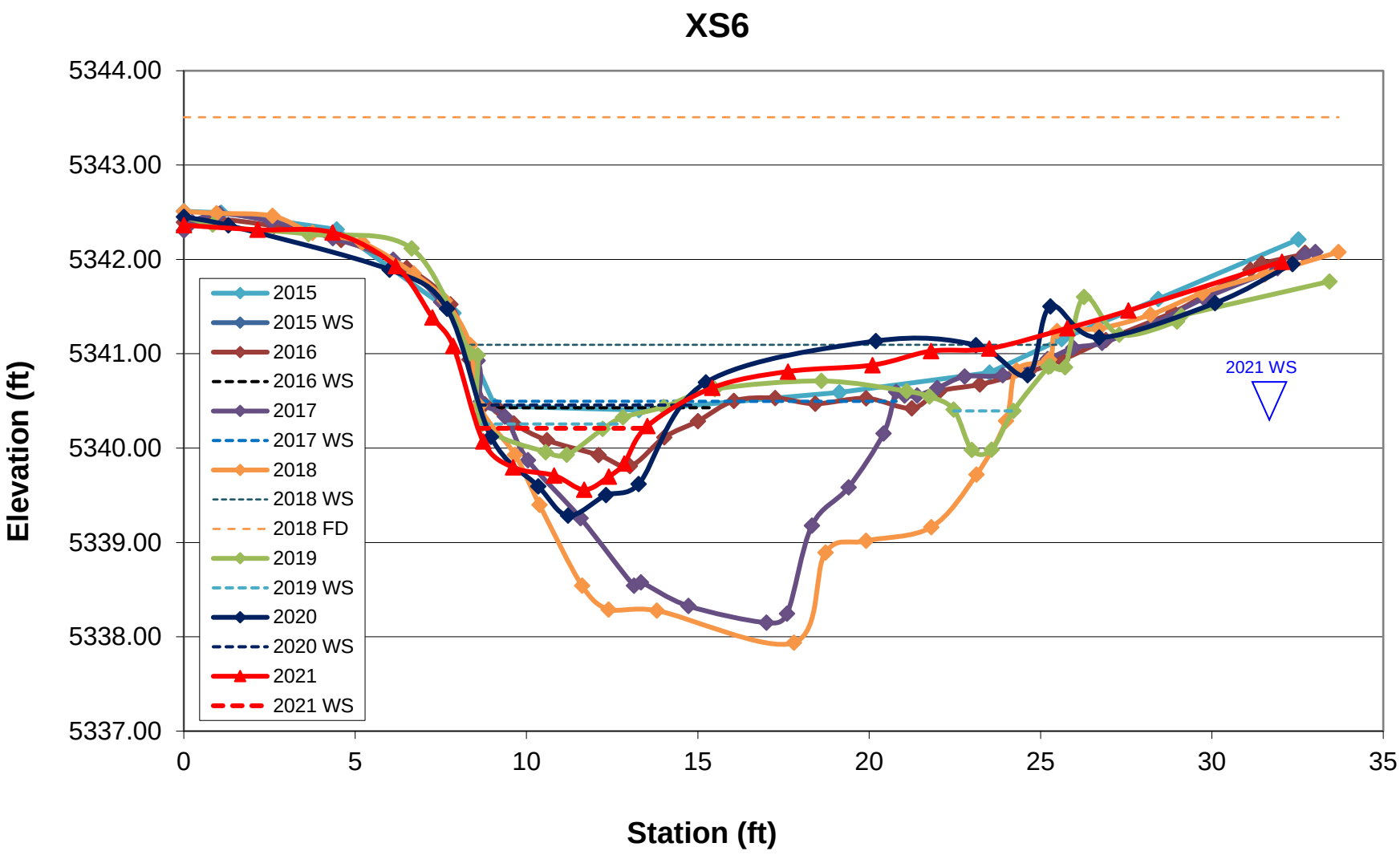

XS1
Elevation (ft)
Station (ft)
5356.00
5355.00
5354.00
5353.00
5352.00
5351.00
5350.00
5349.00
5348.00
0
10
20
30
40
50
60
70
80
2021 WS
2015
2016
2016 WS
2017
2017 WS
2018
2018 WS
2019
2019 WS
2020
2020 WS
2021
2021 WS

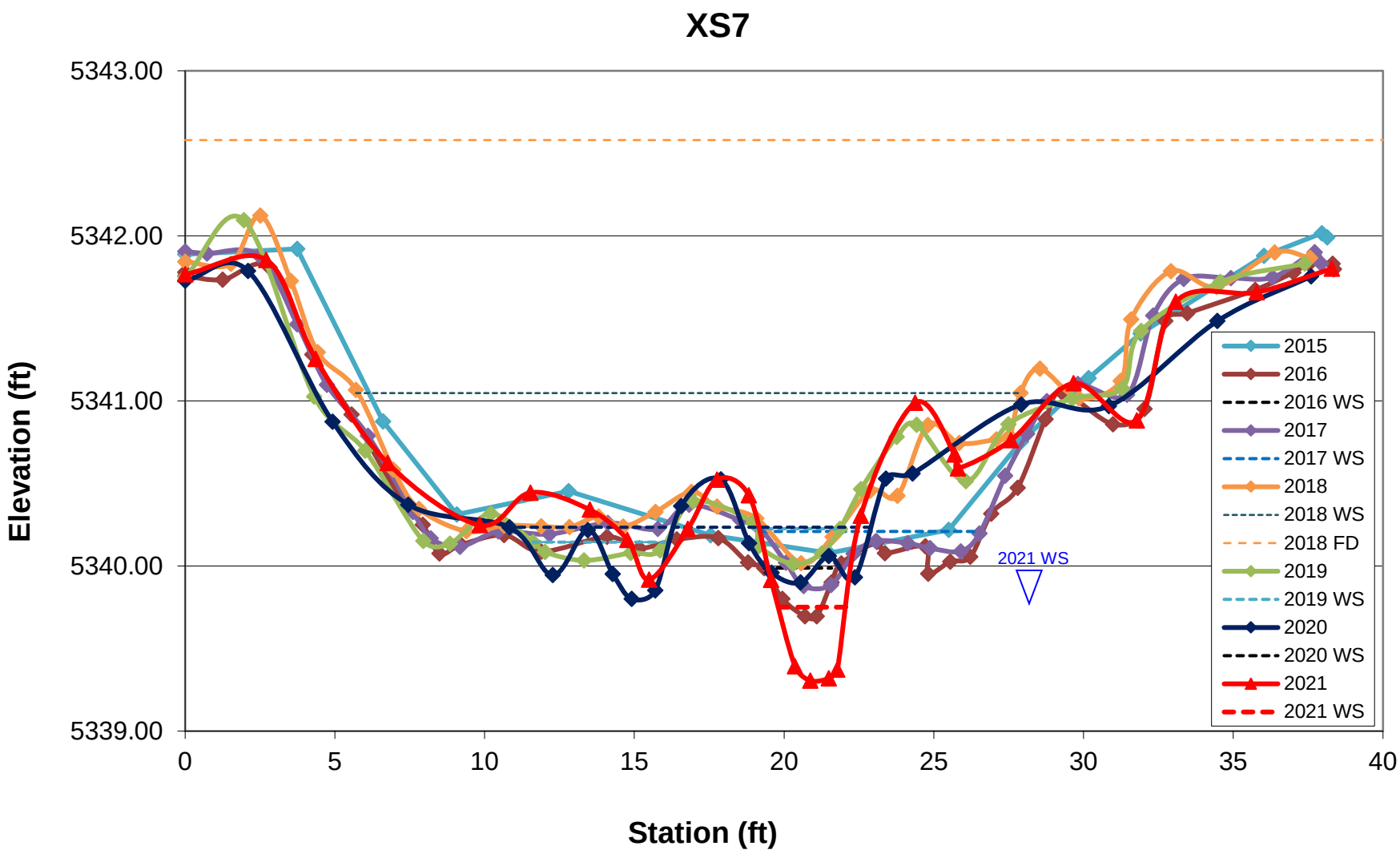

XS2
Elevation (ft)
Station (ft)
5352.00
5351.00
5350.00
5349.00
5348.00
5347.00
5346.00
0
10
20
30
40
50
60
70
2015
2015 WS
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2018 FD
2019
2019 WS
2020
2020 WS
2021
2021 WS
2021 WS

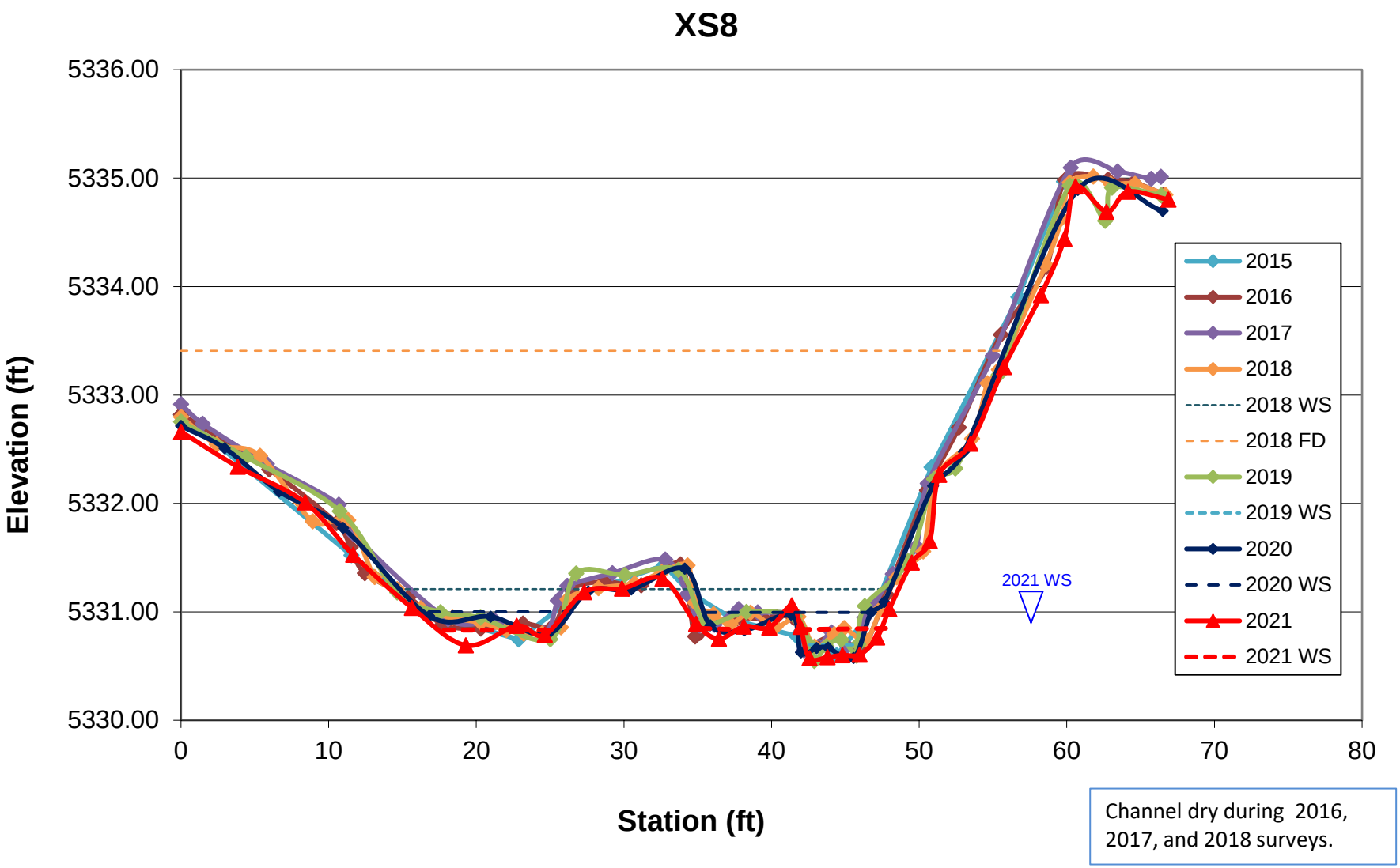

XS3
5347.00
5346.00
5345.00
5344.00
5343.00
5342.00
0
5
10
15
20
25
30
35
40
45
50
Elevation (ft)
Station (ft)
2021 WS
2015
2015 WS
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2019
2019 ws
2020
2020 WS
2021
2021 WS


XS4
Elevation (ft)
Station (ft)
5346.00
5345.00
5344.00
5343.00
5342.00
5341.00
0
5
10
15
20
25
30
35
40
45
50
2021 WS
2015
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2018 FD
2019
2019 WS
2020
2020 WS
2021
2021 WS


XS5
5345.00
5344.00
5343.00
5342.00
5341.00
5340.00
5339.00
Elevation (ft)
0
5
10
15
20
25
30
35
40
45
Station (ft)
2021 WS
2015
2016
2016 WS
2017
2017 WS
2017 FD
2018
2018 WS
2018 FD
2019
2019 WS
2020
2020 WS
2021
2021 WS


XS6
Elevation (ft)
Station (ft)
5344.00
5343.00
5342.00
5341.00
5340.00
5339.00
5338.00
5337.00
0
5
10
15
20
25
30
35
2015
2015 WS
2016
2016 WS
2017
2017 WS
2018
2018 WS
2018 FD
2019
2019 WS
2020
2020 WS
2021
2021 WS
2021 WS


XS7
5343.00
5342.00
5341.00
5340.00
5339.00
0
5
10
15
20
25
30
35
40
Elevation (ft)
Station (ft)
2021 WS
2015
2016
2016 WS
2017
2017 WS
2018
2018 WS
2018 FD
2019
2019 WS
2020
2020 WS
2021
2021 WS


XS8
5336.00
5335.00
5334.00
5333.00
5332.00
5331.00
5330.00
Elevation (ft)
0
10
20
30
40
50
60
70
80
Station (ft)
2021 WS
2015
2016
2017
2018
2018 WS
2018 FD
2019
2019 WS
2020
2020 WS
2021
2021 WS
Channel dry during 2016, 2017, and 2018 surveys.