MONTANA DEPARTMENT OF TRANSPORTATION
WETLAND MITIGATION MONITORING REPORT: YEAR 2013

American Colloid Mitigation Site
Alzada, Carter County, Montana



Prepared for:

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December 2013

MONTANA DEPARTMENT OF TRANSPORTATION

WETLAND MITIGATION MONITORING REPORT:

YEAR 2013

American Colloid
Carter County, Montana

Initial Construction:
MDT Project Number NH STPS BR 6(10)
Control Number 1396

Watershed 16 Repair:
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Control Number 6714

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CCI Project No: MDT.006

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Cover: View from NE corner of AC wetland looking west near constructed berm.

1. INTRODUCTION

The American Colloid 2013 Wetland Mitigation Monitoring Report presents the results of the third year of monitoring at the American Colloid Wetland Mitigation Site since the berm and outlet structure were reconstructed in 2010. The 2010 construction repaired damages to the dike sustained from piping (leaking) along the outlet pipe that caused a subsequent failure in 2007. The American Colloid mitigation project is situated approximately 2 miles south and 7 miles west of Alzada, Montana, on Montana School Trust Land in Lot 7, Lot 10, and Lot 11 of Section 36, Township 9 South, Range 58 East (Figure 1). Figures 2 and 3 in Appendix A show the Monitoring Activity Locations and Mapped Site Features, respectively. The Montana Department of Transportation (MDT) Wetland Mitigation Site Monitoring Form, the US Army Corps of Engineers (USACE) Wetland Determination Data Forms (USACE 2010), and the 2008 MDT Montana Wetland Assessment Form (MWAM) (Berglund and McEldowney 2008) are included in Appendix B. Appendix C shows project area photographs and Appendix D presents the project plan sheet.

The mitigation site is located in Watershed 16, the Little Missouri River Basin, in the Glendive District on land owned by the Montana Department of Natural Resources and Conservation (DNRC). The elevation is approximately 3,518 feet above mean sea level. The land was formerly leased to the American Colloid Mining Company. The site was mined for bentonite clay prior to the 1971 Open Cut Mining Act and is currently surrounded by topography typical of open cut mining activities. A dike approximately 190 feet in length was constructed along a topographic depression to impound precipitation runoff from a 167-acre ephemeral drainage. Soil borings at the site revealed highly erodible clay soils underlain by shale, suitable for impounding and storing surface water. The property is managed for perpetuity in a conservation easement between DNRC and MDT. A fenced enclosure surrounds the 15-acre easement and includes the proposed 5-acre wetland and a 10-acre buffer zone of upland vegetation. The mitigation monitoring limits, per MDT guidance and for purposes of this report, encompass only the 6.44-acre monitoring boundary as depicted on Figure 2. However, the entire 15-acre site is included for purposes of calculating mitigation credits (Table 6). A mitigation ratio of 1:1 (impact to credit) for the created wetland and open water habitat and a ratio of 5:1 for the preservation and maintenance of the upland buffer have been used for calculating credit acres for the American Colloid mitigation site.

The MDT designed and constructed the American Colloid wetland restoration project. The site was initially constructed in October 2001 to mitigate for 4.4 acres of wetland impacts associated within the Alzada-West and Alzada-South projects in Watershed 16. The initial mitigation monitoring event was conducted in 2002. Monitoring ceased in 2007 following the dike failure, and resumed in 2011 following the dike repair in 2010.

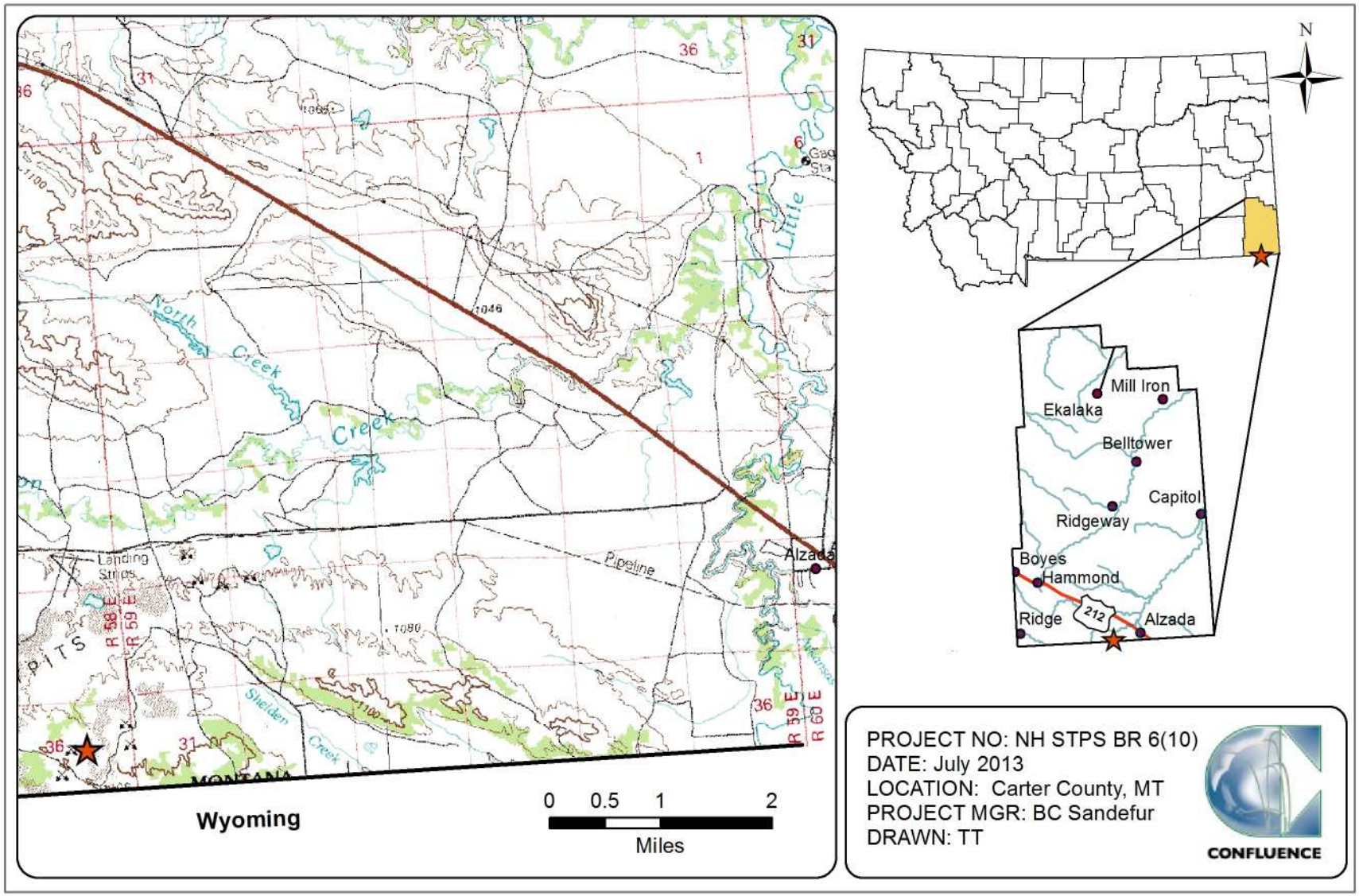


Figure 1. Project location of American Colloid Wetland Mitigation Site.

No specific goals or success criteria were defined for this project, which was constructed prior to release of the 2008 USACE mitigation rule that requires such components. Wetland success will be based on the following performance standards:

1. **Wetland Characteristics**: All restored, created, enhanced, and preserved wetlands within the project limits will meet the three parameter criteria for hydrology, vegetation, and soils established for determining wetland areas as outlined in the *1987 Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987) and the *2010 Regional Supplement to the Corps of Engineers Manual: Great Plains Region (Version 2.0)* (USACE 2010).
    a) **Wetland Hydrology Success** will be achieved where wetland hydrology is present as per the technical guidelines in the 1987 Wetland Manual and the 2010 Regional Supplement.
        (i) Soil saturation will be present for at least 12.5 percent of the growing season.
        (ii) Depressional wetlands excavated within the upland areas will be monitored to determine if groundwater hydrology is filling sites and establishing vegetation communities.
        (iii) Hydrologic success will also require that the constructed stream channel be stable in the wetlands.
    b) **Hydric Soil Success** will be achieved where hydric soil conditions are present (per the most recent Natural Resource Conservation Service (NRCS) definitions for hydric soil) or appear to be forming, the soil is sufficiently stable to prevent erosion, and the soil is able to support plant cover. Soil sampling will be conducted during the course of the monitoring period to determine if wetland areas are exhibiting characteristics of hydric soils per the 1987 Wetland Manual and 2010 Regional Supplement. Since typical hydric soil indicators may require long periods to form, a lack of distinctive hydric soil features will not be considered a failure if hydrologic and vegetation success is achieved.
    c) **Hydrophytic Vegetation Success** will be achieved through the delineation of developing wetlands utilizing the technical guidelines established in the 1987 Wetland Manual and the 2010 Regional Supplement. The following concept of “dominance”, as defined in the 1987 Manual, will be applied during future routine wetland determinations in created/restored wetlands: “*Subjectively determine the dominant species by estimating those having the largest relative basal area (woody overstory), greatest height (woody understory), greatest percentage of aerial cover (herbaceous understory), and/or greatest number of stems (woody vines).”*

2. **Upland Buffer Success** will be achieved when noxious weeds do not exceed 10 percent of cover within the buffer areas on site. Any area within the creditable buffer zone disturbed by project construction must have at least 50 percent aerial cover of non-weed species by the end of the monitoring period.

3. **Weed Control** will be based upon annual monitoring of the site to determine weed species and degree of infestation within the site, and control measures based upon the monitoring results will be implemented by MDT to minimize and/or eliminate the intrusion of State Listed Noxious weed species within the site. MDT will manage the wetland conservation easement area to meet a goal of having less than 10 percent absolute cover of state listed noxious weed species across the site.

4. **Fencing** of the proposed mitigation site has been installed along the boundaries to protect the integrity of the wetland and upland buffer from disturbance that may be detrimental to the site. Fencing installed along the perimeter of the site has been designed to be "wildlife friendly" to allow for wildlife movement into and out of the wetland complex.

5. **Monitoring** of this MDT mitigation site will be based upon the MDT standard monitoring protocols utilized for all MDT wetland mitigation sites for a minimum period of five years or longer as determined by the US Army Corps Montana Regulatory Office's review of annual monitoring reports for the site and whether or not the site has met the wetland success criteria.

2. METHODS

The 2013 monitoring event was completed on August 16, 2013. Information for the Mitigation Monitoring Form and Wetland Determination Data Forms was entered electronically in the field on a palmtop computer during the field investigation (Appendix B). Monitoring activity sites were located with a global positioning system (GPS) and illustrated in Figure 2 (Appendix A). Information collected included a wetland delineation, vegetation community mapping, vegetation transect monitoring, soil and hydrology data, bird and wildlife use documentation, photographic documentation, and a non-engineering examination of the infrastructure established within the mitigation project area.

2.1. Hydrology

The presence of hydrological indicators as outlined on the Wetland Determination Data Forms was documented at two data points established within the project area. The hydrologic indicators were evaluated according to features observed *in situ* during the site visit. The data were recorded on electronic field data sheets (Appendix B). Hydrologic assessments allow evaluation of mitigation performance standards addressing inundation and saturation requirements.

Technical criteria for wetland hydrology guidelines have been established as "permanent or periodic inundation, or soil saturation within 12 inches of the ground surface for a significant period (12.5 percent of the growing season)

during the growing season" (USACE 2010). Systems with continuous inundation or saturation for greater than 12.5 percent of the growing season are considered jurisdictional wetlands. The growing season is defined in the 1987 Wetland Delineation Manual (Environmental Laboratory 1987) as the number of days where there is a 50 percent probability that the minimum daily temperature is greater than or equal to 28 degrees Fahrenheit. The growing season recorded for the predominant soil map unit, Neldore-rock outcrop complex (58D), averages 120 days (USDA 2011). Areas defined as wetlands would require 15 days of continuous inundation or saturation within 12 inches of the ground surface to meet the hydrology criteria.

Soil pits excavated during the wetland delineation were used to evaluate groundwater levels within 18 inches of the ground surface. The data were recorded on the Wetland Determination Data Form (Appendix B). No monitoring wells were installed at this site.

2.2. Vegetation

The boundaries of dominant-species based vegetation communities were determined in the field during the active growing season and subsequently delineated on the 2013 aerial photograph. Community types were named based on the predominant vegetation species that characterized each mapped polygon (Figure 3, Appendix A). Percent cover of dominant species within a community type was estimated and recorded using the following values: 0 (less than 1 percent), 1 (1 to 5 percent), 2 (6 to 10 percent), 3 (11 to 20 percent), 4 (21 to 50 percent), and 5 (greater than 50 percent) (Appendix B). No woody species were planted at the American Colloid Mitigation Site.

Temporal changes in vegetation are evaluated through annual assessments of a single static belt transect, which was originally established in July 2002 and reestablished in 2011. Vegetation composition was assessed and recorded along a 10-foot wide and 300-foot long belt transect (T-1) (Figure 2, Appendix A). The transect location was recorded with a resource-grade GPS unit. Spatial changes in the dominant vegetation communities were recorded along the stationed transect. The percent aerial cover of each vegetation species within the belt transect was estimated using the same values and cover ranges used for the vegetation community polygon data on the 2013 aerial photograph (Figure 3, Appendix B). Photographs were taken at the transect endpoints during the monitoring event (Appendix C).

The Montana State Noxious Weed List (September 2010), prepared by the Montana Department of Agriculture, was used to categorize weeds identified within the site. The location of noxious weeds was noted in the field and mapped on the aerial photo (Figure 3, Appendix A). The names of the noxious weed species are color-coded. The locations are denoted with the symbol "**x**", "▲", or "■" representing 0 to 0.1 acre, 0.1 to 1 acre, or greater than 1 acre in extent, respectively. Cover classes are represented by a T, L, M, or H, for less than 1 percent, 1 to 5 percent, 6 to 25 percent, and 26 to 100 percent, respectively.

2.3. Soil

Soil information was obtained from the *Soil Survey for Carter County Area* (USDA 2011) and *in situ* soil descriptions. Soil cores were excavated using a hand auger and evaluated according to procedures outlined in the 1987 Manual and 2010 Regional Supplement. A description of the soil profile, including hydric soil indicators when present, was recorded on the electronic Wetland Determination Data Form for each profile (Appendix B).

2.4. Wetland Delineation

Waters of the U.S. including special aquatic sites and jurisdictional wetlands were delineated throughout the project area in accordance with criteria established in the 1987 Manual and the 2010 Regional Supplement. The technical criteria for hydrophytic vegetation, hydric soil, and wetland hydrology described in the 2010 Regional Supplement must be satisfied to delineate a representative area as a wetland. The name and indicator status of plant species was derived from the Draft 2012 National Wetland Plant List (NWPL) (Lichvar and Kartesz. 2009). Monitoring reports written prior to 2012 used the 1988 National List of Plant Species that Occur in Wetlands: Northwest Region 4 (Reed 1988). Following USACE guidance, the 2012 NWPL scientific plant names were used in this report. Many common names used in the draft 2012 NWPL appear incomplete or erroneous. When used in this report, 2012 NWPL common names that appear to be incomplete or erroneous are provided with parenthetical clarification. For example, the common name for the plant *Agrostis exarata* in the 2012 NWPL is “spiked bent”. As this is likely an error, this species’ common name would be reported here as “spiked bent (grass)”. A Routine Level-2 on-site Determination Method (Environmental Laboratory 1987) was used to delineate jurisdictional areas within the project boundaries. The information was recorded electronically on the Wetland Determination Data Form (Appendix B).

The wetland boundary was determined in the field based on changes in plant communities and/or hydrology, and changes in soil characteristics. Topographic relief boundaries within the project area were also examined and cross referenced with soil and vegetation communities as supportive information for this delineation. Vegetation composition, soil characteristics, and hydrology were assessed at likely wetland and adjacent upland locations. If all three parameters met the criteria, the area was designated as wetland and mapped by vegetation community type. If any one of the parameters did not exhibit positive wetland indicators, the area was determined to be upland unless the site was classified as an atypical situation, potential problem area for vegetation, soil or hydrology, or special aquatic site, i.e., mudflat. The wetland boundaries were surveyed using resource-grade GPS and imported into Geographic Information System (GIS) format. Wetland areas reported were calculated using GIS spatial quantification methodology.

2.5. Wildlife

Direct observations and other positive indicators of use of mammal, reptile, amphibian, and bird species were recorded on the Mitigation Monitoring Form during the site visit. Indirect use indicators, including tracks, scat, burrow, eggshells, skins, and bones, were also recorded. These signs were recorded while traversing the site for other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used. A comprehensive wildlife species list of animals observed from 2011 to 2013 was compiled for this report.

2.6. Functional Assessment

The 2008 MDT MWAM was used to evaluate functions and values on the site from 2011 through 2013. This method provides an objective means of assigning wetlands an overall rating and provides regulators a means of assessing mitigation success based on wetland functions. Functions are self-sustaining properties of a wetland ecosystem that exist in the absence of society and relate to ecological significance without regard to subjective human values (Berglund and McEldowney 2008). Field data for this assessment were collected during the site visit. One Wetland Assessment form was completed for the project area (Appendix B).

2.7. Photo Documentation

Monitoring at photo points provided supplemental information documenting wetland, upland, and transect conditions; site trends; and current land uses surrounding the site. Photographs were taken at established photo points throughout the mitigation site during the site visit (Appendix C). Photo point locations were recorded with a resource grade GPS unit (Figure 2, Appendix A).

2.8. GPS Data

Site features and survey points were collected with a resource grade Thales Pro Mark III GPS unit during the 2013 monitoring season. Points were collected using WAAS-enabled differential correction satellites, typically improving resolution to sub-meter accuracy. The collected data were then transferred to a personal computer, imported into GIS, and projected in Montana State Plane Single Zone NAD 83 meters. Site features and survey points that were located with GPS included fence boundaries, photographic points, transect endpoints, and wetland data points.

2.9. Maintenance Needs

Engineered structures including the dike and outlet structure, fencing, and other features were examined during the site visit for obvious signs of breaching, damage, or other problems. This was a cursory examination and did not constitute an engineering-level structural inspection.

3. RESULTS

3.1. Hydrology

Climate data from the meteorological station at Albion 1 N, Montana (240088), located approximately 16 miles northeast of the site, recorded an average annual precipitation rate of 14.23 inches from 1945 to 2010 (WRCC 2012). The total precipitation recorded in 2010 was 23.6 inches, 9.37 inches above the 65 year average. The WRCC precipitation data for the Albion 1 N station was incomplete for most of 2011 and 2013. Monthly precipitation totals collected at the Broadus meteorological station (241127), located approximately 50 miles northwest of the mitigation site, were used to provide additional regional climate data. The mean annual precipitation total for the period of record at Broadus (92 years) is 14.07 inches. The annual precipitation totals recorded at the Broadus station were 17.54 inches in 2010, 17.26 inches in 2011, and 9.15 inches in 2012, indicating above average precipitation for the first year of monitoring (2011) and significantly below average precipitation for 2012. The total from January to August was 10.9 inches (long-term average), 16.48 inches (2011), 7.68 inches (2012) and 13.85 inches (2013). These data indicate the region received above-average precipitation during the 2011 and 2013 growing season and below-average precipitation in 2012, as reflected by the lower water level within the constructed impoundment during the 2012 field survey as compared to 2011 and 2013 water levels.

The wetland basin was constructed in an ephemeral drainage within a 167-acre watershed. Wetland hydrology at the site is provided solely through direct precipitation and surface runoff. During the site inspection, the constructed dike was impounding surface water and functioning as designed. There were approximately 3.2 acres of surface water at depths ranging from 0.0 to 2.7 feet. Hydrologic indicators observed during the investigation indicated that water levels measured in August were less than the maximum elevation attained during spring runoff at the beginning of the growing season. The water surface was approximately one foot below the outlet elevation. Surface soil cracks, water-stained leaves, drift deposits, and an algal crust were noted at the water's edge. Inundation was also visible on the aerial imagery. Rills and other drainage patterns were observed throughout the uplands surrounding the inundated basin. Surface water from the wetland depression discharges to the ephemeral drainage through a series of down gradient wetlands into an unnamed tributary of Thompson Creek and eventually into the Little Missouri River located approximately 15 miles downstream of the mitigation site. Precipitation, surface water runoff, and evaporation rates are the dominant factors influencing seasonal water elevations within the wetland. Groundwater input is limited based on the low hydraulic conductivity of the soil forming the unconsolidated bottom of the basin.

No groundwater monitoring wells were installed within this site. Hydrological data were collected at two data points, AC-1u and AC-1w. Data point AC-1w located on the water margin exhibited a high water table at 11 inches below the

ground surface (bgs) and saturation at 9 inches below the ground surface. No primary or secondary indicators of wetland hydrology were observed at AC-1u, located on the upland slope above AC-1w.

3.2. Vegetation

Thirty-eight plant species have been identified onsite from 2011 through 2013 (Table 1). Vegetation community types were mapped based on the dominant species within an area and the results of the wetland delineation data. The 2013 vegetation communities were the same as the previous two years, Type 1 – *Ericameria nauseosa/Atriplex argentea* Upland; Type 2 – *Schizachyrium scoparium/Grindelia squarrosa* Upland; and Type 3 – *Spartina pectinata* Wetland. The impounded depression, defined by polygon 4, encompassed 3.2 acres of open water in 2013, an increase of approximately 1.16 acres from 2012 (Figure 3, Appendix A and Monitoring Form, Appendix B). The dominant species for each community type are presented in descending order of abundance in the following discussions.

Upland Community Type 1 – *Ericameria nauseosa/Atriplex argentea* has developed on approximately 1.73 acres within the site perimeter. Rubber rabbitbrush (*Ericameria nauseosa* - *Chrysothamnus nauseousus* on 1988 list), silverscale salt bush (*Atriplex argentea*), fox-tail barley (*Hordeum jubatum*), curly-cup gumweed (*Grindelia squarrosa*), big sagebrush (*Artemisia tridentata*), plains pricklypear (*Opuntia polyacantha*), and greasewood (*Sarcobatus vermiculatus*) dominated the vegetation cover. More than 50 percent of the area characterized by the community was bare ground.

Upland Community Type 2 – *Schizachyrium scoparium/Grindelia squarrosa* characterized the 1.13 acre community that abuts the wetland fringe surrounding the open water. This represented a 0.31 acre decrease in the extent of the community since 2012. The vegetation was dominated by little false bluestem (*Schizachyrium scoparium*), curly-cup gumweed, prairie sandreed (*Calamovilfa longifolia*) and twelve other species. Approximately 11 to 20 percent of the total cover was bare ground.

Wetland Community Type 3 – *Spartina pectinata* (freshwater cord grass) dominated the 0.38 acre wetland community that characterized the wetland fringe adjacent to the open water. The decrease of 0.85 acres in wetland area from 2012 to 2013 was the result of a corresponding increase in the open water area. Narrow-leaf goosefoot (*Chenopodium leptophyllum*), curly-cup gumweed, fox-tail barley, saltmarsh club-rush (*Schoenoplectus maritimus*, called *Scirpus maritimus* on 1988 list), broad-leaf cattail (*Typha latifolia*), meadow fescue (*Festuca pratensis*), broom snakeweed (*Gutierrezia sarothrae*), little false bluestem, and 10 other species were also identified within the community. The cover class for bare ground was estimated at 21 to 50 percent.

Table 1. Vegetation species observed from 2011 thru 2013 at the American Colloid Wetland Mitigation Site.

Scientific Name	Common Name	GP Indicator Status[1]
Achillea millefolium	Common Yarrow	FACU
Algae, green	Algae, green	NL
Amaranthus retroflexus	Red-Root	FACU
Artemisia tridentata	Big Sagebrush	UPL
Aster sp.	Aster	NL
Atriplex argentea	Silverscale	FAC
Avena fatua	Wild Oat	UPL
Beckmannia syzigachne	American Slough Grass	OBL
Bromus arvensis	Japanese Brome	FACU
Bromus tectorum	Cheatgrass	UPL
Calamovilfa longifolia	Prarie Sandreed	UPL
Chenopodium leptophyllum	**Narrow-Leaf Goosefoot**	**FACU**
Chenopodium sp.	Goosefoot	NL
Cirsium arvense	Canadian Thistle	FACU
Echinochloa crus-galli	Large Barnyard Grass	FAC
Eleocharis palustris	**Common Spike-Rush**	**OBL**
Elymus elymoides	Western Bottle-Brush Grass	FACU
Elymus repens	Creeping Wild Rye	FACU
Ericameria nauseosa	Rubber rabbitbrush	NL
Festuca pratensis	**Meadow Fescue**	**FACU**
Grindelia squarrosa	Curly-Cup Gumweed	FACU
Gutierrezia sarothrae	Broom Snakeweed	UPL
Hordeum jubatum	Fox-Tail Barley	FACW
Juncus tenuis	Lesser Poverty Rush	FAC
Juniperus communis	**Common Juniper**	**UPL**
Opuntia polyacantha	Plains Pricklypear	UPL
Panicum capillare	Common Panic Grass	FAC
Pascopyrum smithii	Western-Wheat Grass	FACU
Poa sp.	Blue Grass	NL
Puccinellia nuttalliana	Nuttall's Alkali Grass	OBL
Rumex acetosella	**Common Sheep Sorrel**	**FAC**
Sarcobatus vermiculatus	Greasewood	FAC
Schizachyrium scoparium	Little False Bluestem	FACU
Schoenoplectus maritimus	Saltmarsh Club-Rush	OBL
Spartina pectinata	Freshwater Cord Grass	FACW
Spergula arvensis	Corn Spurry	UPL
Typha latifolia	Broad-Leaf Cat-Tail	OBL
Xanthium strumarium	Rough Cockleburr	FAC

[1]Draft 2012 NWPL (Lichvar and Kartesz 2009).
New species identified in 2013 are bolded.

Approximately 3.2 acres of open water (Polygon 4) covered a bit less than half of the area within the constructed wetland cell. This represented an increase in open water of 1.16 acres from 2012 to 2013. The open water contained less than five percent cover of green algae, freshwater cord grass, broad leaf cattail, and saltmarsh club-rush. The wetland cell has been flooded only since the dike repair in 2010. Productivity levels in the open water are likely limited by the

presence of suspended clay particles and a high level of turbidity that restricts photosynthesis through the water column.

Data collected on Transect 1 (Monitoring Form, Appendix B) are summarized in tabular and graphic formats (Table 2, Charts 1 and 2, respectively). The start and finish of Transect 1 were photographed as shown on Page C-5 of Appendix C. The transect intersected Type 3 – *Spartina pectinata* wetland and open water (Polygon 4). Hydrophytic vegetation was identified on 6.3 percent of the belt transect and open water extended across 93.7 percent of the transect. This represented a 2.0 percent decrease in the presence of the wetland community on the transect and an 8.7 percent increase in open water on the transect as compared to the 2012 results. The upland community identified at the end of T-1 in 2011 and 2012 had converted to wetland in 2013.

Table 2. Data summary for Transect 1 from 2011 thru 2013 at the American Colloid Wetland Mitigation Site.

Monitoring Year	**2011**	**2012**	**2013**
Transect Length (feet)	**300**	**300**	**300**
Vegetation Community Transitions along Transect	3	3	2
Vegetation Communities along Transect	2	2	1
Hydrophytic Vegetation Communities along Transect	1	1	1
Total Vegetative Species	7	12	11
Total Hydrophytic Species	4	5	4
Total Upland Species	3	7	7
Estimated % Total Vegetative Cover	12	15	15
% Transect Length Comprising Hydrophytic Vegetation Communities	7.3	8.3	6.3
% Transect Length Comprising Upland Vegetation Communities	4.3	6.7	0
% Transect Length Comprising Unvegetated Open Water	88.3	85.0	93.7
% Transect Length Comprising Bare Substrate	0.0	0.0	0

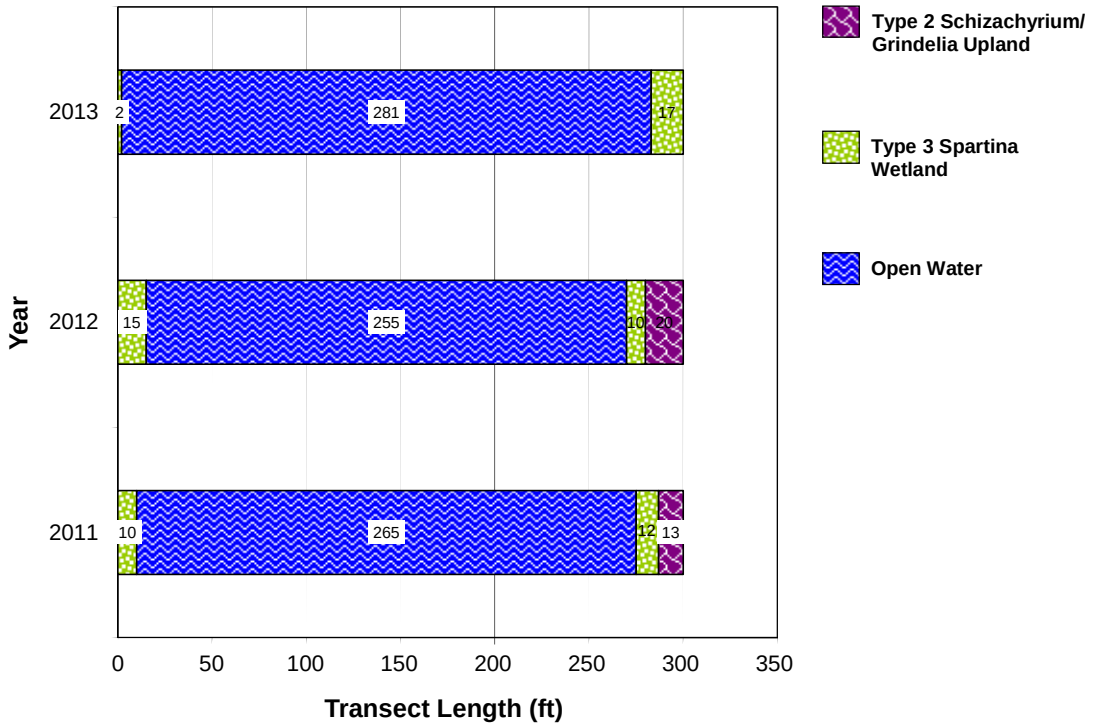


Chart 1. Transect map showing community types on Transect 1 from 2011 thru 2013 from start (0 feet) to finish (300 feet) at the American Colloid Wetland Mitigation Site.

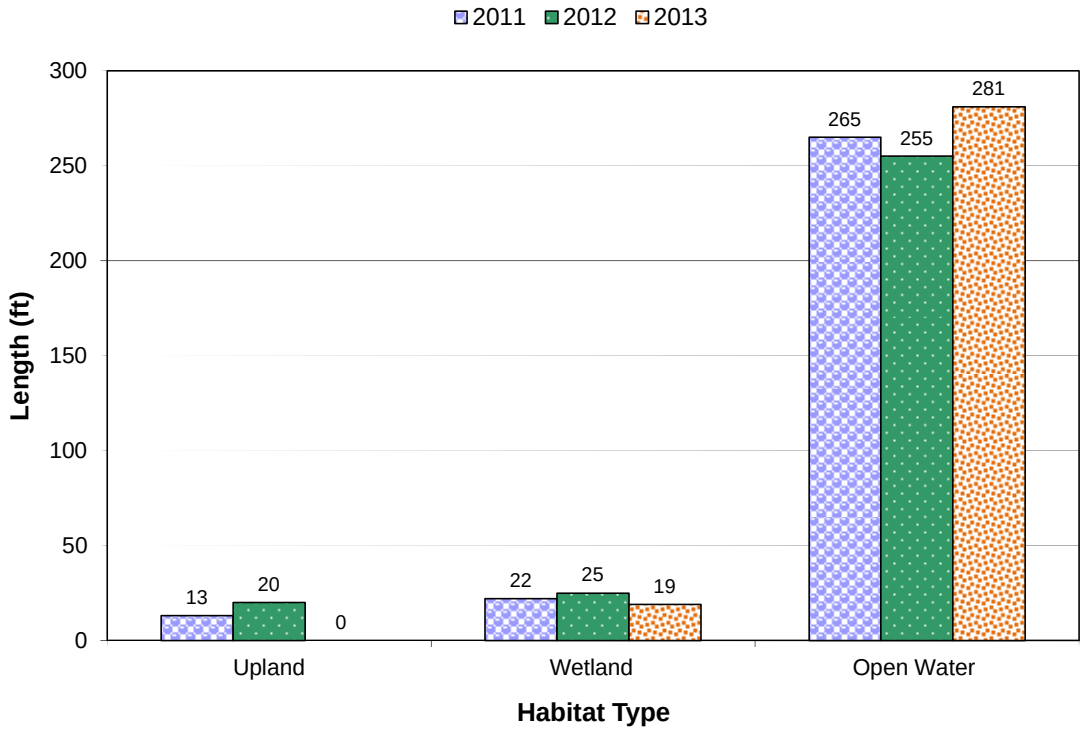


Chart 2. Length of habitat types within Transect 1 from 2011 thru 2013 at the American Colloid Wetland Mitigation Site.

Two clusters of Canadian thistle, a Priority 2B weed, at less than 0.1 acre were noted near the northwest mitigation boundary at the edge of wetland and open water. The cover was less than 1 percent. The MDT has an ongoing weed control program that annually manages State noxious weed infestations on each mitigation site.

3.3. Soil

The project site was mapped in the *Carter County Soil Survey* (USDA 2011) within the Neldor-Rock outcrop complex at 4 to 15 percent slopes on hill slopes. The parent material of this complex is clay residuum over semi-consolidated shale. These are well drained, low-permeable, non-hydric soils with clay loam inclusions. The test pit results generally confirmed the presence of clay soil.

Soil pit AC-1w was located in wetland community 3 in the vegetated fringe along the open water. The soil profile revealed a gray (10 YR 5/1) clay with five percent dark yellowish brown redoximorphic concentrations (10 YR 4/4) in the matrix. The depleted matrix provided a positive indication of hydric soil. The soil profile at AC-1u, located in the adjacent upland just upslope of AC-1w, was a light brownish gray (10 YR 6/2) clay without redox features. There were no hydric soil indicators in the soil profile.

3.4. Wetland Delineation

Two data points, AC-1w and AC-1u, were evaluated to confirm the wetland boundary determination. Between 2012 and 2013, the wetland acreage decreased by 0.85 acre and the open water aquatic habitat increased by 1.16 acres. This change was predominantly the result of increased inundation levels observed in 2013. A total of 3.58 acres of wetland and open water aquatic habitat was delineated in 2013, an increase of 0.31 acre since 2012 (Table 3).

Table 3. Total wetland acres delineated from 2011 thru 2013 at the American Colloid Wetland Mitigation Site.

WETLAND AND AQUATIC HABITAT ACREAGES	2011	2012	2013
Wetlands	0.26	1.23	0.38
Open Water	3.01	2.04	3.20
Total	3.27	3.27	3.58

3.5. Wildlife

A comprehensive list of bird and other wildlife species observed directly or indirectly from 2011 through 2013 is presented in Table 4. Five bird species were observed in 2013, a killdeer (*Charadrius vociferus*), mourning dove (*Zenaida macroura*), Northern harrier (*Cirsus cyaneus*), turkey vulture (*Cathartes aura*), and vesper sparrow (*Pooecetes gramineus*). Five northern leopard frogs (*Rana pipiens*), bones of a beaver (*Castor canadensis*), deer tracks (*Odocoileus sp*.), and two mule deer (*Odocoileus hemionus*) were noted onsite in 2013.

Table 4. Wildlife species observed from 2011 thru 2013 within the American Colloid Wetland Mitigation Site.

COMMON NAME	SCIENTIFIC NAME
AMPHIBIANS	
Northern Leopard Frog	***Rana pipiens***
BIRDS	
Canada Goose	*Branta canadensis*
Grasshopper Sparrow	*Ammodramus savannarum*
Killdeer	***Charadrius vociferus***
Mallard	*Anas platyrhynchos*
Mourning Dove	***Zenaida macroura***
Northern Harrier	***Cirsus cyaneus***
Turkey Vulture	***Cathartes aura***
Vesper Sparrow	***Pooecetes gramineus***
MAMMALS	
Beaver	**Castor canadensis**
Deer sp.	**Odocoileus sp.**
Mule Deer	***Odocoileus hemionus***
Muskrat	*Ondatra zibethicus*
Pronghorn	*Antilocapra americana*
REPTILES	
Turtle sp	

Species identified in 2013 are bolded.

3.6. Functional Assessment

The 2011 monitoring data provided a baseline for subsequent functional assessments. The 2008 MWAM was used in 2011 through 2013 to evaluate the assessment area (AA) that included the open water depression and adjacent wetland fringe (Appendix B). The site is situated within the semiarid Pierre Shale Plains with a surrounding habitat of undulating rolling plains and vegetation consisting of shortgrass prairie and scattered stands of Ponderosa pine. The AA is located on DNRC property under a MDT conservation easement. There is no active mining or roads within 500 feet of the assessment area (AA) and there are a few isolated ponds and wetland areas near the AA.

The size of the AA increased from 3.27 acres in 2012 to 3.58 acres in 2013 as a result of the increase in the extent of inundation in the depression. Table 5 summarizes the function and value ratings of the AA from 2011 to 2013. The AA was rated as a Category III wetland with 42 percent of the total points possible in 2013. This AA achieved 13.60 functional units in 2013, an increase from 12.75 in 2012. The increase in functional units was related to the increase of total wetland acreage at this site. A modification to the production export/food chain support rating between 2012 and 2013 was related to the reevaluation of the vegetated component within the AA. The short and long term surface water storage was rated as high in 2013. The presence of a large depression containing perennial surface water increased the ratings of this function. The AA

received moderate ratings for general wildlife habitat and sediment/nutrient/toxicant removal.

Table 5. Functional assessment results from 2011 thru 2013 for the American Colloid Wetland Mitigation Site.

Function and Value Parameters from the 2008 Montana Wetland Assessment Method	2011	2012	2013
Listed/Proposed T&E Species Habitat	Low (0.0)	Low (0.0)	Low (0.0)
MTNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)
General Wildlife Habitat	Mod (0.4)	Mod (0.6)	Mod (0.6)
General Fish/Aquatic Habitat	NA	NA	NA
Flood Attenuation	NA	NA	NA
Short and Long Term Surface Water Storage	High (1.0)	High (1.0)	High (1.0)
Sediment/Nutrient/Toxicant Removal	Mod (0.6)	Mod (0.6)	Mod (0.6)
Sediment/Shoreline Stabilization	Low (0.3)	Low (0.3)	Low (0.3)
Production Export/Food Chain Support	Mod (0.7)	High (0.8)	Mod (0.7)
Groundwater Discharge/Recharge	Low (0.1)	Low (0.1)	Low (0.1)
Uniqueness	Low (0.3)	Mod (0.4)	Mod (0.4)
Recreation/Education Potential (bonus points)	NA	NA	NA
Actual Points/Possible Points	**3.5 / 9**	**3.9 / 9**	**3.8 / 9**
% of Possible Score Achieved	**39%**	**43%**	**42%**
Overall Category	**III**	**III**	**III**
Total Acreage of Assessed Wetlands within Site Boundaries	**3.27**	**3.27**	**3.58**
Functional Units (acreage x actual points)	**11.45**	**12.75**	**13.60**

There were no disturbances to the site in 2012 or 2013 and there was one vegetation class, emergent. Wildlife use was minimal during the site visit. The assessment yielded 13.96 functional units for the American Colloid Wetland Mitigation Site in 2013. The percent cover of wetland species at the edge of open water is expected to increase in subsequent growing seasons, contingent on the continued presence of wetland hydrology, resulting in an associated increase in functional units. The increase in water levels in 2013 inundated emerging seedlings that had begun to grow at the edge of the depression and may hamper the establishment of woody vegetation along the water's margin.

3.7. Photo Documentation

Photographs taken from five photo points, PP1 to PP5, are shown on pages C-1 to C-4 of Appendix C. Photos of the transect end points are presented on page C-5 and the delineation data points are shown on page C-6 (Appendix C). In general, these photos show that vegetation cover in both the wetland and upland communities has been slow to develop.

3.8. Maintenance Needs

There were no nesting structures installed at the site. The outlet control structure was repaired in 2010 and was in good working condition when inspected in August 2012. The water-control standpipes were in good condition and working as designed during the 2013 field visit. A wildlife friendly fence that surrounds

the 15 acre site was in good condition and did not require maintenance. Two clusters of Canadian thistle, a Priority 2B weed, less than 0.1 acre in size were noted near the northwest mitigation boundary. The cover was less than 1.0 percent. The MDT administers an ongoing weed control program that annually assesses the location and size of State noxious weed infestations on each mitigation site.

The vegetation cover in the wetland and upland communities at the site is less than 50 percent. Reseeding the bare areas with appropriate species may facilitate an overall increase in cover.

3.9. Current Credit Summary

The calculation of credit acres shown in Table 6 assumed a mitigation ratio of 1:1 (impact to credit) for the created wetland and open water aquatic habitat within the wetland depression and a 5:1 credit ratio for preservation and maintenance of the upland buffer. The wetland and aquatic habitat acreage totaled 3.27 acres in 2011 and 2012 and 3.58 acres in 2013 (Table 6). The full acreage (11.42 acres) of the fenced upland buffer was used to calculate the upland preservation credit acreage of 2.28 in 2013. The increase in open water habitat acreage in 2013 was reflected in the corresponding increase in total credit acres from 5.62 in 2011 and 2012 to 5.86 in 2013. The proposed credit acreage for this site, based upon the planned design for creating 5 acres of wetlands and preserving 10 acres of upland buffer, totaled 7 credit acres. The 5.86 credit acres estimated in 2013 was 1.14 acres under the proposed credits for the American Colloid wetland mitigation site.

Table 6. Credit summary from 2011 thru 2013 for the American Colloid Wetland Mitigation Site.

COMPENSATORY MITIGATION TYPE	USACE MITIGATION RATIO	PROPOSED ACRES	2011 DELINEATED ACRES	2011 CREDIT ACRES	2012 DELINEATED ACRES	2012 CREDIT ACRES	2013 DELINEATED ACRES	2013 CREDIT ACRES
Creation: Establishment (wetland)	1:1	5	0.26	0.26	1.23	1.23	0.38	0.38
Creation: Establishment (open water)	1:1		3.01	3.01	2.04	2.04	3.2	3.20
Upland Buffer (Preservation and Maintenance)	5:1	10 (2 credit acres)	11.73*	2.35	11.73*	2.35	11.42*	2.28
Total		7	15.00	5.62	15.00	5.62	15.00	5.86

*Value includes all uplands within fenced 15-acre site

In summary, the areas identified as wetland and open water aquatic habitat met the criteria for jurisdictional waters of the US including wetlands. The following summarizes key elements of the performance standards observed in the 2013 monitoring effort:

- The percent cover of aquatic macrophytes is expected to increase in the open water areas in the long term eventually creating an aquatic bed vegetation class.
- The wetland depression was inundated throughout the growing season.
- Hydric soil indicators were evident at the wetland data point (AC-1w).
- The vegetation cover of the wetland and upland within the mitigation boundary is less than 50 percent, three years after the dam was repaired.
- The noxious weed cover is less than 10 percent site wide.

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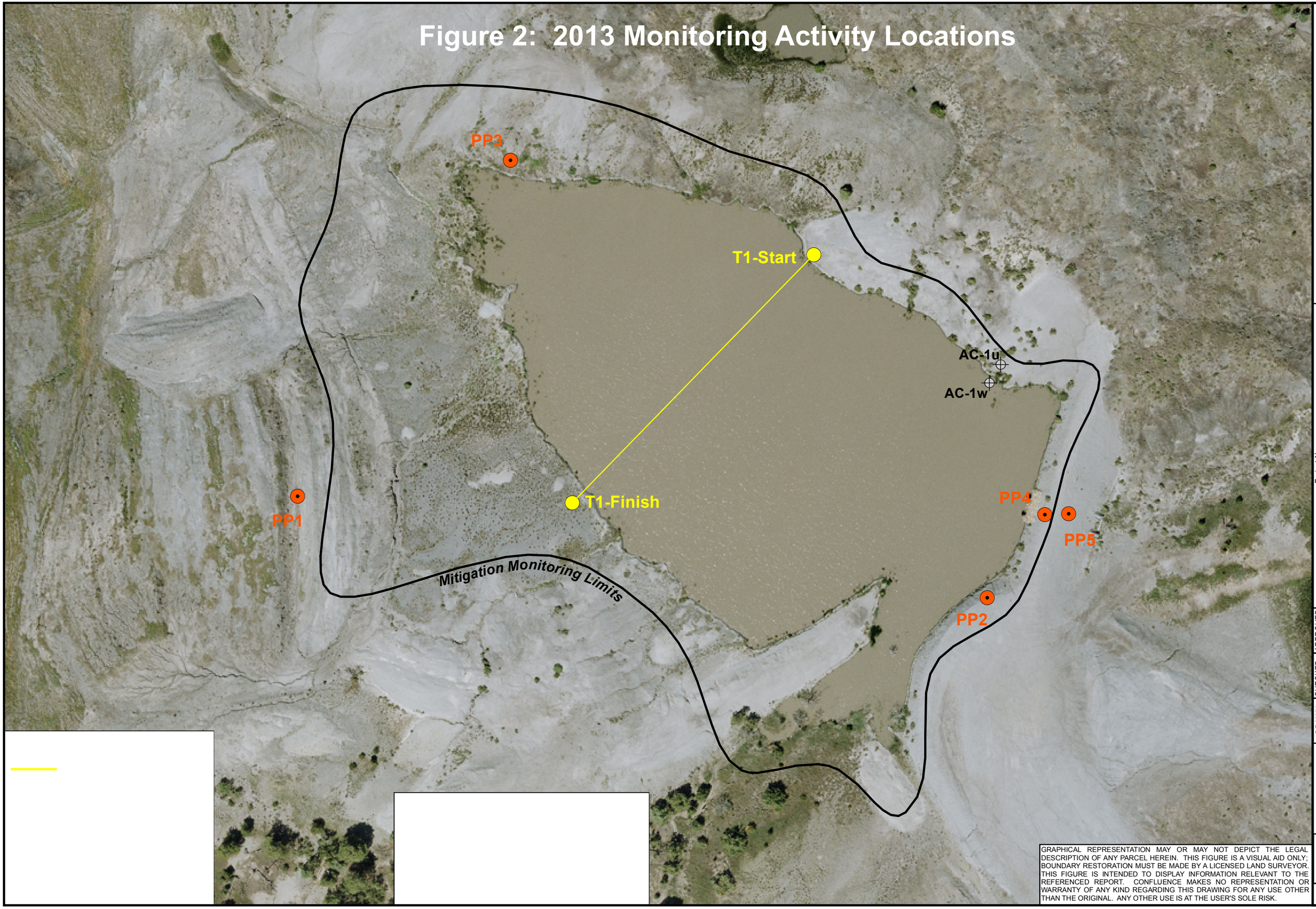
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Appendix A

Project Area Maps – Figures 2 and 3

MDT Wetland Mitigation Monitoring
American Colloid
Carter County, Montana

Figure 2: 2013 Monitoring Activity Locations



GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

LOCATION: Carter Co., MT

PROJECT NO: STPX 6(15)

FILE: AmericanColloid/Monitor2013.mxd

Project Name
American Colloid Mitigation Site

Drawing Title
2013 Monitoring Activity Locations

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 9, 2013

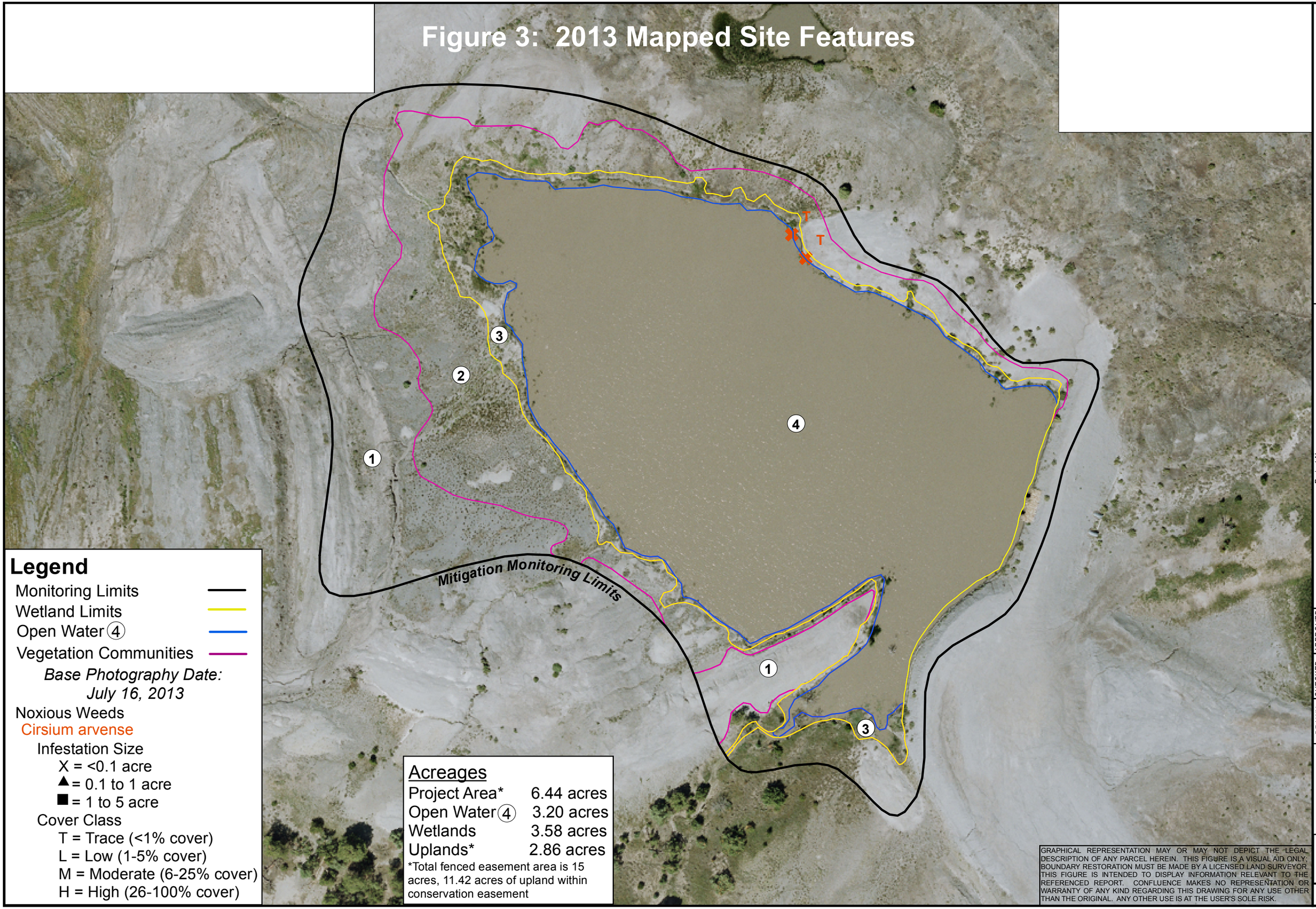
PROJ MGR: B Sandefur

CONFLUENCE
consulting incorporated

Figure
2

REV -

Figure 3: 2013 Mapped Site Features



Legend

- Monitoring Limits
- Wetland Limits
- Open Water (4)
- Vegetation Communities

Base Photography Date: July 16, 2013

Noxious Weeds

Cirsium arvense

Infestation Size

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

Cover Class

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

Acreages

Project Area*	6.44 acres
Open Water (4)	3.20 acres
Wetlands	3.58 acres
Uplands*	2.86 acres

*Total fenced easement area is 15 acres, 11.42 acres of upland within conservation easement

GRAPHICAL REPRESENTATION MAY OR MAY NOT DEPICT THE LEGAL DESCRIPTION OF ANY PARCEL HEREIN. THIS FIGURE IS A VISUAL AID ONLY; BOUNDARY RESTORATION MUST BE MADE BY A LICENSED LAND SURVEYOR. THIS FIGURE IS INTENDED TO DISPLAY INFORMATION RELEVANT TO THE REFERENCED REPORT. CONFLUENCE MAKES NO REPRESENTATION OR WARRANTY OF ANY KIND REGARDING THIS DRAWING FOR ANY USE OTHER THAN THE ORIGINAL. ANY OTHER USE IS AT THE USER'S SOLE RISK.

LOCATION: Carter Co., MT

PROJ NO: STPX 6(15)

FILE: AmericanColloid/Veg2013.mxd

Project Name: American Colloid Mitigation Site

Drawing Title: 2013 Mapped Site Features

DRAWN	CHECKED	APPROVED
BCS	BV	LU

SCALE: Noted

Drawn: September 9, 2013

PROJ MGR: B Sandefur

CONFLUENCE consulting incorporated

Figure 3

REV -

Appendix B

2013 MDT Wetland Mitigation Site Monitoring Form
2013 USACE Wetland Determination Data Form
2013 MDT Montana Wetland Assessment Form

MDT Wetland Mitigation Monitoring
American Colloid
Carter County, Montana

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Site: American Colloid Assessment Date/Time 8/16/2013 9:45:55 AM

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

Weather: Warm & sunny, breezy Location: Alzada, MT

MDT District: Billings Milepost: NA

Legal Description: T 9S R 58E Section(s) 36

Initial Evaluation Date: 8/9/2011 Monitoring Year: 3 #Visits in Year: 1

Size of Evaluation Area: 6.44 (acres)

Land use surrounding wetland:

Bentonite mine, open range

HYDROLOGY

Surface Water Source: Precipitation, runoff

Inundation: ☑ Average Depth: 1.2 **(ft)** Range of Depths: 0-2.7 **(ft)**

Percent of assessment area under inundation: 50 %

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

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

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

Soil cracks, water-stained leaves, drift deposits, inundation visible on aerial imagery, and algal crust.

Groundwater Monitoring Wells

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

Well ID	Water Surface Depth (ft)
No Wells	

Additional Activities Checklist:

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

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

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

Hydrology Notes:

Over 3 acres of surface water present within the impounded basin, water surface approximately 1-ft below outlet elevation.

VEGETATION COMMUNITIES

Site American Colloid

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

Community # 1 **Community Type:** Ericameria nauseosa / Atriplex argentea **Acres** 1.73

Species	Cover class	Species	Cover class
Artemisia tridentata	1	Aster sp.	0
Atriplex argentea	3	Avena fatua	0
Bare Ground	5	Elymus repens	0
Ericameria nauseosa	3	Grindelia squarrosa	2
Hordeum jubatum	2	Juniperus communis	0
Opuntia polyacantha	1	Pascopyrum smithii	0
Sarcobatus vermiculatus	1		

Comments:

Community # 2 **Community Type:** Schizachyrium scoparium / Grindelia squarrosa **Acres** 1.13

Species	Cover class	Species	Cover class
Artemisia tridentata	1	Atriplex argentea	1
Bare Ground	3	Bromus arvensis	1
Bromus tectorum	1	Calamovilfa longifolia	2
Echinochloa crus-galli	1	Elymus elymoides	1
Grindelia squarrosa	3	Hordeum jubatum	1
Panicum capillare	0	Puccinellia nuttalliana	1
Sarcobatus vermiculatus	1	Schizachyrium scoparium	3
Spartina pectinata	1	Xanthium strumarium	1

Comments:

Community # 3 **Community Type:** Spartina pectinata / **Acres** 0.38

Species	Cover class	Species	Cover class
Achillea millefolium	0	Amaranthus retroflexus	0
Aquatic macrophytes	0	Atriplex argentea	0
Bare Ground	4	Beckmannia syzigachne	0
Chenopodium leptophyllum	1	Cirsium arvense	0
Echinochloa crus-galli	0	Festuca pratensis	1
Grindelia squarrosa	1	Gutierrezia sarothrae	1
Hordeum jubatum	1	Panicum capillare	0
Rumex acetosella	0	Schizachyrium scoparium	1
Schoenoplectus maritimus	1	Spartina pectinata	2
Typha latifolia	1	Xanthium strumarium	0

Comments:

Community # 4 **Community Type:** Open Water / **Acres** 3.2

Species	Cover class	Species	Cover class
Algae, green	1	Eleocharis palustris	0
Open Water	5	Schoenoplectus maritimus	1
Spartina pectinata	1	Spergula arvensis	0
Typha latifolia	1		

Comments:

Total Vegetation Community Acreage **6.44**

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

VEGETATION TRANSECTS

Site: American Colloid Date: 8/16/2013 9:45:55 AM

Transect Number: 1 **Compass Direction from Start:** 130

Interval Data:

Ending Station 2 **Community Type:** Spartina pectinata /

Species	Cover class	Species	Cover class
Aquatic macrophytes	1	Bare Ground	4
Cirsium arvense	2	Spartina pectinata	1

Ending Station 283 **Community Type:** Open Water /

Species	Cover class	Species	Cover class
Algae, green	1	Eleocharis palustris	0
Open Water	5	Spartina pectinata	0

Ending Station 300 **Community Type:** Spartina pectinata /

Species	Cover class	Species	Cover class
Bare Ground	5	Hordeum jubatum	1
Panicum capillare	0	Schizachyrium scoparium	0
Spartina pectinata	2	Xanthium strumarium	1

Transect Notes:

PLANTED WOODY VEGETATION SURVIVAL

American Colloid

Planting Type	#Planted	#Alive	Notes
None planted			

Comments

No woody vegetation planted at this site.

American Colloid

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
Killdeer	3	F, FO	OW, US
Mourning Dove	3	F	UP
Northern Harrier	1	FO	OW, UP
Turkey Vulture	3	FO	OW, UP
Vesper Sparrow	16	F, L	OW, UP

Bird Comments

BEHAVIOR CODES

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

HABITAT CODES

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

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

Mammals and Herptiles

Species	# Observed	Tracks	Scat	Burrows	Comments
Beaver		No	No	No	Bones
Deer Sp.		Yes	No	No	
Mule Deer	2	No	No	No	
Northern Leopard Frog	5	No	No	No	

Wildlife Comments:

American Colloid

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
1341-46	45.003201	-104.547737	130	PP-1
1351-54	45.003777	-104.549034	80	PP-3
1357	45.004608	-104.548531	130	T-1, start
1360	45.005005	-104.548141	0	AC-1w
1363	45.005051	-104.548088	180	AC-1u
1365-69	45.00523	-104.547684	185	PP-4
1370-74	45.00523	-104.547684	10	PP-5, pano
1375	45.00523	-104.547684	10	PP-5
1376-82	45.004951	-104.547249	230	PP-2
1387	45.004108	-104.547676	310	T-1, end

Comments:

American Colloid

ADDITIONAL ITEMS CHECKLIST

Hydrology

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

Photos

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

Vegetation

☑ Map vegetation community boundaries

☑ Complete Vegetation Transects

Soils

☑ Assess soils

Wetland Delineations

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

Wetland Delineation Comments

Functional Assessments

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

Functional Assessment Comments:

Maintenance

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

If yes, do they need to be repaired?

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

Were man-made structures built or installed to impound water or control water flow into or out of the wetland? Yes

If yes, are the structures in need of repair? No

If yes, describe the problems below.

Water-control standpipes in good condition and working properly at time of 2013 site visit.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: American Colloid | City/County: Carter Co. | Sampling Date: 8/16/2013

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

Investigator(s): B Sandefur | Section, Township, Range: 36 9S 58E

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

Subregion (LRR): LRR F | Lat: 45.0050233333333 | Long: -104.5481 | Datum: WGS84

Soil Map Unit Name: Neldore-Rock outcrop | NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes ☑	No ☐
Hydric Soil Present?	Yes ☐	No ☑
Wetland Hydrology Present?	Yes ☐	No ☑

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

Remarks: DP upland companion to AC-1w.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Chrysothamnus nauseousus	5	☐	NL
2. Sarcobatus vermiculatus	20	☑	FAC
3. Grindelia squarrosa	5	☐	UPL
4. Bromus tectorum	5	☐	UPL
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	35 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 65

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	0
FACW species	0	x 2 =	0
FAC species	20	x 3 =	60
FACU species	0	x 4 =	0
UPL species	10	x 5 =	50
Column Totals	30 (A)		110 (B)

Prevalence Index = B/A = 3.66667

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: AC-1u

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

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

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes _____ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes _____ No ☑

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

Remarks: No positive signs of wetland hydrology.

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: American Colloid | City/County: Carter Co. | Sampling Date: 8/16/2013

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

Investigator(s): B Sandefur | Section, Township, Range: 36 9S 58E

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

Subregion (LRR): LRR F | Lat: 45.005 | Long: -104.548056666667 | Datum: WGS84

Soil Map Unit Name: Neldore-Rock outcrop | NWI classification: Upland

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

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

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

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

Hydrophytic Vegetation Present?	Yes ☑	No ☐
Hydric Soil Present?	Yes ☑	No ☐
Wetland Hydrology Present?	Yes ☑	No ☐

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

Remarks: DP in vegetated fringe along open water.

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
	0 = Total Cover		
Sapling/Shrub Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
3.	0	☐	
4.	0	☐	
5.	0	☐	
	0 = Total Cover		
Herb Stratum (Plot size: 5ft)			
1. Spartina pectinata	20	☑	FACW
2. Hordeum jubatum	5	☐	FACW
3. Echinochloa crus-galli	10	☑	FAC
4.	0	☐	
5.	0	☐	
6.	0	☐	
7.	0	☐	
8.	0	☐	
9.	0	☐	
10.	0	☐	
	35 = Total Cover		
Woody Vine Stratum (Plot size:)			
1.	0	☐	
2.	0	☐	
	0 = Total Cover		

% Bare Ground in Herb Stratum 70

Dominance Test worksheet:

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

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

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

Prevalence Index worksheet:

Total % Cover of:		Multiply by:	
OBL species	0	x 1 =	
FACW species	25	x 2 =	50
FAC species	10	x 3 =	30
FACU species	0	x 4 =	0
UPL species	0	x 5 =	0
Column Totals	35 (A)		80 (B)

Prevalence Index = B/A = 2.28571

Hydrophytic Vegetation Indicators:

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

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

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

SOIL

Sampling Point: AC-1w

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

Depth (inches)	Matrix Color (moist)	%	Redox Features Color (moist)	%	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/1	100					Clay	
6-12	10YR 5/1	95	C M	10YR	4/4	5	Clay	

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

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

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

Indicators for Problematic Hydric Soils[3]:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes ☑ No ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

Water Table Present? Yes ☑ No ☐ Depth (inches): 11

Saturation Present? (includes capillary fringe) Yes ☑ No ☐ Depth (inches): 9

Wetland Hydrology Present? Yes ☑ No ☐

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

Remarks: Hydrology provided by impoundment of surface water, periodically inundated and saturated.

MDT Montana Wetland Assessment Form (revised March 2008)

1. Project name American Colloid **2. MDT project#** STPX 6(15) **Control#** 6714

3. Evaluation Date 8/16/2013 **4. Evaluators** B Sandefur **5. Wetland/Site# (s)** American Colloid

6. Wetland Location(s): T 9S **R** 58E **Sec1** 36 **T** **R** **Sec2**

Approx Stationing or Mileposts NA

Watershed 10110201 **Watershed/County** Little Missouri/Carter County, MT

7. Evaluating Agency Confluence for MDT

8. Wetland size acres 3.58

Purpose of Evaluation

How assessed: Measured e.g. by GPS

☐ **Wetlands potentially affected by MDT project**

9. Assesssment area (AA) size (acres) 3.58

☐ **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	Unconsolidated Bottom	Impounded	Permanent/Perennial	90
Depressional	Emergent Wetland	Impounded	Seasonal/Intermittent	10

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)

No disturbance to site or AA since dam breach was repaired in 2011. Hydrology from precipitation and surface runoff. AA is fenced to include a 10-acre upland buffer. Surrounding area is mined for bentonite although there is no active mining within 500 ft. of AA.

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

Cirsium arvense in low amounts, hoary alyssum

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

AA located on DNRC property under an MDT conservation easement. No active mining or roads within 500 ft of AA. A few isolated ponds and wetland areas near AA. Site is situated within the semiarid Pierre Shale Plains with surrounding habitat of undulating rolling plains and vegetation of shortgrass prairie and some scattered stands of Ponderosa pine.

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

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

Comments: Emergent vegetation class.

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 T&E list.

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

Incidental habitat (list species) ○ D ◉ S Greater Sage-Grouse (S2)

No usable habitat ☐ S

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

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

Sources for documented use MTNHP SOC list for Carter County.

14C. General Wildlife Habitat Rating:

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

Low

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

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

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

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

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

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

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

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

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

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

Comments Minimal wildlife observation during site visits, limited upland food sources.

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

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

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

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

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

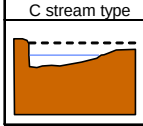
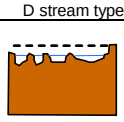
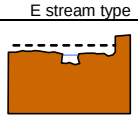
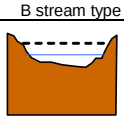
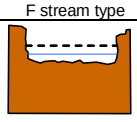
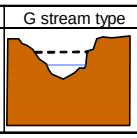
b) Does the AA contain a documented spawning area or other critical habitat feature (i.e., sanctuary pool, upwelling area, etc.- specify in comments) for native fish or introduced game fish? ◯ **Y** ◉ **N** *If yes, add 0.1 to the adjusted score in **i** or **iia** above:*
Modifed Rating

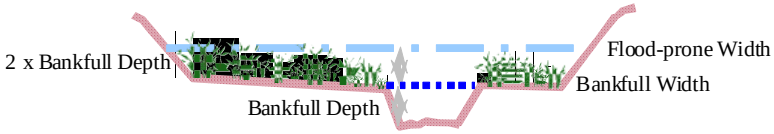
iii. Final Score and Rating: 0 NA **Comments:**

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

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

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

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



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

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

Comments:

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

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

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

Comments: Hydrology source for AA from precip and upland surface runoff. Approx 3-acres of surface water present during the majority of the year with an average depth of 2-3 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 depression contains a surface water outlet, water level below max design elevation at time of visit.

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: Three acres of open water subject to wave action. The vegetation cover of species w/ high stability ratings is <35%.

14I. Production Export/Food Chain Support:

i. Level of Biological Activity (synthesis of wildlife and fish habitat ratings [check])

General Fish Habitat Rating (14D.iii.)	**General Wildlife Habitat Rating (14C.iii.)**		
	E/H	M	L
E/H	H	H	M
M	H	M	M
L	M	M	L
N/A	H	M	L

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

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

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

a) Is there an average ≥ 50 foot-wide vegetated upland buffer around ≥ 75% of the AA circumference? **Y** ◉ **N** ○ *If yes, add 0.1 to the score in **ii** above and adjust rating accordingly:* **Modified Rating** .7M

Comments: Vegetated component of AA is 10% of 3.58-ac, <0.5-ac.

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

i. Discharge Indicators

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

ii. Recharge Indicators

- ☐ Permeable substrate present without underlying impeding layer
- ☐ Wetland contains inlet but no outlet
- ☐ Stream is a known 'losing' stream; discharge volume decreases
- ☐ Other:

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

	Duration of saturation at AA Wetlands *FROM GROUNDWATER DISCHARGE OR WITH WATER THAT IS RECHARGING THE GROUNDWATER SYSTEM*			
Criteria	P/P	S/I	T	None
Groundwater Discharge or Recharge	1H	.7M	.4M	.1L
Insufficient Data/Information	NA			

Comments: The AA contains an unconsolidated bottom composed of bentonite with minimal permeability.

14K. Uniqueness:

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

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

Comments:

14L. Recreation/Education Potential: (affords "bonus" points if AA provides recreation or education opportunity)

i. Is the AA a known or potential rec./ed. site: (check) **Y** ○ **N** ◉ (if 'Yes' continue with the evaluation; if 'No' then click ☑ **NA** here and proceed to the overall summary and rating page)

ii. Check categories that apply to the AA: ☐ Educational/scientific study; ☐ Consumptive rec.; ☐ Non-consumptive rec.; ☐ Other

iii. Rating (use the matrix below to arrive at [check] the functional points and rating)

Known or Potential Recreation or Education Area	Known	Potential
Public ownership or public easement with general public access (no permission required)	.2H	.15H
Private ownership with general public access (no permission required)	.15H	.1M
Private or public ownership without general public access, or requiring permission for public access	.1M	.05L

Comments:

The mitigation site is surrounded by active mining.

General Site Notes

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

Function & Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units: (Actual Points x Estimated AA Acreage)	Indicate the four most prominent functions with an asterisk (*)
A. Listed/Proposed T&E Species Habitat	L	0	1	0	☐
B. MT Natural Heritage Program Species Habitat	L	.1	1	0.358	☐
C. General Wildlife Habitat	M	.6	1	2.148	☑
D. General Fish Habitat	NA	0	0	0	☐
E. Flood Attenuation	NA	0	0	0	☐
F. Short and Long Term Surface Water Storage	H	1	1	3.58	☑
G. Sediment/Nutrient/Toxicant Removal	M	.6	1	2.148	☑
H. Sediment/Shoreline Stabilization	L	.3	1	1.074	☐
I. Production Export/Food Chain Support	M	.7	1	2.506	☑
J. Groundwater Discharge/Recharge	L	.1	1	0.358	☐
K. Uniqueness	M	.4	1	1.432	☐
L. Recreation/Education Potential (bonus points)	NA	0	NA	0	☐
Totals:		3.8	9	13.604	
Percent of Possible Score			**42.22** %		

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

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

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

☑

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

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

I | II | **III** | IV

Appendix C

Project Area Photographs

MDT Wetland Mitigation Monitoring
American Colloid
Carter County, Montana



Photo Point 1 – *Photo 1*
Bearing: ~270-10 Degrees

Location: Outside south boundary.
Taken in 2012



Photo Point 1 – *Photo 1*
Bearing: ~270-10 Degrees

Location: Outside south boundary.
Taken in 2013



Photo Point 2 – *Photo 1*
Bearing: 230 Degrees

Location: Northeast edge of wetland cell.
Taken in 2012



Photo Point 2 – *Photo 1*
Bearing: 230 Degrees

Location: Northeast edge of wetland cell.
Taken in 2013



Photo Point 3 – *Photo 1*
Bearing: 30-80 Degrees

Location: Southwest edge of wetland cell.
Taken in 2012



Photo Point 3 – *Photo 1*
Bearing: 30-80 Degrees

Location: Southwest edge of wetland cell.
Taken in 2013



Photo Point 4 – *Photo 1* **Location:** North edge of cell.
Bearing: 185 Degrees **Taken in 2012**



Photo Point 4 – *Photo 1* **Location:** North edge of cell.
Bearing: 185 Degrees **Taken in 2013**





Photo Point 5 – *Photo 1* **Location:** Outside N border.
Bearing: 10 Degrees **Taken in 2013**



Transect 1 – *Start*
Bearing: 130 Degrees
Location: NW wet boundary
Taken in 2012



Transect 1 – *Start*
Bearing: 130 Degrees
Location: NW wet boundary
Taken in 2013





Transect 1 – *End*
Bearing: 310 Degrees
Location: SE wet boundary.
Taken in 2013



Data Point – *AC-1u* **Location:**
Bearing: 180 Degrees **Taken in 2013**



Data Point – *AC-1w* **Location:**
Bearing: 0 Degrees **Taken in 2013**

Appendix D

Project Plan Sheet

MDT Wetland Mitigation Monitoring
American Colloid
Carter County, Montana

RECEIVED
JAN 06 1999
ENVIRONMENTAL

LAND & WATER D-1

Montana Department of Transportation
Helena, Montana 59620-1001

MASTER FILE COPY

Memorandum

To: Carl S. Peil , P.E.
Preconstruction Engineer

From: Gordon J. Stockstad
Resources Bureau Chief

Date: December 23, 1998

Subject: NH STPS BR 6(10)
Watershed 16
American Colloid
Control No. 1396

We request that you approve the Revised Preliminary Field Review Report for the subject project.

Approved D. John Blacker Date 1/4/99
Carl S. Peil, P.E.
Preconstruction Engineer

We are requesting comments from the following individuals, who have also received a copy of the report. We will assume their concurrence if no comments are received by two weeks from the above date.

Distribution:
C. S. Peil
J. M. Marshik
D. R. McIntyre
R. E. Williams
B. F. Juvan
M. P. Johnson
J. D. Blacker
FHWA
Precon File
P. Saindon
B. A. Larsen
D. P. Dusek
K. H. Neumiller
T. E. Martin
R. D. Tholt
S. Prestipino
Mark A. Wissinger

Revised Preliminary Field Review Report

A field review of the subject project was held in September 18, 1997, with the following people in attendance:

R. E. Mengel	Engineering Services Supr.	Glendive
J. S. Michel	Hydraulics Section	Helena
Larry Sickerson	Environmental Services	Helena
Tim Olson	Environmental Services	Helena
Tom Atkins	Road Design	Helena
John Moran	Geotech	Helena

Introduction

A preliminary field review was previously conducted for this project. The original Preliminary Field Review Report that went out did not request approval from Carl Peil nor did it request comments. The purpose of this Revised Preliminary Field Review Report is to follow the proper procedures for the purpose of activating activities from the Project Management System flow chart for Wetland Mitigation and to include comments that were received after the document had been circulated. The intent of this Report is also to bring everyone up to date on where this project is at and where it is going. Some of the activities on the PMS Wetland Mitigation flow chart have already been completed and will need to be carded out when this project comes around for overrides.

Purpose

As a result of wetland impacts associated with the Alzada - East & West (STPP 23-3(6)130, Control No. 2150), and Alzada South (STPS 326-1(1)0, Control No. 2299) highway projects, MDT is proposing mitigation efforts on Montana School Trust Land. **It is intended to tie the construction of this mitigation project to Alzada - East and West for letting purposes. The proposed ready date for the Alzada-East and West project is December, 1999.**

To mitigate impacts on the projects mentioned above, MDT is working with American Colloid, the Department of Natural Resources and Conservation (Eastern Land Office), and the Department of Environmental Quality (Reclamation Division) to create wetland habitat. MDT and American Colloid will work together to amend American Colloids reclamation plan to reflect this project. Department of Environmental Quality - Reclamation Division must approve the plan.

MDT is anticipating a mitigation site of approximately 5 acres in size for the wetland impacts associated with the previously mentioned projects. The 5 acres of wetlands will

also be surrounded by a 10 acre buffer zone of upland vegetation. The entire 15 acres will be fenced as an exclosure to livestock grazing. This exclosure will need to be sheep-proof.

Project Location and Limits
The wetland mitigation site is located in Carter County approximately 2 miles south and 7 miles west of Alzada, MT. This site is located on Montana School Trust Land in the Lot 7, Lot 10, Lot 11 of Section 36, Township 9 South, Range 58 East, M.P.M., as shown on the attached project location map.

Site Description
The wetland mitigation site is located on land owned by the Montana Department of Natural Resources and Conservation which is leased to the American Colloid Mining Company of Belle Fourche, SD. The 15 acre site was mined for bentonite clay prior to the 1971 Open Cut Mining Act and is in need of reclamation. The topography of the site is typical of open cut mining activities.

Design
The design for this proposed mitigation site will be provided by MDT's Road Design Section. It is anticipated that no excavation will be necessary. A dike approximately 58 meters in length will need to be constructed to impound the water for this site. Other design criteria will be based on the water budget analysis provided by the Hydraulics Section. Environmental Services will be the lead unit for this project.

Construction
MDT will be responsible for the project letting, construction, and project manager. This project will be tied to the Alzada - East & West project for letting and construction and has an anticipated ready date of December, 1999.

Hydraulics
The drainage patterns as shown on existing topographic maps for the watershed associated with this site have been altered due to mining activities. American Colloid provided

MDT with a drainage area of 167 acres of surrounding watershed. Jerry Michaels is working on a water budget for the proposed site.

Water Rights
The Department of Natural Resources and Conservation will be responsible for acquiring the water rights for this site.

Geotechnical Considerations
The Geotechnical Section has completed their field investigation. This consisted of five borings at the mitigation site which revealed clay soils underlain by shale. This material is suitable for the creation of a wetland. These soils are highly erodible therefore the design should avoid an earthen spillway for the emergency outlet.

Right-of Way
The mitigation site lies within the boundaries of Montana School Trust Land and will be managed and maintained by the DNRC. A wetland conservation agreement between DNRC and MDT will be drafted by MDT for perpetuity. It needs to be addressed in this document whom the responsible party will be for removal of the sheep proof fence once the wetland is functional. It is anticipated the R/W Plans Section will review documents prepared by the DNRC. If the easement or legal description is to be provided by MDT, R/W should be notified so they can request the appropriate survey.

Environmental Considerations
No significant environmental effects or issues were identified. An appropriate environmental evaluation and document will be prepared by MDT through Environmental Services for this project. The project should have minimal effect on the habitat of any threatened or endangered species. A hazardous waste analysis and a Cultural Resource site assessment will be needed for the environmental documentation.

Field Survey
A topographic survey of the area has been performed. Additional survey for the legal description for the easement

may be required. Right-of-Way Plans Section will be notified so they can request the appropriate survey.

Legal

Legal Services will need to review all agreements with American Colloid and DNRC.

Estimated Cost

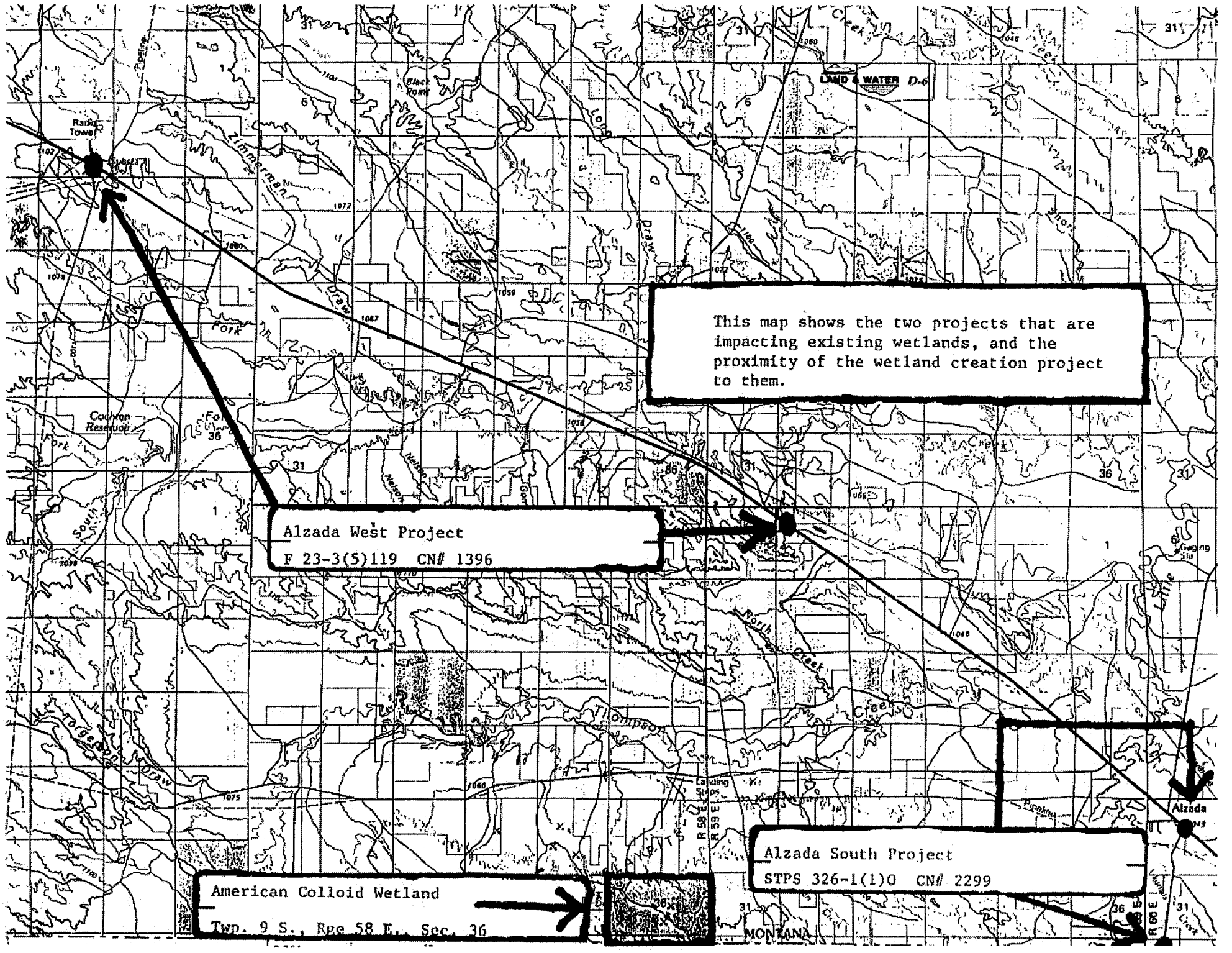
The estimated cost to construct this project is $15,500. This estimate includes Preliminary Engineering, Acquisition of Right-of-Way, and Construction costs. As soon as more information is available a modification to the programming will be made.

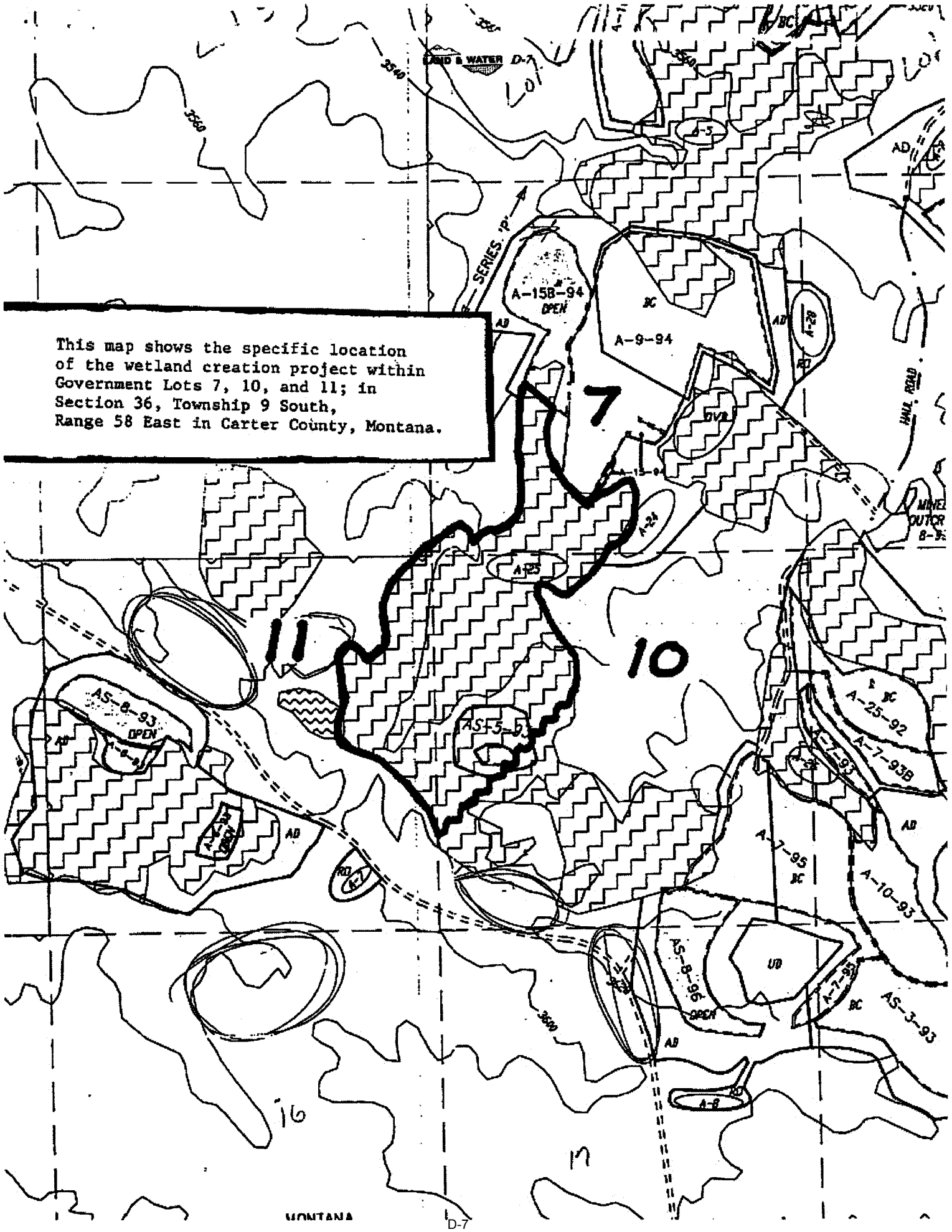
Attachment

GJS:DSA

Distribution:

C.S. Piel - Preconstruction
M. Johnson - Glendive District
K.H. Neumiller - Materials
T.E. Martin - Right of Way
J.M. Marshik - Environmental
K.M. Helvik - Environmental
R.E. Williams - Road Design
B.F. Juvan - Project Management
P. Saindon - Planning
D.W. Jensen - Planning
J.J. Moran - Geotechnical
D. Paulson - FHWA
Environmental File
Mark A. Wissinger - Contract Plans Supervisor


This map shows the two projects that are impacting existing wetlands, and the proximity of the wetland creation project to them.
Alzada West Project
F 23-3(5)119 CN# 1396
Alzada South Project
STPS 326-1(1)0 CN# 2299
American Colloid Wetland
Twp. 9 S., Rge 58 E., Sec. 36
LAND & WATER D-6
Alzada
MONTANA


This map shows the specific location of the wetland creation project within Government Lots 7, 10, and 11; in Section 36, Township 9 South, Range 58 East in Carter County, Montana.
7
10
11
16
17
A-15B-94
OPEN
A-9-94
AS-8-93
OPEN
AS-5-93
A-25-92
A-7-93
A-7-93B
A-7-95
A-10-93
AS-8-96
OPEN
AS-3-93
A-8
A-15-94
A-24
A-28
A-27
A-26
A-21
A-22
A-23
A-1-94
A-2
A-3
A-4
A-5
A-6
A-7
A-9
A-11
A-12
A-13
A-14
A-16
A-17
A-18
A-19
A-20
AD
BC
UD
DIV
RD
HAUL ROAD
SERIES 'P'
3540
3560
3580
3600
MONTANA

MONTANA DEPARTMENT OF TRANSPORTATION
HELENA, MONTANA 59620-1001

DATE ISSUED: July 18, 2001

ADDENDUM

For the Following Project
To Be Let On

July 26, 2001

6. NH-STPS-BR 6(10)
Watershed 16 – Wetland Mitigation

ADDENDUM NO. 1

ATTACHMENT NO. 1- Revised Schedule of Items, deleting item 203 100 000 Unclassified Excavation, and adding new item 203 300 000 Embankment In Place 2,115.0 M3.

ATTACHMENT NO. 2- Revised Special Provision 6, Dike Embankment.

ATTACHMENT NO. 3- Revised Plan Sheet 3, revision of Grading Frame.

INSTRUCTIONS – READ CAREFULLY

Load the electronic amendment file while in the opened project file to apply the addendum. In order to be responsive, the Schedule of Items printout on projects with addendums must show the addendum(s) applied at the bottom of each page.

Revised documents supersede and replace the documents you now have. New documents supplement the documents you now have. Make the necessary changes in your bidding documents.

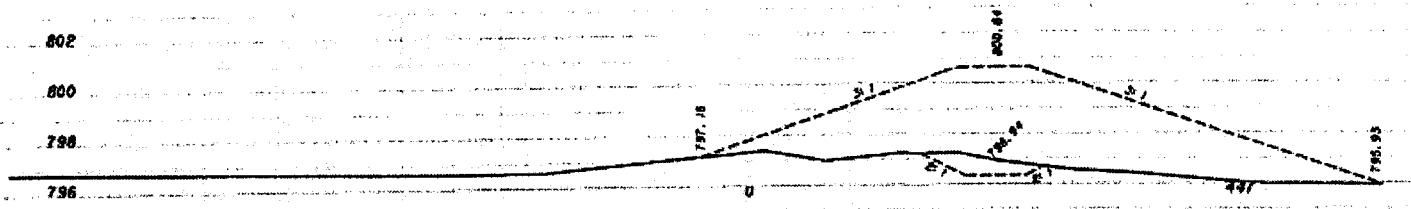
Mark A. Wissinger, P.E.
Contract Plans Supervisor

STATE	PROJECT NO.	SHEET NO.
MONTANA	STPS-BR 61(10)	1

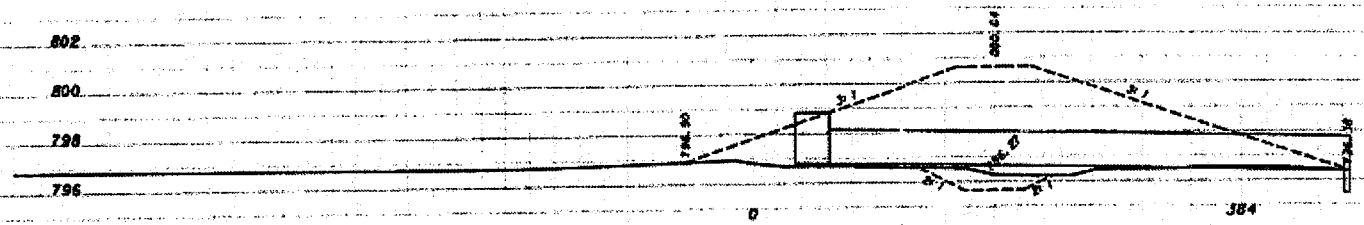
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EXCAVATION
cubic meters

EMBANKMENT
cubic meters

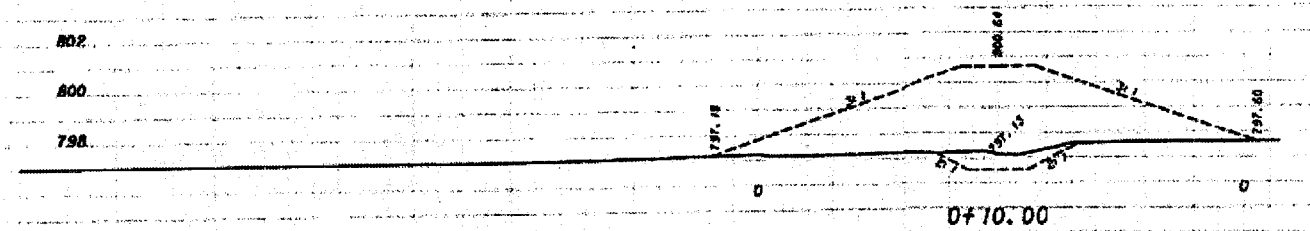


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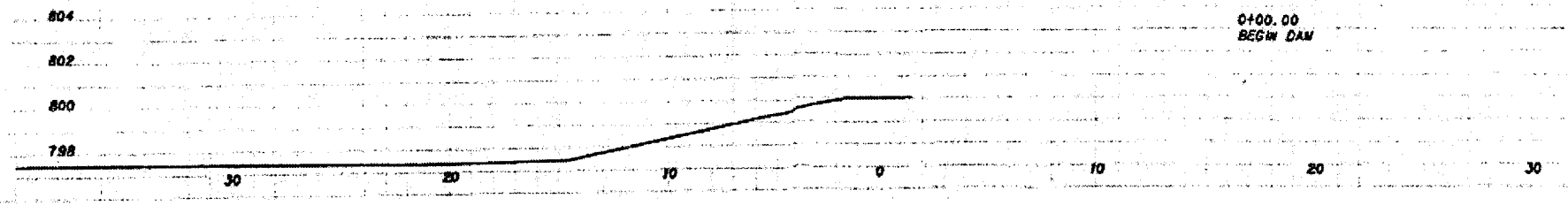
0+20
TRIPLE 1350 mm x 63.0 m CSP
TRIPLE 1350 mm x 5.5 m CSP RISER LT
2.6 m³ CL 00 CONC CUTOFF WALL
0.7 m³ CL 00 CONC BASE
2.9 m COVER

0+20.00



0+10.00 TO 0+50.00
KEY
106 m² ADD EXC.

0+10.00



0+00.00
BEGIN DAM

TABLE OF CONTENTS

ROAD PLANS	SHEET NO.
TITLE SHEET	1
TABLE OF CONTENTS	2
NOTES	2
SUMMARIES	3
GRADING	3
FENCING	3
TOPSOIL & SEEDING	3
CULVERTS	3
DETAILS	4
DAM SIDE VIEW	4
DAM END VIEW	4
CONCRETE BASE	4
PLAN & PROFILE	5
CROSS SECTIONS	1-2

NOTES

PROPERTY CORNER

THE PROPERTY CORNER LOCATED WITHIN THE EASEMENT WILL BE REMOVED AND RESET BY STATE FORCES.

BACKSLOPE

GRADE AND SHAPE BACKSLOPES OF THE WETLAND SITE TO 4:1 AS DIRECTED BY THE ENGINEER. THE COST OF THE BACKSLOPE WORK IS INCLUDED IN THE OTHER GRADING ON THE PROJECT.

CLEARING AND GRUBBING

CLEAR AND GRUB TO CONSTRUCTION LIMITS. INCLUDE THE COST OF CLEARING AND GRUBBING IN OTHER ITEMS.

SUMMARY

ADDENDUM NO. 1
ATTACHMENT NO. 3

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	NH-STPS-BR 6(10)	3

LAND & WATER D-11

GRADING

STATION	cubic meters EXCAVATION		EMB. IN PLACE	REMARKS
0+10.00				
	106			KEY
0+50.00				
0+00.00				
0+57.50			2006	DAM
			109	TOPSOIL REPLACEMENT
TOTAL	* 106		2115	

* FOR INFORMATION ONLY

FENCING

STATION* FROM	TO	meters TYPE FSM			EACH SINGLE PANEL	DOUBLE PANEL		meters GATES 02		REMARKS
		1 043			4	4		9.6		
TOTAL		1 043			4	4		9.6		

* REFERENCE TO SURVEYED EASEMENT

TOPSOIL & SEEDING*

STATION FROM	TO	cubic meters TOPSOIL SALVAGING & PLACING	hectares SEED NO. 1	NO. 2	NO. 3	FERTILIZER NO. 1	NO. 2	NO. 3	CONDITION SEEDBED		REMARKS
0+00.00	0+57.50	109	1			1			1		DAM
TOTAL		109	1			1			1		

* SEEDING WILL BE HAND BROADCAST

CULVERTS

STATION	meters CSP 1350 mm	END SECTIONS LEFT	RIGHT	cubic meters CULVERT EXCAVATION	BEDDING MATERIAL	CLASS "00" CONCRETE	CULVERT RIPRAP CLASS	meters REMOVE	RELAY	HEIGHT OF COVER IN meters	EACH CLEAN CULVERT	IN PLACE mm X m	REMARKS
0+20	68.5		50.	100		3.3				2.9			TRIPLE 1350 mm x 6.5 m CSP RISER LT
TOTAL	68.5	~	~	100		3.3		~		~			

MONTANA DEPARTMENT OF TRANSPORTATION

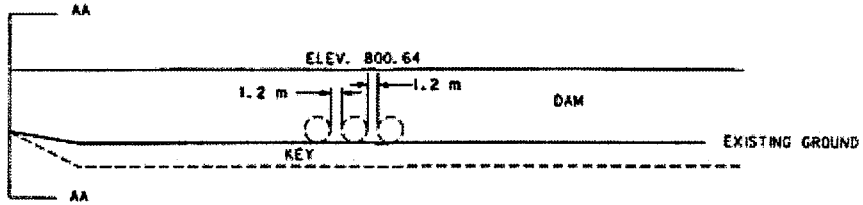
MONTANA CADD

1398\RD\wetsul.dgn

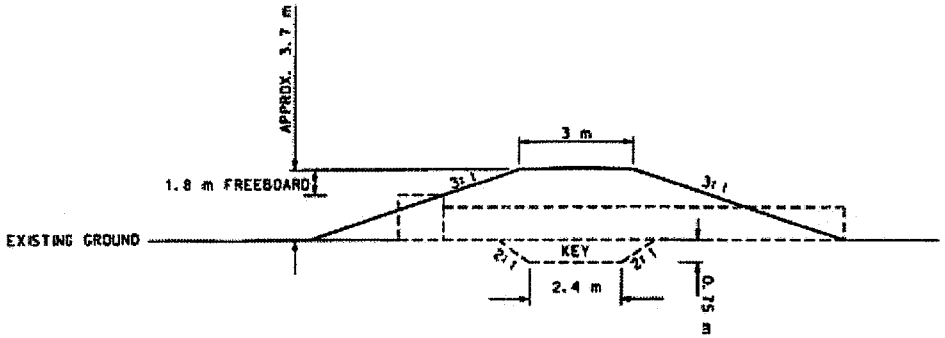
1398\RD\wetsul.dgn	DESIGNED BY L. ZEILER	5-01-2001
DATE 5-01-01	DRAWN BY L. ZEILER	5-01-2001
09:07:00	APPROVED BY P. KEMPF	5-01-2001
WIN32 64 EPS - UNSIGNED	REVISED BY	

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	MH-STPS-BR 6(110)	4

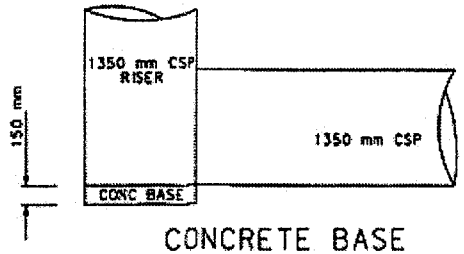
DETAILS



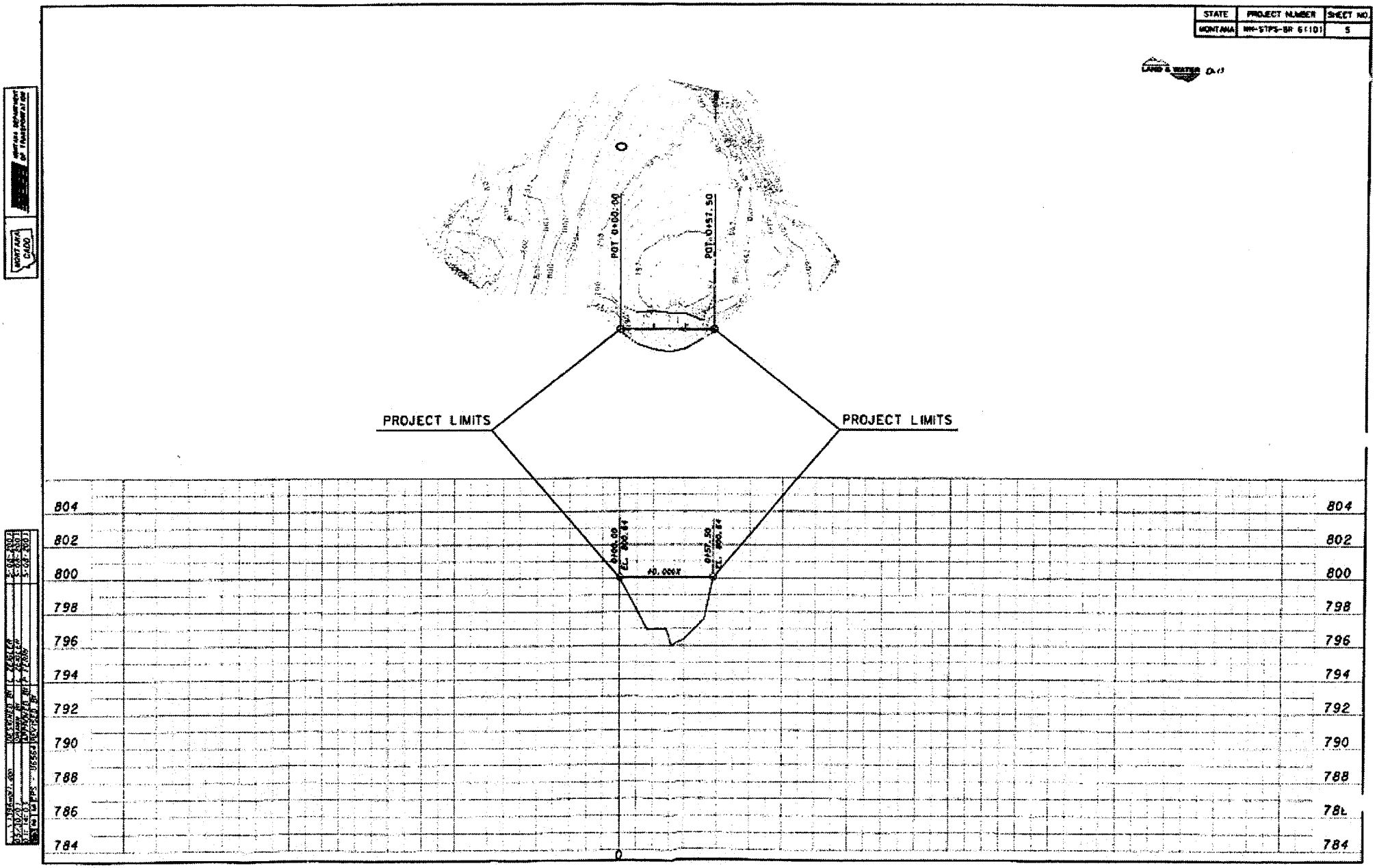
SIDE VIEW DAM
NOT TO SCALE



END VIEW DAM
NOT TO SCALE
SECTION AA



CONCRETE BASE
NOT TO SCALE


STATE
PROJECT NUMBER
SHEET NO.
MONTANA
NH-STPS-BR 6(101)
5
PROJECT LIMITS
PROJECT LIMITS
804
802
800
798
796
794
792
790
788
786
784