
MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: YEAR 2005

*Hoskins Landing
Dixon, Montana*



Prepared for:

MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Ave
Helena, MT 59620-1001

Prepared by:

LAND & WATER CONSULTING
~ A DIVISION OF **PBS&J**
P.O. Box 239
Helena, MT 59624

December 2005

Project No: B43054.00 - 0110



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1.0 INTRODUCTION

The Hoskins Landing Wetland Mitigation Site was developed to mitigate wetland impacts associated with Montana Department of Transportation (MDT) proposed Dixon-West and Paradise-East highway reconstruction projects along Montana Highway 200. This report documents the fourth year of monitoring at the site. Hoskins Landing is located in Sanders County in Watershed # 3 (Lower Clark Fork). The mitigation site is located approximately one-quarter mile north of Dixon, adjacent to the Flathead River (**Figure 1**). Elevation is approximately 2,500 feet with slight topographic variation throughout the project site. Western EcoTech conducted the original wetland delineation for the Hoskins Landing proposed mitigation site in 1999. Land & Water Consulting conducted a biological assessment for the Hoskins Landing Mitigation Project during fall 2001.

The approximate site boundary is illustrated on **Figure 2 (Appendix A)**, and the original site plans are included in **Appendix D**. The project is located adjacent to the Flathead River in an area of historic floodplain, heavily impacted from past agricultural activities. Seasonal flooding provides the primary wetland hydrology through inundation of backwater channels. Local groundwater systems moving through alluvium provide a secondary source of hydrology for this site. The site is located on the Flathead Indian Reservation and is managed by the Confederated Salish & Kootenai Tribes. The wetland easement area is mostly fenced with several exclusions on the east and west ends near the river banks. Livestock grazing has mostly been removed from the site with the establishment of electric fences, although a small corridor adjacent to the Flathead River is still accessible to livestock.

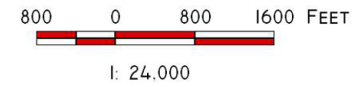
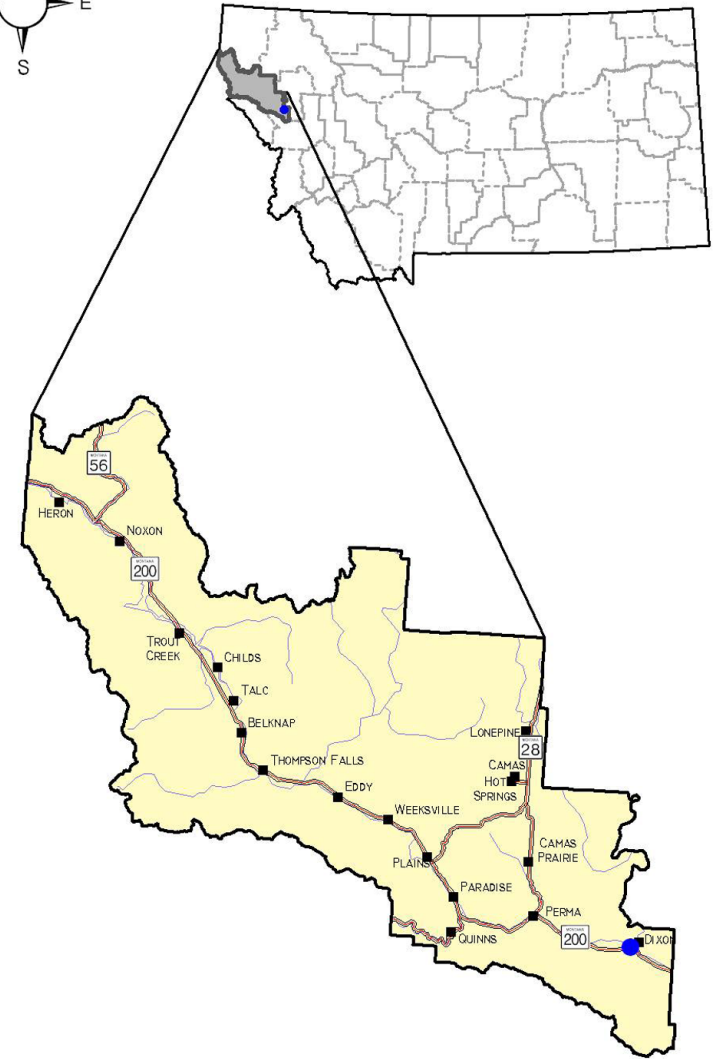
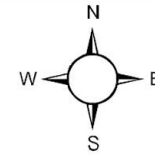
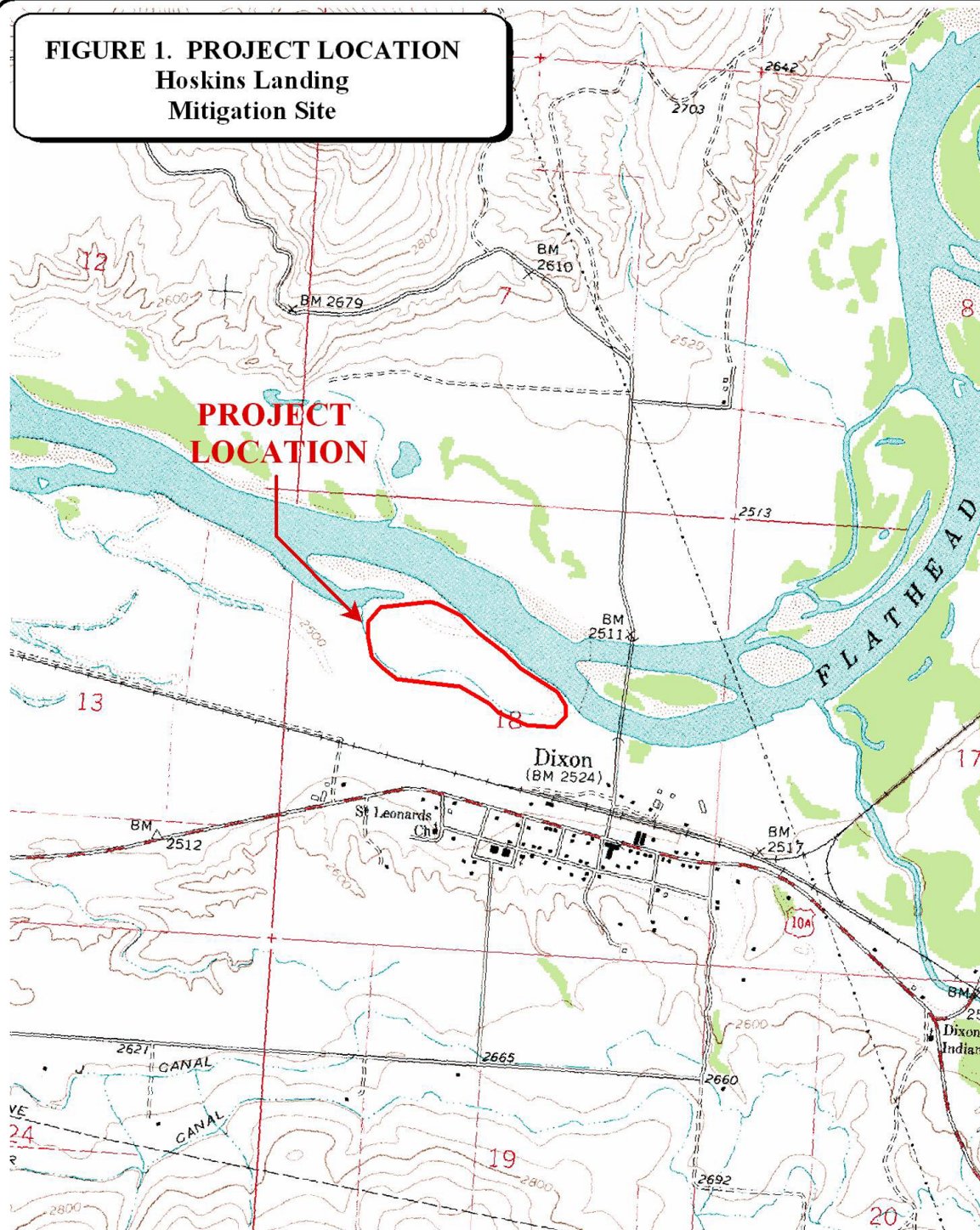
Initial construction was completed in fall 2002 with the goal of restoring/creating 8.1 acres of wetlands and enhancing vegetation on 5.2 acres of heavily grazed and cleared lands. Construction diagrams are presented in **Appendix D**. Revegetation work was conducted during the spring and fall of 2003, 2004 and 2005, and a berm / road crossing of the backwater channel was removed during spring 2005 to reconnect historical flow patterns. The primary components of construction include:

- Excavation and grading of 8.1 acres to facilitate wetland development.
- Enhancement of 5.2 acres of native vegetation characteristics in the lower Flathead River riparian corridor.
- Filling of inlet channel and removal of headgate in the northeast corner of the site.
- Removal of outlet dam along the remnant channel bordering the south portion of the site.
- Removal of man-made flood control berm along the Flathead River and grading of excavated ground to 10:1 slopes.
- Removal of a man-made berm along the remnant backwater channel.

The site was designed to mitigate for specific wetland functions impacted by MDT roadway projects, including: storm water retention, roadway runoff filtration, sediment and nutrient retention, water quality, groundwater recharge, wildlife habitat and riparian vegetation.

Pre-construction wetland delineation documented 6.67 acres of wetlands at the site (Western EcoTech, 1999). The monitoring area is illustrated on **Figure 2 (Appendix A)**.

FIGURE 1. PROJECT LOCATION
Hoskins Landing
Mitigation Site



PROJECT #: 130091.039
 DATE: Nov 2002
 LOCATION: DIXON
 PROJECT MANAGER: J. BERGLUND
 DRAWN BY: B. STEINEBACH

LAND & WATER CONSULTING, INC.
 1120 CEDAR PO BOX 8254 MISSOULA, MT 59807

2.0 METHODS

2.1 Monitoring Dates and Activities

Monitoring activities were conducted on May 18th (spring), August 10th (mid-season), and November 4th 2005 (late-season). The spring visit was conducted to observed bird and other wildlife use. The mid-season visit was conducted to document vegetation, soil, and hydrologic conditions used to map jurisdictional wetlands. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected at this time. Activities and information conducted/collected included: wetland delineation; wetland/open water aquatic habitat boundary mapping; vegetation community mapping; vegetation transect; soils data; hydrology data; bird and general wildlife use; photograph points; macroinvertebrate sampling; GPS data points; functional assessment; and (non-engineering) examination of topographic features. The late season visit was conducted to document disturbances from cattle that accessed the site during the fall.

2.2 Hydrology

Wetland hydrology indicators were recorded during the mid-season visit using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data were recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). Additional hydrologic data were recorded on the mitigation site monitoring form (**Appendix B**). No groundwater monitoring wells were installed at the site

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Eleocharis/Phalaris*) were delineated on an aerial photograph during the mid-season visit. Standardized community mapping was not employed as many of these systems are geared towards climax vegetation and do not reflect yearly changes. Estimated percent cover of the dominant species in each community type was listed on the site monitoring form (**Appendix B**).

A 10-foot wide belt transect was established during the mid-season monitoring event to represent the range of current vegetation conditions. Percent cover was estimated for each vegetative species within each successive vegetative community encountered within the “belt” using the following values: T (few plants); P (1-5%), 1 (5-15%); 2 (15-25%); 3 (25-35%); 4 (35-45%); 5 (45-55%) and so on to 9 (85-95%). Wetland indicator status was recorded for each species. The transect location is illustrated on **Figure 2 (Appendix A)**. The transect will be used to evaluate changes over time, especially the establishment and increase of hydrophytic vegetation. The transect location was marked on the aerial photo and all data were recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with the GPS unit in 2002. A photo was taken from both ends of the transect along the transect path.

A comprehensive plant species list for the site was compiled and will be updated as new species are encountered. Ultimately, observations from past years will be compared with new data to document vegetation changes over time.

2.4 Soils

Soils were evaluated during the mid-season site visit using the hydric soils determination procedures outlined in the COE 1987 Wetland Delineation Manual. Soil data were recorded for each wetland determination point on the COE Routine Wetland Delineation Data Forms (**Appendix B**). The most current terminology used by NRCS was used to describe hydric soils (USDA 1998).

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit according to the 1987 COE Wetland Delineation Manual. Wetland and upland areas within the monitoring area were investigated for the presence of wetland hydrology, hydrophytic vegetation and hydric soils. The information was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was originally delineated on the aerial photo and then recorded with a resource grade GPS unit using the procedures outlined in **Appendix E**. Modifications to these boundaries in 2005 were accomplished by hand mapping onto the 2002 aerial photograph. The wetland/upland boundary in combination with the wetland/open water boundary was used to calculate the final wetland acreage. Pre-construction wetland delineation documented 6.7 acres of wetlands at the site (Western EcoTech 1999).

2.6 Mammals, Reptiles and Amphibians

Mammal and herptile species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during each visit. Indirect use indicators, including tracks, scat, burrows, eggshells, skins, bones, etc. were also recorded. Observations were recorded as the observer traversed the site while conducting other required activities. Direct sampling methods, such as snap traps, live traps, and pitfall traps, were not used.

2.7 Birds

Bird observations were recorded during the spring and mid-season visits. No formal census plots, spot mapping, point counts, or strip transects were conducted. Observations were recorded incidental to other monitoring activities and were categorized by species, activity code, and general habitat association.

2.8 Macroinvertebrates

Macroinvertebrate samples were collected during the mid-season site visit at two separate locations (**Figure 2**). Samples were preserved as outlined in the sampling procedure (**Appendix F**) and sent to Rhithron Associates for analysis.

2.9 Functional Assessment

A functional assessment form was completed using the 1999 MDT Montana Wetland Assessment Method (**Appendix B**). Field data necessary for this assessment were collected during the mid-season visit. Western Eco Tech completed baseline functional assessment during the initial wetland delineation using the 1996 MDT Montana Wetland Field Evaluation Form.

2.10 Photographs

Photographs were taken illustrating current land uses surrounding the site, the upland buffer, the monitored area and the vegetation transect. Each photograph point location was recorded with a resource grade GPS in 2002. The location of photo points is shown on **Figure 2, Appendix A**. All photographs were taken using a digital camera.

2.11 GPS Data

During the 2002 monitoring season, point data were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations and at all photograph locations. Wetland boundaries were also recorded with a resource grade GPS unit in 2002, but were modified via hand mapping onto aerial photographs in 2005. The method used to collect these points is described in the GPS protocol in **Appendix E**.

2.12 Maintenance Needs

Observations were made of existing structures and of erosion/sediment problems to identify maintenance needs. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented on the monitoring form.

3.0 RESULTS

3.1 Hydrology

The main source of hydrology is seasonal flooding by the Flathead River. This mitigation site occurs in Flathead River floodplain consisting of back channels and shallow open water areas. The eastern end of the site once contained a headgate that controlled the flow of water into the remnant channel running along the southern boundary. This has been removed, allowing water to flow through channel during seasonally high flows. A secondary source of hydrology is the persistent upwelling and lateral movement of groundwater through the alluvial materials. The water regime at Hoskins Landing is ultimately controlled by water release from Kerr Dam over 42 miles upriver.

Open water areas decreased during the 2005 monitoring due an increase in aquatic vegetation. Some former open water areas were mapped as type 3 vegetation consisting of emergent wetland and aquatic bed types in shallow waters. These shallow waters occurred across approximately 3.87 acres or 30% of the wetland area (**Figure 3**) during the mid-season visit. Water depth at the open water/rooted vegetation boundary was approximately 1.0 feet. Inundation was observed at

this time across another 60% of the wetland area. Inundation was present throughout all of community types 2, 3, 11 and 12 (**Figure 3**).

3.2 Vegetation

Eighty-three plant species were identified at the site and are listed in **Table 1**. The majority of these species are herbaceous. A few small remnant shrub patches exist, found mostly along the active backwater channel. Several small stands of black cottonwood (*Populus trichocarpa*) and box elder (*Acer negundo*) occur on higher terraces located along the river and backwater channels. Seven wetlands types and six upland community types were identified and mapped at the mitigation site (**Figure 3, Appendix A**). The seven wetland community types include Type 2: *Eleocharis/Phalaris*, Type 3: *Potamogeton/Elodea*, Type 5: *Phalaris/Salix*, Type 7: *Phalaris*, Type 11: *Ceratophyllum*, Type 12: *Juncus/Eleocharis* and Type 13: *Phalaris/Agrostis*. Plant species observed within each of these communities are listed on the attached data form (**Appendix B**). The six upland community types include Type 4: *Agropyron/Melilotus*, Type 6: *Festuca/Phleum*, Type 8: *Agropyron/Plantago*, Type 9: *Bromus*, Type 10: *Populus/Crataegus*, and Type 14: *Agrostis/Poa*. Plant species observed within each of these communities are also listed on the attached data form (**Appendix B**).

Types 3 and 11 are the wettest community types and occurred as aquatic bed/emergent wetland communities in the shallow waters of the excavated wetlands and remnant backwater channel (**Figure 3**). Type 3 is dominated by largeleaf pondweed (*Potamogeton amplifolius*), curly pondweed (*Potamogeton crispus*), broad water-weed (*Elodea canadensis*) and least spike-rush (*Eleocharis acicularis*). Type 11 is mostly dominated by common hornwort (*Ceratophyllum demersum*). Type 2 and 12 are the next wettest areas, consisting of emergent vegetation types occurring in an undisturbed wetland and the fringes of excavated wetland.

Type 2 is located on the west side, surrounded by the newly constructed wetlands, dominated by least spike rush, reed canarygrass (*Phalaris arundinacea*) and bulrush (*Scirpus acutus*). Type 12 occurs along the fringes of excavated wetland in areas that receive annual inundation; vegetation is dominated by three-stamen rush (*Juncus ensifolius*), creeping spike rush (*Eleocharis palustris*) and redtop (*Agrostis alba*). Type 5 occurs throughout the backwater channel located on the south side of the project border. Type 7 and 13 are the least wet, dominated by reed canarygrass, and are located within the seasonally flooded areas adjacent to river. A few mature cottonwoods growing on the along the river terrace are also mapped as part of the Type 7 community.

Adjacent upland vegetation communities are mainly dominated by rangeland and/or aggressive invasive species. Type 6 upland areas are currently dominated with pasture grasses such as *Festuca/Phleum*. Type 4 upland areas increased in vegetation cover, now mostly dominated by upland grass species including quackgrass (*Agropyron repens*) and slender wheatgrass (*Elymus trachycaulus*). Native shrubs were planted during the spring of 2003 and 2004, as part of the riparian enhancement efforts. The cover value of the plantings has increasing since the previous monitoring, but currently is not considered dominant for this community type.

Type 10 is located along the higher terraces of the river and backwater channel, consisting of mature cottonwoods and box elder. A minor shrub layer is present, consisting of hawthorne (*Crataegus douglasii*) and American plum (*Prunus americana*). Type 8 is located adjacent to

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the Flathead River and along the backwater channels. Type 8 is dominated by quackgrass, redtop and English plantain (*Plantago lanceolata*). Type 14 is located near the back water channel along the southern boundary of the mitigation site and is a new vegetation community. Type 14 is dominated by redtop and Kentucky bluegrass (*Poa pratensis*). This area was considered within the Type 6 community during previous monitoring. The removal of livestock from this area has allowed the dominant species to flourish.

Several noxious weeds were observed throughout the Hoskins Landing site. Type 4 and 6 had small amounts of invasive species. During the 2003 mapping Type 9 was dominated by mostly invasive species. Evidence of weed control measures were observed during the 2005 monitoring. These control measures have reduced the cover of invasive species and increased the cover value of grasses within Type 9. Type 9 is currently dominated by non-native grass species that usually follow a disturbance such as herbicide application.

Category 1 Noxious weeds found at this mitigation site include: spotted knapweed (*Centaurea maculosa*), Canada thistle, hounds tongue (*Cynoglossum officinale*), oxeye daisy (*Chrysanthemum leucanthemum*), St. John's wort (*Hypericum perforatum*) and Dalmatian toadflax (*Linaria dalmatica*). Two Category 3 noxious weed was also found: yellowflag iris (*Iris pseudacorus*) and Eurasian water milfoil (*Myriophyllum spicatum*). Other exotic weedy species include common dandelion (*Taraxicum officinalis*), white goosefoot, pepper-grass (*Lepidium perfoliatum*), tumbleweed (*Sisymbrium altissimum*) and quackgrass.

Vegetation transect results are detailed in the attached data forms (**Appendix B**) and are summarized in **Table 2** and **Charts 1** and **2**.

Table 1: 2002 to 2005 Hoskins Landing vegetation species list.

Scientific Name ¹	Common Name	Region 9 (Northwest) Wetland Indicator
<i>Acer negundo</i>	box elder	FAC+
<i>Agropyron repens</i>	quackgrass	FACU
<i>Agrostis alba</i>	redtop	FAC+
<i>Achillea millefolium</i>	common yarrow	FACU
<i>Alnus incana</i>	alder	FACW
<i>Alopecurus pratensis</i>	meadow foxtail	FACW
<i>Amaranthus retroflexus</i>	red-root pigweed	FACU+
<i>Amelanchier alnifolia</i>	serviceberry	FACU
<i>Artemisia ludoviciana</i>	white sagebrush	FACU-
<i>Bromus japonicus</i>	Japanese brome	UPL
<i>Bromus tectorum</i>	cheatgrass	--
<i>Carex bebbiana</i>	Bebbs sedge	OBL
<i>Carex lanuginose</i>	wooly sedge	OBL
<i>Carex nebrascensis</i>	Nebraska sedge	OBL
<i>Carex retrorsa</i>	retrorsa sedge	FAC
<i>Carex utriculata</i>	beaked sedge	OBL
<i>Centaurea maculosa</i>	spotted knapweed	--
<i>Ceratophyllum demersum</i>	common hornwort	OBL
<i>Chenopodium album</i>	white goosefoot	FAC
<i>Chrysanthemum leucanthemum</i>	oxeye daisy	--
<i>Cirsium arvense</i>	Canada thistle	FACU+
<i>Cirsium vulgare</i>	bull thistle	FACU
<i>Coreopsis atkinsoniana</i>	tickseed	FACU
<i>Cornus stolonifera</i>	red-osier dogwood	FACW
<i>Crataegus douglasii</i>	Douglas hawthorn	FAC
<i>Cynoglossum officinale</i>	hound's tongue	FACU

Table 1 (continued): 2002 to 2005 Hoskins Landing vegetation species list.

Scientific Name ¹	Common Name	Region 9 (Northwest) Wetland Indicator
<i>Dactylis glomerata</i>	orchard grass	--
<i>Eleocharis acicularis</i>	least spike rush	OBL
<i>Eleocharis palustris</i>	creeping spike rush	OBL
<i>Elodea canadensis</i>	broad water-weed	OBL
<i>Elymus trachycaulus</i>	slender wheatgrass	FAC
<i>Equisetum arvense</i>	field horsetail	FAC
<i>Equisetum hyemale</i>	scouring rush	FACW
<i>Festuca pratensis</i>	meadow fescue	FACU+
<i>Erodium cicutarium</i>	red-stem filaree	NI
<i>Gnaphalium palustre</i>	cudweed	FAC+
<i>Helianthus annuus</i>	common sunflower	FACU+
<i>Hippuris vulgaris</i>	common mare's-tail	OBL
<i>Hypericum perforatum</i>	St. John's wort	--
<i>Iris pseudoacorus</i>	yellow iris	OBL
<i>Juncus balticus</i>	Baltic rush	FACW
<i>Juncus ensifolius</i>	three-stamen rush	FACW
<i>Juniperus scopulorum</i>	Rocky Mountain juniper	--
<i>Lepidium perfoliatum</i>	clasping pepper-grass	FACU+
<i>Linaria dalmatica</i>	Dalmatian toadflax	--
<i>Malva neglecta</i>	mallow	--
<i>Melilotus alba</i>	white sweetclover	FACU
<i>Melilotus officinalis</i>	yellow sweetclover	FACU
<i>Mentha arvensis</i>	field mint	FAC
<i>Myosotis scorpioides</i>	true forget me not	FACW
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil	OBL
<i>Oenothera villosa</i>	hairy evening-primrose	FAC+
<i>Panicum capillare</i>	old witchgrass	FACU+
<i>Phalaris arundinacea</i>	canary reed grass	FACW
<i>Phleum pratense</i>	Timothy	FACU
<i>Pinus ponderosa</i>	ponderosa pine	FACU-
<i>Plantago lanceolata</i>	English plantain	FAC
<i>Plantago major</i>	plantain	FACU+
<i>Poa pratensis</i>	Kentucky bluegrass	FACU+
<i>Polygonum amphibium</i>	water smartweed	OBL
<i>Polygonum aviculare</i>	prostrate knotweed	FACW+
<i>Populus tremuloides</i>	quaking aspen	FAC+
<i>Populus trichocarpa</i>	cottonwood	FAC
<i>Potamogeton amplifolius</i>	large-leaf pondweed	OBL
<i>Potamogeton crispus</i>	curly pondweed	OBL
<i>Potamogeton natans</i>	floating-leaf pondweed	OBL
<i>Prunella vulgaris</i>	heal-all	FACU+
<i>Prunus americana</i>	american plum	FACU
<i>Rosa woodsii</i>	woods rose	FACU
<i>Rumex crispus</i>	curly dock	FACW
<i>Sagittaria latifolia</i>	arrow-head	OBL
<i>Salix bebbiana</i>	Bebb willow	FACW
<i>Salix exigua</i>	sandbar willow	OBL
<i>Scirpus acutus</i>	hard stem bulrush	OBL
<i>Scirpus microcarpus</i>	small-fruit bulrush	OBL
<i>Scirpus validus</i>	soft-stem bulrush	OBL
<i>Sisymbrium altissimum</i>	tall tumble mustard	FACU-
<i>Solidago missouriensis</i>	Missouri goldenrod	--
<i>Symphoricarpos albus</i>	snowberry	FACU
<i>Taraxicum officinalis</i>	common dandelion	FACU
<i>Trifolium pratense</i>	red clover	FACU
<i>Verbascum thapsus</i>	common mullien	--
<i>Veronica Americana</i>	american speedwell	OBL

¹ Bolded species indicate those documented in the analysis area for the first time in 2005.

Table 2: Transect 1 data summary.

Monitoring Year	2002	2003	2004	2005
Transect Length (feet)	390	390	390	390
# Vegetation Community Transitions along Transect	6	11	10	10
# Vegetation Communities along Transect	4	5	5	5
# Hydrophytic Vegetation Communities along Transect	2	3	3	3
Total Vegetative Species	31	31	30	30
Total Hydrophytic Species	22	23	22	23
Total Upland Species	9	8	8	7
Estimated % Total Vegetative Cover	65	70	71	74
% Transect Length Comprised of Hydrophytic Vegetation Communities	72	70	68	68
% Transect Length Comprised of Upland Vegetation Communities	28	30	32	32
% Transect Length Comprised of Unvegetated Open Water	0	0	0	0
% Transect Length Comprised of Bare Substrate	0	0	0	0

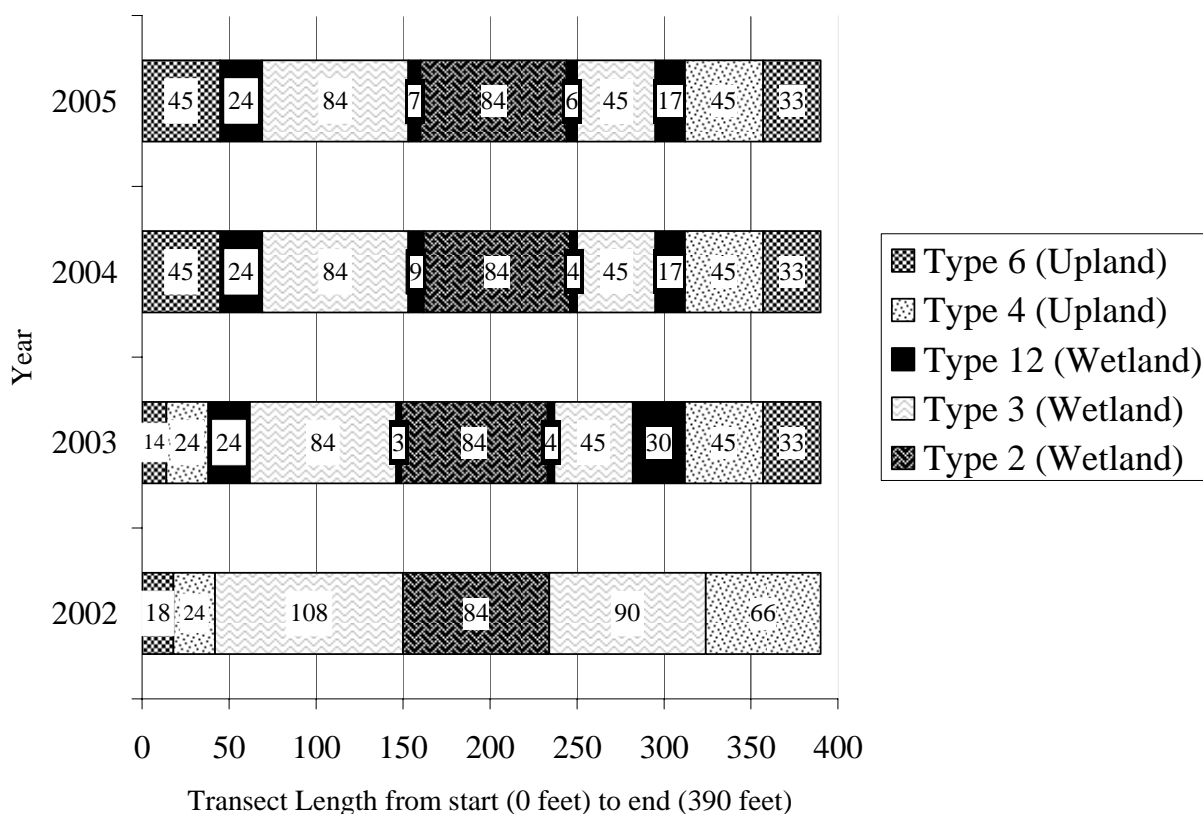
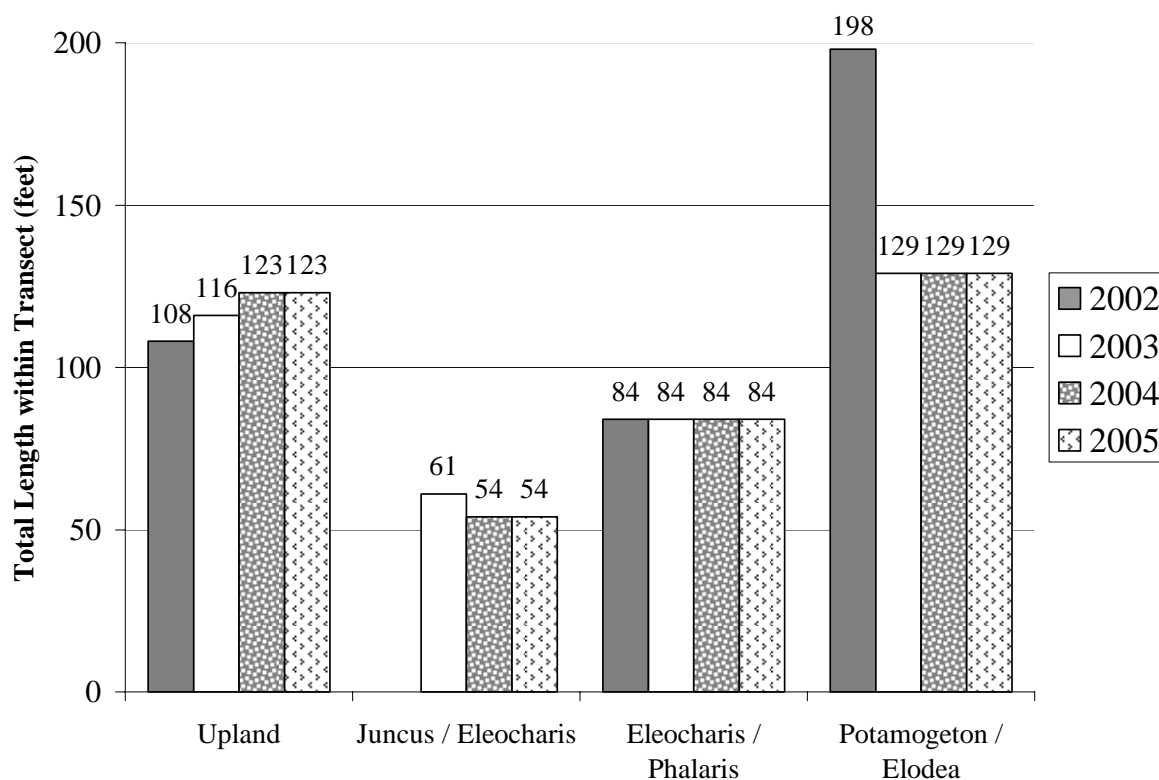
Chart 1: Transect maps showing vegetation type from the start of transect (0 feet) to the end of transect (390 feet).


Chart 2: Length of vegetation communities within Transect 1 for each year monitored.



3.3 Soils

Soils at the site are mapped in the Sanders County Soil Survey as Horseplains-riverwash and Revais silt loam. Horseplains-riverwash is described as a fine sandy loam, 60 inches deep with a lighter surface layer, and slopes of 0-2%. Revais silt loam has a depth of 60 inches with lighter colored surface and slopes of 0-2% (NRCS 2002). Horseplains and Revais soils are not listed on the Montana NRCS Hydric Soil list. Soil characteristics at each wetland determination point were compared with those of the Horseplains and Revais soil. The soils observed across most of the site did not generally match the Horseplains and Revais soil descriptions, as textures were slightly different.

Wetland soils observed during monitoring and documented on the Routine Wetland Determination form were mostly loams, silt loams or clays with very low chromas (1 or 2) within 2 inches of the surface. Mottles (redoximorphic features) were present in three profiles, both having surface inundation. The two remaining soil profiles described on the Routine Wetland Determination forms were mapped as upland sampling points, having no soil moisture or distinct hydric characteristics within 18 inches of the surface.

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3** in **Appendix A**. Completed wetland delineation forms are included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Wetland conditions were identified during the 2005 monitoring (**Table 3**).

Table 3: Wetland conditions identified during monitoring from 2002 to 2005.

Condition	Monitoring Area 2005	Monitoring Area 2004	Monitoring Area 2003	Monitoring Area 2002
Wetland Area	13.01	11.88	11.35	10.99
Open Water Area	0.0	1.14	1.14	1.14
Total Aquatic Habitat Area	13.01	13.02	12.49	12.13

Approximately 13.01 wetland acres are currently within the monitoring area (**Table 3, Figure 3**). The open water areas (1.14 ac.) mapped during the previous monitoring years were considered shallow water with aquatic vegetation during 2005. The pre-construction wetland delineation reported 6.67 wetland and no open water acres. A pre-project delineation map is provided in **Appendix D**. The net increase in aquatic habitat acres is $13.01 - 6.67 = 6.35$ acres. Additional area may form with time and more normal precipitation around the low gradient portions of the current wetland area.

An increase of 1.13 wetland acres was observed between 2004 and 2005 monitoring. The increase in wetland acres was recorded within the type 3 area. Areas considered as open water in the past have been mapped as shallow water with emergent wetland types dominated by aquatic vegetation. Community types along the shoreline of the excavated wetland have similar conditions as observed in 2004. Community Type 12 is mapped as developing emergent vegetation in areas inundated by seasonal flooding. Community Type 13 is a wetland area located adjacent to the shoreline of the excavated wetlands, further up the bank in less saturated conditions.

During the 2003 to 2005 delineations, the backwater channel areas were mapped as waters of the U.S. due to the hydrologic connection to the Flathead River. Some of these areas are also mapped as wetlands, but most of this area is not considered wetland due to the lack of qualifying vegetation and soil characteristics. During the 2002 monitoring, vegetative cover was dominated by mostly invasive upland species. The majority of the backwater channel remains in a similar condition to that observed during 2004 monitoring.

The only decrease in wetland area was observed within Community Type 7 located along the Flathead River. This area was delineated as a larger unit during 2004 monitoring. Located at a slightly higher elevation along the upper banks of the river, this area was observed to have a portion dominated by mostly upland species associated with Community Type 6 and was classified as upland.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2002, 2003, 2004 and 2005 monitoring efforts are listed in **Table 4**. Specific evidence observed, as well as activity codes pertaining to birds, is provided on the completed monitoring form in **Appendix B**.

This site provides habitat for a variety of wildlife species. One mammal, one reptile, and 18 bird species were noted at the mitigation site during the 2005 site visits. Many other wildlife species presumably use the site but were not observed during the monitoring visits.

Table 4: Fish and wildlife species observed at the Hoskins Landing Mitigation Site from 2002 to 2005.

FISH	
Black Bullhead (<i>Ictalurus melas</i>)¹ Pumpkinseed (<i>Lepomis gibbosus</i>)¹	
AMPHIBIANS	
None	
REPTILES	
Painted Turtle (<i>Chrysemys picta</i>)	
BIRDS	
American Coot (<i>Fulica americana</i>) American Crow (<i>Corvus brachyrhynchos</i>) American Robin (<i>Turdus migratorius</i>) Bald Eagle (<i>Haliaeetus leucocephalus</i>)² Barn Swallow (<i>Hirundo rustica</i>) Black & White Warbler (<i>Mniotilta varia</i>) Blue-Winged Teal (<i>Anas discors</i>) Brown-Headed cowbird (<i>Molothrus ater</i>) Canada Goose (<i>Branta canadensis</i>) Cinnamon Teal (<i>Anas cyanoptera</i>) Cliff Swallow (<i>Petrochelidon pyrrhonota</i>) Common Raven (<i>Corvus corax</i>) Eurasian Wigeon (<i>Anas Penelope</i>) Field Sparrow (<i>Spizella pusilla</i>) Great Blue Heron (<i>Ardea herodias</i>) Killdeer (<i>Charadrius vociferous</i>)	Lesser Yellowlegs (<i>Tringa flavipes</i>) Mallard (<i>Anas platyrhynchos</i>) Northern Flicker (<i>Colaptes auratus</i>) Northern Harrier (<i>Circus cyaneus</i>) Northern Shoveler (<i>Anas clypeata</i>) Osprey (<i>Pandoin haliaetus</i>) Red-Tailed Hawk (<i>Buteo jamaicensis</i>) Red-Winged blackbird (<i>Agelaius phoeniceus</i>) Ring-necked Pheasant (<i>Phasianus colchicus</i>) Song Sparrow (<i>Melospiza melodia</i>) Spotted Sandpiper (<i>Actitis macularia</i>) Tree Swallow (<i>Tachycineta bicolor</i>) Western Kingbird (<i>Tyrannus verticalis</i>) Western Meadowlark (<i>Sturnella neglecta</i>) Wood Duck (<i>Aix sponsa</i>) Yellow-Headed Blackbird (<i>Xanthocephalus xanthocephalus</i>)
MAMMALS	
Coyote (<i>Canis latrans</i>) Deer (<i>Odocoileus spp.</i>)	Mouse [young] (<i>Peromyscus spp.</i>) Muskrat (<i>Ondatra zibethicus</i>)

Bolded species were observed during 2005 monitoring. All other species were observed during one or more of the previous monitoring years, but not during 2005.

¹ Observed by MDT staff 2005.

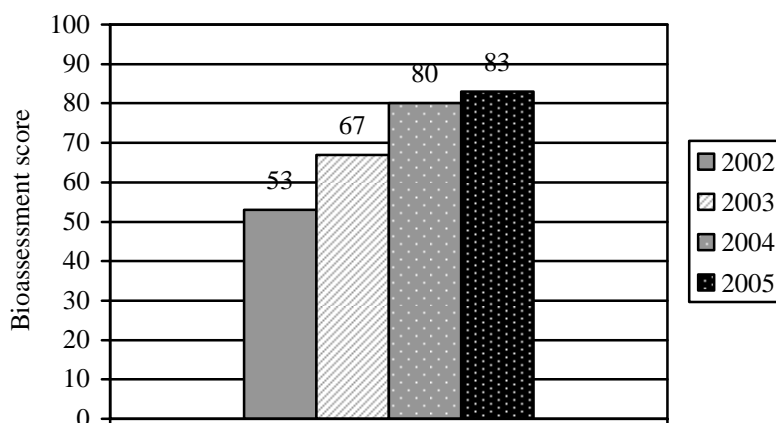
² Observed perched in cottonwood along river and then flyover across site by PBS&J during fall 2005.

3.6 Macroinvertebrates

Complete results from the macro invertebrate sampling locations (**Figure 2**) are presented in **Appendix F**. Sampling points for Hoskins Landing were located along the western side of the excavated wetland. The following analysis was provided by Rhithron Associates (Bollman 2005).

*Bioassessment index scores suggest continuing improvement in conditions at the Hoskins Landing site. Taxa richness, POET taxa, and midge taxa all increased between 2004 and 2005, suggesting increasing habitat complexity. Water quality indicators imply good water quality and an expected thermal regime; the biotic index value was well below the median value for all sites in this study, and both expected mayfly taxa (*Caenis* sp. and *Callibaetis* sp.) were collected. Sandy, hypoxic substrates are suggested by the midge fauna, and ample macrophyte surfaces also apparently contributed habitat space. Filamentous algae may also have added complexity to habitats. The functional composition of the sampled assemblage was diverse, and contained all expected feeding groups. Optimal conditions are indicated by metric performance.*

Chart 3: Bioassessment scores for Hoskins Landing.



3.7 Functional Assessment

Completed 2005 functional assessment forms are included in **Appendix B**. The Hoskins Landing site was separated into two assessment areas (AA's) for the purpose of functional assessments. The two assessment areas on the Hoskins Landing mitigation site are currently rated as Category III (AA 1) and IV (AA 2)(moderate value), primarily due to moderate ratings for T&E species habitat, general wildlife habitat, flood attenuation and sediment / shoreline stabilization variables. Other factors contributing to this score were high rating for fish / aquatic habitat, surface water storage, production export / food chain support and groundwater discharge / recharge. Additional factors contributing to this score were a low rating for MNHP species habitat, sediment / nutrient removal and recreation / education ratings.

The main body of the site received a high rating for fish / aquatic habitat due to increased covering of floating leaved vegetation and surface water storage due to the acre-feet of water contained in wetlands. The variable for production export/food chain support rated high due to the overall vegetated acres, high structural diversity and perennial water regime. The variable for groundwater discharge / recharge rated high due to permeable substrate consisting of alluvial material underlying the site allowing for groundwater recharge from the Flathead River.

The site received a moderate rating for T&E habitat due to observation of a bald eagle (*Haliaeetus leucocephalus*) at the site. The site received a moderate flood attenuation rating due to the presence of an inflow channel into the wetland and unrestricted nature of the outlet. This category rated slightly lower during the 2005 monitoring season due to the removal of an outlet along the backwater channel that constricted flow. A road crossing into the site near the west end of the backwater channel was removed during 2005, allowing for unimpeded flow of floodwaters through the entire channel.

The site received a moderate rating for sediment / shoreline stability due to increased cover in plants with deep binding roots including willows and grass-like species (sedges & rushes). Recent revegetation efforts along the fringe of excavated wetland have contributed to the increase in the sediment/shoreline stability rating.

The site received a low recreation/education rating since it has moderate disturbance level and is in private (Tribal) ownership. In addition, the site received a low rating for sediment / nutrient toxicant removal due to unrestricted nature of the backwater channel.

Based on functional assessment results (**Table 5**), approximately 91.65 functional units occur at the Hoskins Landing mitigation site. Baseline functional assessment results are also provided in **Table 5** for general comparative purposes. However, it should be noted that direct comparison between the baseline and 2005 functional assessments are not possible as they were completed using different versions of the MDT functional assessment method. The baseline assessment was completed using the 1996 version, while the 2002, 2003, 2004 and 2005 assessments were conducted using the most current (1999) version.

Table 5: Summary of baseline, 2002, 2003, 2004 and 2005 wetland function/value ratings and functional points ¹ at the Hoskins Landing Mitigation Project.

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	WETLAND NUMBERS ASSESSED WITH 1996 METHOD ¹						WETLANDS ASSESSED WITH 1999 METHOD							
	Baseline 1A	Baseline 1B	Baseline 3	Baseline 8	Baseline 2, 9A, 9B, 10, 11, 12, 13	Baseline 5, 6, 7, 14A, 14B	2002 Site 5	2002 Remainder of Wetlands	2003 Site 5	2003 Remainder of Wetlands	2004 Site 5	2004 Remainder of Wetlands	2005 Site 5 ²	2005 Remainder of Wetlands ²
Listed/Proposed T&E Species Habitat	Low (0.3)	Mod (0.7)	None (0.0)	Mod (0.7)	None (0.0)	None (0.0)	Low (0.0)	Mod (0.7)	Low (0.0)	Mod (0.7)	Low (0.0)	Mod (0.7)	Low (0.0)	Mod (0.8)
MNHP Species Habitat	Low (0.1)	Low (0.1)	Low (0.1)	Mod (0.7)	None (0.0)	None (0.0)	Low (0.0)	Low (0.1)	Low (0.0)	Low (0.1)	Low (0.0)	Low (0.1)	Low (0.0)	Low (0.1)
General Wildlife Habitat	High (0.9)	Mod (0.5)	Mod (0.5)	High (0.9)	Low (0.1)	Low (0.1)	Low (0.2)	Mod (0.7)	Low (0.2)	Mod (0.7)	Low (0.2)	Mod (0.7)	Low (0.2)	Mod (0.7)
General Fish/Aquatic Habitat	Low (0.2)	Mod (0.7)	NA	High (1)	NA	NA	NA	Mod (0.6)	NA	Mod (0.6)	NA	Mod (0.6)	NA	High (0.8)
Flood Attenuation	Mod (0.5)	Low (0.2)	Low (0.2)	Low (0.1)	Low (0.2)	NA	Low (0.2)	Mod (0.5)	Low (0.2)	Mod (0.5)	Low (0.2)	Mod (0.5)	Low (0.2)	Mod (0.4)
Short and Long Term Surface Water Storage	High (0.8)	NA	Low (0.3)	NA	NA	Low (0.3)	Low (0.3)	High (0.9)	Low (0.3)	High (0.9)	Low (0.3)	High (0.9)	Low (0.3)	High (0.9)
Sediment, Nutrient, Toxicant Removal	High (1)	High (1)	High (1)	Mod (0.5)	High (1)	Mod (0.5)	Mod (0.5)	Low (0.3)	Mod (0.5)	Low (0.3)	Mod (0.5)	Mod (0.5)	Mod (0.5)	Mod (0.4)
Sediment/Shoreline Stabilization	Mod (0.7)	Mod (0.7)	NA	Mod (0.4)	High (0.9)	NA	NA	Low (0.2)	NA	Low (0.2)	NA	Low (0.2)	NA	Mod (0.6)
Production Export/Food Chain Support	High (0.8)	Mod (0.6)	Mod (0.6)	Mod (0.7)	Low (0.2)	Low (0.1)	Low (0.2)	High (0.9)	Low (0.2)	High (0.9)	Low (0.2)	High (1.0)	Low (0.2)	High (1.0)
Groundwater Discharge/Recharge	High (1)	High (1)	High (1)	Low (0.1)	Low (0.1)	High (1)	High (1)	High (1.0)	High (1)	High (1.0)	High (1)	High (1.0)	High (1)	High (1.0)
Uniqueness	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.2)	Low (0.3)	Mod (0.5)	Low (0.3)	Mod (0.5)	Low (0.3)	Mod (0.5)	Low (0.3)	Mod (0.5)
Recreation/Education Potential	Low (0.1)	Low (0.1)	Low (0.1)	High (1)	Low (0.1)	Low (0.1)	Low (0.1)	Low (0.3)	Low (0.1)	Low (0.3)	Low (0.1)	Low (0.3)	Low (0.1)	Low (0.3)
Actual Points/Possible Points	6.6 / 12	5.8 / 11	4.0 / 9	6.3 / 11	2.8 / 10	2.3 / 9	2.8 / 10	6.7 / 12	2.8 / 10	6.7 / 12	2.8 / 10	7.0 / 12	2.8 / 10	7.5 / 12
% of Possible Score Achieved	55%	53%	44%	57%	28%	26%	28%	56%	28%	55%	28%	58%	28%	63%
Overall Category	III	III	III	II ³	IV	IV	IV	III	IV	III	IV	III	IV	III
Total Acreage of Assessed Wetlands and Open Water within Easement (ac)	2.58	0.86	0.68	0.06	0.75	1.74	0.29	11.84	0.29	12.20	0.29	12.73	0.46	12.55
Functional Units (acreage x actual points) (fu)	17.03	4.99	2.73	0.37	2.10	4.00	0.81	79.32	0.81	81.74	0.81	89.11	1.29	94.1
Total Acreage at Site (ac)	6.67						12.13		12.49		13.02		13.01	
Total Functional Units at Site (fu)	31.22						80.13		82.55		89.92		95.39	
Net Acreage Gain (ac)	NA						5.46		5.82		6.35		6.34	
Net Functional Unit Gain (fu)	NA						48.91		51.33		58.7		64.17	

¹ The baseline assessment was performed using the 1996 MDT assessment method, of which several parameters were substantially revised and applied to the 1999 MDT assessment method. The 1999 MDT assessment method was used in 2002 to 2004. Therefore, direct comparison of pre- and post-project functions are not possible, but some general trends can be noted.

² See completed 2005 MDT functional assessment forms **Appendix B** for further detail.

³ Did not achieve Category II rating based on functional points, but did achieve Category II rating based on score for fish and wildlife habitat. This narrow fringe wetland was absent during the 2004 delineation.

3.8 Photographs

Representative photographs taken from photo-points and transect ends are presented in **Appendix C**.

3.9 Revegetation Efforts

Wetland and riparian vegetation enhancements were implemented in 2003 and 2004. **Appendix G** presents the different planting specification for each seed mix and containerized plantings. These enhancements included drill seeding of an upland seed mix into the areas of higher topography and planting of native tree, shrub, grass and grass-like seedlings. Plants installed in the upland areas included two tree species, cottonwood and ponderosa pine (*Pinus ponderosa*), and seven shrub species including American plum, chokecherry (*Prunus virginiana*), hawthorn (*Crataegus douglasii*), serviceberry (*Amelanchier alnifolia*), snowberry (*Symphoricarpos albus*), Rocky Mountain juniper (*Juniperus scopulorum*), and woods rose (*Rosa woodsii*).

Wetland areas surrounding the excavated open water area were broadcast seeded with a custom wetland seed mix and also planted with herbaceous and woody seedlings. Vegetation planted in the wetland areas included three tree species - cottonwood, quaking aspen (*Populus tremuloides*), and water birch (*Betula occidentalis*), and four shrub species - alder (*Alnus incana*), red osier dogwood (*Cornus stolonifera*), Bebb's willow (*Salix bebbiana*) and sandbar willow (*Salix exigua*). Five herbaceous wetland species were planted along the fringe of the excavated wetland. These species included hardstem bulrush (*Scirpus microcarpus*), Nebraska sedge (*Carex nebrascensis*), beaked sedge (*Carex utriculata*), Bebb's sedge (*Carex bebbiana*), and small-fruited bulrush (*Scirpus microcarpus*).

Survival rates for native shrub plantings were assessed during the summer of 2003, 2004 and 2005. Land & Water Consulting / PBS&J (**LWC**) and Salish Kootenai College (**SKC**) conducted separate survival ratings for the 2003 and 2004 plantings. During the 2005 monitoring only LWC conducted survival ratings. Methodology conducted by LWC included walking the planting areas and recording all living woody plantings by species. Herbaceous plantings were not counted due to the difficulty in distinguishing between planted and volunteer establishment. LWC results are presented in **Appendix B** in the *Wetland Mitigation Site Monitoring Form*. **Appendix G** presents detailed survival information for the 2003 and 2004 monitoring of each species and planting area.

Two upland plantings areas were evaluated; these areas include the upland islands and along the upper banks of the side channel. Survival rates for the upland areas were low; only two species included woods rose and snowberry showed higher rates. Several other species including hawthorn, chokecherry, serviceberry, ponderosa pine and American plum were counted but at lower levels.

One wetland planting area was evaluated; along the south slopes of the excavated wetland. Survival rates for the wetland planting were high with sandbar willow and cottonwood having the highest rate. Several other species including Bebb's willow, red osier dogwood and alder were present but at lower counts. Several woody species that had low survival rates during the

2003 monitoring were replanted in 2004. The replacement plants are doing well and exhibited a high survival rate in 2005. Approximately 2000 willow cuttings were installed around the fringe of excavated wetland.

3.10 Maintenance Needs/Recommendations

Several Category 1 noxious weeds were still present: Canada thistle, Dalmatian toadflax hound's-tongue, oxeye daisy, St. John's wort, and spotted knapweed. The Category 3 yellowflag iris and Eurasian water-milfoil was also present within the mitigation site. Weed control activities were observed during the mid-season visits. The continued eradication of noxious weeds at this site is important. The majority of the invasive species were still found at this site within the dry backwater channels adjacent to the river.

Evidence of livestock accessing the site was observed during a fall 2005 visit. An electric fence has been put into place, running parallel with the river setback from the shoreline. The drier upland grass meadows were heavily grazed and tramping within the wetlands was observed. Minor browse on the woody plantings within the wetland area was also observed.

3.11 Current Credit Summary

At this time approximately 13.01 acres of wetland occur on the mitigation site. Subtracting the original 6.67 acres of pre-project wetlands from this total yields a current net of approximately 6.35 wetland acres. It is likely that additional acreage will form with additional time and more normal precipitation. Additionally, approximately 64.2 functional units have been gained at the site, although pre- and post-construction functional assessment methods slightly differed.

4.0 REFERENCES

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Appendix A

FIGURES 2 & 3

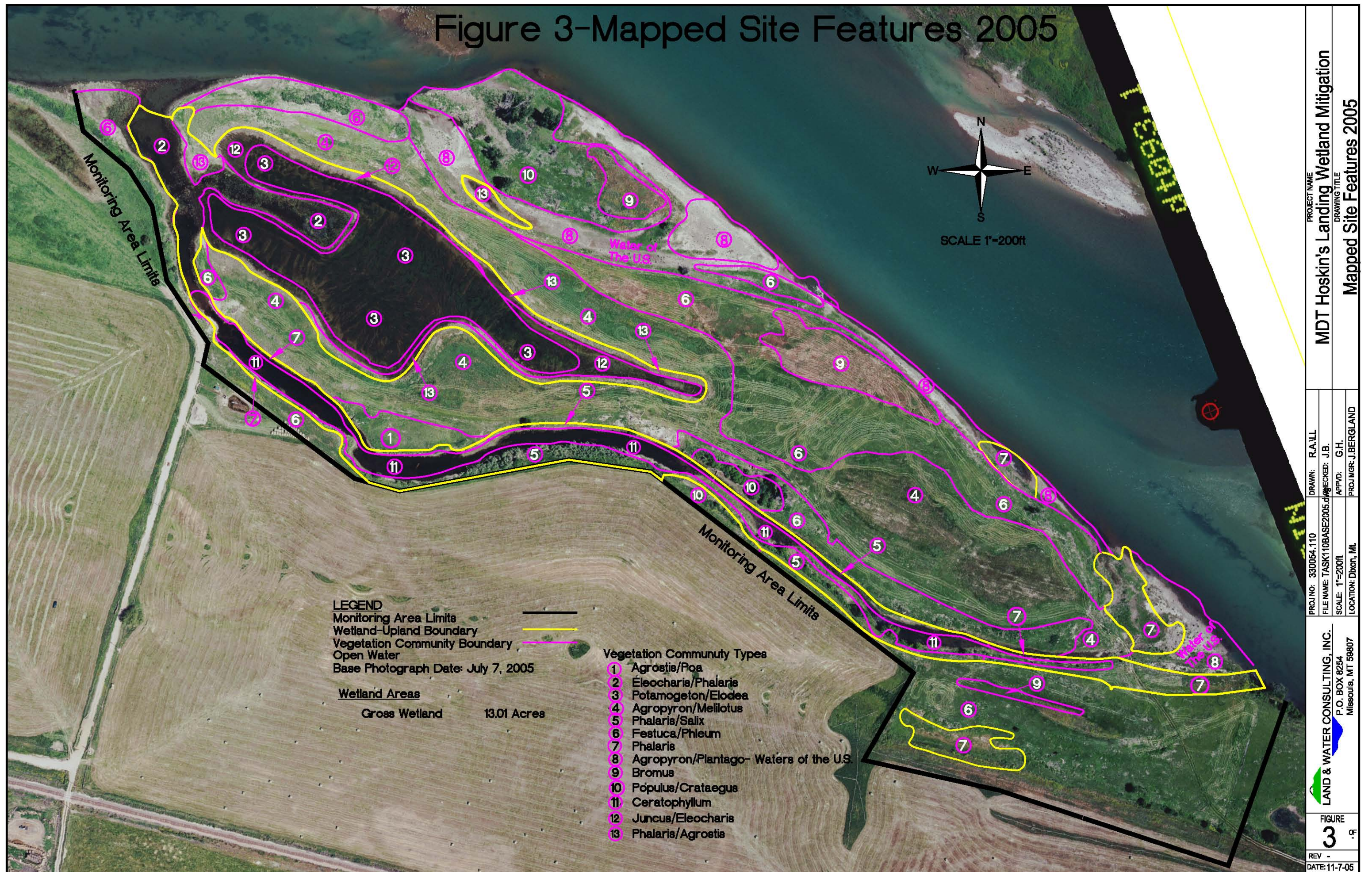
*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

Figure 2-Monitoring Activities Locations



PROJECT NAME MDT Hoskin's Landing Wetland Mitigation		DRAWING TITLE Monitoring Activity Locations	
PROJ NO: 33054.110	DRAWN: R.A./LL	FILE NAME: TASK110BASE2005	CHECKED: J.B.
SCALE: 1"=200ft	APPROVED: J.B.	LOCATION: Dixon, Mt.	PROJ MGR: J.BERGAND
LAND & WATER CONSULTING, INC. P.O. BOX 8254 Missoula, MT 59807		FIGURE 2	
REV -		DATE: 11-7-05	

Figure 3-Mapped Site Features 2005



PROJECT NAME MDT Hoskin's Landing Wetland Mitigation		DRAWING TITLE Mapped Site Features 2005	
PROJ NO: 330054.110	DRAWN: R.A.I.L.L.	FILE NAME: TASK110BASE2005.dwg	CHECKED: J.B.
SCALE: 1"=200ft	APPVD: G.H.	LOCATION: Dixon, Mt.	PROJ MGR: J.BERG LAND
LAND & WATER CONSULTING, INC. P.O. BOX 8254 Missoula, MT 59807		FIGURE 3 REV - DATE: 11-7-05	

Appendix B

**COMPLETED 2005 WETLAND MITIGATION SITE MONITORING
FORM**

COMPLETED 2005 BIRD SURVEY FORM

COMPLETED 2005 WETLAND DELINEATION FORMS

COMPLETED 2005 FUNCTIONAL ASSESSMENT FORM

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

MDT WETLAND MITIGATION SITE MONITORING FORM

Project Name: Hoskins Landing Project Number: B43054.00 0110 Assessment Date: 08/10/05
Location: N. of Dixon, MT MDT District: Missoula Milepost:
Legal description: T: 18 R: 21 Section: 18 Time of Day: Morning to late afternoon
Weather Conditions: Hazy Person(s) conducting the assessment: Greg Howard
Initial Evaluation Date: 09 / 04 / 02 Visit #: 4 Monitoring Year: 2005
Size of evaluation area: 48 acres Land use surrounding wetland: Agriculture; alfalfa & cattle grazing

HYDROLOGY

Surface Water Source: Flathead River

Inundation: Present ☒ Absent ☐ Average depths: 1.5 ft Range of depths: 0 – 2 ft

Assessment area under inundation: 40 %

Depth at emergent vegetation-open water boundary: 0.5 ft

If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes ☐ - ☐ No ☐ - ☐

Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Drift lines present around excavated wetland. Site experiences seasonal high water events; inundation of excavated wetland by flooding of backwater channel.

Groundwater

Monitoring wells: Present ☐ Absent ☒

Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:

☒ Map emergent vegetation-open water boundary on air photo

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

☐ GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: Some weedy areas observed along road into the site. Observation of recent herbicide applications. Backwater channel w / evidence of seasonal flooding; scour marks and sediment deposition on east side. Recent work on w. end of backwater channel, road crossing removed.

VEGETATION COMMUNITIES

Community No.: 1 Community Title (main species): Agrostis / Poa

Dominant Species	% Cover	Dominant Species	% Cover
<i>Agrostis alba</i>	60	<i>Phleum pratense</i>	T
<i>Poa pratensis</i>	20	<i>Agropyron repens</i>	P
<i>Taraxacum officinalis</i>	P	<i>Cirsium arvense</i>	T
<i>Festuca pratensis</i>	T		
<i>Trifolium pratense</i>	P		
<i>Plantago lanceolata</i>	10		

COMMENTS/PROBLEMS: Area of pre-existing pasture undisturbed during construction efforts. Removal of livestock has allowed the dominant species to flourish and identifiable for community type mapping.

Community No.: 2 Community Title (main species): Eleocharis / Phalaris

Dominant Species	% Cover	Dominant Species	% Cover
<i>Scirpus acutus</i>	10	<i>Sagittaria latifolia</i>	20
<i>Scirpus validus</i>	P	<i>Carex retrorsa</i>	P
<i>Phalaris arundinacea</i>	30		
<i>Eleocharis palustris</i>	50		
<i>Potamogeton natans</i>	10		

COMMENTS/PROBLEMS: Undisturbed emergent wetlands located on W. side of site. Type 2 is connected to the outlet of the southern backwater channel. Area is surrounded by excavated wetlands. Wetland inundated during mid-season visit.

Community No.: 3 Community Title (main species): Potamogeton / Elodea

Dominant Species	% Cover	Dominant Species	% Cover
<i>Potamogeton amplifolius</i>	40	<i>Veronica americana</i>	P
<i>Elodea canadensis</i>	10	<i>Juncus ensifolius</i>	T
<i>Potamogeton crispus</i>	P	<i>Myriophyllum spicatum</i>	10
<i>Potamogeton natans</i>	T		

COMMENTS/PROBLEMS: Areas of aquatic vegetation located within the excavated wetlands. Swallow water on east side of excavated wetlands dominated by American speedwell (*Veronica americana*). The west side of type 3 consisting of shallow water dominated by *Myriophyllum spicatum*.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMMENTS: Open water removed from mapping.

VEGETATION COMMUNITIES

Community No.: 4 Community Title (main species): Agropyron / Melilotus

Dominant Species	% Cover	Dominant Species	% Cover
<i>Plantago lanceolata</i>	T	<i>Helianthus annuus</i>	P
<i>Plantago major</i>	P	<i>Lepidium perfoliatum</i>	P
<i>Cirsium arvense</i>	P	<i>Chrysanthemum leucanthemum</i>	T
<i>Verbascum thapsus</i>	T	<i>Centaurea maculosa</i>	T
<i>Agropyron repens</i>	40	Plantings	10
<i>Achillea millefolium</i>	10	<i>Coreopsis atkinsoniana</i>	P
<i>Elymus trachycaulus</i>	20		

COMMENTS/PROBLEMS: Constructed upland slopes w/ re-contoured topography and native shrub plantings. Area mostly dominated by *Agropyron repens* and other invasive or disturbance related species. Three Montana State listed noxious weeds; *Centaurea maculosa*, *Chrysanthemum leucanthemum* & *Cirsium arvense*.

Community No.: 5 Community Title (main species): Phalaris / Salix

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phalaris arundinacea</i>	60	<i>Juncus ensifolius</i>	T
<i>Salix exigua</i>	30	<i>Eleocharis acicularis</i>	P
<i>Juncus balticus</i>	P	<i>Salix bebbiana</i>	T
<i>Scirpus acutus</i>	T		
<i>Cornus stolonifera</i>	T		

COMMENTS/PROBLEMS: Undisturbed side channel running along S. edge of project boundary. Channel w/ stagnate water, no flowing inlet or outlet, except during seasonally high flows. Channel vegetation consisting mostly of aquatic bed, emergent and scrub-shrub types.

Community No.: 6 Community Title (main species): Festuca / Phleum

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phleum pratense</i>	20	<i>Rosa woodsii</i>	T
<i>Agropyron repens</i>	20	<i>Symphoricarpos albus</i>	T
<i>Taraxacum officinale</i>	P	<i>Agrostis alba</i>	10
<i>Cirsium arvense</i>	P	<i>Festuca pratensis</i>	30
<i>Rumex crispus</i>	T	<i>Centaurea maculosa</i>	P

COMMENTS/PROBLEMS: Areas of pre-existing upland pasture. Two stated listed noxious weeds found in this type; *Centaurea maculosa* & *Cirsium arvense*. This area incorporates planting units along the edge of the C.T # 8 near the river.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMMENTS:

VEGETATION COMMUNITIES

Community No.: 7 Community Title (main species): Phalaris

Dominant Species	% Cover	Dominant Species	% Cover
<i>Populus trichocarpa</i>	10	<i>Taraxacum officinale</i>	P
<i>Salix exigua</i>	20	<i>Hypericum perforatum</i>	P
<i>Rumex crispus</i>	10		
<i>Agrostis alba</i>	P		
<i>Phalaris arundinacea</i>	60		

COMMENTS/PROBLEMS: This area receives seasonal flooding and is located adjacent to river. This site has experienced heavy grazing in the past. Removal of livestock grazing has left a vigorous canary reedgrass population. *Populus trichocarpa* seedlings established in 2002 are increasing in cover and density. Average sapling height 3-4 feet tall. An additional Montana state listed noxious weed St. Johnswort (*Hypericum perforatum*) was observed within the Community Type during 2005 monitoring.

Community No.: 8 Community Title (main species): Agropyron / Plantago

Dominant Species	% Cover	Dominant Species	% Cover
<i>Plantago major</i>	P	<i>Agropyron repens</i>	10
<i>Plantago lanceolata</i>	10	<i>Chrysanthemum leucanthemum</i>	T
<i>Verbascum thapsus</i>	T	<i>Centaurea maculosa</i>	10
<i>Populus trichocarpa</i>	10	<i>Agrostis alba</i>	10
<i>Artemisia ludoviciana</i>	10	<i>Linaria dalmatica</i>	T

COMMENTS/PROBLEMS: Area adjacent to Flathead River, cobble and gravel substrate. Community type #8 considered Waters of the U.S. Increasing vegetation cover, mostly invasive or disturbance related species. Size and height of *Populus trichocarpa* saplings increased. An increase in spotted knapweed observed during 2005 monitoring. Montana state listed noxious weed Dalmatian toadflax (*Linaria dalmatica*) observed.

Community No.: 9 Community Title (main species): Bromus

Dominant Species	% Cover	Dominant Species	% Cover
<i>Centaurea maculosa</i>	T	<i>Chenopodium album</i>	P
<i>Sisymbrium altissimum</i>	T	<i>Bromus</i> spp.	50
<i>Lepidium perfoliatum</i>	T	<i>Bromus tectorum</i>	10
<i>Malva neglecta</i>	T	<i>Agropyron repens</i>	10

COMMENTS/PROBLEMS: Area previously dominated by *Centaurea maculosa* in 2003. Weed control activities have been conducted to eradicate invasive species within the community type. Increase in *Bromus tectorum* and other brome species following control activities.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMMENTS:

VEGETATION COMMUNITIES

Community No.: 10 Community Title (main species): Populus / Crataegus

Dominant Species	% Cover	Dominant Species	% Cover
<i>Crataegus douglasii</i>	20	<i>Festuca pratensis</i>	P
<i>Prunus americana</i>	10	<i>Phleum pratense</i>	P
<i>Rosa woodsii</i>	P	<i>Agropyron repens</i>	20
<i>Cornus stolonifera</i>	P	<i>Symphoricarpos albus</i>	P
<i>Populus trichocarpa</i>	30	<i>Centaurea maculosa</i>	P

COMMENTS/PROBLEMS: Mature *Populus trichocarpa* & *Crataegus douglasii* found along higher terrace, adjacent to river & backwater channel. Understory layer consisting of pasture grasses and some invasive species. A few small shrub patches present along backwater channel.

Community No.: 11 Community Title (main species): Ceratophyllum

Dominant Species	% Cover	Dominant Species	% Cover
<i>Ceratophyllum demersum</i>	40	<i>Myriophyllum spicatum</i>	P
<i>Equisetum hyemale</i>	P		
<i>Eleocharis acicularis</i>	P		
<i>Juncus balticus</i>	P		
<i>Phalaris arundinacea</i>	T		

COMMENTS/PROBLEMS: Aquatic bed habitat dominated by *Ceratophyllum demersum*, standing water in channel. Channel experiences seasonal high flows. Evidence of high flows; scour marks, drift lines and sediment depositions on upper terrace. Standing water throughout the season. Some *Myriophyllum spicatum* identified within this wetland.

Community No.: 12 Community Title (main species): Juncus / Eleocharis

Dominant Species	% Cover	Dominant Species	% Cover
<i>Juncus ensifolius</i>	30	<i>Rumex crispus</i>	T
<i>Eleocharis palustris</i>	10	Willow sprigs (<i>Salix</i>)	10
<i>Agrostis alba</i>	10	<i>Prunella vulgaris</i>	T
<i>Phalaris arundinacea</i>	10	<i>Cirsium arvense</i>	T
<i>Eleocharis acicularis</i>	10	<i>Coreopsis atkinsoniana</i>	P
<i>Scirpus acutus</i>	T	<i>Sagittaria latifolia</i>	T
<i>Polygonum amphibium</i>	T		

COMMENTS/PROBLEMS: Emergent wetland vegetation type developing along the fringes of excavated wetland. Shrub & herbaceous plantings installed during spring 2003 and 2004. Increase in wetland species diversity and cover values during the 2005 monitoring.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMMENTS:

VEGETATION COMMUNITIES

Community No.: 13 Community Title (main species): Phalaris / Agrostis

Dominant Species	% Cover	Dominant Species	% Cover
<i>Phalaris arundinacea</i>	50	<i>Agropyron repens</i>	P
<i>Agrostis alba</i>	20	<i>Salix exigua</i>	10
<i>Eleocharis palustris</i>	T	<i>Salix lutea</i>	T
<i>Alopecurus pratensis</i>	T	Plantings (<i>Cornus</i> & <i>Populus</i>)	P
<i>Plantago major</i>	P		

COMMENTS/PROBLEMS: Small area of vegetation developing in the backwater channel on the west side of excavated wetlands. Community # 13 also located adjacent to side slopes of excavated wetland.

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMMENTS:

COMPREHENSIVE VEGETATION LIST

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
<i>Acer negundo</i>	10	<i>Juniperus scopulorum*</i>	4
<i>Agropyron repens</i>	4,6,8,9,10,13,14,15	<i>Lepidium perfoliatum</i>	4,6,9
<i>Agrostis alba</i>	6,7,8,12,13,14,15	<i>Linaria dalmatica</i>	8
<i>Achillea millefolium</i>	4,6,14	<i>Malva neglecta</i>	4,9
<i>Alnus incana*</i>	12	<i>Melilotus alba</i>	14
<i>Alopecurus pratensis</i>	6	<i>Melilotus officinalis</i>	4,6,10
<i>Amaranthus retroflexus</i>	6	<i>Mentha arvensis</i>	2
<i>Amelanchier alnifolia*</i>	4	<i>Myosotis scorpioides</i>	2
<i>Artemisia ludoviciana</i>	4,8	<i>Myriophyllum spicatum</i>	3
<i>Bromus japonicus</i>	6	<i>Oenothera villosa</i>	4
<i>Bromus tectorum</i>	9	<i>Panicum capillare</i>	8
<i>Carex bebbiana</i>		<i>Phalaris arundinacea</i>	2,5,7,11,12,13
<i>Carex lanuginosa</i>	2	<i>Phleum pratense</i>	6,10,15
<i>Carex nebrascensis</i>		<i>Pinus ponderosa*</i>	4
<i>Carex retrorsa</i>	2	<i>Plantago lanceolata</i>	4,8,15
<i>Carex utriculata</i>		<i>Plantago major</i>	4,8,13
<i>Centaurea maculosa</i>	4,6,8,9,10	<i>Poa pratensis</i>	6,15
<i>Ceratophyllum demersum</i>	11	<i>Polygonum amphibium</i>	2,11,12
<i>Chenopodium album</i>	4,6,9	<i>Polygonum aviculare</i>	4
<i>Chrysanthemum leucanthemum</i>	4,8	<i>Populus tremuloides*</i>	4
<i>Cirsium arvense</i>	4,6,12,15	<i>Populus trichocarpa**</i>	7,8,10
<i>Cirsium vulgare</i>	4,6	<i>Potamogeton amplifolius</i>	3
<i>Coreopsis atkinsoniana</i>	4,8	<i>Potamogeton crispus</i>	3
<i>Cornus stolonifera**</i>	5,10	<i>Potamogeton natans</i>	2,3
<i>Crataegus douglasii</i>	10	<i>Prunella vulgaris</i>	12
<i>Cynoglossum officinale</i>	4,6	<i>Prunus americana**</i>	10
<i>Dactylis glomerata</i>	6	<i>Rosa woodsii</i>	6,10
<i>Eleocharis acicularis</i>	2,5,11,12	<i>Rumex crispus</i>	2,4,6,7,12
<i>Eleocharis palustris</i>	2,4,12,13	<i>Sagittaria latifolia</i>	2
<i>Elodea canadensis</i>	3	<i>Salix bebbiana</i>	5
<i>Elymus trachycaulus</i>	4	<i>Salix exigua**</i>	5,7,12
<i>Equisetum arvense</i>	2,4,8,12	<i>Scirpus acutus</i>	2,5,12
<i>Equisetum hyemale</i>	2,11	<i>Scirpus microcarpus</i>	2
<i>Festuca pratensis</i>	6,15	<i>Scirpus validus</i>	2
<i>Erodiun cicutarium</i>	4,8,10	<i>Sisymbrium altissimum</i>	6,8,9,14
<i>Gnaphalium palustre</i>	4,8	<i>Solidago missouriensis</i>	10
<i>Helianthus annuus</i>	4	<i>Symphoricarpos albus**</i>	6,10
<i>Hippuris vulgaris</i>	2	<i>Taraxacum officinalis</i>	4,6,7,8,15
<i>Hypericum perforatum</i>	7	<i>Trifolium pratense</i>	15
<i>Iris pseudacorus</i>	5	<i>Verbascum thapsus</i>	4,6,8
<i>Juncus balticus</i>	5,11,12	<i>Veronica americana</i>	12
<i>Juncus ensifolius</i>	4,5,12		

* Species planted during 2003 & 2004 riparian vegetation enhancements.

** Species observed during vegetation survey and also planted during 2003 & 2004 riparian vegetation enhancements.

Bolded species new to the list for 2005.

COMMENTS/PROBLEMS:

PLANTED WOODY VEGETATION SURVIVAL

[illegible]

COMMENTS/PROBLEMS: The above species were planted during 2003 & 2004. The results are for species found along the transect assessed by LWC and do not reflect the total of number of species planted. Refer to **Appendix G** for the total number of plants installed.

WILDLIFE

BIRDS

See attached Bird Survey – Field Data Sheet

Were man-made nesting structures installed? Yes____ No X Type:_____ How many?_____ Are the nesting structures being utilized? Yes____ No____ Do the nesting structures need repairs? Yes____ No____

MAMMALS AND HERPTILES

Species	Number Observed	Indirect indication of use			
		Tracks	Scat	Burrows	Other
Deer		X			
Painted Turtle	6				

Additional Activities Checklist:

X Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Macroinvertebrate samples collected and location marked on map.

PHOTOGRAPHS

Using a camera with a 50 mm lenses and color film take photographs of the following permanent reference points listed in the checklist below. Record the direction of the photograph using a compass. (The first time at each site establish a permanent reference point by setting a ½ inch rebar or fencepost extending 2-3' above ground, survey the location with a resource grade GPS and mark the location on the air photo.)

Checklist:

- ☒ One photo for each of the 4 cardinal directions surrounding wetland
- ☒ At least one photo showing upland use surrounding wetland – if more than one upland use exists, take additional photos
- ☒ At least one photo showing buffer surrounding wetland
- ☒ One photo from each end of vegetation transect showing transect

Location	Photo	Photograph Description	Compass Reading
1	1	Picture looking S. at upland, emergent vegetation and open water area.	180°
2	2	Picture looking N. at emergent vegetation and open water area.	180°
3	3	Picture looking E. at emergent vegetation that existed before construction.	90°
4	4	Panoramic view running W. to E., created open water area.	315° – 135°
5	5	Picture looking E. at backwater side channel.	90°
6	6	Panoramic view running W. to E., emergent wetlands, open water area & upland.	315° – 90°
7	7	Picture looking E. at side channel & area where berm was removed.	90°
8	8	Picture looking E. at side channel & area of high water disturbance.	90°
9	9a	Picture looking W. at upland, emergent wetlands & created open water areas.	315°
9	9b	Picture looking N. at upland pasture.	0°
9	9c	Picture looking S. at riparian vegetation along side channel.	180°
10	10	Picture looking W. at inlet to backwater side channel.	270° – 135°
11	11	Picture looking NW. along N. side of project boundary & Flathead River.	315°
12	12	Picture looking NW. along N. side of site, areas where berm was removed.	315°
13	13	Picture looking W. at empty floodplain channel near river.	315°

COMMENTS/PROBLEMS: All pictures were taken with a digital camera.

GPS SURVEYING

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

Checklist:

- ☒ Jurisdictional wetland boundary
- ☒ 4-6 landmarks recognizable on the air photo
- ☒ Start and end points of vegetation transect(s)
- ☒ Photo reference points
- ☐ Groundwater monitoring well locations

COMMENTS/PROBLEMS: _____

WETLAND DELINEATION

At each site conduct the items on the checklist below:

- ☒ Delineate wetlands according to the 1987 Army Corps manual.
☒ Delineate wetland-upland boundary on the air photo
☐ Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: _____

FUNCTIONAL ASSESSMENT

See attached completed MDT Montana Wetland Assessment Method forms.

MAINTENANCE

Were man-made nesting structures installed at this site? YES ___ NO X

If yes, do they need to be repaired? YES ___ NO ___

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

Were man-made structures build or installed to impound water or control water flow into or out of the wetland?
YES ___ NO X

If yes, are the structures working properly and in good working order? YES ___ NO ___

If no, describe the problems below.

COMMENTS/PROBLEMS: _____

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 08/10/05 Examiner: Greg Howard Transect # 1

Approx. transect length: 390 ft Compass Direction from Start (Upland): 45°

Vegetation type 1:	Festuca/Phleum (Community No. 6)		
Length of transect in this type:	45		feet
Species:	Cover:		
Plantago lanceolata	T		
Cirsium arvense	T		
Agrostis alba	20		
Phleum pratense	P		
Festuca pratensis	40		
Agropyron repens	P		
Rumex crispus	T		
Phalaris arundinacea	T		
Equisetum arvense	P		
Total Vegetative Cover:	70%		

Vegetation type 3:	Potamogeton/Elodea (Community No. 3)		
Length of transect in this type:	84		feet
Species:	Cover:		
Eleocharis acicularis	T		
Elodea canadensis	T		
Potamogeton amplifolius	T		
Eleocharis palustris	T		
Potamogeton crispus	T		
Potamogeton natans	10		
Myriophyllum spicatum	80		
Total Vegetative Cover:	95%		

Vegetation type 2:	Juncus/Eleocharis (Community No. 12)		
Length of transect in this type:	24		feet
Species:	Cover:		
Eleocharis acicularis	60		
Juncus ensifolius	P		
Eleocharis palustris	P		
Scirpus acutus	T		
Plantago major	T		
Rumex crispus	T		
Salix exigua	T		
Populus trichocarpa	T		
Total Vegetative Cover:	70%		

Vegetation type 4:	Juncus/Eleocharis (Community No. 12)		
Length of transect in this type:	7		feet
Species:	Cover:		
Eleocharis acicularis	50		
Juncus ensifolius	T		
Eleocharis palustris	20		
Scirpus microcarpus	T		
Plantago major	P		
Total Vegetative Cover:	75%		

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 08/10/05 Examiner: Greg Howard Transect # 1

Approx. transect length: 390 ft Compass Direction from Start (Upland): 45°

Vegetation type 5:		Eleocharis/Phalaris (Community No. 2)	
Length of transect in this type:	84		feet
Phalaris arundinacea	50		
Eleocharis palustris	10		
Hippuris vulgaris	P		
Scirpus acutus	20		
Sagittaria latifolia	P		
Veronica americana	P		
Potamogeton natans	10		
Rumex crispus	T		
Myosotis scorpioides	T		
Equisetum arvense	T		
Carex retrorsa	P		
Total Vegetative Cover:		90%	

Vegetation type 7:		Potamogeton/Elodea (Community No. 3)	
Length of transect in this type:	45		feet
Species:	Cover:		
Eleocharis acicularis	P		
Myriophyllum spicatum	60		
Eleocharis palustris	10		
Potamogeton natans	P		
Total Vegetative Cover:		75%	

Vegetation type 6:		Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	6		feet
Species:	Cover:		
Eleocharis acicularis	50		
Juncus ensifolius	P		
Eleocharis palustris	10		
Scirpus acutus	P		
Plantago major	T		
Coreopsis atkinsoniana	T		
Sagittaria latifolia	T		
Total Vegetative Cover:		65%	

Vegetation type 8:		Juncus/Eleocharis (Community No. 12)	
Length of transect in this type:	17		feet
Species:	Cover:		
Eleocharis acicularis	30		
Juncus ensifolius	P		
Eleocharis palustris	20		
Scirpus acutus	T		
Plantago major	P		
Coreopsis atkinsoniana	20		
Total Vegetative Cover:		75%	

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Hoskins Landing Date: 08/10/05 Examiner: Greg Howard Transect # 1

Approx. transect length: 390 ft Compass Direction from Start (Upland): 45°

Vegetation type 9:	Agropyron/Melilotus (Community No. 4)	
Length of transect in this type:	45	feet
Species:	Cover:	
Phalaris arundinacea	10	
Plantago lanceolata	P	
Polygonum amphibium	T	
Scirpus acutus	T	
Agropyron repens	30	
Cirsium arvense	T	
Plantago major	T	
Coreopsis atkinsoniana	P	
Total Vegetative Cover:	50%	

Vegetation type :			
Length of transect in this type:			feet
Species:	Cover:		
Total Vegetative Cover:			

Vegetation type 10:	Festuca/Phleum (Community No. 6)		
Length of transect in this type:	33		feet
Species:	Cover:		
Festuca pratensis	P		
Agropyron repens	T		
Cirsium arvense	P		
Verbascum thapsus	T		
Phalaris arundinacea	50		
Agrostis alba	P		
Plantago major	10		
Total Vegetative Cover:			70%

Vegetation type :			
Length of transect in this type:			feet
Species:	Cover:		
Total Vegetative Cover:			

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate

 $+ = < 1\%$

1 = 1-5%

2 = 6-10%

3 = 11-

20%

 $4 \equiv 21-$

50%

5 => 50%

Indicator Class:

+ = Obligate

- = Facultative/Wet

0 = Facultative

Source:

P = Planted

V = Volunteer

Percent of perimeter % developing wetland vegetation – excluding dam/berm structures.

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

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

Notes:

[illegible]

BIRD SURVEY – FIELD DATA SHEET

Page 1 of 1

Date: 8/10/05

Survey Time: 9:00 – 4:00

SITE: Hoskins Landing

[illegible]

Notes: Conditions: Mostly overcast with hazy conditions from local forest fires.

Behavior: BP – one of a breeding pair; BD – breeding display; F – foraging; FO – flyover; L – loafing; N – nesting

Habitat: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline



SITE: Hoskins Landing

Date: 5/18/05

Survey Time: 4:00pm – 6:00pm

[illegible]

Habitat: AB – aquatic bed; FO – forested; I – island; MA – marsh; MF – mud flat; OW – open water; SS – scrub/shrub; UP – upland buffer; WM – wet meadow, US – unconsolidated shoreline



DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>08/10/05</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u>X</u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u> </u> No Is the area a potential Problem Area?: <u> </u> Yes <u> </u> No (If needed, explain on reverse.)	Community ID: <u>Upland</u> Transect ID: <u>T1</u> Plot ID: <u>1</u>

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	<i>Plantago lanceolata</i>	H	FAC	9			
2	<i>Cirsium arvense</i>	H	FACU+	10			
3	<i>Phleum pratense</i>	H	FACU	11			
4	<i>Agropyron repens</i>	H	FACU+	12			
5	<i>Agrostis alba</i>	H	FACU	13			
6	<i>Festuca pratensis</i>	H	FAC+	14			
7	<i>Phalaris arundinacea</i>	H	FACW	15			
8				16			
Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). <u>3/7 = 33%</u>							
Upland pasture along the outer fringes of excavated wetland slopes.							

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><u> </u> Stream, Lake, or Tide Gauge</p> <p><u> </u> Aerial Photographs</p> <p><u> </u> Other</p> <p><u>X</u> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u> </u> - <u> </u> (in.)</p> <p>Depth to Free Water in Pit: <u> </u> - <u> </u> (in.)</p> <p>Depth to Saturated Soil: <u> </u> - <u> </u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><u> </u> Inundated</p> <p><u> </u> Saturated in Upper 12 Inches</p> <p><u> </u> Water Marks</p> <p><u> </u> Drift Lines</p> <p><u> </u> Sediment Deposits</p> <p><u> </u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><u> </u> Oxidized Root Channels in Upper 12 Inches</p> <p><u> </u> Water-Stained Leaves</p> <p><u> </u> Local Soil Survey Data</p> <p><u> </u> FAC-Neutral Test</p> <p><u> </u> Other (Explain in Remarks)</p>
Remarks: No evidence of hydrology. Soil dry and crumbly, not saturated or moist at the time of inspection.	

SOILS



Map Unit Name (Series and Phase):		Horseplains-riverwash complex		Drainage Class: _____	
Taxonomy (Subgroup):		_____		Field Observations	
				Confirm Mapped Type? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2	A	10 YR 3/2	-	-	Loam
2 – 12	B1	10 YR 4/2	-	-	Silty Loam
12+	B2	10 YR 5/2	-	-	Silty Loam

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Marginal hydric indicators, slight evidence of hydric conditions with low-chroma colors.
--

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Wetland Hydrology Present? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
--	--

Remarks: Sampling point considered within an upland area. Sampling point located near the beginning of vegetation transect within upland.
--

Approved by HQUSACE 2/92

ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>08/10/05</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u> x </u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u> </u> No Is the area a potential Problem Area?: <u> </u> Yes <u> </u> No (If needed, explain on reverse.)	Community ID: <u>Emergent</u> Transect ID: <u>T1</u> Plot ID: <u>2</u>

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	<i>Eleocharis acicularis</i>	H	OBL	9			
2	<i>Juncus ensifolius</i>	H	FACW	10			
3	<i>Eleocharis palustris</i>	H	OBL	11			
4	<i>Scirpus acutus</i>	H	OBL	12			
5	<i>Plantago major</i>	H	FACU+	13			
6				14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 4/5 = 80%

Area dominated by hydrophytic vegetation. Developing emergent vegetation type along outer fringe of excavated wetland.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><u> </u> Stream, Lake, or Tide Gauge</p> <p><u> </u> Aerial Photographs</p> <p><u> </u> Other</p> <p><u> x </u> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u> - </u> (in.)</p> <p>Depth to Free Water in Pit: <u> - </u> (in.)</p> <p>Depth to Saturated Soil: <u> 0 </u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><u> x </u> Inundated</p> <p><u> </u> Saturated in Upper 12 Inches</p> <p><u> </u> Water Marks</p> <p><u> </u> Drift Lines</p> <p><u> </u> Sediment Deposits</p> <p><u> </u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><u> </u> Oxidized Root Channels in Upper 12 Inches</p> <p><u> </u> Water-Stained Leaves</p> <p><u> </u> Local Soil Survey Data</p> <p><u> </u> FAC-Neutral Test</p> <p><u> </u> Other (Explain in Remarks)</p>
<p>Remarks:</p> <p>Hydrology indicators present with saturated soils to ground surface and minor inundation.</p>	

SOILS



Map Unit Name (Series and Phase):		Horseplains-riverwash complex		Drainage Class: _____	
Taxonomy (Subgroup):		_____		Field Observations	
		_____		Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 12+	B	7.5 YR 4/1	7.5 YR 3/4	Common / Prominent	Sandy Clay

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Hydric soil indicators present with low-chroma colors and mottles.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Remarks: Sampling point considered within a wetland. Wetland area dominated by emergent vegetation type located along fringe of excavated wetland.	

Approved by HQUSACE 2/92



DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>08/10/05</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u> x </u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u> </u> No Is the area a potential Problem Area?: <u> </u> Yes <u> </u> No (If needed, explain on reverse.)	Community ID: <u>Emergent</u> Transect ID: <u>T1</u> Plot ID: <u>3</u>

VEGETATION

Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1 <i>Eleocharis palustris</i>	H	OBL		9		
2 <i>Phalaris arundinacea</i>	H	FACW		10		
3 <i>Scirpus acutus</i>	H	OBL		11		
4 <i>Potamogeton natans</i>	H	OBL		12		
5 <i>Carex retrorsa</i>	H	FAC		13		
6 <i>Sagittaria latifolia</i>	H	OBL		14		
7				15		
8				16		

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 6/6 = 100%

Area dominated by hydrophytic vegetation.

HYDROLOGY

<p>Recorded Data (Describe in Remarks):</p> <p><u> </u> Stream, Lake, or Tide Gauge</p> <p><u> </u> Aerial Photographs</p> <p><u> </u> Other</p> <p><u> x </u> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p>Depth of Surface Water: <u> - </u> (in.)</p> <p>Depth to Free Water in Pit: <u> - </u> (in.)</p> <p>Depth to Saturated Soil: <u> 0 </u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p><u> x </u> Inundated</p> <p><u> </u> Saturated in Upper 12 Inches</p> <p><u> </u> Water Marks</p> <p><u> </u> Drift Lines</p> <p><u> </u> Sediment Deposits</p> <p><u> </u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p><u> </u> Oxidized Root Channels in Upper 12 Inches</p> <p><u> </u> Water-Stained Leaves</p> <p><u> </u> Local Soil Survey Data</p> <p><u> </u> FAC-Neutral Test</p> <p><u> </u> Other (Explain in Remarks)</p>
<p>Remarks:</p> <p>Hydrology indicators present with inundation and saturated soils to ground surface.</p>	

SOILS

Map Unit Name (Series and Phase):		Horseplains-riverwash complex		Drainage Class: _____	
Taxonomy (Subgroup):		_____		Field Observations	
		_____		Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 2	O	10 YR 3/2	-	-	Organics
2 – 10	A	10 YR 3/1	10 YR 2/6	Common, Distinct	Clay
10+	B	10 YR 4/1	10 YR 2/6	Many, Prominent	Clay

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Hydric soil indicators present with mottles and low-chroma colors.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
--	--

Remarks:
 Sampling point considered within an emergent wetland type.

Approved by HQUSACE 2/92



SOILS

Map Unit Name (Series and Phase):		Horseplains-riverwash complex		Drainage Class: _____	
Taxonomy (Subgroup):		_____		Field Observations	
		_____		Confirm Mapped Type? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 - 1	A	10 YR 3/1	-	-	Organics w/clay loam
1 - 12	B1	10 YR 5/1	10 YR 4/6	Medium, 15%	Clay
12+	B2	2.5 YR 4/1	10 YR 4/6	Small, 10%	Clay

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input checked="" type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Hydric soil indicators present with low-chroma colors & mottles.
--

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Wetland Hydrology Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Hydric Soils Present? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Is this Sampling Point Within a Wetland? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
--	--

Remarks: Sampling point considered within a wetland area. Excavated wetland; aquatic bed and emergent vegetation types.
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Approved by HQUSACE 2/92



DATA FORM
ROUTINE WETLAND DETERMINATION
(1987 COE Wetlands Delineation Manual)

Project/Site: <u>Hoskins Landing</u> Applicant/Owner: <u>MDT</u> Investigator: <u>Greg Howard</u>	Date: <u>08/10/05</u> County: <u>Sanders</u> State: <u>MT</u>
Do Normal Circumstances exist on the site: <u> x </u> Yes <u> </u> No Is the site significantly disturbed (Atypical Situation)? <u> </u> Yes <u> </u> No Is the area a potential Problem Area?: <u> </u> Yes <u> </u> No (If needed, explain on reverse.)	Community ID: <u> - </u> Transect ID: <u> T1 </u> Plot ID: <u> 5 </u>

VEGETATION

	Dominant Plant Species	Stratum	Indicator		Dominant Plant Species	Stratum	Indicator
1	<i>Agropyron repens</i>	H	FACU	9			
2	<i>Centaurea maculosa</i>	H	-	10			
3	<i>Cirsium arvense</i>	H	FACU+	11			
4	<i>Plantago lanceolata</i>	H	FAC	12			
5	<i>Plantago major</i>	H	FACU	13			
6	<i>Verbascum thapsus</i>	H	-	14			
7				15			
8				16			

Percent of Dominant Species that are OBL, FACW, or FAC (excluding FAC-). 1/6 = 16%

Area dominated upland vegetation.

HYDROLOGY

<p><u> </u> Recorded Data (Describe in Remarks):</p> <p style="padding-left: 40px;"><u> </u> Stream, Lake, or Tide Gauge</p> <p style="padding-left: 40px;"><u> </u> Aerial Photographs</p> <p style="padding-left: 40px;"><u> </u> Other</p> <p><u> x </u> No Recorded Data Available</p> <hr/> <p>Field Observations:</p> <p style="padding-left: 40px;">Depth of Surface Water: <u> - </u> (in.)</p> <p style="padding-left: 40px;">Depth to Free Water in Pit: <u> - </u> (in.)</p> <p style="padding-left: 40px;">Depth to Saturated Soil: <u> - </u> (in.)</p>	<p>Wetland Hydrology Indicators:</p> <p>Primary Indicators:</p> <p style="padding-left: 20px;"><u> </u> Inundated</p> <p style="padding-left: 20px;"><u> </u> Saturated in Upper 12 Inches</p> <p style="padding-left: 20px;"><u> </u> Water Marks</p> <p style="padding-left: 20px;"><u> </u> Drift Lines</p> <p style="padding-left: 20px;"><u> </u> Sediment Deposits</p> <p style="padding-left: 20px;"><u> </u> Drainage Patterns in Wetlands</p> <p>Secondary Indicators (2 or more required):</p> <p style="padding-left: 20px;"><u> </u> Oxidized Root Channels in Upper 12 Inches</p> <p style="padding-left: 20px;"><u> </u> Water-Stained Leaves</p> <p style="padding-left: 20px;"><u> </u> Local Soil Survey Data</p> <p style="padding-left: 20px;"><u> </u> FAC-Neutral Test</p> <p style="padding-left: 20px;"><u> </u> Other (Explain in Remarks)</p>
<p>Remarks:</p> <p>No hydrology indicators present, sampling pit was dry.</p>	

SOILS

Map Unit Name		Horseplains-riverwash complex		Drainage Class: _____	
(Series and Phase):		_____		Field Observations	
Taxonomy (Subgroup):		_____		Confirm Mapped Type? _____ Yes <u> x </u> No	

Profile Description:					
Depth inches	Horizon	Matrix Color (Munsell Moist)	Mottle Colors (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc.
0 – 1	B1	10 YR 4/2	-	-	Roots w/silty clay
1 – 12+	B2	10 YR 4/2	-	-	Silty loam

Hydric Soil Indicators:	
<input type="checkbox"/> Histosol <input type="checkbox"/> Histic Epipedon <input type="checkbox"/> Sulfidic Odor <input type="checkbox"/> Aquic Moisture Regime <input type="checkbox"/> Reducing Conditions <input type="checkbox"/> Gleyed or Low-Chroma Colors	<input type="checkbox"/> Concretions <input type="checkbox"/> High Organic Content in surface Layer in Sandy Soils <input type="checkbox"/> Organic Streaking in Sandy Soils <input type="checkbox"/> Listed on Local Hydric Soils List <input type="checkbox"/> Listed on National Hydric Soils List <input type="checkbox"/> Other (Explain in Remarks)

Soil profile has low-chroma colors, no other hydric soils indicators found.

WETLAND DETERMINATION

Hydrophytic Vegetation Present? <input type="checkbox"/> Yes <u> X </u> No Wetland Hydrology Present? <input type="checkbox"/> Yes <u> X </u> No Hydric Soils Present? <input type="checkbox"/> Yes <u> X </u> No	Is this Sampling Point Within a Wetland? <input type="checkbox"/> Yes <u> x </u> No
---	---

Remarks:
 Sampling point considered within an upland area.

Approved by HQUSACE 2/92



1. Project Name: Hoskins Landing

2. Project #: B43054.00-0110

Control #: _____

3. Evaluation Date: 8/10/2005

4. Evaluator(s): G. Howard

5. Wetland / Site #(s): AA-1, Excavated WL & channel

6. Wetland Location(s) i. T: 18 N R: 21 W S: 18 T: __ N R: __ E S: _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 3 - Lower Clark Fork GPS Reference No. (if applies): _____

Other Location Information: _____

7. A. Evaluating Agency MDT

8. Wetland Size (total acres): _____ (visually estimated)
12.55 (measured, e.g. GPS)

B. Purpose of Evaluation:

☐ Wetlands potentially affected by MDT project

☐ Mitigation wetlands; pre-construction

☒ Mitigation wetlands; post-construction

☐ Other _____

9. Assessment Area (total acres): _____ (visually estimated)
12.55 (measured, e.g. GPS)

Comments: _____

HGM CLASS ¹	SYSTEM ²	SUBSYSTEM ²	CLASS ²	WATER REGIME ²	MODIFIER ²	% OF AA
Riverine	Palustrine	None	Aquatic Bed	Permanently Flooded	Excavated	50
Riverine	Palustrine	None	Emergent Wetland	Seasonally Flooded	---	15
Riverine	Palustrine	None	Unconsolidated Bottom	Permanently Flooded	Excavated	20
Riverine	Palustrine	None	Scrub-Shrub Wetland	Seasonally Flooded	---	5
Riverine	Palustrine	None	Rock Bottom	Seasonally Flooded	---	10

¹ = Smith et al. 1995, ² = Cowardin et al. 1979.

Comments:

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

Common **Comments:**

12. GENERAL CONDITION OF AA

i. Regarding Disturbance: (Use matrix below to select appropriate response.)

Conditions Within AA	Predominant Conditions Adjacent (within 500 Feet) To AA		
	Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings.	Land not cultivated, but moderately grazed or hayed or selectively logged or has been subject to minor clearing; contains few roads or buildings.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.
AA occurs and is managed in predominantly a natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	---	---	---
AA not cultivated, but moderately grazed or hayed or selectively logged or has been subject to relatively minor clearing, or fill placement, or hydrological alteration; contains few roads or buildings.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

Comments: (types of disturbance, intensity, season, etc.) Historic livestock grazing. Cattle still access site.

ii. Prominent weedy, alien, & introduced species: spotted knapweed, Canada thistle, bull thistle, hound's tongue, goats weed, and oxeye daisy.

iii. **Briefly describe AA and surrounding land use / habitat:** Area of historic heavy alteration from livestock. AA had several small wetlands and an active backwater channel. Surrounding lands are used for cropland, livestock, and boat launching.

13. STRUCTURAL DIVERSITY (Based on 'Class' column of #10 above.)

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	≤ 1 Vegetated Class
Select Rating	High	---	---

Comments:

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

i. AA is Documented (D) or Suspected (S) to contain (check box):

Primary or Critical habitat (list species) ☐ D ☐ S _____
 Secondary habitat (list species) ☒ D ☐ S Bald Eagle
 Incidental habitat (list species) ☐ D ☒ S gray wolf, bull trout
 No usable habitat ☐ D ☒ S spalding's campion, grizzly bear, Canada lynx

ii. Rating (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	.8 (M)	---	---	---	---

If documented, list the source (e.g., observations, records, etc.): Bald Eagle observed on the site during fall visit (11/04/05).

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

i. AA is Documented (D) or Suspected (S) to contain (check box):

Primary or Critical habitat (list species) ☐ D ☐ S _____
 Secondary habitat (list species) ☐ D ☐ S _____
 Incidental habitat (list species) ☐ D ☒ S boreal toad, peregrine falcon
 No usable habitat ☐ D ☐ S _____

ii. Rating: Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	---	.1 (L)	---

If documented, list the source (e.g., observations, records, etc.): _____

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of overall wildlife use in the AA: Check either substantial, moderate, or low.

☐ Substantial (based on any of the following)

- ☐ 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

☐ Low (based on any of the following)

- ☐ 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 AA

☒ Moderate (based on any of the following)

- ☐ 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, select the AA attribute to determine the exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from 13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see 10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A = absent.

Structural Diversity (from 13)	<input checked="" type="checkbox"/> High								<input type="checkbox"/> Moderate								<input type="checkbox"/> Low			
Class Cover Distribution (all vegetated classes)	<input type="checkbox"/> Even				<input checked="" type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> 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 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see 12)	--	--	--	--	H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
High disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. Rating: Use 14C(i) and 14C(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L) for this function.

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	.7 (M)	--	--
Low	--	--	--	--

Comments: _____

14D. GENERAL FISH / AQUATIC HABITAT RATING ☐ NA (proceed to 14E)

If the AA is not or was not historically used by fish due to lack of habitat or excessive gradient, then check the NA box above.

Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [e.g. fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (e.g. fish use within an irrigation canal), then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

i. Habitat Quality: Pick the appropriate AA attributes in matrix to determine the quality rating of exceptional (E), high (H), moderate (M), or low (L).

Duration of Surface Water in AA	<input checked="" type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)									
Shading - >75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities	--	--	--	--	--	--	--	--	--
Shading - 50 to 75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--
Shading - < 50% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	H	--	--	--	--	--	--	--	--

ii. Modified Habitat Quality: Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

☐ Y ☒ N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

iii. Rating: Use the conclusions from 14D(i) and 14D(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L).

Types of Fish Known or Suspected within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input checked="" type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	.8 (H)	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: AA has in the past been altered by man-made berms, head gates, and grading. These features were removed to restore connection. Change in the rating due to increase cover of floating-leaved vegetation.

14E. FLOOD ATTENUATION ☐ NA (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA do not flood from in-channel or overbank flow, then check NA.

i. Rating: Working from top to bottom, mark the appropriate attributes to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input checked="" type="checkbox"/> <10, >2 acres			<input type="checkbox"/> ≤ 2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
% of flooded wetland classified as forested, scrub/shrub, or both									
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	.4 (M)	--	--	--

ii. Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA? (check)

☐ Y ☒ N **Comments:** Road crossing on west end of backwater channel has been removed, allowing for surface flow during highwater to move unrestricted along channel and drain back into excavated wetland and Flathead River.

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

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

i. Rating: Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input checked="" type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input type="checkbox"/> ≤ 1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Duration of surface water at wetlands within the AA									
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	.9 (H)	--	--	--	--	--	--	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

i. Rating Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds 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 has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
% cover of wetland vegetation in AA	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Evidence of flooding or ponding in AA								
AA contains no or restricted outlet	--	--	--	--	--	--	--	--
AA contains unrestricted outlet	--	--	--	--	.4 (M)	--	--	--

Comments: _____

14H. SEDIMENT/ShORELINE STABILIZATION☐ NA (proceed to 14I)

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, then check NA above.

i. **Rating:** Working from top to bottom, use the matrix below to arrive at the functional point and rating exceptional (E), high (H), moderate (M), or low (L) for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input checked="" type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	.6 (M)	--
< 35 %	--	--	--

Comments: Shoreline planted with wetland shrubs and development of emergent vegetation along banks.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating:** Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet. P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input type="checkbox"/> Vegetated component <1 acre					
B	<input checked="" type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low	
C	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N
P/P	1H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

14J. GROUNDWATER DISCHARGE / RECHARGE (DR) (Check the indicators in i & ii below that apply to the AA.)i. ☐ Discharge Indicators

- ☐ Springs 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.
- ☐ Other _____

ii. ☒ Recharge Indicators

- ☒ Permeable substrate presents without underlying impeding layer.
- ☐ Wetland contains inlet but not outlet.
- ☐ Other _____

iii. **Rating:** Use information from 14J(i) and 14J(ii) above and the table below to arrive at the functional point and rating of high (H) or low (L) for this function.

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

i. **Rating:** Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

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 from 11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant
Low disturbance at AA (12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (12i)	--	--	--	--	.5M	--	--	--	--
High disturbance at AA (12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

i. Is the AA a known recreational or educational site? ☒ Yes [Rate ☐ High (1.0), then proceed to 14L(ii) only] ☐ No [Proceed to 14L(iii)]

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

☒ Yes [Proceed to 14L (ii) and then 14L(iv)] ☐ No [Rate as low in 14L(iv)]

iv. **Rating** Use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Ownership	Disturbance at AA from 12(i)		
	<input type="checkbox"/> Low	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	.3(L)	--

Comments: Area managed by the Confederated Salish & Kootenai Tribes.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	moderate	0.80	1	
B. MT Natural Heritage Program Species Habitat	low	0.10	1	
C. General Wildlife Habitat	moderate	0.70	1	
D. General Fish/Aquatic Habitat	high	0.80	1	
E. Flood Attenuation	moderate	0.40	1	
F. Short and Long Term Surface Water Storage	high	0.90	1	
G. Sediment/Nutrient/Toxicant Removal	moderate	0.40	1	
H. Sediment/Shoreline Stabilization	moderate	0.60	1	
I. Production Export/Food Chain Support	high	1.00	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	moderate	0.50	1	
L. Recreation/Education Potential	low	0.30	1	
Total:		<u>7.50</u>	<u>12.00</u>	
Percent of Total Possible Points:			<u>63%</u> (Actual / Possible) x 100 [rd to nearest whole #]	

Category I Wetland: (Must satisfy **one** of the following criteria. If not satisfied, proceed 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 total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)

- ☐ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic 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 total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, return to Category III.)

- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☐ Percent of total possible points is < 30%.

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

☐ **I**
☐ **II**
☒ **III**
☐ **IV**

1. Project Name: Hoskins Landing

2. Project #: B43054.00-0110 Control #: _____

3. Evaluation Date: 8/10/2005 4. Evaluator(s): G. Howard 5. Wetland / Site #(s): AA-2, Emergent Wetland

6. Wetland Location(s) i. T: 18 N R: 21 W S: 18 T: __ N R: __ E S: _____

ii. Approx. Stationing / Mileposts: _____

iii. Watershed: 3 - Lower Clark Fork GPS Reference No. (if applies): _____

Other Location Information: _____

7. A. Evaluating Agency MDT 8. Wetland Size (total acres): _____ (visually estimated)
0.46 (measured, e.g. GPS)

B. Purpose of Evaluation:

☐ Wetlands potentially affected by MDT project

☐ Mitigation wetlands; pre-construction

☒ Mitigation wetlands; post-construction

☐ Other

9. Assessment Area (total acres): _____ (visually estimated)
0.46 (measured, e.g. GPS)

Comments: _____

HGM CLASS ¹	SYSTEM ²	SUBSYSTEM ²	CLASS ²	WATER REGIME ²	MODIFIER ²	% OF AA
Riverine	Palustrine	None	Emergent Wetland	Seasonally Flooded	---	100
---	---	---	---	---	---	
---	---	---	---	---	---	
---	---	---	---	---	---	
---	---	---	---	---	---	

Comments:

Common **Comments:**

i. Regarding Disturbance: (Use matrix below to select appropriate response.)

Conditions Within AA	Predominant Conditions Adjacent (within 500 Feet) To AA		
	Land managed in predominantly natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or buildings.	Land not cultivated, but moderately grazed or hayed or selectively logged or has been subject to minor clearing; contains few roads or buildings.	Land cultivated or heavily grazed or logged; subject to substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.
AA occurs and is managed in predominantly a natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	---	---	---
AA not cultivated, but moderately grazed or hayed or selectively logged or has been subject to relatively minor clearing, or fill placement, or hydrological alteration; contains few roads or buildings.	---	moderate disturbance	---
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	---	---	---

Comments: (types of disturbance, intensity, season, etc.) Historic livestock grazing. Cattle still access site.

ii. Prominent weedy, alien, & introduced species: spotted knapweed, timothy, and tumble mustard.

iii. Briefly describe AA and surrounding land use / habitat: Small isolated emergent depression within larger mitigation site. This site is essentially at baseline conditions, currently.

Number of 'Cowardin' Vegetated Classes Present in AA	≥3 Vegetated Classes or ≥ 2 if one class is forested	2 Vegetated Classes or 1 if forested	≤ 1 Vegetated Class
Select Rating	---	---	Low

1

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

i. AA is Documented (D) or Suspected (S) to contain (check box):

Primary or Critical habitat (list species) ☐ D ☐ S _____
 Secondary habitat (list species) ☐ D ☐ S _____
 Incidental habitat (list species) ☐ D ☐ S _____
 No usable habitat ☐ D ☒ S none

ii. Rating (Based on the strongest habitat chosen in 14A(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.): _____

14B. HABITAT FOR PLANTS AND ANIMALS RATED AS S1, S2, OR S3 BY THE MONTANA NATURAL HERITAGE PROGRAM.

Do not include species listed in 14A(i).

i. AA is Documented (D) or Suspected (S) to contain (check box):

Primary or Critical habitat (list species) ☐ D ☐ S _____
 Secondary habitat (list species) ☐ D ☐ S _____
 Incidental habitat (list species) ☐ D ☐ S _____
 No usable habitat ☐ D ☒ S none

ii. Rating: Based on the strongest habitat chosen in 14B(i) above, find the corresponding rating of High (H), Moderate (M), or Low (L) for this function.

Highest Habitat Level	doc/primary	sus/primary	doc/secondary	sus/secondary	doc/incidental	sus/incidental	none
Functional Point & Rating	---	---	---	---	---	---	0 (L)

If documented, list the source (e.g., observations, records, etc.): _____

14C. GENERAL WILDLIFE HABITAT RATING

i. Evidence of overall wildlife use in the AA: Check either substantial, moderate, or low.

☐ Substantial (based on any of the following)

- ☐ 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

☒ Low (based on any of the following)

- ☒ 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 AA

☐ Moderate (based on any of the following)

- ☐ 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, select the AA attribute to determine the exceptional (E), high (H), moderate (M), or low (L) rating. Structural diversity is from 13. For class cover to be considered evenly distributed, vegetated classes must be within 20% of each other in terms of their percent composition in the AA (see 10). Duration of Surface Water: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; A = absent.

Structural Diversity (from 13)	<input type="checkbox"/> High								<input type="checkbox"/> Moderate								<input checked="" type="checkbox"/> Low			
	<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input type="checkbox"/> Even				<input type="checkbox"/> Uneven				<input checked="" type="checkbox"/> Even			
Class Cover Distribution (all vegetated classes)	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
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 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	M	--	--
High disturbance at AA (see 12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

iii. Rating: Use 14C(i) and 14C(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L) for this function.

Evidence of Wildlife Use from 14C(i)	Wildlife Habitat Features Rating from 14C(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input checked="" type="checkbox"/> Moderate	<input type="checkbox"/> Low
Substantial	--	--	--	--
Moderate	--	--	--	--
Low	--	--	.2 (L)	--

Comments: _____

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

If the AA is not or was not historically used by fish due to lack of habitat or excessive gradient, then check the NA box above.

Assess if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [e.g. fish use is precluded by perched culvert or other barrier, etc.]. If fish use occurs in the AA but is not desired from a resource management perspective (e.g. fish use within an irrigation canal), then Habitat Quality [14D(i)] below should be marked as "Low", applied accordingly in 14D(ii) below, and noted in the comments.

i. Habitat Quality: Pick the appropriate AA attributes in matrix to determine the quality rating of exceptional (E), high (H), moderate (M), or low (L).

Duration of Surface Water in AA	<input type="checkbox"/> Permanent/Perennial			<input type="checkbox"/> Seasonal / Intermittent			<input type="checkbox"/> Temporary / Ephemeral		
	>25%	10-25%	<10%	>25%	10-25%	<10%	>25%	10-25%	<10%
Cover - % of waterbody in AA containing cover objects (e.g. submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation)									
Shading - >75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities	--	--	--	--	--	--	--	--	--
Shading - 50 to 75% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--
Shading - < 50% of streambank or shoreline of AA contains riparian or wetland scrub-shrub or forested communities.	--	--	--	--	--	--	--	--	--

ii. Modified Habitat Quality: Is fish use of the AA precluded or significantly reduced by a culvert, dike, other man-made structure or activity or is the waterbody included on the 'MDEQ list of waterbodies in need of TMDL development' with 'Probable Impaired Uses' listed as cold or warm water fishery or aquatic life support?

☐ Y ☐ N If yes, reduce the rating from 14D(i) by one level and check the modified habitat quality rating: ☐ E ☐ H ☐ M ☐ L

iii. Rating: Use the conclusions from 14D(i) and 14D(ii) above and the matrix below to arrive at the functional point and rating of exceptional (E), high (H), moderate (M), or low (L).

Types of Fish Known or Suspected within AA	Modified Habitat Quality from 14D(ii)			
	<input type="checkbox"/> Exceptional	<input type="checkbox"/> High	<input type="checkbox"/> Moderate	<input type="checkbox"/> Low
Native game fish	--	--	--	--
Introduced game fish	--	--	--	--
Non-game fish	--	--	--	--
No fish	--	--	--	--

Comments: _____

14E. FLOOD ATTENUATION ☐ **NA** (proceed to 14G)

Applies only to wetlands subject to flooding via in-channel or overbank flow. If wetlands in AA do not flood from in-channel or overbank flow, then check NA.

i. Rating: Working from top to bottom, mark the appropriate attributes to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Estimated wetland area in AA subject to periodic flooding	<input type="checkbox"/> ≥ 10 acres			<input type="checkbox"/> <10, >2 acres			<input checked="" type="checkbox"/> ≤2 acres		
	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
% of flooded wetland classified as forested, scrub/shrub, or both									
AA contains no outlet or restricted outlet	--	--	--	--	--	--	--	--	.2 (L)
AA contains unrestricted outlet	--	--	--	--	--	--	--	--	--

ii. Are residences, businesses, or other features which may be significantly damaged by floods located within 0.5 miles downstream of the AA? (check)

☐ Y ☒ N Comments: Rarely floods, but does likely occur on occasion.

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

Applies to wetlands that flood or pond from overbank or in-channel flow, precipitation, upland surface flow, or groundwater flow.

If no wetlands in the AA are subject to flooding or ponding, then check NA above.

i. Rating: Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral.

Estimated maximum acre feet of water contained in wetlands within the AA that are subject to periodic flooding or ponding.	<input type="checkbox"/> >5 acre feet			<input type="checkbox"/> <5, >1 acre feet			<input checked="" type="checkbox"/> ≤1 acre foot		
	P/P	S/I	T/E	P/P	S/I	T/E	P/P	S/I	T/E
Duration of surface water at wetlands within the AA									
Wetlands in AA flood or pond ≥ 5 out of 10 years	--	--	--	--	--	--	--	.3 (L)	--
Wetlands in AA flood or pond < 5 out of 10 years	--	--	--	--	--	--	--	--	--

Comments: _____

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

Applies to wetlands with the potential to receive excess sediments, nutrients, or toxicants through influx of surface or ground water or direct input.

If no wetlands in the AA are subject to such input, check NA above.

i. Rating Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Sediment, Nutrient, and Toxicant Input Levels Within AA	AA receives or surrounding land use has potential to deliver low to moderate levels of sediments, nutrients, or compounds 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 has potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
	<input type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%		<input checked="" type="checkbox"/> ≥ 70%		<input type="checkbox"/> < 70%	
% cover of wetland vegetation in AA	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Evidence of flooding or ponding in AA								
AA contains no or restricted outlet	--	--	--	--	.5 (M)	--	--	--
AA contains unrestricted outlet	--	--	--	--	--	--	--	--

Comments: _____

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

Applies only if AA occurs on or within the banks of a river, stream, or other natural or man-made drainage, or on the shoreline of a standing water body that is subject to wave action. If this does not apply, then check NA above.

i. **Rating:** Working from top to bottom, use the matrix below to arrive at the functional point and rating exceptional (E), high (H), moderate (M), or low (L) for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses.	Duration of Surface Water Adjacent to Rooted Vegetation		
	<input type="checkbox"/> Permanent / Perennial	<input type="checkbox"/> Seasonal / Intermittent	<input type="checkbox"/> Temporary / Ephemeral
≥ 65 %	--	--	--
35-64 %	--	--	--
< 35 %	--	--	--

Comments: Shoreline planted with wetland shrubs and development of emergent vegetation along banks.

14I. PRODUCTION EXPORT / FOOD CHAIN SUPPORT

i. **Rating:** Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

A = acreage of vegetated component in the AA. B = structural diversity rating from #13. C = Yes (Y) or No (N) as to whether or not the AA contains a surface or subsurface outlet. P/P = permanent/perennial; S/I = seasonal/intermittent; T/E/A = temporary/ephemeral/absent.

A	<input checked="" type="checkbox"/> Vegetated component >5 acres						<input type="checkbox"/> Vegetated component 1-5 acres						<input checked="" type="checkbox"/> Vegetated component <1 acre					
B	<input checked="" type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input type="checkbox"/> Low		<input type="checkbox"/> High		<input type="checkbox"/> Moderate		<input checked="" type="checkbox"/> Low	
C	<input checked="" type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input type="checkbox"/> N	<input type="checkbox"/> Y	<input checked="" type="checkbox"/> N
P/P	1H	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
S/I	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	.2L
T/E/A	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Comments: _____

14J. GROUNDWATER DISCHARGE / RECHARGE (DR) (Check the indicators in i & ii below that apply to the AA.)i. ☒ **Discharge Indicators**

- ☐ Springs 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.
☒ Other Likely discharges groundwater through alluvium.

ii. ☐ **Recharge Indicators**

- ☐ Permeable substrate presents without underlying impeding layer.
☐ Wetland contains inlet but not outlet.
☐ Other _____

iii. **Rating:** Use information from 14J(i) and 14J(ii) above and the table below to arrive at the functional point and rating of high (H) or low (L) for this function.

Criteria	Functional Point and Rating
AA has known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	--
Available Discharge/Recharge information inadequate to rate AA D/R potential	--

Comments: _____

14K. UNIQUENESS

i. **Rating:** Working from top to bottom, use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

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 from 11	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input type="checkbox"/> common	<input type="checkbox"/> abundant	<input type="checkbox"/> rare	<input checked="" type="checkbox"/> common	<input type="checkbox"/> abundant
Low disturbance at AA (12i)	--	--	--	--	--	--	--	--	--
Moderate disturbance at AA (12i)	--	--	--	--	--	--	--	.3L	--
High disturbance at AA (12i)	--	--	--	--	--	--	--	--	--

Comments: _____

14L. RECREATION / EDUCATION POTENTIAL

i. Is the AA a known recreational or educational site? ☒ **Yes** [Rate ☐ **High (1.0)**, then proceed to 14L(ii) only] ☐ **No** [Proceed to 14L(iii)]

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

iii. Based on the location, diversity, size, and other site attributes, is there a strong potential for recreational or educational use?

- ☐ **Yes** [Proceed to 14L (ii) and then 14L(iv)] ☐ **No** [Rate as low in 14L(iv)]

iv. **Rating** Use the matrix below to arrive at the functional point and rating of high (H), moderate (M), or low (L) for this function.

Ownership	Disturbance at AA from 12(i)		
	<input type="checkbox"/> Low	<input type="checkbox"/> Moderate	<input checked="" type="checkbox"/> High
Public ownership	--	--	--
Private ownership	--	--	.1(L)

Comments: Area managed by the Confederated Salish & Kootenai Tribes.

FUNCTION, VALUE SUMMARY, AND OVERALL RATING

Function and Value Variables	Rating	Actual Functional Points	Possible Functional Points	Functional Units (Actual Points x Estimated AA Acreage)
A. Listed/Proposed T&E Species Habitat	low	0.00	1	
B. MT Natural Heritage Program Species Habitat	low	0.00	1	
C. General Wildlife Habitat	low	0.20	1	
D. General Fish/Aquatic Habitat	N/A		--	
E. Flood Attenuation	low	0.20	1	
F. Short and Long Term Surface Water Storage	low	0.30	1	
G. Sediment/Nutrient/Toxicant Removal	moderate	0.50	1	
H. Sediment/Shoreline Stabilization	N/A		--	
I. Production Export/Food Chain Support	low	0.20	1	
J. Groundwater Discharge/Recharge	high	1.00	1	
K. Uniqueness	low	0.30	1	
L. Recreation/Education Potential	low	0.10	1	
Total:		<u>2.80</u>	<u>10.00</u>	
Percent of Total Possible Points:		<u>28%</u> (Actual / Possible) x 100 [rd to nearest whole #]		

Category I Wetland: (Must satisfy **one** of the following criteria. If not satisfied, proceed 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 total Possible Points is > 80%.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following Category II criteria. If not satisfied, proceed to Category IV.)

- ☐ Score of 1 functional point for Species Rated S1, S2, or S3 by the MT Natural Heritage Program; **or**
- ☐ Score of .9 or 1 functional point for General Wildlife Habitat; **or**
- ☐ Score of .9 or 1 functional point for General Fish/Aquatic 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 total possible points is > 65%.

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

Category IV Wetland: (Criteria for Categories I or II are not satisfied **and** all of the following criteria are met; If not satisfied, return to Category III.)

- ☐ "Low" rating for Uniqueness; **and**
- ☐ "Low" rating for Production Export / Food Chain Support; **and**
- ☒ Percent of total possible points is < 30%.

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

☐ **I**
☐ **II**
☐ **III**
☒ **IV**

Appendix C

REPRESENTATIVE PHOTOGRAPHS

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

HOSKINS LANDING MITIGATION SITE 2005



Photo Point No. 1: View looking south along vegetation transect. Foreground consisting of upland slopes seeded with native grass species.



Photo Point No. 2: View looking south towards excavated wetland and emergent wetlands.



Photo Point No. 3: View looking east, excavated wetland, adjacent to undisturbed emergent wetlands. Emergent vegetation expanding into inundated portions of excavated wetland.



Photo Point No. 4: View looking north across the mitigation site. Western side of excavated wetland with aquatic bed and emergent wetland types, undisturbed wetland located in center.



Photo Point No. 5: View looking east, remnant backwater channel along southern edge of site boundary.



Photo Point No. 7: View looking east near backwater channel. Area of native shrub plantings with browse protection guards over grown with seeded grass and upland species.

HOSKINS LANDING MITIGATION SITE 2005



Photo Point No. 8: View looking east along backwater channel.



Photo Point No. 9: View looking west, towards excavated wetland. Upland community in foreground and excavated wetland in background.



Photo Point No. 9: View looking north across remnant pasture. Undisturbed areas consisting of mostly upland grasses. Area heavily grazed in the past exhibiting dense vegetation cover.



Photo Point No. 9: View looking south, upland shrub community type consisting of hawthorne, American plum and cottonwood. Located on higher terrace along backwater channel.



Photo Point No. 10: View looking west; inlet to backwater channel on eastern side of mitigation site. Increased vegetation cover observed during 2004 monitoring.



Photo Point No. 11: View looking northwest along the Flathead river banks. Increase in vegetation cover, area dominated by reed canarygrass and redtop. Electric fence established to exclude livestock grazing.

HOSKINS LANDING MITIGATION SITE 2005



Photo Point No. 12: View looking northwest along Flathead River. Area of excavation and grading work to remove historic berm along north boundary of site during 2002.



Photo Point No. 13: View looking west along backwater flood channel. Substrate of cobbles and gravels with increasing vegetation cover. Cottonwood saplings observed during 2004 monitoring. Area establishing with dense vegetation cover.



Photo Point No. 6: Panoramic view looking northwest; area of upland grass community in foreground and excavated wetland in background. Emergent wetland vegetation developing around excavated wetland fringe.

HOSKINS LANDING MITIGATION SITE 2005



Photo Point No. 6: Panoramic view looking northeast; area of upland grass community in foreground and excavated wetland in background.



Photo Point No. 4: Panoramic view looking north across the mitigation site. Western side of excavated wetland, aquatic bed and emergent wetland types, undisturbed wetland located in center. Outlet to remnant backwater channel located on left side of photo. Transect located along western side of excavated wetland. Emergent vegetation developing dense cover around excavated wetland fringe.

Appendix D

ORIGINAL SITE PLAN SOIL SURVEY MAP AND DESCRIPTION

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

MONTANA DEPARTMENT OF TRANSPORTATION

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 45(29)	1

FEDERAL AID PROJECT NO. STPP 45(29)

WETLAND

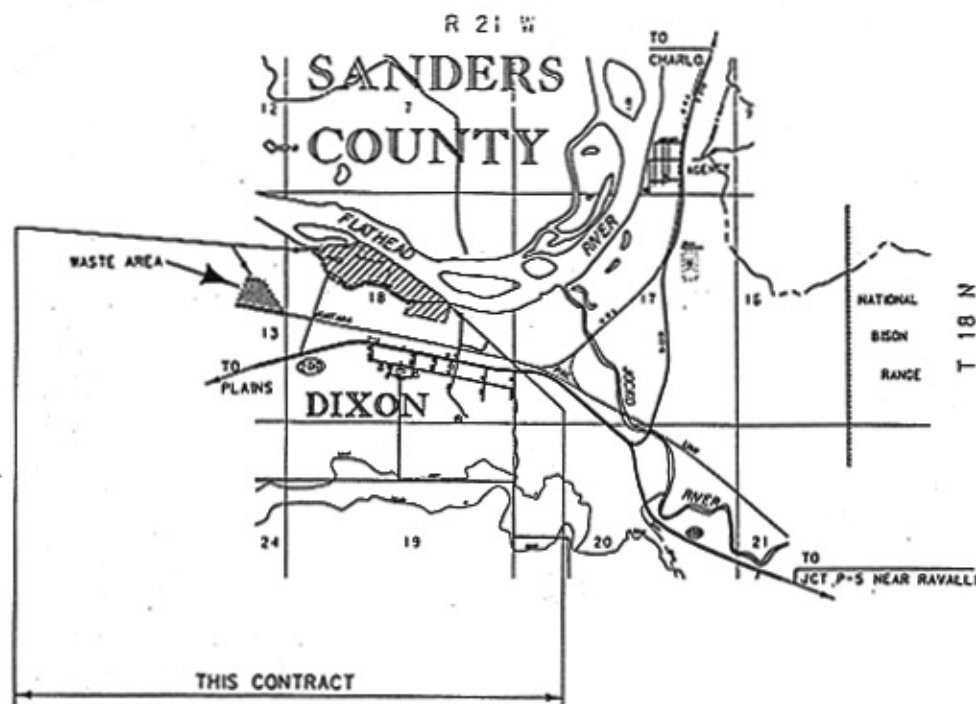
DIXON WETLAND MITIGATION
SANDERS COUNTY



THIS PROJECT

SCALES AS NOTED ON PLANS

REDUCED PRINTS 1/1 ORIGINAL SCALE



PRELIMINARY
FOR PLAN IN HAND ONLY

RELATED PROJECTS

ASSOCIATED PROJECT AGREEMENT NUMBERS

MONTANA DEPARTMENT OF TRANSPORTATION	
APPROVED: _____ DAVID A. SALT DIRECTOR OF TRANSPORTATION	
BY: _____ PRODUCTION NUMBER	
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION	
APPROVED: _____ HIGHWAY ADMINISTRATION	DATE: _____

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NOTES

STATE	PROJECT NUMBER	SHEET
MONTANA	STPP 434281	2

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SHEET NO.

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WASTE AREA	1-6
LINE G1	7-14
WETLAND POOL	7-11
UPLAND AREAS	12-14
LINE G1N	15-21
BERM REMOVAL	15-20
INLET CHANNEL	20-21
LINE G1S	22-26
EXISTING CHANNEL	22-24

CONSTRUCTION ACCESS

THE CONTRACTOR IS RESPONSIBLE FOR REVEGETATING ALL DISTURBED ACCESS AND STAGING AREAS.

WETLAND TOPSOIL

EXCAVATE WETLAND TOPSOIL FROM WITHIN CONSTRUCTION LIMIT AREAS AND STOCKPILE TOPSOIL IN THE AREAS DESIGNATED ON THE PLANS. PLACE TOPSOIL TO A MINIMUM DEPTH OF 100MM ON ALL DISTURBED AREAS.
FINISHED GRADE ELEVATIONS DO NOT INCLUDE TOPSOIL.

GRADING

PERFORM ALL EXCAVATION AND EMBANKMENTS BY METHODS DESCRIBED IN SECTION 203 OF THE STANDARD SPECIFICATIONS. ALL EXCAVATION INCLUDING MUCK EXCAVATION AND DISPOSAL OF EXCESS MATERIAL WILL BE PAID FOR AS "UNCLASSIFIED EXCAVATION". EXCAVATION OF SATURATED MATERIAL IS ANTICIPATED IN SOME AREAS, HOWEVER NO PAYMENT WILL BE MADE FOR MUCK EXCAVATION. DISPOSE OF EXCESS MATERIAL OFF SITE IN AREA SPECIFIED SOUTHWEST OF THE WETLAND SITE.
ROUND ALL SLOPES 10:1 AND STEEPER

SEEDING

SEED AREAS SHOWN ON THE PLANS AND OTHER AREAS DISTURBED DURING CONSTRUCTION. SEE SPECIAL PROVISIONS FOR SEED MIX TO BE USED ON EACH AREA.

FENCING

PERIMETER FENCING IS STANDARD 140T BARBED 5-WIRE FENCE WITH WOODEN POSTS (TYPE FSW1). PLACE PERIMETER FENCING 0.2 m OUTSIDE THE BOUNDARY DEFINED BY THE CERTIFICATE OF SURVEY (C.O.S. 20701). DO NOT FENCE THE NORTH BOUNDARY ADJACENT TO THE RIVER.

PRELIMINARY

LINEAR AND LEVEL DATA

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 454293	3

CENTERLINE COORDINATE TABLE

STATION	DESCRIPTION	N OR Y COORDINATE	E OR X COORDINATE	REMARKS
8+00.00	POB	37,418.1288	44,607.6208	LINE = 61
8+12.97	POB	37,848.3482	47,507.5918	LINE = 61
8+25.94	POB	38,278.5676	50,407.5624	LINE = 61W
8+38.91	POB	38,708.7870	53,307.5330	LINE = 61W
8+51.88	POB	39,138.9964	56,207.5036	LINE = 61W
9+04.85	POB	39,569.2058	59,107.4742	LINE = 61W
9+17.82	POB	40,000.4152	62,007.4448	LINE = 61W
9+30.79	POB	40,430.6246	64,907.4154	LINE = 61W
9+43.76	POB	40,860.8340	67,807.3860	LINE = 61W
9+56.73	POB	41,291.0434	70,707.3566	LINE = 61W
10+09.70	POB	41,721.2528	73,607.3272	LINE = 61W
10+22.67	POB	42,151.4622	76,507.2978	LINE = 61W
10+35.64	POB	42,581.6716	79,407.2684	LINE = 61W
10+48.61	POB	43,011.8810	82,307.2390	LINE = 61W
10+61.58	POB	43,442.0904	85,207.2096	LINE = 61W
10+74.55	POB	43,872.2998	88,107.1802	LINE = 61W
10+87.52	POB	44,302.5092	91,007.1508	LINE = 61W
11+00.49	POB	44,732.7186	93,907.1214	LINE = 61W
11+13.46	POB	45,162.9280	96,807.0920	LINE = 61W
11+26.43	POB	45,593.1374	99,707.0626	LINE = 61W
11+39.40	POB	46,023.3468	102,607.0332	LINE = 61W
11+52.37	POB	46,453.5562	105,507.0038	LINE = 61W
12+05.34	POB	46,883.7656	108,406.9744	LINE = 61W
12+18.31	POB	47,313.9750	111,306.9450	LINE = 61W
12+31.28	POB	47,744.1844	114,206.9156	LINE = 61W
12+44.25	POB	48,174.3938	117,106.8862	LINE = 61W
12+57.22	POB	48,604.6032	120,006.8568	LINE = 61W
13+10.19	POB	49,034.8126	122,906.8274	LINE = 61W
13+23.16	POB	49,465.0220	125,806.7980	LINE = 61W
13+36.13	POB	49,895.2314	128,706.7686	LINE = 61W
13+49.10	POB	50,325.4408	131,606.7392	LINE = 61W
13+62.07	POB	50,755.6502	134,506.7098	LINE = 61W
13+75.04	POB	51,185.8596	137,406.6804	LINE = 61W
13+88.01	POB	51,616.0690	140,306.6510	LINE = 61W
14+00.98	POB	52,046.2784	143,206.6216	LINE = 61W
14+13.95	POB	52,476.4878	146,106.5922	LINE = 61W
14+26.92	POB	52,906.6972	149,006.5628	LINE = 61W
14+39.89	POB	53,336.9066	151,906.5334	LINE = 61W
14+52.86	POB	53,767.1160	154,806.5040	LINE = 61W
15+05.83	POB	54,197.3254	157,706.4746	LINE = 61W
15+18.80	POB	54,627.5348	160,606.4452	LINE = 61W
15+31.77	POB	55,057.7442	163,506.4158	LINE = 61W
15+44.74	POB	55,487.9536	166,406.3864	LINE = 61W
15+57.71	POB	55,918.1630	169,306.3570	LINE = 61W
16+10.68	POB	56,348.3724	172,206.3276	LINE = 61W
16+23.65	POB	56,778.5818	175,106.2982	LINE = 61W
16+36.62	POB	57,208.7912	178,006.2688	LINE = 61W
16+49.59	POB	57,639.0006	180,906.2394	LINE = 61W
16+62.56	POB	58,069.2100	183,806.2100	LINE = 61W
16+75.53	POB	58,499.4194	186,706.1806	LINE = 61W
16+88.50	POB	58,929.6288	189,606.1512	LINE = 61W
17+01.47	POB	59,359.8382	192,506.1218	LINE = 61W
17+14.44	POB	59,790.0476	195,406.0924	LINE = 61W
17+27.41	POB	60,220.2570	198,306.0630	LINE = 61W
17+40.38	POB	60,650.4664	201,206.0336	LINE = 61W
17+53.35	POB	61,080.6758	204,106.0042	LINE = 61W
18+06.32	POB	61,510.8852	207,005.9748	LINE = 61W
18+19.29	POB	61,941.0946	210,905.9454	LINE = 61W
18+32.26	POB	62,371.3040	214,805.9160	LINE = 61W
18+45.23	POB	62,801.5134	218,705.8866	LINE = 61W
18+58.20	POB	63,231.7228	222,605.8572	LINE = 61W
19+11.17	POB	63,661.9322	226,505.8278	LINE = 61W
19+24.14	POB	64,092.1416	230,405.7984	LINE = 61W
19+37.11	POB	64,522.3510	234,305.7690	LINE = 61W
19+50.08	POB	64,952.5604	238,205.7396	LINE = 61W
19+63.05	POB	65,382.7698	242,105.7102	LINE = 61W
19+76.02	POB	65,812.9792	246,005.6808	LINE = 61W
19+88.99	POB	66,243.1886	250,905.6514	LINE = 61W
20+01.96	POB	66,673.3980	254,805.6220	LINE = 61W
20+14.93	POB	67,103.6074	258,705.5926	LINE = 61W
20+27.90	POB	67,533.8168	262,605.5632	LINE = 61W
20+40.87	POB	67,964.0262	266,505.5338	LINE = 61W
20+53.84	POB	68,394.2356	270,405.5044	LINE = 61W
21+06.81	POB	68,824.4450	274,305.4750	LINE = 61W
21+19.78	POB	69,254.6544	278,205.4456	LINE = 61W
21+32.75	POB	69,684.8638	282,105.4162	LINE = 61W
21+45.72	POB	70,115.0732	286,005.3868	LINE = 61W
21+58.69	POB	70,545.2826	290,905.3574	LINE = 61W
22+11.66	POB	70,975.4920	294,805.3280	LINE = 61W
22+24.63	POB	71,405.7014	298,705.2986	LINE = 61W
22+37.60	POB	71,835.9108	302,605.2692	LINE = 61W
22+50.57	POB	72,266.1202	306,505.2398	LINE = 61W
23+03.54	POB	72,696.3296	310,405.2104	LINE = 61W
23+16.51	POB	73,126.5390	314,305.1810	LINE = 61W
23+29.48	POB	73,556.7484	318,205.1516	LINE = 61W
23+42.45	POB	73,986.9578	322,105.1222	LINE = 61W
23+55.42	POB	74,417.1672	326,005.0928	LINE = 61W
24+08.39	POB	74,847.3766	330,905.0634	LINE = 61W
24+21.36	POB	75,277.5860	334,805.0340	LINE = 61W
24+34.33	POB	75,707.7954	338,705.0046	LINE = 61W
24+47.30	POB	76,138.0048	342,604.9752	LINE = 61W
24+60.27	POB	76,568.2142	346,504.9458	LINE = 61W
24+73.24	POB	76,998.4236	350,404.9164	LINE = 61W
24+86.21	POB	77,428.6330	354,304.8870	LINE = 61W
25+00.00	POB	77,858.8424	358,204.8576	LINE = 61W

BEARING SOURCE

THE BASIS OF BEARING N 69°10'00" E BETWEEN MDOH CONTROL CAPS STAMPED 1088 AND 108C ESTABLISHED FOR THE DIXON - WEST PROJECT STPP 6-1188/89.

LEVEL DATUM SOURCE

U.S.C.&G.S. BRONZE DISK (L373) ELEV. 782.48 ESTABLISHED THE ELEVATIONS FOR THE CONTROL TRAVERSE ON THE DIXON - WEST PROJECT STPP 6-1188/89. CONTROL POINT 1088 ON DIXON - WEST = CONTROL POINT 2 ON THIS PROJECT. ELEVATION = 784.253

BENCH MARKS *

LOCATION	DESCRIPTION	ELEVATION
1.0 = S. OF G.	BRONZE DISK 1.0 mm	782.48
	S.E. OF PEMA HOUSE L373	

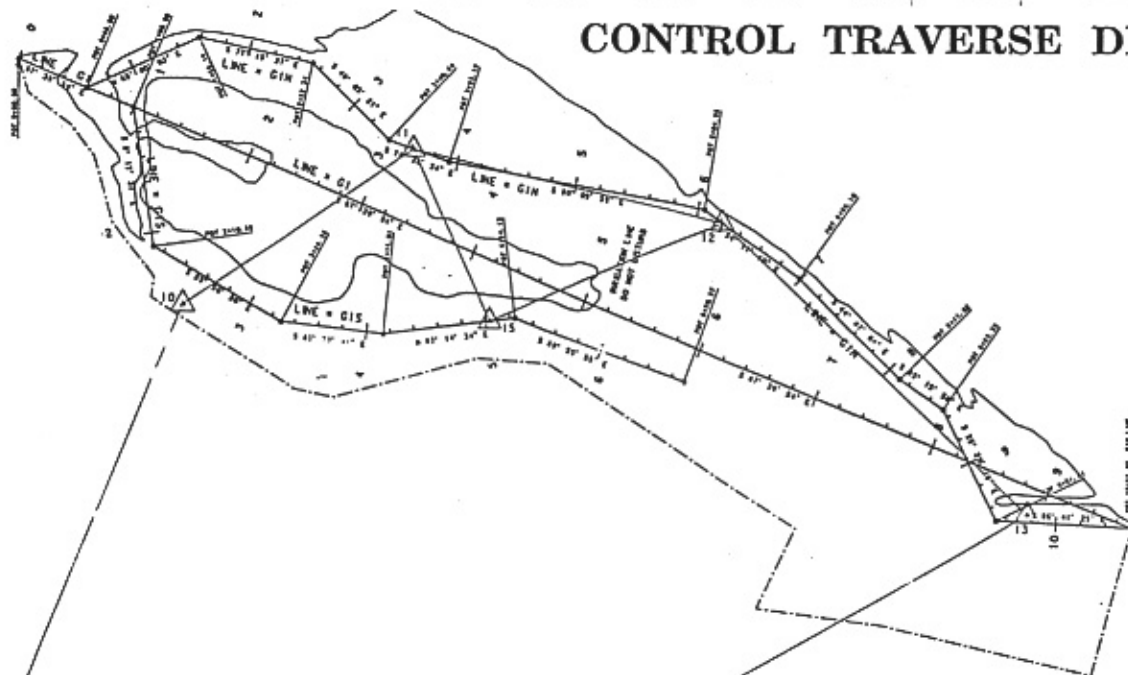
LEVEL DATUM SOURCE *

LEVEL DATUM IS BASED ON U.S.C. & G.S. BENCH MARKS WHICH ARE BASED ON THE SEA-LEVEL DATUM OF 1929 THROUGH THE PACIFIC NORTHWEST SUPPLEMENTARY ADJUSTMENT OF 1947.

PRELIMINARY

CONTROL TRAVERSE DIAGRAM

STATE	PROJECT NUMBER	SHEET
MONTANA	STPP 451291	4



T. 18 N. R. 21 W

SEC 18

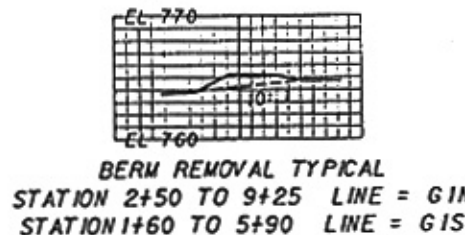
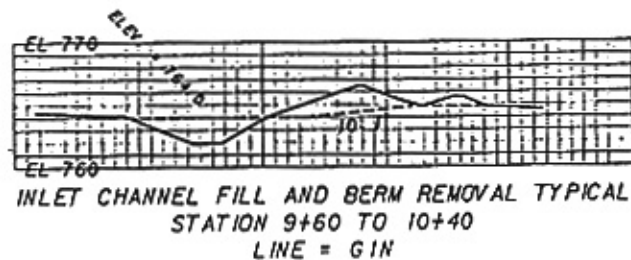
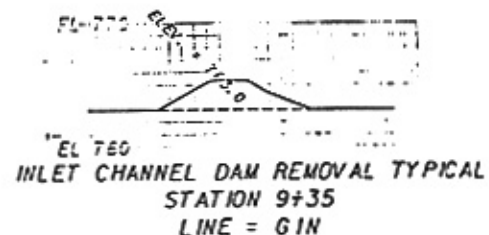
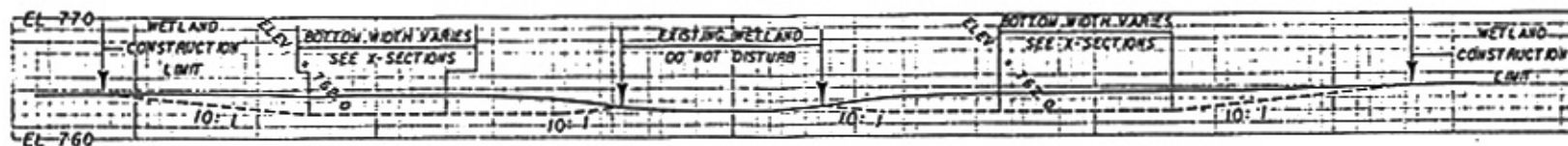


CONTROL TRAVERSE ABSTRACT

POINT NAME/NUMBER	N OR Y COORDINATE	E OR X COORDINATE	POINT ELEVATION	LOCATION AND DESCRIPTION
2	22 824.941	66 492.165	764.253	16 mm x 762 mm L.P. w/ALUM CAP - 50 mm 1088 ON BLUFF 15.2 m + ABOVE ROAD, 1.9 m N.E. OF FX LINE, 21 m N.E. OF FX COR.
3	22 825.908	67 019.714	764.218	16 mm x 762 mm L.P. w/ALUM CAP - 50 mm 1088 2 m S.W. OF R/R FX, 10.6 m N.E. OF TEL. POLE, 11.6 m S.W. CENTERLINE R.R. RAILROAD
13	23 040.401	67 423.532	764.551	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
12	23 292.455	67 180.607	765.344	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
11	23 344.561	66 927.843	764.125	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
10	23 326.122	66 735.675	765.448	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
15	23 213.133	66 991.185	764.152	16 mm x 762 mm L.P. w/25mm YELLOW PLASTIC CAP
139	22 505.478	67 430.571	765.350	SET 600 NAIL BETWEEN GRAVEL ACCESS ROAD FENCE AROUND STORM WATER LAGOON 25m NORTH OF THE SE FENCE CORNER

PRELIMINARY

TYPICAL SECTIONS



PRELIMINARY

SUMMARY

STATE	FEDERAL	UNDER	...
MONTANA	STPP 45(29)	6	...

GRADING						
STATION		cubic meters				REMARKS
FROM	TO	EXCAVATION	EMB. +	TOPSOIL	EXCESS	
1+00.00	8+16.00	33 358	6 907	3 155	25 576	GI LNE
1+25.00	10+00.00	5 293	979	935	1 379	GI LNE
1+50.00	11+00.00	3 725	0	105	3 620	GI LNE
1+75.00	12+00.00	2 1				EXCESS SOLVATE WASTE AREA
2+00.00	2+40.00				20 091	WASTE AREA
TOTAL		44 631	6 886	7 543	30 192	

* FOR INFORMATION ONLY

IRRIGATION STRUCTURES			
STATION	COUNT		REMARKS
	REMOVE	REMAINING	
1+17.00	1		GIH LEFT
TOTAL	1		

TOPSOIL & SEEDING						
STATION		FACTORS				REMARKS
FROM	TO	TOPSOIL SALVAGE & PLACING	SEED	FERTILIZER	CONDITION SEEDING	
1+00.00	8+16.00	7 153	2.54	3.64	3.64	GI LNE
1+25.00	10+00.00	922	0.99	0.99	0.99	GIH LNE
1+50.00	11+00.00	500	0.99	0.99	0.99	GIH LNE
2+00.00	2+40.00	1 215	2.25	2.25	2.25	WASTE AREA
TOTAL		7 543	7.8	7.8	7.8	

ADD 2, 3
↑
WASTE
UNITS NOT

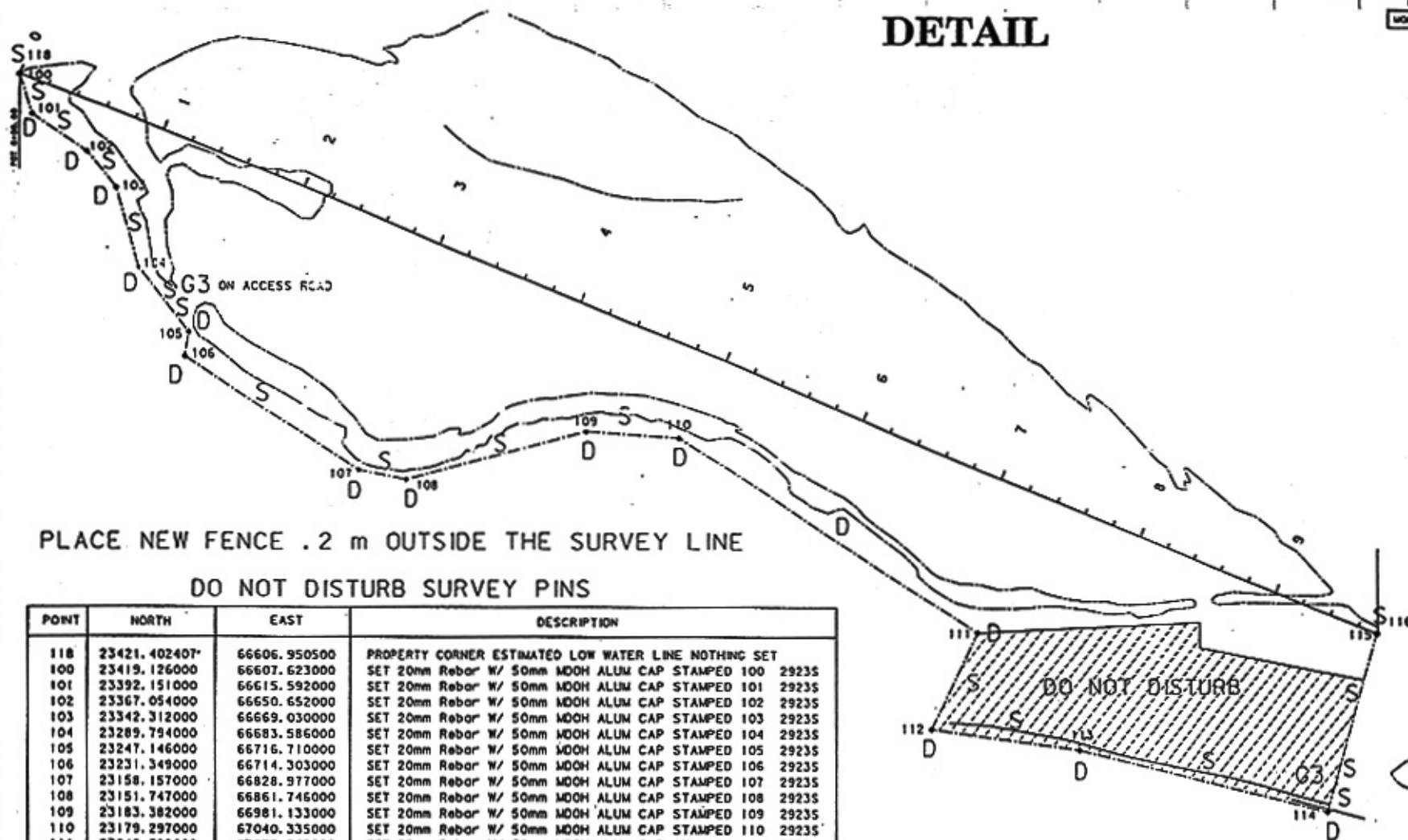
PLUG WATER WELL			
STATION	COUNT		REMARKS
	REMOVE	REMAINING	
1+34	0.5		1/4 RIGHT OF LNE GI
2+00	0.5		1/4 RIGHT OF LNE GI
TOTAL	1.0		

FENCING						
STATION		REMOVE		FARM FENCE		REMARKS
FROM	TO	REMOVE	TYPE	TYPE	TYPE	
0+00	3+73		1227.65	10	15	RIGHT OF GI LNE
1+28	1+73	1055.44				RIGHT OF GI LNE
TOTAL		1055.44	1227.65	10	15	

PRELIMINARY

DETAIL

DATE 1 NUMBER 10
MONTANA STOP 45250 7



POINT	NORTH	EAST	DESCRIPTION
118	23421.402407	66606.950500	PROPERTY CORNER ESTIMATED LOW WATER LINE NOTHING SET
100	23419.126000	66607.623000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 100 29235
101	23392.151000	66615.592000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 101 29235
102	23367.054000	66650.652000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 102 29235
103	23342.312000	66669.030000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 103 29235
104	23289.794000	66683.586000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 104 29235
105	23247.146000	66716.710000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 105 29235
106	23231.349000	66714.303000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 106 29235
107	23158.157000	66828.977000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 107 29235
108	23151.747000	66861.746000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 108 29235
109	23183.382000	66981.133000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 109 29235
110	23179.297000	67040.335000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 110 29235
111	23049.592000	67239.242000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 111 29235
112	22984.430000	67208.423000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 112 29235
113	22970.254000	67306.505000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 113 29235
114	22928.750000	67475.036000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 114 29235
115	23049.382000	67507.593000	SET 20mm Rebar W/ 50mm MOOH ALUM CAP STAMPED 115 29235
116	23053.606339	67508.733094	PROPERTY CORNER ESTIMATED LOW WATER LINE NOTHING SET

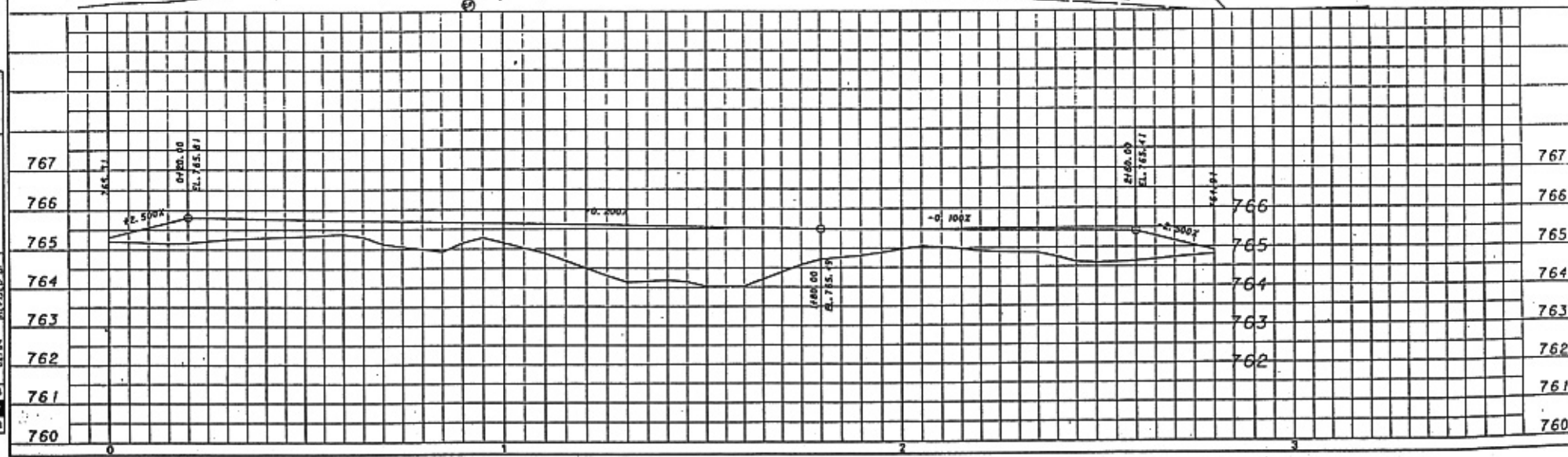
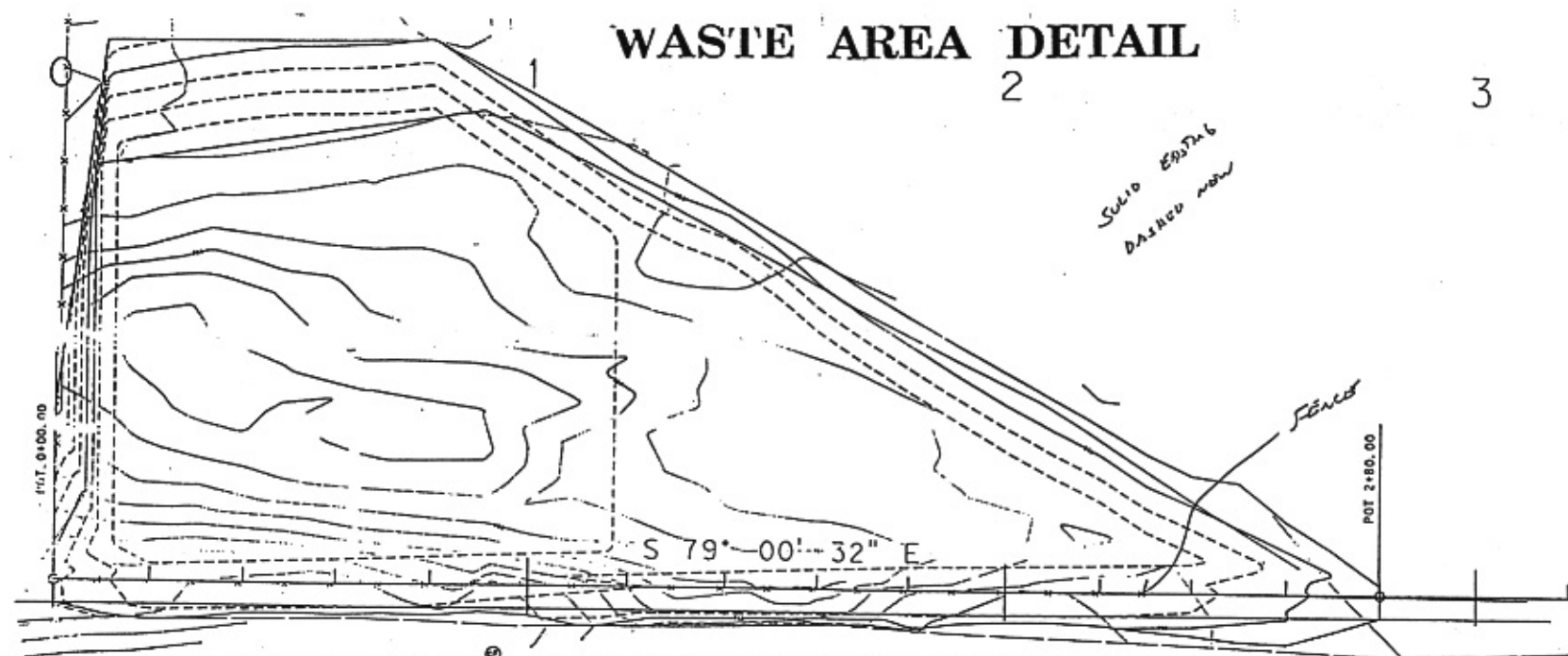
S = SINGLE PANEL
D = DOUBLE PANEL
G3 = GATE (G-3)

FENCING

PRELIMINARY

WASTE AREA DETAIL

DATE	NUMBER	SHEET NO.
MONTANA	STPP 45(29)	8

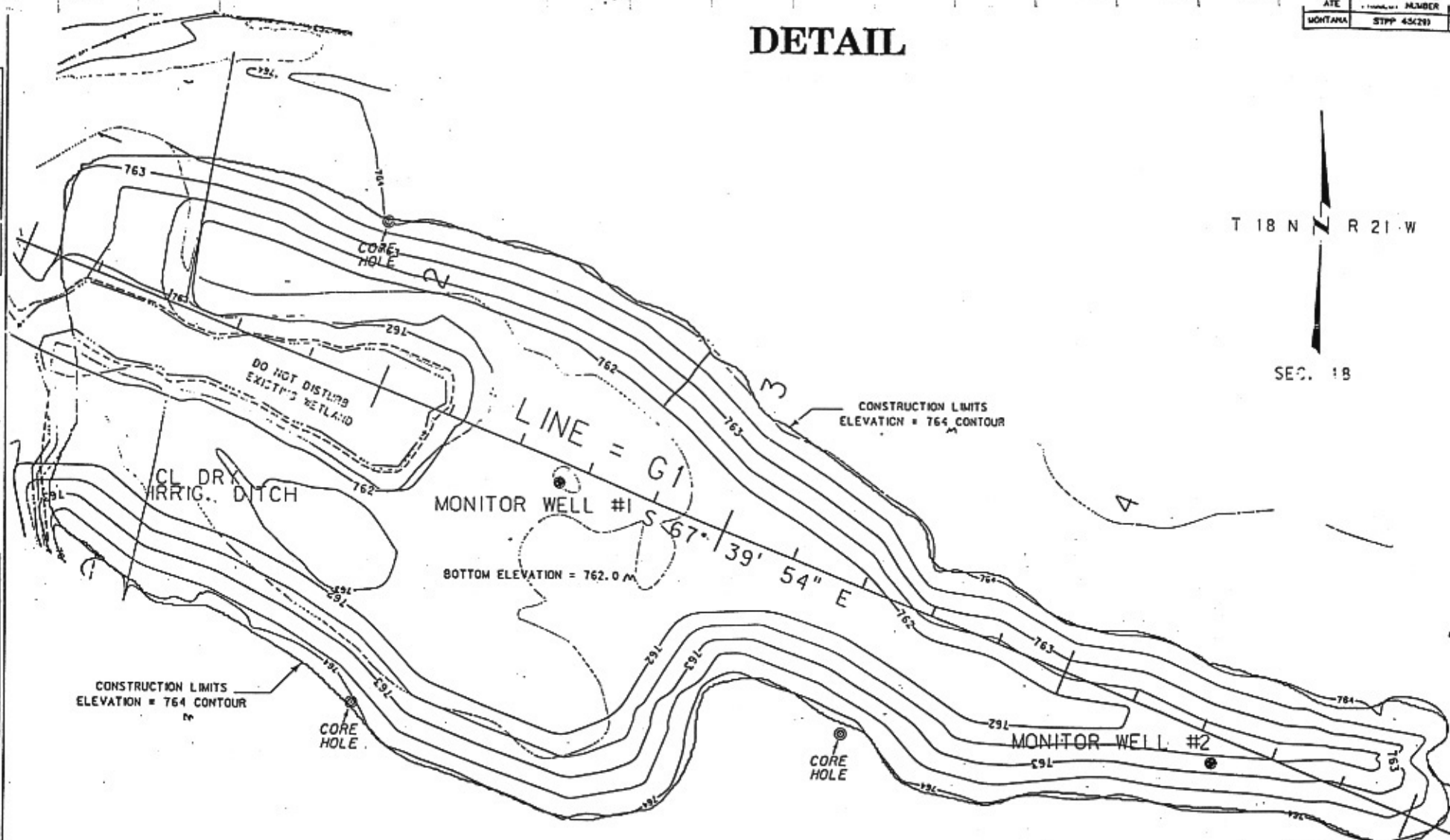


DETAIL

DATE	NUMBER	SHEET NO.
MONTANA	STPP 454291	10

T 18 N R 21 W

SEC. 18



LINE = G1
MONITOR WELL #1

BOTTOM ELEVATION = 762.0 M

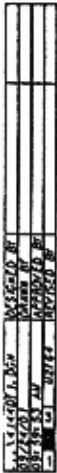
CONSTRUCTION LIMITS
ELEVATION = 764 CONTOUR

CONSTRUCTION LIMITS
ELEVATION = 764 CONTOUR

MONITOR WELL #2

GRADING PLAN
WETLAND POOL
PRELIMINARY

MTANA	45(22)
-------	--------



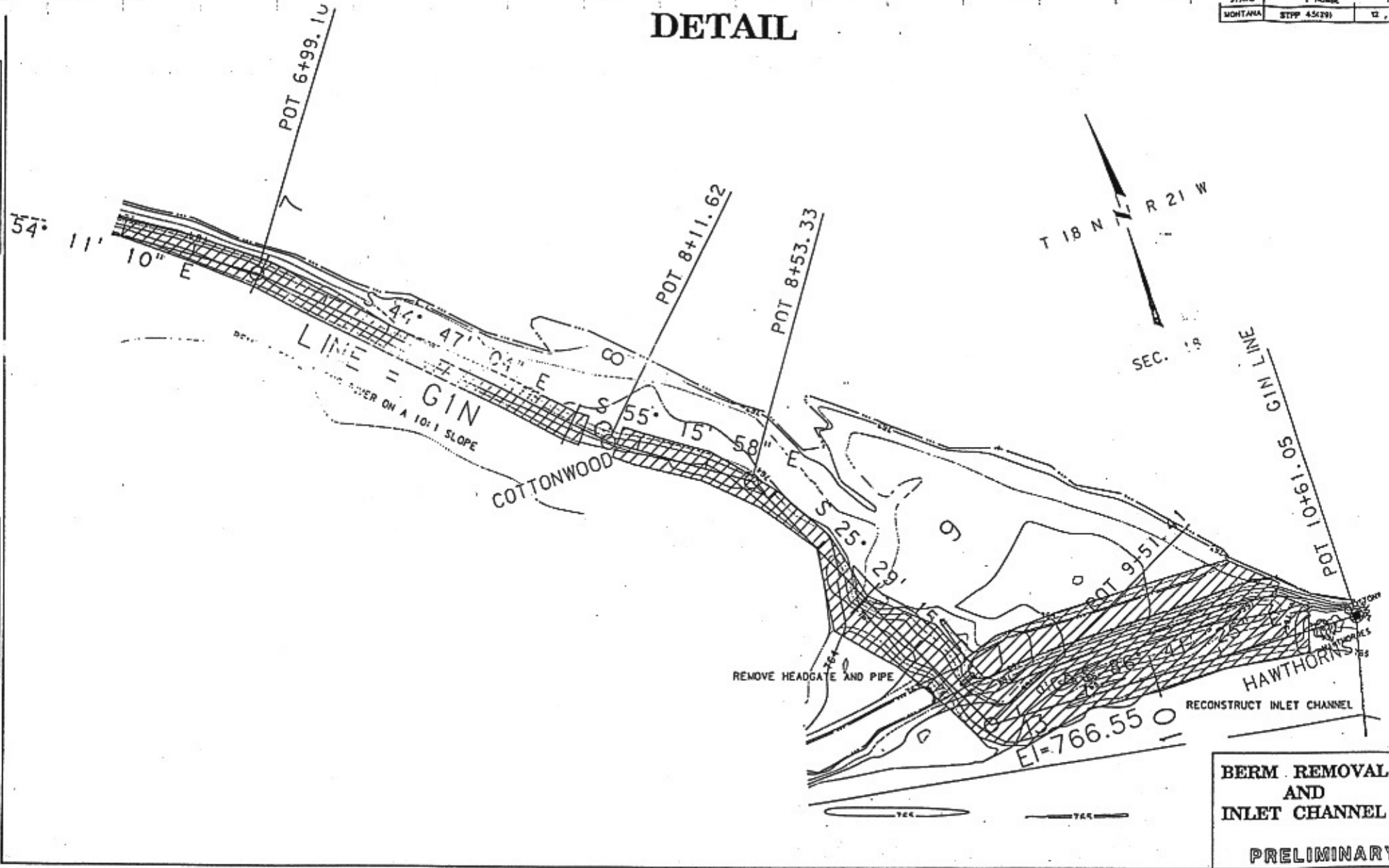
12
765.27

Waste Room
Join to water Area

BERM REMOVAL

PRELIMINARY

STATE	F NUMBER	
MONTANA	STPP 45629)	12 ,



DETAIL

STATE	NAME
MONTANA	STPP 45C293

T 18 N R 21 W

SEC. 18

POT 2+10.85

POT 3+28.36

POT 4+14.01

POT 5+24.13

LINE = GIS

15
EL=764.75

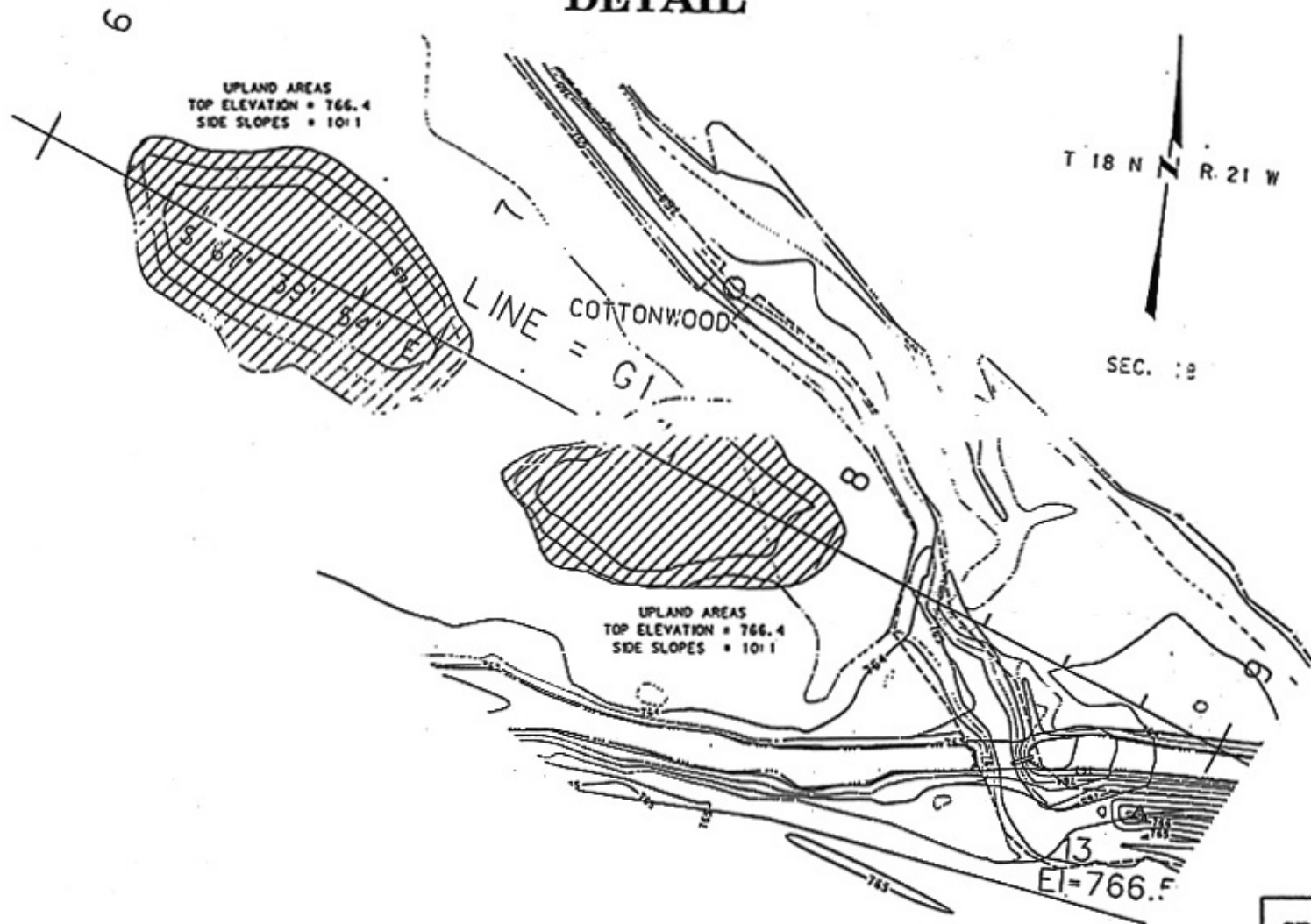
REMOVE BERM ALONG EXISTING CHANNEL ON A 10:1 SLOPE

GRADING PLAN
EXISTING
CHANNEL

PRELIMINARY

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPP 45420	34

DETAIL



GRADING PLAN
UPLAND AREAS

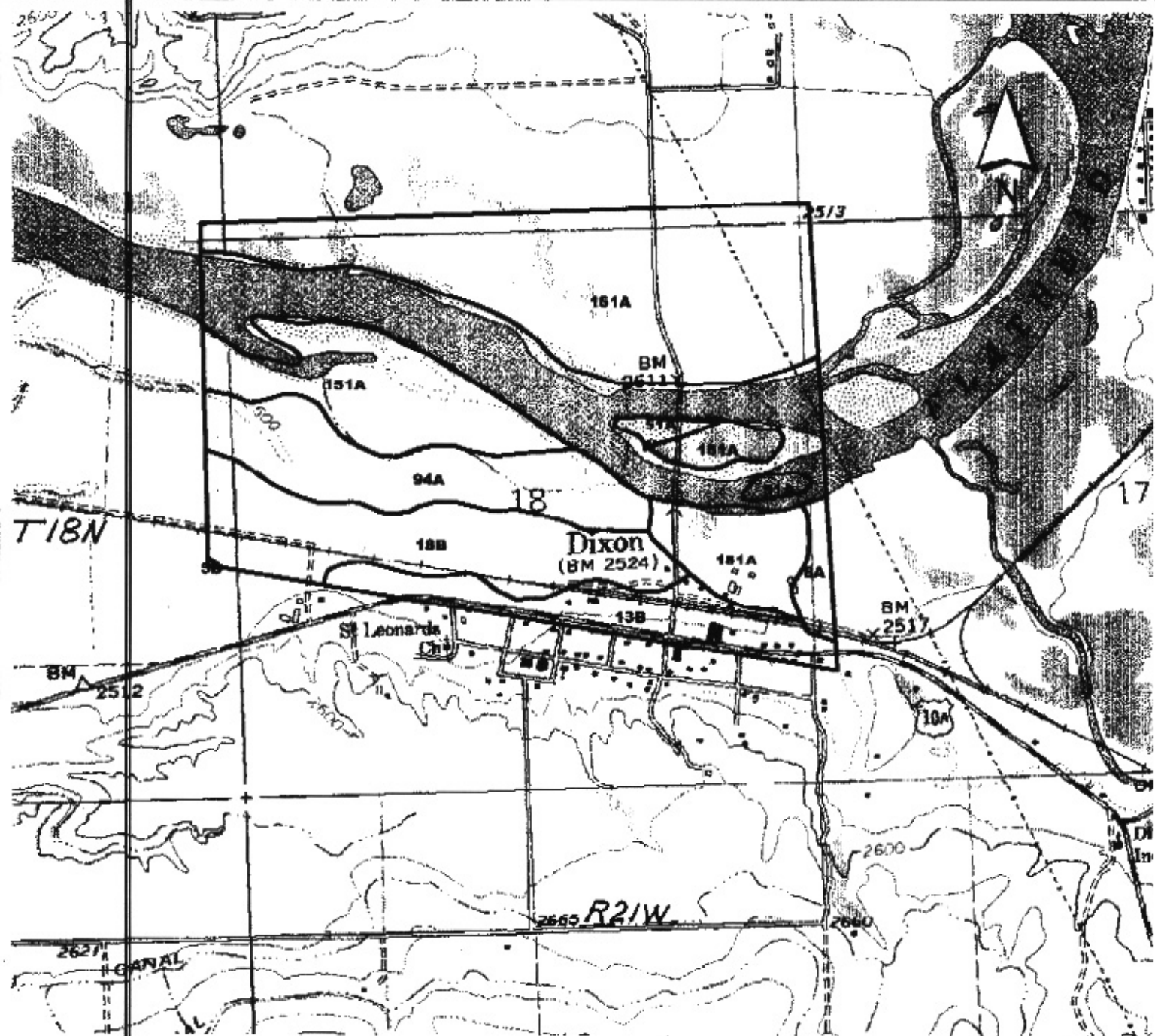
PRELIMINARY

Soils Map

Land and Water Consulting

ESCD

Date: 11/27/2002

Plains Service Center
NRCS
Don J. FeistTo: Greg Howard
From: Don Feist

Legend



Scale 1:15840 (4" = 1 mile)



Non-Technical Descriptions

Sanders And Parts Of Lincoln And Flathead Counties, Montana

Only those map units that have entries for the selected non-technical description categories are included in this report.

Map Unit: 8A - Hewolf gravelly loam, 0 to 2 percent slopes

Description Category: SOI

HEWOLF GRAVELLY LOAM IS MORE THAN 60 INCHES DEEP WITH A DARK COLORED SURFACE LAYER AND SLOPES OF 0-2 PERCENT. LANDFORM: STREAM TERRACES; FROST FREE DAYS: 90-110; AVAILABLE WATER CAPACITY IN INCHES: 2.1-3.4; MAJOR CONSIDERATIONS: FLOODING, WATER TABLE; LANDUSE MAY INCLUDE: RANGELAND.

Map Unit: 13B - Round butte silty clay loam, 2 to 8 percent slopes

Description Category: SOI

ROUND BUTTE SILTY CLAY LOAM IS MORE THAN 60 INCHES DEEP WITH A LIGHTER COLORED SURFACE LAYER AND SLOPES OF 2-8 PERCENT. LANDFORM: LAKE PLAINS OR TERRACES; FROST FREE DAYS: 105-125; AVAILABLE WATER CAPACITY IN INCHES: 4.8-6.7; MAJOR CONSIDERATIONS: SODICITY; LANDUSE MAY INCLUDE: RANGELAND.

Map Unit: 18B - Dryfork silt loam, 0 to 4 percent slopes

Description Category: SOI

DRYFORK SILT LOAM IS MORE THAN 60 INCHES DEEP WITH A LIGHTER COLORED SURFACE LAYER AND SLOPES OF 0-4 PERCENT. LANDFORM: LAKE PLAINS OR TERRACES; FROST FREE DAYS: 105-125; AVAILABLE WATER CAPACITY IN INCHES: 9.1-11.5; MAJOR CONSIDERATIONS: SODICITY; LANDUSE MAY INCLUDE: CROPLAND, RANGELAND.

Map Unit: 51A - Horseplains-riverwash complex, 0 to 2 percent slopes

Description Category: SOI

RIVERWASH (NO DATA)

Description Category: SOI

HORSEPLAINS FINE SANDY LOAM IS MORE THAN 60 INCHES DEEP WITH A LIGHTER COLORED SURFACE LAYER AND SLOPES OF 0-2 PERCENT. LANDFORM: FLOOD PLAINS; FROST FREE DAYS: 105-120; AVAILABLE WATER CAPACITY IN INCHES: 4.0-5.7; MAJOR CONSIDERATIONS: FLOODING; LANDUSE MAY INCLUDE: CROPLAND, WOODLAND.

Map Unit: 94A - Revals silt loam, 0 to 2 percent slopes

Description Category: SOI

REVALS SILT LOAM IS MORE THAN 60 INCHES DEEP WITH A LIGHTER COLORED SURFACE LAYER AND SLOPES OF 0-2 PERCENT. LANDFORM: FLOOD PLAINS; FROST FREE DAYS: 105-125; AVAILABLE WATER CAPACITY IN INCHES: 9.1-11.5; MAJOR CONSIDERATIONS: FLOODING; LANDUSE MAY INCLUDE: CROPLAND, WOODLAND.

Non-Technical Descriptions - Continued

Sanders And Parts Of Lincoln And Flathead Counties, Montana

Map Unit: 151A - Revais silt loam, gravelly substratum, 0 to 2 percent slopes

Description Category: SOI

REVAIS SILT LOAM IS MORE THAN 60 INCHES DEEP WITH A LIGHTER COLORED SURFACE LAYER AND SLOPES OF 0-2 PERCENT. LANDFORM: FLOOD PLAINS; FROST FREE DAYS: 95-115; AVAILABLE WATER CAPACITY IN INCHES: 6.7-9.8; MAJOR CONSIDERATIONS: FLOODING; LANDUSE MAY INCLUDE: CROPLAND, WOODLAND.

Appendix E

BIRD SURVEY PROTOCOL GPS PROTOCOL

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

BIRD SURVEY PROTOCOL

The following is an outline of the MDT Wetland Mitigation Site Monitoring Bird Survey Protocol. Though each site is vastly different, the bird survey data collection methods must be standardized to a certain degree to increase repeatability. An Area Search within a restricted time frame will be used to collect the following data: a bird species list, density, behavior, and habitat-type use. There will be some decisions that team members must make to fit the protocol to their particular site. Each of the following sections and the desired result describes the protocol established to reflect bird species use over time.

Species Use within the Mitigation Wetland: Survey Method

Result: To conduct a bird survey of the wetland mitigation site within a restricted period of time and the budget allotment.

Sites that can be circumambulated or walked throughout.

These types of sites will include ponds, enhanced historic river channels, wet meadows, and any area that can be surveyed from the entirety of its perimeter or walked throughout. If the wetland is not uncomfortably inundated, conduct several “meandering” transects through the site in an orderly fashion (record the number and approximate location/direction of the transects in the field notebook; they do not have to be formalized or staked). If a very small portion of the site cannot be crossed due to inundation, this method will also apply. Though the sizes of the site vary, each site will require surveying to the fullest extent possible within a set time limit. The optimum times to conduct the survey are in the morning hours. Conduct the survey from sunrise to no later than 11:00 AM. (Note: some sites may have to be surveyed in the late afternoon or evening due to time constraints or weather; if this is the case, record the time of day and include this information in your report discussion.) If the survey is completed before 11:00 AM and no additions are being made to the list, then the task is complete. The overall limiting factor regarding the number of hours that are spent conducting this survey is the number of budgeted hours; this determination must be made by site by each individual.

In many cases, binoculars will be the only instrument that is needed to identify and count the birds using the wetland. If the wetland includes deep water habitat that can not be assessed with binoculars, then a scope and tripod are necessary. If this is the case, establish as many lookout posts as necessary from key vantage points to collect the data. Depending on the size of the open water, more time may be spent viewing the mitigation area from these vantage points than is spent walking the peripheries of more shallow-water wetlands.

Sites that cannot be circumambulated.

These types of sites will include large-bodied waters, such as reservoirs, particularly those with deep water habitat (>6 ft) close to the shore and no wetland development in that area of the shoreline. If one area of the reservoir was graded in such a way to create or enhance the development of a wetland, then that will be the area in which the ambulatory bird survey is conducted. The team member must then determine the length of the shoreline that will be surveyed during each visit.



As stated above in the ambulatory site section, these large sites most likely will have to be surveyed from established vantage points.

Species Use within the Mitigation Wetland: Data Recording

Result: A complete list of bird species using the site, an estimate of bird densities and associated behaviors, and identification of habitat use.

1. Bird Species List

Record the bird species on the Bird Survey - Field Data Sheet using the appropriate 4-letter code of the common name. The coding uses the first two letters of the first two words of the birds' common name or if one name, the first four (4) letters. For example, mourning dove is coded MODO and mallard is MALL. If an unknown individual is observed, use the following protocol and define your abbreviation at the bottom of the field data sheet: unknown shorebird: UNSB; unknown brown bird (UNBR); unknown warbler (UNWA); unknown waterfowl (UNWF). For a flyover of a flock of unknown species, use a term that describes the birds' general characteristics and include the approximate flock size in parentheses; do not fill in the habitat column. For example, a flock of black, medium-sized birds could be coded: UNBB / FO (25). You may also note on the data sheet if that particular individual is using a constructed nest box.

2. Bird Density

In the office, sum the Bird Survey – Field Data Sheet data by species and by behavior. Record this data in the Bird Summary Table.

3. Bird Behavior

Bird behavior must be identified by what is known. When a species is simply observed, the behavior that it is immediately exhibiting is what is recorded. Only behaviors that have discreet descriptive terms should be used. The following terms are recommended: breeding pair individual (BP); foraging (F); flyover (FO); loafing (L; e.g. sleeping, roosting, floating with head tucked under wing are loafing behaviors); and, nesting (N). If more behaviors are observed that do have a specific descriptive word, use them and we will add it to the protocol; descriptive words or phrases such as “migrating” or “living on site” are unknown behaviors.

4. Bird Species Habitat Use

We are interested in what bird species are using which particular habitat within the mitigation wetlands. This data is easily collected by simply recording what habitat the species was initially observed. Use the following broad category habitat classifications: aquatic bed (AB - rooted floating, floating-leaved, or submergent vegetation); forested (FO); marsh (MA – cattail, bulrush, emergent vegetation, etc. with surface water); open water (OW – primarily unvegetated); scrub-shrub (SS); and upland buffer (UP); wet meadow (WM – sedges, rushes, grasses with little to no surface water). If other categories are observed onsite that are not suggested here, we will make a new category next year.



GPS Mapping and Aerial Photo Referencing Procedure

The wetland boundaries, photograph location points and sampling locations were field located with mapping grade Trimble Geo III GPS units. The data was collected with a minimum of three positions per feature using Course/Acquisition code. The collected data was then transferred to a PC and differentially corrected to the nearest operating Community Base Station. The corrected data was then exported to ACAD drawings in Montana State Plain Coordinates NAD 83 international feet.

The GPS positions collected and processed had a 68% accuracy of 7 feet except in isolated areas of Tasks .008 and .011, where it went to 12 feet. This is within the 1 to 5 meter range listed as the expected accuracy of the mapping grade Trimble GPS.

Aerial reference points were used to position the aerial photographs. This positioning did not remove the distortion inherent in all photos; this imagery is to be used as a visual aide only. The located wetland boundaries were given a final review by the wetland biologist and adjustments were made if necessary.

Any relationship of features located to easement or property lines are not to be construed from these figures. These relationships can only be determined with a survey by a licensed surveyor.



Appendix F

MACROINVERTEBRATE SAMPLING PROTOCOL AND DATA

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

AQUATIC INVERTEBRATE SAMPLING PROTOCOL

Equipment List

- D-frame sampling net with 1 mm mesh. Wildco is a good source of these.
- Spare net.
- 1-liter plastic sample jars, wide-mouth. VWR has these: catalog #36319-707.
- 95% ethanol: Northwest Scientific in Billings carries this.

All these other things are generally available at hardware or sporting goods stores. Make the labels on an ink jet printer preferably.

- hip waders.
- pre-printed sample labels (printed on Rite-in-the-Rain or other coated paper, two labels per sample).
- pencil.
- plastic pail (3 or 5 gallon).
- large tea strainer or framed screen.
- towel.
- tape for affixing label to jar.
- cooler with ice for sample storage.

Site Selection

Select the sampling site with these considerations in mind:

- Select a site accessible with hip waders. If substrates are too soft, lay a wide board down to walk on.
- Determine a location that is representative of the overall condition of the wetland.

Sampling

Wetland invertebrates inhabit the substrate, the water column, the stems and leaves of aquatic vegetation, and the water surface. Your goal is to sweep the collecting net through each of these habitat types, and then to combine the resulting samples into the 1-liter sample jar.

Dip out about a gallon of water into the pail. Pour about a cup of ethanol into the sample jar. Fill out the top half of the sample labels, using pencil, since ink will dissolve in the ethanol.

Ideally, you can sample a swath of water column from near-shore outward to a depth of approximately 3 feet with a long sweep of the net, keeping the net at about half the depth of the water throughout the sweep. Sweep the water surface as well. Pull the net through a vegetated area, beneath the water surface, for at least a meter of distance.

Sample the substrate by pulling the net along the bottom, bumping it against the substrate several times as you pull.

This step is optional, but it gives you a chance to see that you've collected some invertebrates. Rinse the net out into the bucket, and look for insects, crustaceans, etc. If necessary, repeat the sampling process in a nearby location, and add the net contents to the bucket. Remember to sample all four environments.

Sieve the contents of the bucket through the straining device and pour or carefully scrape the contents of the strainer into the sample jar.

If you skip the bucket-and-sieve steps, simply lift handfuls of material out of the sampling net into the jars. In either case, please include some muck or mud and some vegetation in the jar. Often, you will have collected a large amount of vegetable material. If this is the case, lift out handfuls of material from the sieve into the jar, until the jar is about half full. Please limit material you include in the sample, so that there is only a single jar for each sample.

Top off the sample jar with enough ethanol to cover all the material in the jar. Leave as little headroom as possible.

It is not necessary to sample habitats in any specified order. Keep in mind that disturbing the habitats prior to sampling will chase off the animals you are trying to capture.

Complete the sample labels. Place one label inside the sample jar and tape the other label securely to the outside of the jar. Dry the jar before attaching the outer label if necessary. In some situations, it may be necessary to collect more than one sample at a site. If you take multiple samples from the same site, clearly indicate this by using individual sample numbers, along with the total number of samples collected at the site (e.g. Sample #3 of 5 total samples).

Photograph the sampled site.

Sample Handling/Shipping

- In the field, keep collected samples cool by storing them in a cooler. Only a small amount of ice is necessary.
- Inventory all samples, preparing a list of all sites and enumerating all samples, before shipping or delivering to the laboratory.
- Deliver samples to Rhithron.

MDT Mitigated Wetland Monitoring Project

Aquatic Invertebrate Monitoring Summary 2001 - 2005

METHODS

Among other monitoring activities, aquatic invertebrate assemblages were collected at a number of mitigated wetlands throughout Montana. This report summarizes data generated from five years of collection. In 2001, 29 sites were sampled statewide. Nineteen of these sites were revisited in 2002, and 13 new sites were sampled. In 2003, 17 sites that had been visited in both 2001 and 2002 were re-sampled, and 11 sites sampled for the first time in 2001 were re-visited. In addition, 2 new sites were sampled. In 2004, 25 sites were re-visited, and 6 new sites were sampled. In 2005, an additional 2 sites were added. Over all years of sampling, a total of 151 sites were sampled for invertebrates. Table 2 summarizes sites and sampling years.

The method employed to assess these wetlands is based on an index incorporating a battery of 12 bioassessment metrics or attributes (Table 1) tested and recommended by Stribling et al. (1995) in a report to the Montana Department of Health and Environmental Science. In that study, it was determined that some of the metrics were of limited use in some geographic regions, and for some wetland types. Despite that finding, all 12 metrics are used in this evaluation of mitigated wetlands, since detailed geographic information and wetland classifications were unavailable.

Scoring criteria for metrics were developed by generally following the tactic used by Stribling et al. Boxplots were generated using a statistical software package (Statistica), and distributions, median values, ranges, and quartiles for each metric were examined. All sites in all years of sampling were used. Camp Creek, which was sampled in 2002, 2003, 2004, and 2005, and Kleinschmidt Creek, sampled in 2003, 2004, and 2005, were assessed using the tested metric battery developed for montane streams of Western Montana (Bollman 1998). Invertebrate assemblages at these sites were different from that of the other sites, and suggested montane or foothill stream conditions rather than wetland conditions. For the wetland sites, "optimal" scores were generally those that fell above the 75th percentile (for those metrics that decrease in value in response to stress) or below the 25th percentile (for metrics that respond to stress by an increase in value) of all scores. Additional scoring ranges were established by bisecting the range below the 75th percentile for decreasing scores (or above the 25th percentile for increasing scores) into "sub-optimal" and "poor" assessment categories. A score of 5, 3, or 1 was assigned to optimal, sub-optimal, and poor metric performance, respectively. In this way, metric values were translated into normalized metric scores, and scores for all metrics were summed to produce a total bioassessment score. Total bioassessment scores were classified according to a similar process, using the ranges and distributions of total scores for all sites studied in all years.

The purpose of constructing an index from biological attributes or metrics is to provide a means of integrating information to facilitate the determination of whether management action is needed. The nature of the action needed is not determined solely by the index score, however, but by consideration of an analysis of the component metrics, the taxonomic composition of the assemblages, and other issues. The diagnostic functions of the metrics and taxonomic data need more study; our understanding of the interrelationships of natural environmental factors and anthropogenic disturbances are tentative. Thus, the further interpretive remarks accompanying the raw taxonomic and metric data are offered cautiously.

Table 1. Montana Department of Transportation Mitigated Wetlands Monitoring Project sites, 2001 – 2005.

2001	2002	2003	2004	2005
Beaverhead 1	Beaverhead 1	Beaverhead 1	Beaverhead 1	Beaverhead 1
Beaverhead 2	Beaverhead 2			
Beaverhead 3	Beaverhead 3		Beaverhead 3	Beaverhead 3
Beaverhead 4	Beaverhead 4	Beaverhead 4		
Beaverhead 5	Beaverhead 5	Beaverhead 5	Beaverhead 5	Beaverhead 5
Beaverhead 6	Beaverhead 6	Beaverhead 6	Beaverhead 6	Beaverhead 6
Big Sandy 1				
Big Sandy 2				
Big Sandy 3				
Big Sandy 4				
Johnson-Valier				
VIDA				
Cow Coulee	Cow Coulee	Cow Coulee		
Fourchette – Puffin	Fourchette - Puffin	Fourchette - Puffin	Fourchette - Puffin	
Fourchette – Flashlight	Fourchette – Flashlight	Fourchette – Flashlight	Fourchette – Flashlight	
Fourchette – Penguin	Fourchette – Penguin	Fourchette – Penguin	Fourchette – Penguin	
Fourchette – Albatross	Fourchette – Albatross	Fourchette – Albatross	Fourchette – Albatross	
Big Spring	Big Spring	Big Spring	Big Spring	Big Spring
Vince Ames				
Ryegate				
Lavinia				
Stillwater	Stillwater	Stillwater	Stillwater	Stillwater
Roundup	Roundup	Roundup	Roundup	Roundup
Wigeon	Wigeon	Wigeon	Wigeon	Wigeon
Ridgeway	Ridgeway	Ridgeway	Ridgeway	Ridgeway
Musgrave – Rest. 1	Musgrave – Rest. 1	Musgrave – Rest. 1	Musgrave – Rest. 1	Musgrave – Rest. 1
Musgrave – Rest. 2	Musgrave – Rest. 2	Musgrave – Rest. 2	Musgrave – Rest. 2	Musgrave – Rest. 2
Musgrave – Enh. 1	Musgrave – Enh. 1	Musgrave – Enh. 1	Musgrave – Enh. 1	Musgrave – Enh. 1
Musgrave – Enh. 2				
	Hoskins Landing	Hoskins Landing	Hoskins Landing	Hoskins Landing
	Peterson - 1	Peterson – 1	Peterson – 1	Peterson – 1
	Peterson – 2		Peterson – 2	Peterson – 2
	Peterson – 4	Peterson – 4	Peterson – 4	Peterson – 4
	Peterson – 5	Peterson – 5	Peterson – 5	Peterson – 5
	Jack Johnson - main	Jack Johnson - main		
	Jack Johnson - SW	Jack Johnson - SW		
	Creston	Creston	Creston	Creston
	Lawrence Park			
	Perry Ranch			Perry Ranch
	SF Smith River	SF Smith River	SF Smith River	SF Smith River
	Camp Creek	Camp Creek	Camp Creek	Camp Creek
	Kleinschmidt	Kleinschmidt – pond	Kleinschmidt – pond	Kleinschmidt – pond
		Kleinschmidt – stream	Kleinschmidt – stream	Kleinschmidt – stream
		Ringling - Galt		
			Circle	
			Cloud Ranch Pond	Cloud Ranch Pond
			Cloud Ranch Stream	
			Colloid	Colloid
			Jack Creek	Jack Creek
			Norem	Norem
				Rock Creek Ranch
				Wagner Marsh

Sample Processing

Aquatic invertebrate samples were collected at mitigation wetland sites in the summer months of 2001, 2002, 2003, 2004, and 2005 by personnel of Land and Water Consulting, Inc. Sampling procedures utilized were based on the protocols developed by the Montana Department of Environmental Quality (MT DEQ). Sampling consisted of D-frame net sweeps through emergent vegetation (when present), the water column, over the water surface, and included disturbing and scraping substrates at each sampled sites. Samples were preserved in ethanol at each wetland site and subsequently delivered to Rhithron Associates, Inc. for processing, taxonomic determinations, and data analysis.

At Rhithron's laboratory, Caton subsamplers and stereomicroscopes with 10X magnification were used to randomly select a minimum of 100 organisms, when possible, from each sample. In some cases, the entire sample contained fewer than 100 organisms; in these cases, all organisms from the sample were taken. Taxa were identified in general accordance with the taxonomic resolution standards set out in the MT DEQ Standard Operating Procedures for Sampling and Sample Analysis (Bukantis 1998). All samples were re-identified by a second taxonomist for quality assurance purposes. The identified samples have been archived at Rhithron's laboratory. Taxonomic data and organism counts were entered into an Excel 2000 spreadsheet, and metrics were calculated and scored using spreadsheet formulae.

Bioassessment Metrics

An index based on the performance of 12 metrics was constructed, as described above. Table 2 lists those metrics, describes their calculation and the expected response of each to increased degradation or impairment of the wetland.

In addition to the summed scores of each metric and the associated impairment classification described above, each individual metric informs the bioassessment to some degree. The four richness metrics (Total taxa, POET, Chironomidae taxa, and Crustacea taxa + Mollusca taxa) can be interpreted to express habitat complexity as well as water quality. Complex, diverse habitats consist of variable substrates, emergent vegetation, variable water depths and other factors, and are potential features of long-established stable wetlands with minimal human disturbance. In the study conducted by Stribling et al. (1995), all four richness metrics were found to be significantly associated with water quality parameters including conductance, salinity, and total dissolved solids.

Four composition metrics (%Chironomidae, %Orthocladiinae of Chironomidae, %Crustacea + %Mollusca, and %Amphipoda) measure the relative contributions of certain taxonomic groups that may have significant responses to habitat and/or water quality impacts. For example, amphipods have been demonstrated to increase in abundance in alkaline conditions. Short-lived, relatively mobile taxa such as chironomids dominate ephemeral environments; many are hemoglobin-bearers capable of tolerating de-oxygenated conditions.

Two tolerance metrics (the Hilsenhoff Biotic Index and %Dominant taxon) were included in the bioassessment battery. The HBI indicates the overall invertebrate assemblage tolerance to nutrient enrichment, warm water, and/or low dissolved oxygen conditions. The percent abundance of the dominant taxon has been demonstrated to be strongly associated with pH, conductance, salinity, total organic carbon, and total dissolved solids.

Two trophic measures (%Collector-gatherers and %Filterers) may be helpful in expressing functional integrity of the invertebrate assemblage, which can be impacted by poor water quality or habitat degradation. High proportions of filtering organisms suggest nutrient and/or organic enrichment, while abundant collectors suggest more positive functional conditions and well-developed wetland morphology. These organisms graze periphyton growing on stable surfaces such as macrophytes.

Metric scoring criteria were re-examined each year as new data was added. For 2005, all 151 records were utilized. Ranges of individual metrics, as well as median metric values remained remarkably consistent over all 5 years of analysis. Since metric value distributions changed insignificantly with the addition of the 2005 data, no changes were made to scoring criteria this year. Summary metric values and scores for the 2005 samples are given in Tables 3a-3d.

Table 2. Aquatic invertebrate metrics employed in the MTDT mitigation wetland monitoring study, 2001-2005.

Metric	Metric calculation	Expected response to degradation or impairment
Total taxa	Count of unique taxa identified to lowest recommended taxonomic level	Decrease
POET	Count of unique Plecoptera, Trichoptera, Ephemeroptera, and Odonata taxa identified to lowest recommended taxonomic level	Decrease
Chironomidae taxa	Count of unique midge taxa identified to lowest recommended taxonomic level	Decrease
Crustacea taxa + Mollusca taxa	Count of unique Crustacea taxa and Mollusca taxa identified to lowest recommended taxonomic level	Decrease
% Chironomidae	Percent abundance of midges in the subsample	Increase
Orthocladiinae/Chironomidae	Number of individual midges in the sub-family Orthocladiinae / total number of midges in the subsample.	Decrease
% Amphipoda	Percent abundance of amphipods in the subsample	Increase
% Crustacea + % Mollusca	Percent abundance of crustaceans in the subsample plus percent abundance of molluscs in the subsample	Increase
HBI	Relative abundance of each taxon multiplied times that taxon's modified Hilsenhoff Biotic Index value. These numbers are summed over all taxa in the subsample.	Increase
% Dominant taxon	Percent abundance of the most abundant taxon in the subsample	Increase
% Collector-Gatherers	Percent abundance of organisms in the collector-gatherer functional group	Decrease
% Filterers	Percent abundance of organisms in the filterer functional group	Increase

RESULTS

(Note: Individual site discussions were removed from this report by Land & Water Consulting / PBS&J and are included in the Macro-Invertebrate sections of individual reports. Summary tables are provided on the following pages.)

Table 3a. Metric values and scores for Montana Department of Transportation mitigated wetland sites in 2005.

	BEAVERHEAD #1	BEAVERHEAD #3	BEAVERHEAD #5	BEAVERHEAD #6	BIG SPRING CREEK	STILLWATER	ROUNDUP	WIDGEON
Total taxa	22	9	14	18	28	17	7	19
POET	2	0	0	2	4	4	0	0
Chironomidae taxa	7	4	4	4	9	5	3	11
Crustacea + Mollusca	4	3	1	4	7	5	2	4
% Chironomidae	59.80%	7.55%	50.00%	16.67%	33.65%	9.43%	22.22%	76.47%
Orthoclaadiinae/Chir	0.197	0.625	0.059	0.067	0.457	0.500	0.000	0.205
% Amphipoda	1.96%	0.94%	0.00%	1.11%	18.27%	7.55%	0.00%	10.78%
% Crustacea + % Mollusca	10.78%	90.57%	2.94%	55.56%	33.65%	53.77%	72.65%	15.69%
HBI	7.71	7.88	7.88	7.98	7.55	7.28	8.33	8.25
% Dominant taxon	34.31%	76.42%	35.29%	25.56%	18.27%	33.02%	71.79%	44.12%
% Collector-Gatherers	56.86%	93.40%	47.06%	21.11%	70.19%	64.15%	82.05%	26.47%
% Filterers	0.00%	0.00%	0.00%	0.00%	0.96%	3.77%	0.00%	6.86%
Total taxa	5	1	1	3	5	3	1	3
POET	1	1	1	1	5	5	1	1
Chironomidae taxa	5	3	3	3	5	3	3	5
Crustacea + Mollusca	3	1	1	3	5	3	1	3
% Chironomidae	1	5	1	5	3	5	3	1
Orthoclaadiinae/Chir	3	5	1	1	5	5	1	3
% Amphipoda	5	5	5	5	3	3	5	3
% Crustacea + % Mollusca	5	1	5	3	3	3	1	5
HBI	1	1	1	1	3	3	1	1
% Dominant taxon	3	1	3	5	5	5	1	3
% Collector-Gatherers	3	5	3	1	3	3	5	1
% Filterers	3	3	3	3	3	3	3	1
Total score	38	32	28	34	48	44	26	30
Percent of maximum score	0.633333	0.533333	0.466667	0.566667	0.8	0.733333	0.433333	0.5
Impairment classification	sub-optimal	poor	poor	sub-optimal	optimal	optimal	poor	poor

Table 3b. Metric values and scores for Montana Department of Transportation mitigated wetland sites in 2005.

	RIDGEWAY	MUSGRAVE REST. 1	MUSGRAVE REST. 2	MUSGRAVE ENH. 1	HOSKINS LANDING	PETERSON RANCH 1	PETERSON RANCH 2	PETERSON RANCH 4	PETERSON RANCH 5
Total taxa	19	19	23	19	27	29	16	25	16
POET	3	1	3	1	5	4	2	4	4
Chironomidae taxa	6	6	8	3	6	11	6	8	7
Crustacea + Mollusca	5	5	3	7	6	6	5	6	2
% Chironomidae	9.26%	14.55%	22.00%	2.80%	17.58%	17.48%	13.91%	24.55%	16.96%
Orthoclaadiinae/Chir	0.600	0.750	0.136	0.667	0.188	0.556	0.563	0.630	0.632
% Amphipoda	6.48%	3.64%	0.00%	0.93%	0.00%	0.97%	7.83%	1.82%	8.04%
% Crustacea + % Mollusca	22.22%	30.91%	38.00%	58.88%	27.47%	31.07%	72.17%	20.00%	8.93%
HBI	7.71	7.22	7.77	7.16	6.81	7.16	7.43	7.65	8.08
% Dominant taxon	53.70%	21.82%	35.00%	28.04%	14.29%	26.21%	33.04%	18.18%	31.25%
% Collector-Gatherers	68.52%	40.00%	15.00%	11.21%	31.87%	59.22%	28.70%	43.64%	68.75%
% Filterers	0.00%	0.00%	0.00%	2.80%	0.00%	4.85%	33.91%	5.45%	1.79%
Total taxa	3	3	5	3	5	5	3	5	3
POET	3	1	3	1	5	5	1	5	5
Chironomidae taxa	3	3	5	3	3	5	3	5	5
Crustacea + Mollusca	3	3	1	5	5	5	3	5	1
% Chironomidae	5	5	3	5	5	5	5	3	5
Orthoclaadiinae/Chir	5	5	1	5	3	5	5	5	5
% Amphipoda	3	5	5	5	5	5	3	5	3
% Crustacea + % Mollusca	5	5	3	3	5	5	1	5	5
HBI	1	3	1	3	5	3	3	1	1
% Dominant taxon	1	5	3	5	5	5	5	5	5
% Collector-Gatherers	3	1	1	1	1	3	1	1	3
% Filterers	3	3	3	3	3	3	1	3	3
Total score	38	42	34	42	50	54	34	48	44
Percent of maximum score	0.633333	0.7	0.566667	0.7	0.833333	0.9	0.566667	0.8	0.733333
Impairment classification	sub-optimal	optimal	sub-optimal	optimal	optimal	optimal	sub-optimal	optimal	optimal

Table 3c. Metric values and scores for Montana Department of Transportation mitigated wetland sites in 2005.

	CRESTON	PERRY RANCH	SOUTH FORK SMITH RIVER	CAMP CREEK	KLEINSCH MIDT POND	KLEINSCH MIDT STREAM	CLOUD RANCH POND	COLLOID	JACK CREEK
Total taxa	16	18	19	36	27	23	22	9	16
POET	0	0	4	14	6	5	2	1	1
Chironomidae taxa	4	8	6	13	6	9	11	4	9
Crustacea + Mollusca	6	4	5	0	2	3	3	1	4
% Chironomidae	27.62%	43.69%	21.67%	45.54%	8.85%	45.08%	37.50%	25.83%	29.41%
Orthoclaadiinae/Chir	0.931	0.622	0.192	0.804	0.200	0.473	0.256	0.000	0.467
% Amphipoda	0.00%	0.00%	29.17%	0.00%	5.31%	0.82%	0.00%	0.00%	0.98%
% Crustacea + % Mollusca	52.38%	38.83%	62.50%	0.00%	7.96%	3.28%	7.69%	67.50%	41.18%
HBI	7.52	7.31	7.54	5.06	7.40	5.83	6.96	8.53	7.39
% Dominant taxon	25.71%	25.24%	29.17%	18.81%	30.09%	32.79%	41.35%	67.50%	35.29%
% Collector-Gatherers	64.76%	47.57%	65.00%	47.52%	37.17%	50.82%	75.96%	88.33%	91.18%
% Filterers	6.67%	27.18%	8.33%	5.94%	0.88%	2.46%	2.88%	0.00%	2.94%
Total taxa	3	3	3	5	5	5	5	1	3
POET	1	1	5	5	5	5	1	1	1
Chironomidae taxa	3	5	3	5	3	5	5	3	5
Crustacea + Mollusca	5	3	3	1	1	1	1	1	3
% Chironomidae	3	1	3	1	5	1	3	3	3
Orthoclaadiinae/Chir	5	5	3	5	3	5	3	1	1
% Amphipoda	5	5	1	5	3	5	5	5	5
% Crustacea + % Mollusca	3	3	3	5	5	5	5	1	3
HBI	3	3	3	5	3	5	3	1	3
% Dominant taxon	5	5	5	5	5	5	3	1	3
% Collector-Gatherers	3	3	3	3	1	3	3	5	5
% Filterers	1	1	1	3	3	3	3	3	3
Total score	40	38	36	48	42	48	40	26	38
Percent of maximum score	0.666667	0.633333	0.6	0.8	0.7	0.8	0.666667	0.433333	0.633333
Impairment classification	sub-optimal	sub-optimal	sub-optimal	optimal	optimal	optimal	sub-optimal	poor	sub-optimal

Table 3d. Metric values and scores for Montana Department of Transportation mitigated wetland sites in 2005.

	NOREM	ROCK CREEK RANCH	WAGNER MARSH
Total taxa	4	24	23
POET	0	2	5
Chironomidae taxa	2	8	8
Crustacea + Mollusca	2	4	5
% Chironomidae	37.50%	22.00%	24.00%
Orthocladiinae/Chir	0.000	0.318	0.167
% Amphipoda	0.00%	3.00%	7.00%
% Crustacea + % Mollusca	62.50%	40.00%	19.00%
HBI	7.50	7.61	8.58
% Dominant taxon	56.25%	18.00%	38.00%
% Collector-Gatherers	6.25%	57.00%	40.00%
% Filterers	0.00%	0.00%	3.00%
Total taxa	1	5	5
POET	1	1	5
Chironomidae taxa	1	5	5
Crustacea + Mollusca	1	3	3
% Chironomidae	3	3	3
Orthocladiinae/Chir	1	3	1
% Amphipoda	5	5	3
% Crustacea + % Mollusca	3	3	5
HBI	3	1	1
% Dominant taxon	1	5	3
% Collector-Gatherers	1	3	1
% Filterers	3	3	3
Total score	24	40	38
Percent of maximum score	0.4	0.666667	0.633333
Impairment classification	poor	sub-optimal	sub-optimal

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Stribling, J.B., J. Lathrop-Davis, M.T. Barbour, J.S. White, and E.W. Leppo. 1995. Evaluation of environmental indicators for the wetlands of Montana: the multimetric approach using benthic macroinvertebrates. Report to the Montana Department of Health and Environmental Science. Helena, Montana.

Taxa Listing

Project ID: MDT05LW
RAI No.: MDT05LW015

RAI No.: MDT05LW015

Sta. Name: HOSKINS LANDING

Client ID:

Date Coll.: 8/10/2005

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Non-Insect							
Acari	2	2.20%	Yes	Unknown		5	PR
Cambaridae							
Cambaridae	2	2.20%	Yes	Immature	Immature	6	OM
Lymnaeidae							
<i>Radix</i> sp.	3	3.30%	Yes	Unknown		6	SC
Naididae							
Naididae	7	7.69%	Yes	Unknown		8	CG
Physidae							
Physidae	13	14.29%	Yes	Unknown		8	SC
Pisidiidae							
Pisidiidae	1	1.10%	Yes	Unknown		8	CG
Planorbidae							
<i>Helisoma</i> sp.	1	1.10%	Yes	Unknown		6	SC
Planorbidae	5	5.49%	No	Immature	Immature	6	SC
Odonata							
Coenagrionidae							
<i>Enallagma</i> sp.	11	12.09%	Yes	Larva		7	PR
Libellulidae							
<i>Leucorrhinia</i> sp.	1	1.10%	Yes	Larva		9	PR
Ephemeroptera							
Baetidae							
<i>Callibaetis</i> sp.	4	4.40%	Yes	Larva		9	CG
Caenidae							
<i>Caenis</i> sp.	3	3.30%	Yes	Larva		7	CG
Heteroptera							
Belostomatidae							
<i>Belostoma</i> sp.	1	1.10%	Yes	Larva		7	PR
Corixidae							
Corixidae	2	2.20%	Yes	Larva	Larva	10	PH
Nepidae							
<i>Ranatra</i> sp.	1	1.10%	Yes	Adult		11	PR
Notonectidae							
<i>Notonecta</i> sp.	1	1.10%	Yes	Adult		5	PR
Trichoptera							
Leptoceridae							
Leptoceridae	1	1.10%	Yes	Larva	Early Instar	4	CG
Leptoceridae	1	1.10%	No	Pupa	Pupa	4	CG
Coleoptera							
Dytiscidae							
<i>Neoporus</i> sp.	1	1.10%	Yes	Adult		5	PR
Halplidae							
<i>Peltodytes</i> sp.	5	5.49%	Yes	Adult		5	SH
Hydrophilidae							
Hydrophilidae	1	1.10%	Yes	Larva	Larva	5	PR

Monday, November 07, 2005

Taxa Listing

Project ID: MDT05LW
RAI No.: MDT05LW015

RAI No.: MDT05LW015

Sta. Name: HOSKINS LANDING

Client ID:

Date Coll.: 8/10/2005

No. Jars: 1

STORET ID:

Taxonomic Name	Count	PRA	Unique	Stage	Qualifier	BI	Function
Diptera							
Ceratopogonidae							
Ceratopogoninae	8	8.79%	Yes	Pupa	Pupa	6	PR
Chironomidae							
Chironomidae							
<i>Ablabesmyia</i> sp.	1	1.10%	Yes	Larva		8	CG
<i>Apedilum</i> sp.	1	1.10%	Yes	Larva		11	CG
<i>Cricotopus (Isocladius)</i> sp.	3	3.30%	Yes	Larva		7	SH
<i>Paratanytarsus</i> sp.	2	2.20%	Yes	Larva		6	CG
<i>Procladius</i> sp.	1	1.10%	Yes	Larva		9	PR
<i>Pseudochironomus</i> sp.	8	8.79%	Yes	Larva		5	CG
Sample Count	91						

Metrics Report

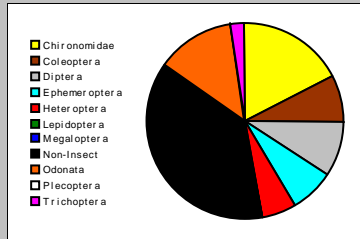
Project ID: MDT05LW
RAI No.: MDT05LW015
Sta. Name: HOSKINS LANDING
Client ID:
STORET ID
Coll. Date: 8/10/2005

Abundance Measures

Sample Count: 91
Sample Abundance: 91.00 100.00% of sample used
Total Abundance: 122.40
Coll. Procedure:
Sample Notes:

Taxonomic Composition

Category	R	A	PRA
Non-Insect	7	34	37.36%
Odonata	2	12	13.19%
Ephemeroptera	2	7	7.69%
Plecoptera			
Heteroptera	4	5	5.49%
Megaloptera			
Trichoptera	1	2	2.20%
Lepidoptera			
Coleoptera	3	7	7.69%
Diptera	1	8	8.79%
Chironomidae	6	16	17.58%

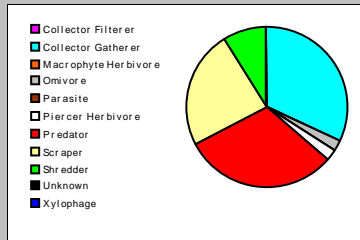


Dominant Taxa

Category	A	PRA
Physidae	13	14.29%
Enallagma	11	12.09%
Pseudochironomus	8	8.79%
Ceratopogoninae	8	8.79%
Naididae	7	7.69%
Planorbidae	5	5.49%
Peltodytes	5	5.49%
Callibaetis	4	4.40%
Radix	3	3.30%
Cricotopus (Isocladius)	3	3.30%
Caenis	3	3.30%
Paratanytarsus	2	2.20%
Leptoceridae	2	2.20%
Corixidae	2	2.20%
Acari	2	2.20%

Functional Composition

Category	R	A	PRA
Predator	10	28	30.77%
Parasite			
Collector Gatherer	9	29	31.87%
Collector Filterer			
Macrophyte Herbivore			
Piercer Herbivore	1	2	2.20%
Xylophage			
Scraper	3	22	24.18%
Shredder	2	8	8.79%
Omnivore	1	2	2.20%
Unknown			

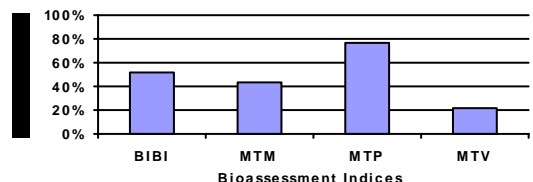


Metric Values and Scores

Metric	Value	BIBI	MTP	MTV	MTM
<i>Composition</i>					
Taxa Richness	26	3	3		2
Non-Insect Percent	37.36%				
E Richness	2	1		1	
P Richness	0	1		0	
T Richness	1	1		0	
EPT Richness	3		1		0
EPT Percent	9.89%		0		0
Oligochaeta+Hirudinea Percent	7.69%				
Baetidae/Ephemeroptera	0.571				
Hydropsychidae/Trichoptera	0.000				
<i>Dominance</i>					
Dominant Taxon Percent	14.29%		3		3
Dominant Taxa (2) Percent	26.37%				
Dominant Taxa (3) Percent	35.16%	5			
Dominant Taxa (10) Percent	73.63%				
<i>Diversity</i>					
Shannon H (loge)	2.847				
Shannon H (log2)	4.107		3		
Margalef D	5.627				
Simpson D	0.067				
Evenness	0.056				
<i>Function</i>					
Predator Richness	10		3		
Predator Percent	30.77%	5			
Filterer Richness	0				
Filterer Percent	0.00%			3	
Collector Percent	31.87%		3		3
Scraper+Shredder Percent	32.97%		3		1
Scraper/Filterer	0.000				
Scraper/Scraper+Filterer	0.000				
<i>Habit</i>					
Burrower Richness	2				
Burrower Percent	17.58%				
Swimmer Richness	4				
Swimmer Percent	13.19%				
Clinger Richness	1	1			
Clinger Percent	3.30%				
<i>Characteristics</i>					
Cold Stenotherm Richness	0				
Cold Stenotherm Percent	0.00%				
Hemoglobin Bearer Richness	6				
Hemoglobin Bearer Percent	19.78%				
Air Breather Richness	3				
Air Breather Percent	3.30%				
<i>Voltinism</i>					
Univoltine Richness	11				
Semivoltine Richness	5	5			
Multivoltine Percent	24.18%		3		
<i>Tolerance</i>					
Sediment Tolerant Richness	0				
Sediment Tolerant Percent	5.49%				
Sediment Sensitive Richness	0				
Sediment Sensitive Percent	0.00%				
Metals Tolerance Index	3.486				
Pollution Sensitive Richness	0				
Pollution Tolerant Percent	35.16%	1			0
Hilsenhoff Biotic Index	6.742		1		0
Intolerant Percent	0.00%				
Supertolerant Percent	32.97%				
CTQa	96.923				

Bioassessment Indices

BioIndex	Description	Score	Pct	Rating
BIBI	B-IBI (Karr et al.)	26	52.00%	
MTP	Montana DEQ Plains (Bukantis 1998)	23	76.67%	Slight
MTV	Montana Revised Valleys/Foothills (Bollman 1998)	4	22.22%	Moderate
MTM	Montana DEQ Mountains (Bukantis 1998)	9	42.86%	Moderate



Appendix G

2003 AND 2004 REVEGETATION AND SURVIVAL DATA

*MDT Wetland Mitigation Monitoring
Hoskins Landing
Dixon, Montana*

RIPARIAN VEGETATION ENHANCEMENT - SURVIVAL DATA FOR SPRING 2004

Hoskins Landing 2004 Planting Ledger

	Container size / Type	Species	Spring 2004 Quantity Planted	Spring Survival	Fall 2004 Quantity Planted
Inlet Channel	Sm Shrub	American Plum	100	93	
Side Channel	Sm Shrub	American plum	100	90	
Upland Islands	Sm Shrub	American plum	100	96	
	Sm Shrub	Chokecherry	100	100	
	Sm Shrub	Hawthorn	100	99	
	Sm Shrub	Serviceberry	100	98	
	Sm Shrub	Rose	100	100	
Wetland	Plug	Hardstem bulrush			1600
	Plug	Nebraska sedge			1440
	Plug	Beaked sedge			1120
	Plug	Bebb's sedge			1120
	Plug	Small-fruited bulrush			800
	Lg Tree	Cottonwood	50	50	
	Lg Shrub	Dogwood	150	150	
	Sm Tree	Aspen	200	183	
	Sm Tree	Cottonwood	100	92	
	Sm Shrub	Dogwood	401	397	
	Sm Shrub	Bebb's Willow	239	218	
	Sm Shrub	Alder	150	142	
	Sm Shrub	Waterbirch	150	144	
	Cutting	Sandbar willow	1000	inundated	
Replacement	Sm	Waterbirch	53	53	
	Sm	Alder	49	49	
	Sm	Aspen	16	16	
	Sm	Cottonwood	42	42	
	Cutting	Bebb's Willow	445	Inundated	
	Cutting	Sandbar Willow	500	Inundated	
Total			4245	2212	6080

RIPARIAN VEGETATION ENHANCEMENT - SURVIVAL DATA FOR SPRING 2003

(Confederated Salish and Kootenai Tribes, November 2003)

Wetland Planting Areas

Created Pond

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	125	41	22	62	50%
Water Birch	175	20	76	79	55%
Aspen	75	9	19	47	37%
Total Trees	375	70	117	188	50%
SHRUBS					
Alder	42	7	5	30	29%
Sandbar willow	100	34	47	19	81%
R O Dogwood	400	111	68	221	45%
Total Shrubs	542	152	120	270	50%

Spring 2003 Cuttings					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	13	4	8	1	92%
Total Trees	13	4	8	1	92%
SHRUBS					
Sandbar willow	119	109	8	2	98%
Total Shrubs	119	109	8	2	98%

Side Channel

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	100	60	27	13	87%
Water Birch	75	15	56	4	95%
Aspen	50	29	7	14	72%
Pine	103	18	26	59	43%
Total Trees	328	122	116	90	73%
SHRUBS					
Alder	50	15	25	10	80%
Sandbar willow	125	60	17	48	62%
R O Dogwood	200	81	82	37	82%
Rose	50	24	15	11	78%
Service berry	25	16	4	5	80%
Total Shrubs	450	196	143	111	75%

Survival Data Continued...

Upland Planting Areas

Upland Islands

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Cottonwood	25	18	2	5	80%
Pine	100	23	29	48	52%
Total Trees	125	41	31	53	58%
SHRUBS					
Juniper	20	6	7	7	65%
Rose	200	136	39	23	88%
Snowberry	100	55	21	24	76%
Service berry	25	5	10	10	60%
Total Shrubs	345	202	77	64	81%

Access Road

Spring 2003 Containers					
Type / Species	# Planted	# Alive	# Poor	# Dead	Survival Rate
TREES					
Pine	100	50	2	48	52%
Total Trees	100	50	2	48	52%
SHRUBS					
Plum	72	0	2	70	3%
Juniper	20	0	0	20	0%
Chokecherry	20	2	6	12	40%
Rose	100	5	15	80	20%
Snowberry	65	8	2	55	15%
Serviceberry	50	3	4	43	14%
Total Shrubs	327	18	29	280	14%