MONTANA DEPARTMENT OF TRANSPORTATION WETLAND MITIGATION MONITORING REPORT: 2001

Vida Mitigation Site
Vida, Montana

Prepared for:
MONTANA DEPARTMENT OF TRANSPORTATION
2701 Prospect Avenue
Helena, MT 59620-1001

Prepared by:
LAND & WATER CONSULTING, INC.
P.O. Box 8254
Missoula, MT 59807

July 2002

Project No: 130091.026

MONTANA DEPARTMENT OF TRANSPORTATION

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1.0 INTRODUCTION

The Vida wetland mitigation site was constructed in 1995 to mitigate wetland impacts associated with Montana Department of Transportation (MDT) Vida North & South project. Constructed in Watershed #12 (Lower Missouri) within the MDT Glendive District, the site is located approximately 3.5 miles south of Vida immediately west of Montana Secondary Highway 13 (**Figure 1**). The entire site occurs in McCone County.

The intent of this mitigation project was to create 3.9 acres of additional wetlands within an intermittent drainage by placing a cross-drainage dike upstream of an existing reservoir (see proposed layout in **Appendix D**). Minor excavation (0.2 acre) to depths of 1 to 3 feet was performed upstream of the dike to enhance wetland development. Wetland hydrology was to be provided via surface flow from the intermittent drainage. MDT examined the site in August of 1997, during which less than 0.5 acre of wetland was delineated (see map in **Appendix D**).

Subsequent to mitigation site construction, two new reservoirs were constructed upstream within the same drainage. Consequently, considerably less surface water is reaching the site than was originally anticipated (Urban pers. comm.). A new well is now operating in the general site vicinity. According to MDT, seepage beneath the new dike may be occurring, further reducing retention time of any water that reaches the site (Urban pers. comm.).

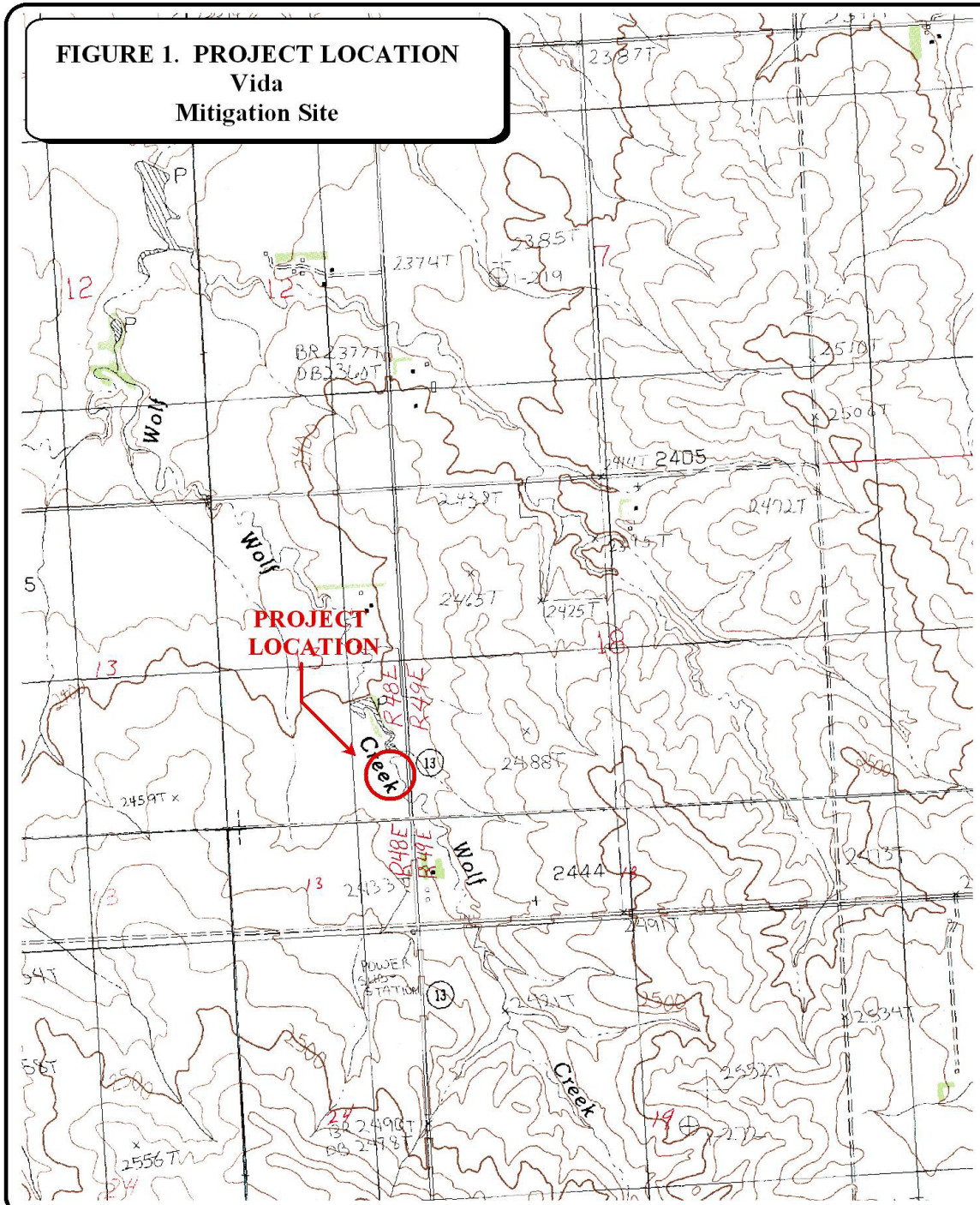
MDT personnel visited the site intermittently over the past several years, most recently in 1997. During this last visit, several photographs were taken. These materials have not been incorporated into a report format, but are available in the MDT project files. This site requires a one-time final monitoring effort to document wetland attributes (Urban pers. comm.).

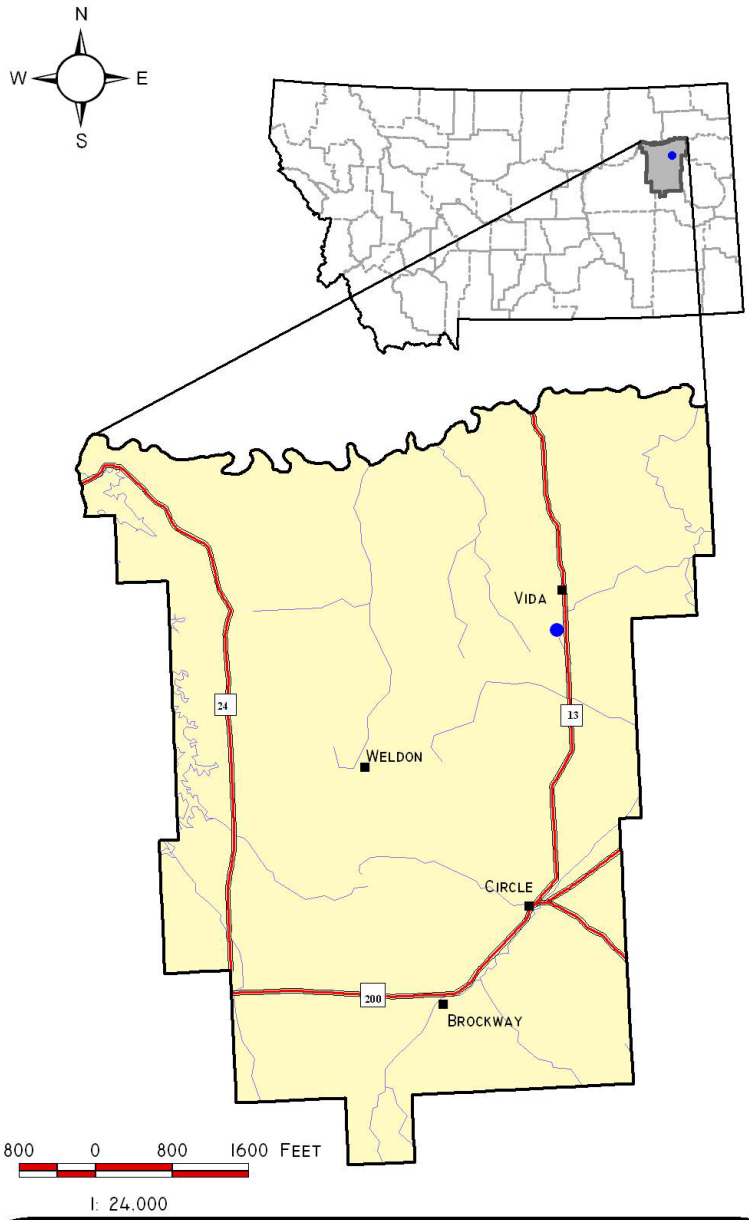
The August 23, 1995 Nationwide Permit authorization for placement of the dike indicates that the Interagency Wetland Group will provide input subsequent to monitoring to determine the appropriateness of the 3.9-acre credit. The authorization letter then references the following monitoring section of the MDT project prospectus:

> *Year 1 after construction will be a review of the water budget by observing water marks, vegetation changes, and dam condition. Spring precipitation will be noted. Photos will be taken in the locations designated after construction. Year 2 will compare Year 1 observation and assess vegetation and indicators of a developing wetland. Cottonwood trees and willows will be observed for any stress the change in hydrologic conditions could have created. Year 3 will compare Year 1 and 2. Monitoring will continue until such time the goals and objective have been met and it is deemed successful by reviewing parties.*

The monitoring area is illustrated in **Figure 2** (**Appendix A**).

FIGURE 1. PROJECT LOCATION
Vida
Mitigation Site





PROJECT #: 130091.026
DATE: APRIL 2001
LOCATION:
PROJECT MANAGER: B. DUTTON
DRAWN BY: B. NOECKER

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

2.0 METHODS

2.1 Monitoring Dates and Activities

The site was visited on July 19, 2001. All information contained on the Wetland Mitigation Site Monitoring Form (**Appendix B**) was collected then. 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; GPS data points; functional assessment; and (non-engineering) examination of the dike structure. Additionally, a single macroinvertebrate sample was taken.

2.2 Hydrology

Hydrologic indicators were evaluated during the mid-season visit. Wetland hydrology indicators were recorded using procedures outlined in the COE 1987 Wetland Delineation Manual (Environmental Laboratory 1987). Hydrology data was recorded on COE Routine Wetland Delineation Data Forms (**Appendix B**). All additional hydrologic data was recorded on the mitigation site monitoring form (**Appendix B**).

There are no groundwater monitoring wells at the site. If located within 18 inches of the ground surface (soil pit depth for purposes of delineation), groundwater depths were documented on the routine wetland delineation data form.

2.3 Vegetation

General dominant species-based vegetation community types (e.g., *Typha latifolia/Scirpus acutus*) 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. Estimated percent cover of the dominant species in each community type was recorded on the site monitoring form (**Appendix B**).

A single 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 encountered within the "belt" using the following values: + (<1%); 1 (1-5%); 2 (6-10%); 3 (11-20%); 4 (21-50%); and 5 (>50%).

The transect location, depicted on **Figure 2** (**Appendix A**), was marked on an aerial photograph and all data recorded on the mitigation site monitoring form. Transect endpoint locations were recorded with a GPS unit. Photos of the transect were taken from both ends during the mid-season visit. No woody species were planted at the site. Consequently, no monitoring relative to the survival of such species was conducted.

2.4 Soils

Soils were evaluated during the mid-season visit according to 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 Form (**Appendix B**). The most current NRCS terminology was used to describe hydric soils (USDA 1998). The McCone County soil survey was published by the Soil Conservation Service in 1984. Map units and associated properties listed in this published survey were used in describing project area soils.

2.5 Wetland Delineation

Wetland delineation was conducted during the mid-season visit according 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 indicator status of vegetation was derived from the National List of Plant Species that Occur in Wetlands: North Plains Region 4 (Reed 1988). The information was recorded on Army Corps Routine Wetland Delineation Data Forms (**Appendix B**). The wetland/upland boundary was delineated on the aerial photograph and recorded with a resource grade GPS unit.

MDT examined the site in August of 1997, during which less than 0.5 acre of wetlands were delineated. Wetland delineation data collected during 2001 will be compared to this 1997 data in an effort to document additional wetland change since project construction.

2.6 Mammals, Reptiles, and Amphibians

Mammal, reptile, and amphibian species observations and other positive indicators of use, such as vocalizations, were recorded on the wetland monitoring form during the site visit. Indirect use indicators, including tracks; scat; burrows; eggshells; skins; bones; etc., were also recorded. These 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 implemented. A comprehensive wildlife species list for the entire site was compiled.

2.7 Birds

Bird observations were also recorded during the site visit. No formal census plots, spot mapping, point counts, or strip transects were conducted. Bird observations were recorded incidental to other monitoring activities observations, using the bird survey protocol (**Appendix E**) as a general guideline. Observations were categorized by species, activity code, and general habitat association (see data forms in **Appendix B**). A comprehensive bird list was compiled using these observations.

2.8 Macroinvertebrates

Due to the presumed absence of significant surface water features within the analysis area, no macroinvertebrate sample collection was originally proposed. However, since surface water was present during the July 19th visit, a single macroinvertebrate sample was collected. Macroinvertebrate sampling procedures are provided in **Appendix E**. Sampling locations are

shown on **Figure 2** (**Appendix A**). Samples were preserved as outlined in the sampling procedure and sent to a laboratory for analysis.

2.9 Functional Assessment

A functional assessment was completed using the 1999 MDT Montana Wetland Assessment Method. Field data necessary for this assessment were collected during the mid-season site visit. An abbreviated field data sheet for the 1999 MDT Montana Wetland Assessment Method was compiled to facilitate rapid collection of field information (**Appendix B**). The remainder of the functional assessment was completed in the office.

2.10 Photographs

Photographs were taken showing the current land use surrounding the site, the upland buffer, the monitored area, and the vegetation transect. Two photo points were established and shot during 2001. Each photo point location was recorded with a resource grade GPS unit. The approximate locations of these photo points are shown on **Figure 2** (**Appendix A**). All photos were taken using a 50 mm lens. A description and compass direction for each photograph was recorded on the wetland monitoring form.

2.11 GPS Data

During the 2001 monitoring season, survey points were collected with a resource grade GPS unit at the vegetation transect beginning and ending locations, macroinvertebrate sampling location, and all photograph locations. The wetland boundary was also surveyed with a resource grade GPS unit.

2.12 Maintenance Needs

The dike near the north end of the site was examined during the 2001 site visit for obvious signs of breaching, damage, or other problems. This did not constitute an engineering-level structural inspection, but rather a cursory examination. Current or future potential problems were documented.

3.0 RESULTS

3.1 Hydrology

According to the Western Regional Climate Center, Vida yearly precipitation totals for 2000 (13.72 inches) and 2001 (13.78 inches) were 90 and 91 percent, respectively, of the total annual mean precipitation (15.15 inches) in this area.

Inundation was present in a small depression immediately adjacent to the dike face. No open water (water with no rooted vegetation) was observed. Specific recorded values are provided on the attached data forms.

The site, as a whole, was approximately two to three percent inundated, with an average depth of 10 inches and a range of depths from zero to two feet. No evidence of groundwater interaction was observed. Surface runoff enters the site primarily through an ephemeral drainage flowing from the south. This drainage exhibited signs of minor, periodic flow, but supports no wetland vegetation. Water was impounded against the dike, but no evidence was observed indicating that the spillway had been breached in 2001.

In general, it appears that the water available to the site is insufficient to support the proposed four-acre wetland. This is likely due to increased upstream water use subsequent to site design.

3.2 Vegetation

Vegetation species identified on the site are presented in **Table 1** and on the attached data form. One wetland community type, *Populus deltoides/Carex vesicaria* (Type 2), was identified and mapped on the mitigation area (**Figure 3**, **Appendix A**). Vegetation community Type 1 was comprised of upland species. Dominant species within each of these communities are listed on the attached data form (**Appendix B**).

The vast majority of the site was dominated by upland vegetation including smooth brome (*Bromus inermis*), crested wheatgrass (*Agropyron cristatum*), Kentucky bluegrass (*Poa pratensis*), Canada thistle (*Cirsium arvense*), prairie rose (*Rosa nutkana*), and western snowberry (*Symphoricarpos occidentalis*).

Vegetation transect results are detailed in the attached data form, and are summarized graphically below.

Transect Start (east)	***Upland (37')***	***Type 2 (48')***	***Upland (30')***	**Total: 115'**	**Transect End (west)**

3.3 Soils

According to the McCone County soil survey (Soil Conservation Service 1984), soils at the site are comprised of a Typic Ustorthents – Typic Ustifluvents association. These are well drained to somewhat poorly drained soils that range from loams to clays. Typic Ustifluvents, which seem to dominate the mitigation site, typically occur along coulee bottoms and narrow drainageways.

B Horizon soils in the wetland portion of the site consist clay loams with a matrix color of 2.5Y4/2 and faint mottles at 7.5YR5/8, indicating periodic inundation. Wetland soils were inundated or saturated within 12 inches of the ground surface during the July delineation.

Table 1: ***2001 Vida Mitigation Site Vegetation Species List***

Species	Region 4 (North Plains) Wetland Indicator
Agropyron cristatum	--
Agropyron repens	FAC
Agrostis alba	FACW
Apocynum androsaemifolium	--
Artemisia frigida	--
Artemisia ludoviciana	FACU
Asclepias speciosa	FAC
Bromus inermis	--
Carex vesicaria	OBL
Cirsium arvense	FACU
Convolvulus arvensis	--
Elymus cinereus	NI
Glycyrrhiza lepidota	FACU
Grindelia squarrosa	--
Helianthus annuus	FACU
Lactuca serriola	FACU
Medicago sativa	--
Poa pratensis	FACU
Polygonum lapathifolium	OBL
Populus deltoid s	FAC
Prunus Americana	UPL
Ratibida columnifera	--
Rosa nutkana	NI
Rumex crispus	FACW
Salix lutea	FACW
Symphoricarpos occidentalis	--
Thlaspi arvense	--
Tragopogon dubius	--

3.4 Wetland Delineation

Delineated wetland boundaries are illustrated on **Figure 3** (**Appendix A**). The completed wetland delineation form is included in **Appendix B**. Soils, vegetation, and hydrology are discussed in preceding sections. Delineation results are as follows:

Vida Mitigation Area: 0.11 wetland acre (emergent, forested)
0.0 acre open water

Based on MDT 1997 delineation results, during which approximately 0.5 wetland acre was delineated, up to approximately 0.4 acre of wetland has reverted to upland since 1997.

Approximately 0.11 wetland acre occurs on the site presently. No pre-project delineation was found in the project files; however, the August 23, 1995 Section 404 permit for site construction indicates that fill was placed in approximately 0.2 wetland acre during dike construction. If this is the case, then the mitigation site has currently resulted in a net loss of approximately 0.1 acre.

3.5 Wildlife

Wildlife species, or evidence of wildlife, observed on the site during 2001 monitoring effort are listed in **Table 2**. Specific evidence observed, as well as activity codes pertaining to birds, are provided on the completed monitoring form in **Appendix B**. Evidence of one mammal and four bird species was noted on the mitigation site. No reptiles or amphibians were observed.

Table 2: ***Fish and Wildlife Species Observed on the Vida Mitigation Site during 2001***

FISH None
AMPHIBIANS None
REPTILES None
BIRDS American Kestrel (*Falco sparverius*) American Robin (*Turdus migratorius*) Eastern Kingbird (*Tyrannus tyrannus*) Mourning Dove (*Zenaida macroura*)
MAMMALS Mule Deer (*Odocoileus hemionus*) (tracks only)

3.6 Macroinvertebrates

Macroinvertebrate sampling results are provided in **Appendix B**. The summary prepared by Rhithron Associates is presented below. Surface water was likely present due to a recent storm event.

There were very few organisms present in the sample from this site. It is not possible to positively state whether this is due to poor habitat or water quality conditions, or to inadequate sampling effort. However, given extreme turbidity and temporary nature of surface water, the lack of organisms is likely due to poor habitat and water quality conditions.

3.7 Functional Assessment

A completed functional assessment form is presented in **Appendix B**. Functional assessment results are summarized in **Table 3**. The wetland portion of the mitigation site rated as a Category III (moderate value) site, primarily due to the presence of forested wetland on the site. The presence of forested wetlands contributed to "moderate" ratings for wildlife habitat, food chain support, and uniqueness. Remaining evaluated functions were rated as "low".
Based on functional assessment results (**Table 3)**, approximately 0.32 functional unit currently exists at the Vida mitigation site.

3.8 Photographs

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

Table 3: ***Summary of 2001 Wetland Function/Value Ratings and Functional Points [1] at the Vida Mitigation Project***

Function and Value Parameters From the 1999 MDT Montana Wetland Assessment Method	Wetland Site Vida wetland along dike face
Listed/Proposed T&E Species Habitat	Low (0)
MNHP Species Habitat	Low (0)
General Wildlife Habitat	Mod (0.7)
General Fish/Aquatic Habitat	NA
Flood Attenuation	Low (0.3)
Short and Long Term Surface Water Storage	Low (0.2)
Sediment, Nutrient, Toxicant Removal	Mod (0.5)
Sediment/Shoreline Stabilization	NA
Production Export/Food Chain Support	Mod (0.5)
Groundwater Discharge/Recharge	Low (0.1)
Uniqueness	Mod (0.5)
Recreation/Education Potential	Low (0.1)
Actual Points/Possible Points	2.9 / 10
% of Possible Score Achieved	29%
Overall Category	III
Total Acreage of Assessed Wetlands and Other Aquatic Habitats within Site Boundaries	0.11 ac
Functional Units (acreage x actual points)	0.32 fu
Net Acreage Gain	0 to .11 ac (see text)
Net Functional Unit Gain	0 to 0.32 fu (see text)
Total Functional Unit "Gain"	0 to 0.32 Total Functional Units

[1] See completed MDT functional assessment forms in Appendix B for further detail.

3.9 Maintenance Needs/Recommendations

The dike and spillway were in good condition during the mid-season visit. Water was impounded against the dike, but no evidence was observed indicating that the spillway had been breached in 2001. It was not possible to ascertain whether seepage is occurring beneath the dike.

In general, it appears that the water available to the site is insufficient to support the proposed four-acre wetland. This is likely due to upstream impoundment construction and increased water use subsequent to site design (Urban pers. comm.). It is recommended that MDT explore the possibility of purchasing water rights from upstream users in sufficient quantity to support the mitigation site. If this is not possible, it seems little can be done to remedy the existing water shortage at the site. In this case, MDT may want to explore developing another mitigation site in the region.

3.10 Current Credit Summary

No specific performance criteria were required to be met at this site in order to document its success. The August 23, 1995 Nationwide Permit authorization for placement of the dike references the "monitoring" section of the MDT project prospectus; however, no written monitoring reports were produced since project construction. The overall intent of the project was to provide 3.9 wetland acres.

Approximately 0.11 wetland acre occurs on the site presently. Based on MDT 1997 delineation results (**Appendix D**), up to approximately 0.4 acre of wetland has reverted to upland since 1997. No pre-project delineation was found in the project files; however, the August 23, 1995 Section 404 permit for site construction indicates that fill was placed in approximately 0.2 wetland acre during dike construction. If this is the case, then the mitigation site may have resulted in a net loss of approximately 0.1 acre.

The maximum assignable credit at this site as of 2001 is approximately 0.11 acre. Approximately 0.32 functional unit currently exists at the site. In a "worst-case" scenario, the site has resulted in a loss of approximately 0.1 acre. Under either scenario, the site has not provided the desired 3.9 acres of credit, and likely will not be capable of this until water availability increases.

4.0 REFERENCES

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

Ralph, C.J., Geupel, G.R., Pyle, P., Martin, T.E., and D.F. DeSante. 1993. *Handbook of field methods for monitoring landbirds*. Gen. Tech. Rep. PSW-GTR-144. Albany, CA: Pacific Southwest Research Station, Forest Service, U.S. Dept. of Agriculture. 41 p.

Reed, P.B. 1988. National list of plant species that occur in wetlands: North Plains (Region 4). Biological Report 88(26.4), May 1988. U.S. Fish and Wildlife Service. Washington, D.C.

Urban, L. Wetland Mitigation Specialist, Montana Department of Transportation. Helena, MT. March 13, 2001 meeting.

USDA Natural Resources Conservation Service. 1998. *Field Indicators of Hydric Soils in the United States*, Version 4. G. Hurt, P. Whited and R. Pringle (eds.). USDA, NRCS Fort Worth, TX.

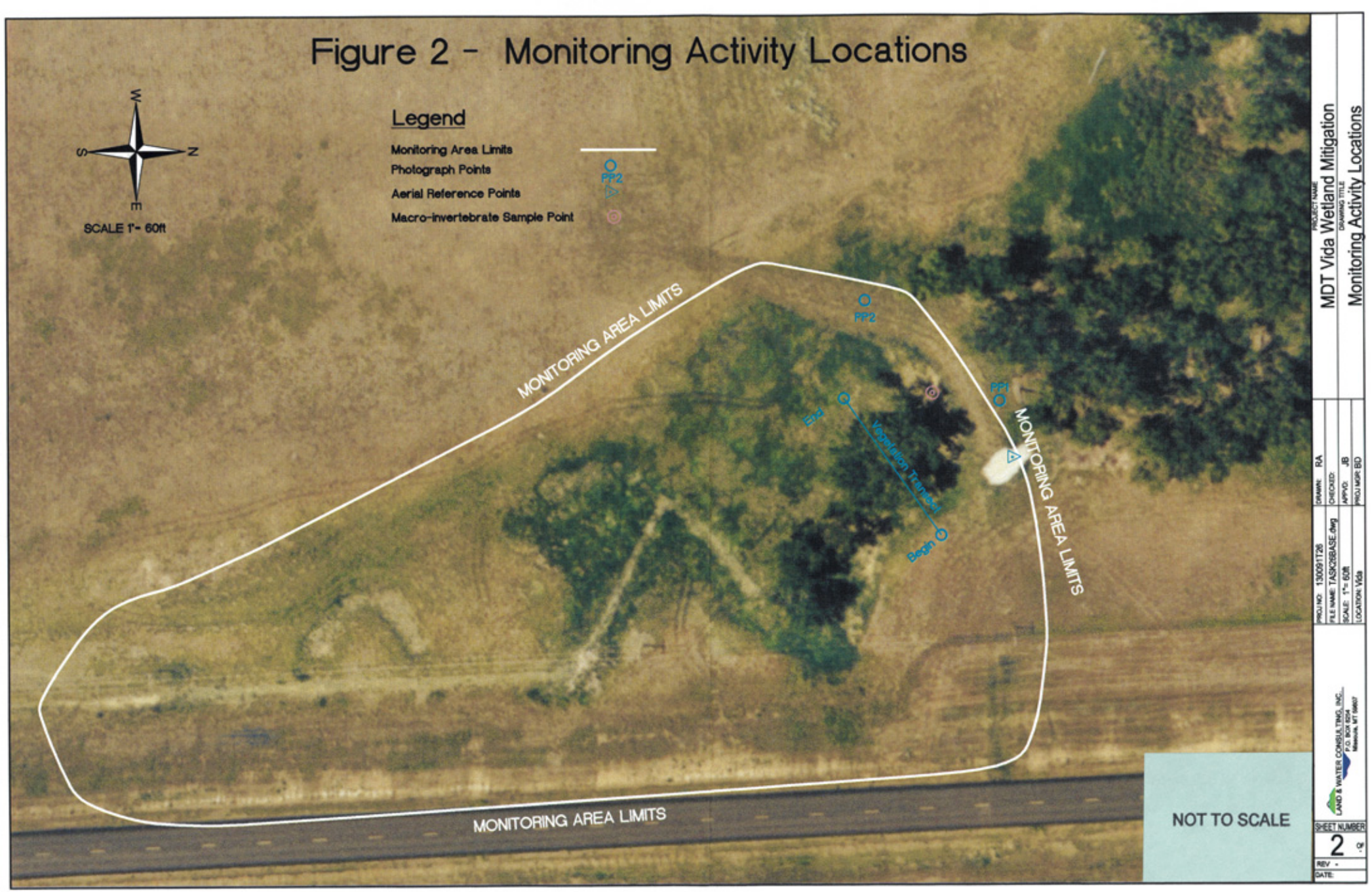
Appendix A

FIGURES 2 - 3

MDT Wetland Mitigation Monitoring
Vida
Vida, Montana

LAND & WATER

Figure 2 - Monitoring Activity Locations



PROJECT NAME: MDT Vida Wetland Mitigation

DRAWING TITLE: Monitoring Activity Locations

PROJ NO: 130091T26
FILE NAME: TASK08BASE.dwg
SCALE: 1"= 60ft
LOCATION: Vida

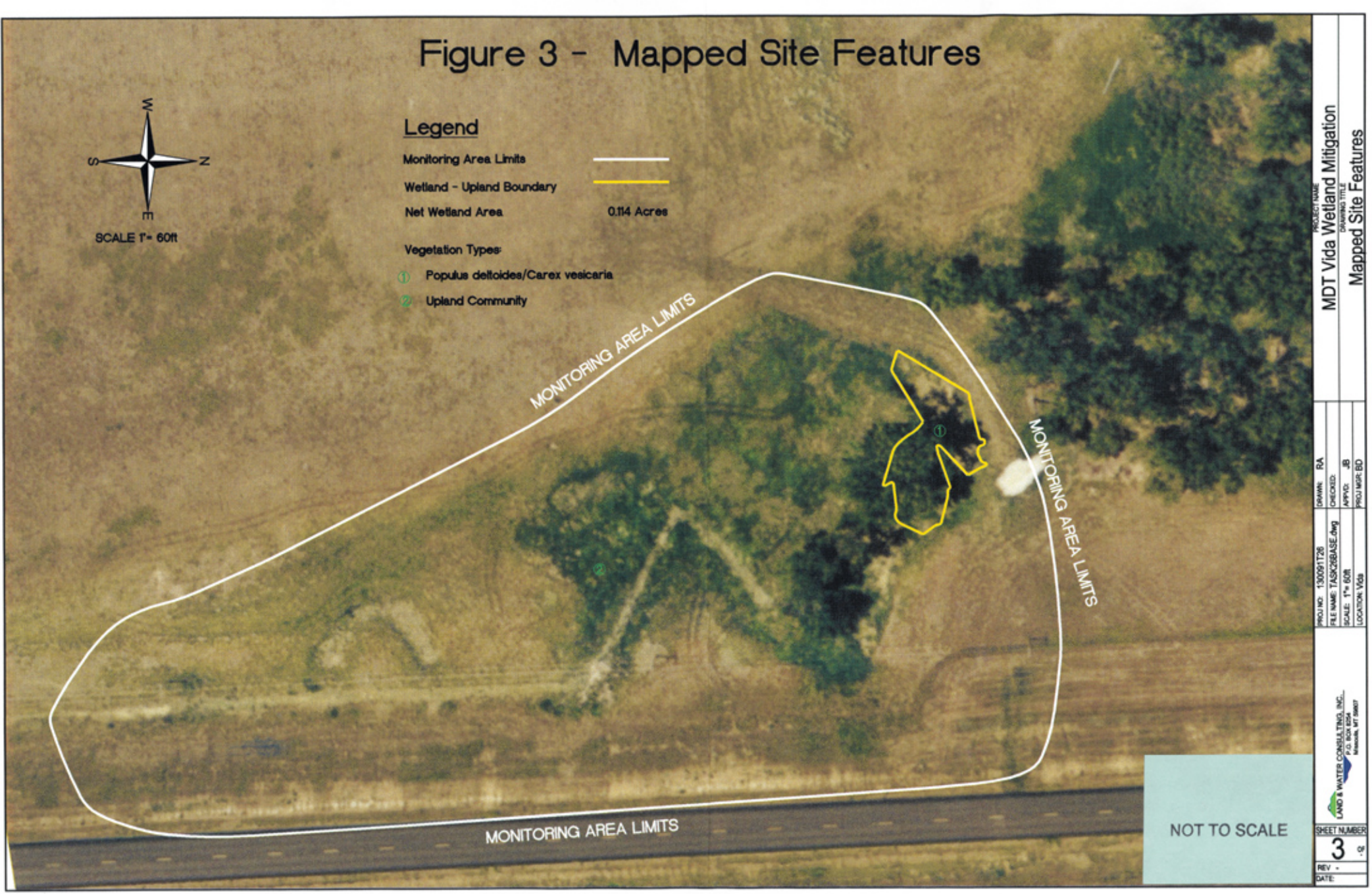
DRAWN: RA
CHECKED:
APPVD: JB
PROJ MGR: BD

LAND & WATER CONSULTING, INC.
P.O. BOX 8254
Missoula, MT 59807

SHEET NUMBER: 2

REV: -
DATE:

Figure 3 - Mapped Site Features



PROJECT NAME
MDT Vida Wetland Mitigation
DRAWING TITLE
Mapped Site Features

PROJ NO: 13009T126
FILE NAME: TASK26BASE.dwg
SCALE: 1"= 60ft
LOCATION: Vida
DRAWN: RA
CHECKED:
APP'D: JB
PROJ MGR: BD

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Missoula, MT 59807

SHEET NUMBER
3
REV -
DATE:

Appendix B

COMPLETED 2001 WETLAND MITIGATION SITE MONITORING FORM
COMPLETED 2001 BIRD SURVEY FORMS
COMPLETED 2001 WETLAND DELINEATION FORMS
COMPLETED 2001 FIELD AND FULL FUNCTIONAL ASSESSMENT FORMS
MACROINVERTEBRATE DATA

MDT Wetland Mitigation Monitoring
Vida
Vida, Montana

LAND & WATER

DRAFT - MDT WETLAND MITIGATION SITE MONITORING FORM

STPX 0002(205)

Project Name: Vida Project Number: C# 1195 Assessment Date: 7/19/01
Location: Highway 13 MDT District: Glendive Milepost: _____
Legal description: T 23N R 48E Section 13 Time of Day: 10:00-12:00 Am
Weather Conditions: Partly cloudy, dry, calm Person(s) conducting the assessment: JB/RH
Initial Evaluation Date: 7/19/01 Visit #: 1 Monitoring Year: 2001 (1)
Size of evalusaiton area: 3-4 acres Land use surrounding wetland: Hayland, Downstream reservoir, Highway

HYDROLOGY

Surface Water
Inundation: Present X Absent ___ Average depths: 10" ft Range of depths: 0 - 2 ft
Assessment area under inundation: 2-3 %
Depth at emergent vegetation-open water boundary: NA ft
If assessment area is not inundated are the soils saturated w/in 12" of surface: Yes X No ___
Other evidence of hydrology on site (drift lines, erosion, stained vegetation etc.): Drift lines, bent and stained vegetation, sediment deposits

Groundwater
Monitoring wells: Present ___ Absent X
Record depth of water below ground surface

Well #	Depth	Well #	Depth	Well #	Depth

Additional Activities Checklist:
NA Map emergent vegetation-open water boundary on air photo
X Observe extent of surface water during each site visit and look for evidence of past surface water elevations (drift lines, erosion, vegetation staining etc..)
NA GPS survey groundwater monitoring wells locations if present

COMMENTS/PROBLEMS: Water stacks against NE corner of dike, but didn't breach spillway. "Drainage" had evidence of temporary flow, but supported no wetland vegetation. Vast majority of site is upland; does not seem to be adequate source of hydrology to support 2-3 acre wetland. The only way to improve the site is by increasing water availability.

VEGETATION COMMUNITIES

LAND & WATER B-2

Community No.: 1 Community Title (main species): Upland

Dominant Species	% Cover	Dominant Species	% Cover
BRO INE	750	ROS MUT	11-20
AGR CRI	750	SYM SCC	6-10
CIR ARV	21-50		
DOA PRA	11-20		
HEL ANN	1-5		

COMMENTS/PROBLEMS:

Community No.: 2 Community Title (main species): POP DEL/CAR VES

Dominant Species	% Cover	Dominant Species	% Cover
POP DEL	750	CIR ARV	21-50
SAL LUT	750		
CAR VES	750		
AGR ALB	11-20		
POL LAP	11-20		

COMMENTS/PROBLEMS: Heavy CIR ARV; noxious weed.

Community No.:____ Community Title (main species):

Dominant Species	% Cover	Dominant Species	% Cover

COMMENTS/PROBLEMS:

Additional Activities Checklist:

X Record and map vegetative communities on air photo

COMPREHENSIVE VEGETATION LIST

LAND & WATER B-3

Species	Vegetation Community Number(s)	Species	Vegetation Community Number(s)
AGR CRI	1		
AGR REP	1		
CIR ARV	2,1		
BRO INE	1		
POA PRA	1		
CAR VES	2		
HEL ANN	1		
THL ARV	1		
CON ARV	1		
POP DEL	2		
SAL LUT	2		
POL LAP	2		
AGR ALB	2		
ELY CIN	1		
ROS NUT	1		
ASC SPE	1		
GLY LEP	1		
SYM OCC	1		
Cinquefoil	1		
TRA DUB	1		
RAT COL prairie coneflower	1		
LAC SER	1		
ART FRI	1		
MED SAT	1		
RUM CRI	1		
PRU AME	1		
GRI SQU	1		
APO AND	1		

COMMENTS/PROBLEMS: Primarily upland species

MDT WETLAND MONITORING – VEGETATION TRANSECT

Site: Vida Date: 7-19-01 Examiner: JB/RH Transect # 1

Approx. transect length: 115' Compass Direction from Start (Upland): 248° SW

Vegetation type 1:	Upland	
Length of transect in this type:	37	feet
AGR CRI	11-20 %	
CIR ARV	21-50 %	
BRO INE	21-50 %	
POA PRA	1-5 %	
CAR VES	1-5 %	
HEL ANN	1-5 %	
THL ARV	1-5 %	
CON ARV	<1 %	
Total Vegetative Cover:	100 %	

Vegetation type 2:	POP DEL / CAR VES	
Length of transect in this type:	48	feet
POP DEL	>50 %	
CAR VES	>50 %	
POL LAP	21-50 %	
AGR ALB	11-20 %	
BRO INE	6-10 %	
CIR ARV	6-10 %	
Total Vegetative Cover:	85 %	

Vegetation type 3:	Upland	
Length of transect in this type:	30	feet
BRO INE	>50 %	
CIR ARV	11-20 %	
Total Vegetative Cover:	100 %	

Vegetation type 4:		
Length of transect in this type:		feet
Total Vegetative Cover:		

MDT WETLAND MONITORING – VEGETATION TRANSECT (back of form)

Cover Estimate
+ = <1%
1 = 1-5%
2 = 6-10%
3 = 11-20%
4 = 21-50%
5 = >50%

Indicator Class:
+ = Obligate
- = Facultative/Wet
0 = Facultative

Source:
P = Planted
V = Volunteer

Percent of perimeter 5 % 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 food 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:

Small wetland patch in NE corner of site, against dam.

PLANTED WOODY VEGETATION SURVIVAL

LAND & WATER B-6

Species	Number Originally Planted	Number Observed	Mortality Causes
NA			

COMMENTS/PROBLEMS: None planted

WETLAND DELINEATION

LAND & WATER B-7

At each site conduct the items on the checklist below:

X Delineate wetlands according to the 1987 Army Corps manual.

X Delineate wetland-upland boundary on the air photo

X Survey wetland-upland boundary with a resource grade GPS survey

COMMENTS/PROBLEMS: Vast majority of site is upland, including channel. Wetland form attached.

FUNCTIONAL ASSESSMENT

Collect information to complete MDT Function and Values Assessment in the office.

Jeff is completing this section

COMMENTS/PROBLEMS: Forms attached.

MAINTENANCE

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

If yes, do they need to be repaired? YES____ NO X

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 X NO____

If yes, are the structures working properly and in good working order? YES X NO___

If no, describe the problems below.

COMMENTS/PROBLEMS: _____

WILDLIFE

LAND & WATER B-8

BIRDS

Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating	Species	Number Observed	Nesting or Breeding Activity	Likely Breeding Resident	Likely Migrating
See bird data form									

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			

Additional Activities Checklist:

X Macroinvertebrate sampling (if required)

COMMENTS/PROBLEMS: Sampled surface water in NE corner.

BIRD SUMMARY TABLE

Page 1 of 1
Date: 7/19/01
Survey Time: 12:00pm

Site:

Scientific Name	Common Name	Total Density	Foraging	Nesting	Flyover	Breeding	Loafing
	E. Kingbird	1	X				
	Am. Kestrel	1	X				
	morning dove	2-3					X
	Am. Robin	2-3					X

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 Frame #	Photograph Description	Compass Reading
A	4	transect start	248° SW
B	5	transect end	63° NE
C	6	P2, on dike	155° SE
D	7	P2 " "	70° E/NE
E	8	P2 " "	320° W/NW
F	9	P2 " "	205° S/SW
G	10	From top of pipe outlet under highway	337° NW
H	1,2,3	P1, on dike, composite photo	

COMMENTS/PROBLEMS: _____

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 fore 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: _____

DATA FORM
ROUTINE WETLAND
(1987 COE Wetlands Delineation Manual)

Project/Site:	Vida Mitigation	**Project No:** 1195	**Date:** 19-Jul-2001
Applicant/Owner:	Montana Department of Transportation		**County:** McCone
Investigators:	Berglund / Harris		**State:** Montana
			Plot ID: 1

Do Normal Circumstances exist on the site?	(Yes) No	**Community ID:** Forested / Emergent
Is the site significantly disturbed (Atypical Situation:)?	Yes (No)	**Transect ID:** NA
Is the area a potential Problem Area? (If needed, explain on the reverse side)	Yes (No)	**Field Location:** Along Dike Face

VEGETATION (USFWS Region No. 4)

Dominant Plant Species(Latin/Common)	Stratum	Indicator	Plant Species(Latin/Common)	Stratum	Indicator
Carex vesicaria	Herb	OBL	*Cirsium arvense*	Herb	FACU
Sedge,Inflated			Thistle,Creeping		
Agrostis alba	Herb	FACW	*Populus deltoides*	Tree	FAC
Redtop			Cotton-Wood,Eastern		
Polygonum lapathifolium	Herb	OBL	*Salix lutea*	Tree	FACW+
Willow-Weed			Willow,Yellow		

Percent of Dominant Species that are OBL, FACW or FAC: (excluding FAC-) 5/6 = 83.33%

FAC Neutral: 4/5 = 80.00%
Numeric Index: 13/6 = 2.17

Remarks:
Heavy Canada thistle, which is a noxious weed.

HYDROLOGY

YES **Recorded Data(Describe in Remarks):**
- NO **Stream, Lake or Tide Gauge**
- YES **Aerial Photographs**
- NO **Other**

NO **No Recorded Data**

Field Observations

Depth of Surface Water:	= 2 *(in.)*
Depth to Free Water in Pit:	N/A *(in.)*
Depth to Saturated Soil:	N/A *(in.)*

Wetland Hydrology Indicators

Primary Indicators
- YES **Inundated**
- YES **Saturated in Upper 12 Inches**
- NO **Water Marks**
- YES **Drift Lines**
- YES **Sediment Deposits**
- YES **Drainage Patterns in Wetlands**

Secondary Indicators
- NO **Oxidized Root Channels in Upper 12 Inches**
- NO **Water-Stained Leaves**
- NO **Local Soil Survey Data**
- YES **FAC-Neutral Test**
- NO **Other(Explain in Remarks)**

Remarks:
Wet signature on aerial photo.

DATA FORM
ROUTINE WETLAND
(1987 COE Wetlands Delineation Manual)

Project/Site:	Vida Mitigation	**Project No:** 1195	**Date:** 19-Jul-2001
Applicant/Owner:	Montana Department of Transportation		**County:** McCone
Investigators:	Berglund / Harris		**State:** Montana
			Plot ID: 1

SOILS

Map Unit Name (Series and Phase): Typic Ustorthents/Typic Ustifluvents asn
Map Symbol: 146 **Drainage Class:** WD **Mapped Hydric Inclusion?**
Taxonomy (Subgroup): Typic Ustorthents/Typic Ustifluvents **Field Observations Confirm Mapped Type?** (Yes) No
Profile Description

Depth (Inches)	Horizon	Matrix Color (Munsell Moist)	Mottle Color (Munsell Moist)	Mottle Abundance/Contrast	Texture, Concretions, Structure, etc
10	B	2.5Y4/2	7.5YR5/8	Few Faint	Clay loam

Hydric Soil Indicators:

NO **Histosol**	NO **Concretions**
NO **Histic Epipedon**	NO **High Organic Content in Surface Layer in Sandy Soils**
NO **Sulfidic Odor**	NO **Organic Streaking in Sandy Soils**
NO **Aquic Moisture Regime**	NO **Listed on Local Hydric Soils List**
NO **Reducing Conditions**	NO **Listed on National Hydric Soils List**
YES **Gleyed or Low Chroma Colors**	NO **Other (Explain in Remarks)**

Remarks:

WETLAND DETERMINATION

Hydrophytic Vegetation Present?	(Yes) No	Is the Sampling Point within the Wetland? (Yes) No
Wetland Hydrology Present?	(Yes) No	
Hydric Soils Present?	(Yes) No	

Remarks:
Small wetland depression within impounded drainage; occurs at dike face. Limited water availability.

Field Data Sheet for 1999 MDT Wetland Assessment Form Site: Vida Date: 7/19/01 By: JB/RH

Estimated AA Size (Circle Ac.): <1 1-5 >5 Brief Description: Small wetland patch at dike face.

HGM Class (CIRCLE)	Cowardin Class	Est. % of AA	Predominant Water Regime (CIRCLE)
Mineral Soil Flats Organic Soil Flats Riverine (nonperennial) Riverine (upper perennial) Riverine (lower perennial) Lacustrine Fringe Depression (closed) Depression (open, groundwater) Depression (open, surface water) Slope Organic Soil Flats	Emergent	50	Perm Flood Int Exp Sem Perm Flood Seas Flood Sat **Tem Flood** Int Flood
	Aquatic Bed		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
	Moss-Lichen		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
	Scrub-Shrub		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
	Forested	30	Perm Flood Int Exp Sem Perm Flood Seas Flood Sat **Tem Flood** Int Flood
	Unconsolidated Bottom	20	Perm Flood Int Exp Sem Perm Flood **Seas Flood** Sat Tem Flood Int Flood
	Other:		Perm Flood Int Exp Sem Perm Flood Seas Flood Sat Tem Flood Int Flood
	Total Estimated % Vegetated	80	

RELATIVE ABUNDANCE: rare **com** abun. **DISTURBANCE** is: High **Moderate** Low _____

HYDROLOGY: Max. acre-ft surf. water at wetlands in AA subject to inundation: **<1** 1-5 >5 (if no flooding/ponding, go to groundwater* section)

Does AA contain surface or subsurface outlet? **Y** N If outlet present, is it restricted (subsurface will always be "yes")? **Y** N

Longest duration of surface water:	Surface Water Duration and other attributes (circle)		
at any wetlands within AA	Perm / Peren	Seas / Intermit	**Temp / Ephem**
in at least 10% of AA (both wetlands and nonwetlands [deepwater, streambed...]	Perm / Peren	**Seas / Intermit**	Temp / Ephem
Where fish are or historically were present (circle **NA** if not applicable)	Perm / Peren	Seas / Intermit	Temp / Ephem
% of waterbody containing cover objects	>25%	10-25%	<10%
% bank or shore with riparian or wetland shrub or forested communities	>75%	50-74%	<50%
adjacent to rooted wetland vegetation along a defined watercourse or shoreline subject to wave action (circle **NA** if not applicable)	Perm / Peren	Seas / Intermit	Temp / Ephem
% cover of wetland bank or shore by sp. with binding rootmasses	>65%	35-64%	<35%

Flood Attenuation: Do any wetlands on site flood as a result of in-channel or overbank flow? **Y** N (if no, go to groundwater* section below)

Estimated wetland area subject to periodic flooding (acres):	≥10	2-10	**<2**
Estimated % of flooded wetland classified SS, FO or both:	≥75	**25-74**	<25

*Evidence of groundwater discharge or recharge? Y **N** List: _____

HABITAT

Habitat for Listed or Proposed Threatened, Endangered, or Montana Natural Heritage Program S1, S2, or S3 Plants or Animals:

AA is Documented (D) or Suspected (S) to contain (circle based on definitions contained in instructions):

Primary or critical habitat (**list species**)	D S	T/E: _____	D S	MNHP: _____
Secondary habitat (**list species**)	D S	T/E: _____	D S	MNHP: _____
Incidental habitat (**list species**)	D S	T/E: _____	D S	MNHP: _____
No usable habitat	D **S**	T/E: none	D **S**	MNHP: none

Wildlife observations? feral songbirds

Fish observations? —

OTHERS

Do wetlands have potential to receive excess sediments, nutrients, or toxicants? **Y** N From: Ag. use upstream

Potential to receive: low to moderate levels **high levels** On TMDL List? Y **N**

Does site contain bog, fen, warm springs, >80 year-old forested wetland, or MNHP "S1" or "S2" plant association? Y **N**

List: _____

Is AA a known recreation / education site? Y **N** Type: _____

Does AA offer strong potential for use as recreation / education site? Y **N** Type: _____

MDT Montana Wetland Assessment Form (revised 5/25/1999)

1. **Project Name:** Vida Wetland Mitigation 2. **Project #:** — **Control #:** 1195

3. **Evaluation Date:** Mo. 7 Day 19 Yr. 01 4. **Evaluator(s):** JB/RH 5. **Wetlands/Site #(s)** Vida

6. **Wetland Location(s):** i. **Legal:** T 23 (N) or S; R 48 (E) or W; S 13 ; T ___ N or S; R ___ E or W; S ___ ;
ii. **Approx. Stationing or Mileposts:** Off Highway 13, McCone County
iii. **Watershed:** 10060002 **GPS Reference No. (if applies):** ✓
Other Location Information: West of highway

7. a. **Evaluating Agency:** MDT ;
b. **Purpose of Evaluation:**
1. ___ Wetlands potentially affected by MDT project
2. ___ Mitigation wetlands; pre-construction
3. XX Mitigation wetlands; post-construction
4. ___ Other

8. **Wetland size:** (total acres) ✓ (visually estimated)
0.11 (measured, e.g. by GPS [if applies])

9. **Assessment area:** (AA, tot., ac., see instructions on determining AA) ✓ (visually estimated)
0.11 (measured, e.g. by GPS [if applies])

10. **Classification of Wetland and Aquatic Habitats in AA** (HGM according to Brinson, first col.; USFWS according to Cowardin [1979], remaining cols.)

HGM Class	System	Subsystem	Class	Water Regime	Modifier	% of AA
Depression (Open, Surf. Water)	Palustrine	—	EM	TF	I	50
	"	—	FO	TF	I	30
	"	—	UB	SF	I	20

(Abbreviations: **System**: Palustrine(P)/ **Subsyst**.: none/ **Classes**: Rock Bottom (**RB**), Unconsolidated bottom (**UB**), Aquatic Bed (**AB**), Unconsolidated Shore (**US**), Moss-lichen Wetland (**ML**), Emergent Wetland (**EM**), Scrub-Shrub Wetland (**SS**), Forested Wetland (**FO**)/ **System**: Lacustrine (**L**)/ **Subsyst.**: Limnetic (**2**)/ **Classes**: RB, UB, AB/ **Subsystem**: Littoral (**4**)/ **Classes**: RB, UB, AB, US, EM/ **System**: Riverine (**R**)/ **Subsyst.**: Lower Perennial (**2**)/ Classes: RB, UB, AB, US, EM/ **Subsystem**: Upper Perennial (**3**)/ Classes: RB, UB, AB, US/ **Water Regimes**: Permanently Flooded (**H**), Intermittently Exposed (**G**), Semipermanently Flooded (**F**), Seasonally Flooded (**C**), Saturated (**B**), Temporarily Flooded (**A**), Intermittently Flooded (**J**) **Modifiers**: Excavated (**E**), Impounded (**I**), Diked (**D**), Partly Drained (**PD**), Farmed (**F**), Artificial (**A**) **HGM Classes**: Riverine, Depressional, Slope, Mineral Soil Flats, Organic Soil Flats, Lacustrine Fringe

11. **Estimated relative abundance:** (of similarly classified sites within the same Major Montana Watershed Basin, see definitions)
(Circle one) Unknown Rare (Common) Abundant
Comments:

12. **General condition of AA:**
i. **Regarding disturbance:** (use matrix below to determine [circle] appropriate response)

Conditions within AA	*Predominant conditions adjacent to (within 500 feet of) 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 natural state; is not grazed, hayed, logged, or otherwise converted; does not contain roads or occupied buildings.	low disturbance	low disturbance	(moderate disturbance)
AA not cultivated, but moderately grazed or hayed or selectively logged; or has been subject to relatively minor clearing, fill placement, or hydrological alteration; contains few roads or buildings.	moderate disturbance	moderate disturbance	high disturbance
AA cultivated or heavily grazed or logged; subject to relatively substantial fill placement, grading, clearing, or hydrological alteration; high road or building density.	high disturbance	high disturbance	high disturbance

Comments: (types of disturbance, intensity, season, etc.): Highway, upstream water impoundment
ii. **Prominent weedy, alien, & introduced species (including those not domesticated, feral):** (list) * CIR ARV
iii. **Provide brief descriptive summary of AA and surrounding land use/habitat:**
Small wetland depression at face of dike; Adjacent to highway + ag. land.

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

# of "Cowardin" vegetated classes present in AA (see #10)	≥ 3 vegetated classes (or (≥ 2 if one is forested))	2 vegetated classes (or 1 if forested)	≤ 1 vegetated class
Rating (circle)	(High)	Moderate	Low

Comments: Contains forested wetland.

SECTION PERTAINING to FUNCTIONS & VALUES ASSESSMENT

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

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

Primary or critical habitat (**list species**)	D S	_____
Secondary habitat (**list species**)	D S	_____
Incidental habitat (**list species**)	D S	_____
No usable habitat	D (S)	none

II. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus/primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.9 (H)	.8 (M)	.7 (M)	.5 (L)	.3 (L)	0 (L)

Sources for documented use (e.g. observations, records, etc):

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

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

Primary or critical habitat (**list species**)	D S	_____
Secondary habitat (**list species**)	D S	_____
Incidental habitat (**list species**)	D S	_____
No usable habitat	D (S)	none

II. **Rating** (use the conclusions from i above and the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function)

Highest Habitat Level	doc./primary	sus/primary	doc./secondary	sus./secondary	doc./incidental	sus./incidental	None
Functional Points and Rating	1 (H)	.8 (H)	.7 (M)	.6 (M)	.2 (L)	.1 (L)	0 (L)

Sources for documented use (e.g. observations, records, etc.):

14C. General Wildlife Habitat Rating:

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

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

Low (based on any of the following [check]):
- __ few or no wildlife observations during peak use periods
- __ little to no wildlife sign
- __ sparse adjacent upland food sources
- __ interviews with local biologists with knowledge of the AA

Moderate (based on any of the following [check]):
- XX 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, circle appropriate AA attributes in matrix to arrive at 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 of the AA (see #10). Abbreviations for surface water durations are as follows: P/P = permanent/perennial; S/I = seasonal/intermittent; T/E = temporary/ephemeral; and A = absent [see instructions for further definitions of these terms].)

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

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

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

Comments:

14D. General Fish/Aquatic Habitat Rating: (Assess this function if the AA is used by fish or the existing situation is "correctable" such that the AA could be used by fish [i.e., fish use is precluded by perched culvert or other barrier, etc.]. If the AA is not or was not historically used by fish due to lack of habitat, excessive gradient, etc., circle **NA** here and proceed to the next function. If fish use occurs in the AA but is not desired from a resource management perspective [such as fish use within an irrigation canal], then Habitat Quality [i below] should be marked as "Low", applied accordingly in ii below, and noted ih the comments.)

i. Habitat Quality (circle appropriate AA attributes in matrix to arrive at exceptional (E), high (H), moderate (M), or low (L) quality rating.

Duration of surface water in AA	Permanent / Perennial			Seasonal / Intermittent			Temporary / Ephemeral		
Cover - % of waterbody in AA containing cover objects such as submerged logs, large rocks & boulders, overhanging banks, floating-leaved vegetation, etc.	>25%	10–25%	<10%	>25%	10–25%	<10%	>25%	10–25%	<10%
Shading - >**75%** of streambank or shoreline within AA contains riparian or wetland scrub-shrub or forested communities	E	E	H	H	H	M	M	M	M
Shading – **50 to 75%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	H	M	M	M	M	M	L	L
Shading - < **50%** of streambank or shoreline within AA contains rip. or wetland scrub-shrub or forested communities	H	M	M	M	L	L	L	L	L

ii. Modified Habitat Quality (Circle the appropriate response to the following question. If answer is Y, then reduce rating in i above by one level [E = H, H = M, M = L, L = L]). *Is fish use of the AA precluded or significantly reduced by a culvert, dike, or other man-made structure or activity* ***or*** *is the waterbody included on the MDEQ list of waterbodies in need of TMDL development with listed "Probable Impaired Uses" including cold or warm water fishery or aquatic life support?* **Y** **N** Modified habitat quality rating = (circle) **E** **H** **M** **L**

iii. Rating (use the conclusions from i and ii above and the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function)

Types of fish known or suspected within AA	*Modified Habitat Quality (ii)*			
	Exceptional	High	Moderate	Low
Native game fish	1 (E)	.9 (H)	.7 (M)	.5 (M)
Introduced game fish	.9 (H)	.8 (H)	.6 (M)	.4 (M)
Non-game fish	.7 (M)	.6 (M)	.5 (M)	.3 (L)
No fish	.5 (M)	.3 (L)	.2 (L)	.1 (L)

Comments: NA

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

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

Estimated wetland area in AA subject to periodic flooding	≥ 10 acres			<10, >2 acres			<2 acres		
% of flooded wetland classified as forested, scrub/shrub, or both	75%	25-75%	<25%	75%	25-75%	<25%	75%	25-75%	<25%
AA contains **no outlet or restricted outlet**	1(H)	.9(H)	.6(M)	.8(H)	.7(H)	.5(M)	.4(M)	.3(L)	.2(L)
AA contains **unrestricted outlet**	.9(H)	.8(H)	.5(M)	.7(H)	.6(M)	.4(M)	.3(L)	.2(L)	.1(L)

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

Comments: Highway

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

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

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

Comments:

14G. Sediment/Nutrient/Toxicant Retention and Removal: (Applies to wetlands with 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, circle **NA** here and proceed with the evaluation.)

I. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Sediment, nutrient, and toxicant input levels within AA	AA receives or surrounding land use with 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 with potential to deliver high levels of sediments, nutrients, or compounds such that other functions are substantially impaired. Major sedimentation, sources of nutrients or toxicants, or signs of eutrophication present.			
% cover of wetland vegetation in AA	≥ 70%		< 70%		≥ 70%		< 70%	
Evidence of flooding or ponding in AA	Yes	No	Yes	No	Yes	No	Yes	No
AA contains **no or restricted outlet**	1 (H)	.8 (H)	.7 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)	.2 (L)
AA contains **unrestricted outlet**	.9 (H)	.7 (M)	.6 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)	.1 (L)

Comments: Ag. use upstream

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

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [E = exceptional, H = high, M = moderate, or L = low] for this function.

% Cover of wetland streambank or shoreline by species with deep, binding rootmasses	*Duration of surface water adjacent to rooted vegetation*		
	permanent / perennial	seasonal / intermittent	Temporary / ephemeral
≥ 65%	1 (H)	.9 (H)	.7 (M)
35-64%	.7 (M)	.6 (M)	.5 (M)
< 35%	.3 (L)	.2 (L)	.1 (L)

Comments:

14I. Production Export/Food Chain Support:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function. Factor A = acreage of vegetated component in the AA; Factor B = structural diversity rating from #13; Factor C = whether or not the AA contains a surface or subsurface outlet; the final three rows pertain to duration of surface water in the AA, where P/P = permanent/perennial; S/I = seasonal/intermittent; T/E /A= temporary/ephemeral or absent [see instructions for further definitions of these terms].)

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

Comments: Has outlet, but water doesn't stock high enough to use spillway.

14J. Groundwater Discharge/Recharge: (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 present without underlying impeding layer
___Wetland contains inlet but no outlet
___Other

iii. Rating: Use the information from i and ii above and the table below to arrive at [circle] the functional points and rating [H = high, L = low] for this function.

Criteria	*Functional Points and Rating*
AA is known Discharge/Recharge area or one or more indicators of D/R present	1 (H)
No Discharge/Recharge indicators present	.1 (L)
Available Discharge/Recharge information inadequate to rate AA D/R potential	N/A (Unknown)

Comments:

14K. Uniqueness:

i. Rating (working from top to bottom, use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] 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 MNHP			AA does not contain previously cited rare types **and** structural diversity (#13) is high or contains plant association listed as "S2" by the MNHP			AA does not contain previously cited rare types or associations **and** structural diversity (#13) is low-moderate		
Estimated relative abundance (#11)	rare	common	abundant	rare	common	abundant	rare	common	abundant
Low disturbance at AA (#12i)	1 (H)	.9 (H)	.8 (H)	.8 (H)	.6 (M)	.5 (M)	.5 (M)	.4 (M)	.3 (L)
Moderate disturbance at AA (#12i)	.9 (H)	.8 (H)	.7 (M)	.7 (M)	.5 (M)	.4 (M)	.4 (M)	.3 (L)	.2 (L)
High disturbance at AA (#12i)	.8 (H)	.7 (M)	.6 (M)	.6 (M)	.4 (M)	.3 (L)	.3 (L)	.2 (L)	.1 (L)

Comments:

14L. Recreation/Education Potential: i. Is the AA a known rec./ed. site: (circle) Y N (If yes, rate as [circle] High [1] and go to ii; if no go to 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 strong potential for rec./ed. use? Y N
(If yes, go to ii, then proceed to iv; if no, then rate as [circle] Low [0.1])

iv. Rating (use the matrix below to arrive at [circle] the functional points and rating [H = high, M = moderate, or L = low] for this function.

Ownership	*Disturbance at AA (#12i)*		
	low	moderate	high
public ownership	1 (H)	.5 (M)	.2 (L)
private ownership	.7 (M)	.3 (L)	.1 (L)

Comments:

FUNCTION & VALUE SUMMARY & OVERALL RATING

Function & 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	1	
B. MT Natural Heritage Program Species Habitat	Low	0	1	
C. General Wildlife Habitat	MOD	0.7	1	
D. General Fish/Aquatic Habitat	NA	—	—	
E. Flood Attenuation	Low	0.3	1	
F. Short and Long Term Surface Water Storage	Low	0.2	1	
G. Sediment/Nutrient/Toxicant Removal	MOD	0.5	1	
H. Sediment/Shoreline Stabilization	NA	—	—	
I. Production Export/Food Chain Support	MOD	0.5	1	
J. Groundwater Discharge/Recharge	Low	0.1	1	
K. Uniqueness	MOD	0.5	1	
L. Recreation/Education Potential	Low	0.1	1	
Totals:		2.9	10	

29%

OVERALL ANALYSIS AREA (AA) RATING: (Circle appropriate category based on the criteria outlined below) I II (III) IV

Category I Wetland: (Must satisfy **one** of the following criteria; if does not meet criteria, go to Category II)
- ___ Score of 1 functional point for Listed/Proposed Threatened or Endangered Species; **or**
- ___ Score of 1 functional point for Uniqueness; **or**
- ___ Score of 1 functional point for Flood Attenuation **and** answer to Question 14E.ii is "yes"; **or**
- ___ Total actual functional points > 80% (round to nearest whole #) of total possible functional points.

Category II Wetland: (Criteria for Category I not satisfied **and** meets any **one** of the following criteria; if not satisfied, go 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**
- ___ Total Actual Functional Points > 65% (round to nearest whole #) of total possible functional points.

√ **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 does not satisfy criteria go to Category III)
- — ___ "Low" rating for Uniqueness; **and**
- — ___ "Low" rating for Production Export/Food Chain Support; **and**
- X ___ Total actual functional points < 30% (round to nearest whole #) of total possible functional points

Montana Department of Transportation		Project Name	VIDA
Wetland Mitigation Monitoring Project		Project/task number	
for		Date	7/19/2001
Land and Water Consulting		Field Personnel	JB/RH
		Note	
2001		Rhithron Sample Identification	27
Coelenterata		*Hydra*	
Oligochaeta	Enchytraeidae	Enchytraeidae	2
	Naididae	*Chaetogaster*	
		Nais elinguis	
		Nais variabilis	
		Ophidonais serpentina	
	Tubificidae	Tubificidae - immature	
		Limnodrilus hoffmeisteri	
Hirudinea	Erpobdellidae	*Mooreobdella microstoma*	
		Nephelopsis	
	Glossiphoniidae	*Helobdella stagnalis*	
		Helobdella	
		Glossiphonia	
Bivalvia	Sphaeriidae	*Sphaerium*	
Gastropoda	Lymnaeidae	*Fossaria*	
	Physidae	*Physa*	
	Planorbidae	*Gyraulus*	
		Helisoma	
Crustacea	Cladocera	Cladocera	
	Copepoda	Calanoida	
		Cyclopoida	
	Ostracoda	Ostracoda	
	Amphipoda	*Gammarus*	
		Hyalella azteca	
	Decapoda	*Orconectes*	
Acarina		Acari	
Odonata	Aeshnidae	*Anax*	
	Libellulidae	Libellulidae-early instar	
		Sympetrum	
	Coenagrionidae	Coenagrionidae-early instar	
		Enallagma	
	Lestidae	*Lestes*	
Ephemeroptera	Baetidae	*Callibaetis*	
	Caenidae	*Caenis*	
Hemiptera	Corixidae	Corixidae - immature	
		Hesperocorixa	
		Sigara	2
		Trichocorixa	
	Nepidae	*Ranatra*	
	Notonectidae	*Notonecta*	
Trichoptera	Hydroptilidae	Hydroptilidae - pupa	
	Leptoceridae	Leptoceridae - early instar	
		Mystacides	
		Ylodes	
Coleoptera	Chrysomelidae	Chrysomelidae	
	Curculionidae	*Bagous*	
	Dytiscidae	*Acilius*	
		Hydroporinae - early instar larvae	
		Hygrotus	
		Liodessus	
		Laccophilus	
		Neoporus	
	Elmidae	*Heterlimnius*	1
	Haliplidae	*Haliplus*	
		Peltodytes	
	Hydrophilidae	*Berosus*	
		Helophorus	
		Hydrobius	
		Hydrochara	
		Laccobius	
		Tropisternus	
Diptera	Ceratopogoninae	*Bezzia/Palpomyia*	
		Dasyhelea	

Chaoboridae	*Chaoborus*	
Culicidae	*Anopheles*	
	Culex	1
Ephydridae	Ephydridae	
Simuliidae	*Simulium*	1
Sciomyzidae	Sciomyzidae	
Stratiomyidae	*Odontomyia*	
Chironomidae	*Acricotopus*	
	Chironomus	
	Cladotanytarsus	
	Corynoneura	
	Cryptotendipes	
	Dicrotendipes	
	Einfeldia	
	Endochironomus	
	Labrundinia	
	Microtendipes	
	Orthocladius annectens	
	Parachironomus	
	Paramerina	
	Paratanytarsus	
	Phaenopsectra	
	Polypedilum	
	Procladius	
	Psectrocladius	
	Psectrotanypus	
	Pseudochironomus	
	Tanypus	
	Tanytarsus	
	TOTAL	7
	grids	30

Total taxa	5
POET	2
Chironomidae taxa	0
Crustacea taxa + Mollusca taxa	0
% Chironomidae	0
Orthocladiinae/Chironomidae	#DIV/0!
%Amphipoda	0
%Crustacea + %Mollusca	0
HBI	7.28571429
%Dominant taxon	28.5714286
%Collector-Gatherers	42.8571429
%Filterers	14.2857143

Total taxa	1
POET	3
Chironomidae taxa	1
Crustacea taxa + Mollusca taxa	1
% Chironomidae	3
Orthocladiinae/Chironomidae	1
%Amphipoda	3
%Crustacea + %Mollusca	3
HBI	3
%Dominant taxon	3
%Collector-Gatherers	1
%Filterers	1
site score	24

Appendix C

REPRESENTATIVE PHOTOGRAPHS

MDT Wetland Mitigation Monitoring
Vida
Vida, Montana

LAND & WATER

Photo point 1 (from dike), 135 degrees SE.

Photo point 2 (from dike), 70 degrees E/NE (note concrete spillway in background).

Photo point 2 (from dike), 225 degrees S/SW (adjacent uplands).

Transect Start, 248 degrees SW.

Transect End, 63 degrees NE.

Photo from culvert outlet at south end of site, 337 degrees NW.

2001 Vida Photo Sheet 1

Appendix D

1995 Proposed Site Layout
1997 Delineation Map

MDT Wetland Mitigation Monitoring
Vida
Vida, Montana

LAND & WATER

STATE	PROJECT NUMBER	SHEET NO.
MONTANA	STPX 0002(205)	4

LAND & WATER D-1

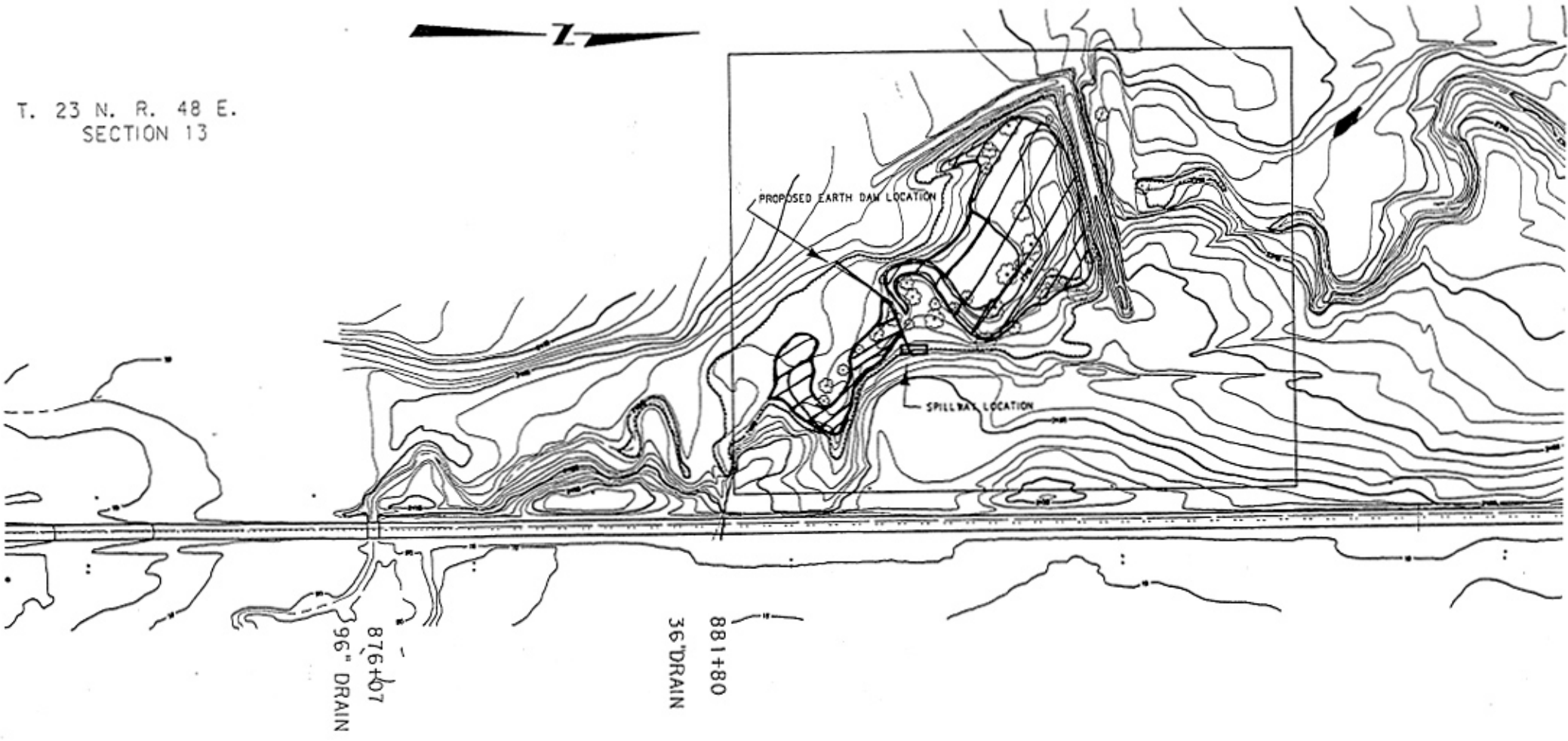
DETAIL

SOUTH OF VIDA
McCONE COUNTY

SCALE 1"=120'

SOUTH OF VIDA
McCONE COUNTY

LAND & WATER D-2



▨ - wetland areas

ViDA Wetland
Mitigation Site
U.S. Hwy 13
McCone County
August 1997

Appendix E

BIRD SURVEY PROTOCOL
MACROINVERTEBRATE SAMPLING PROTOCOL
GPS PROTOCOL

MDT Wetland Mitigation Monitoring
Vida
Vida, Montana

LAND & WATER

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.

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.

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.