



**LITTLE MUDDY STATION CONNECTION PROJECT  
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October 21, 2011

Mr. Paul Hartzheim  
Merjent  
615 First Avenue NE, Suite 425  
Minneapolis, MN 55413

Re: **Wetland Delineation and Habitat Assessment Report – Little Muddy Station and Pipeline Project**

Dear Mr. Hartzheim,

Carlson McCain, Inc. is pleased to submit the “Wetland Delineation and Habitat Assessment Report – Little Muddy Station and Pipeline Project” for your review.

Please call me at 701-255-1475 if you have any questions or need additional informational.

Sincerely,

A handwritten signature in black ink that reads "Greg W. Meyer". The signature is written in a cursive style.

Greg Meyer, MS  
Ecologist

# WETLAND DELINEATION AND HABITAT ASSESSMENT REPORT

Enbridge Pipelines (North Dakota) LLC - Little Muddy Station  
and Pipeline Project  
Sections 17, 20-23, 26, 27, 35, and 36, T156N, R100W  
Williams County, North Dakota  
*Project #3545*

*Prepared for:*

Merjent  
Mr. Paul Hartzheim  
615 First Avenue NE, Suite 425  
Minneapolis, MN 55413

*October 21, 2011*



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## 1.0 SCOPE OF WORK

This project delineated the extent of wetland areas and drainage features and assessed potential habitat of endangered, threatened, and raptor species within and adjacent to the proposed Little Muddy Station and Pipeline Project (Project Area) in Williams County, North Dakota (**Appendix A, Figure 1**). The Project Area comprises portions of Sections 17, 20-23, 26, 27, 35, and 36, T156N, R100W. The Project Area is located near Williston, North Dakota. The proposed project will connect the proposed Little Muddy Station (Section 17, T156N, R100W) with the existing East Fork Station located in Section 36, T156N, R100W.

The Project Area consists of agricultural fields, grasslands, depression wetlands, and shallow drainages (**Appendix A, Figures 2 and 3**). Wheat is a common crop of the agricultural fields although many of the fields were not planted this spring due to wet conditions. Numerous wetlands consisting of isolated depressions and intermittent drainages are located in the Project Area.

The majority of the project is located within the Little Muddy River (10110102) Hydrologic Unit Code (HUC) and a small portion near the East Fork Station is located within the Lake Sakakawea (10110101) HUC.

The wetland field delineation and habitat assessment was conducted September 19 and 20, and October 10, 2011, by Greg Meyer, Ecologist, and Nate Harling, Biologist, Carlson McCain, Inc.

## 2.0 DELINEATION PROCEDURES

The wetland field delineation was conducted in accordance with the U.S. Army Corps of Engineers (USACE) 1987 *Wetland Delineation Manual* and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (Version 2.0)* (Manual).

Wetland areas were systematically evaluated by using numerous observation points to define their boundaries. The frequency of observation points was increased in transitional areas between uplands and lower areas to accurately identify wetland boundaries based on soils, vegetation, hydrology, and landscape. Boundaries were digitally recorded with a Trimble GeoXH Global Positioning System (GPS).

Wetland areas were documented with a single or multiple observation points. Paired upland and wetland soil pits were evaluated for wetland areas. The Wetland Determination Data Form of the Great Plains Manual was completed for the observation points. Climatic conditions were considered typical prior to and during the evaluation.

Existing vegetation was classified using hydrophytic vegetation criteria outlined in the Manual and the *National List of Plant Species that Occur In Wetlands: 1996 National Summary* (Kartesz 1996), and *National list of plant species that occur in wetlands: North Plains (Region 4)* (Reed 1988). Hydric soil indicators were determined using the *Field Indicators of Hydric Soils in the United States; Guide for Identifying and Delineating Hydric Soils, Version 7.0* (USDA-NRCS 2010). Hydrology was determined on-site by observation of hydrologic indicators. Aerial photography was used to assist hydrologic determinations.

Field conditions and existing resource information were used to identify possible wetlands within the Project Area. Williams County NAIP 2010, 2009, and 2005 aerial photographs, U.S. Fish and Wildlife Service National Wetland Inventory (USFWS 2011), and the digital soil survey of Williams County (USDA-NRCS 2011), were consulted prior to the wetland field delineation. Possible drainage features were identified with the U.S. Geological Survey (USGS) Water100k Line GIS Shapefile.

### 3.0 DELINEATION RESULTS

Twelve wetlands and seven drainage features were identified and delineated within the Project Area (**Appendix A, Figures 2-1 – 2-3**). Isolated depression and connected intermittent stream wetlands are located in the Project Area. Numerous depression wetlands are located in the northern portion of the Project Area (Sections 17, 20, and 21) and near the East Fork Station (Section 36). Drainage features within the Project Area consist of ephemeral and intermittent streams. Ephemeral streams were designated as such since they did not have hydrophytic vegetation within them. Intermittent streams contained hydrophytic vegetation and other wetland indicators within their pools and runs and were also identified as wetlands.

Barnyard grass (*Echinochloa crusgalli*), curled dock (*Rumex crispus*), and biennial wormwood (*Artemisia biennis*) are prevalent in the depression wetlands in cultivated fields. Prairie cordgrass (*Spartina pectinata*), reed canarygrass (*Phalaris arundinacea*), and scattered patches of cattails (*Typha* spp.) are present in the intermittent streams that flow through the Project Area.

A description of the wetland type and documentation of the vegetation, hydrology, and hydric soils were recorded on the associated USACE Wetland Determination Data Forms (**Appendix B**) and are identified by observation point number (e.g., 17156100-w1, 17156100-u1). The observation points are identified by wetland (w) or upland soils (u).

Table 1 summarizes the evaluation criteria for the wetland within the Project Area. A total of 6.54 wetland acres and 1.69 drainage feature acres were identified and delineated in the Project Area.

**TABLE 1 - WETLANDS**  
**Wetland and Drainage Feature Identification, Location, and Characteristics (Field) Summary of the Project Area**

Wetland / Drainage Feature ID	Acreage	NWI	Wetland Type
17156100-w1	4.04	PEMC	Depression (isolated)
17156100-w2	0.02	PEMA*	Depression (isolated)
17156100-w3	0.12	PEMA*	Depression (isolated)
20156100-w1	0.89	PABFx	Depression (isolated)
20156100-w2	0.07	PEMA*	Depression (isolated)
21156100-w1	0.09	PEMC	Depression (isolated)
27156100-w1	0.51	PABFh	Intermittent Stream (connected)
26156100-w1	0.50	PEMA*	Depression (isolated)
26156100-w2	0.14	PABFh	Intermittent Stream (connected)
36156100-w1	0.03	PEMC	Depression (isolated)
36156100-w2	0.02	PEMA*	Depression (isolated)
36156100-w3	0.11	PEMA*	Depression (isolated)

Wetland Delineation and Habitat Assessment Report  
 Little Muddy Station and Pipeline Project  
 Williams County, North Dakota

Wetland / Drainage Feature ID	Acreage	NWI	Wetland Type
17156100-s1	0.33	NA	Ephemeral Stream (connected)
22156100-s1	0.01	NA	Ephemeral Stream (connected)
22156100-s2	0.02	NA	Ephemeral Stream (connected)
27156100-s3	0.60	NA	Intermittent Stream (connected)
26156100-s1	0.16	NA	Intermittent Stream (connected)
27156100-s1	0.40	NA	Intermittent Stream (connected)
27156100-s2	0.17	NA	Intermittent Stream (connected)

\*NWI designations were assigned during the wetland field delineation.

#### 4.0 HABITAT ASSESSMENT AND RAPTOR SURVEY

Agricultural fields and native grasslands surrounding drainage features comprise the majority of the habitat within and around the Project Area. Intermittent streams and depression wetlands are located in and around the Project Area. The native grasslands are heavily encroached upon by non-native grassland species including *Bromus inermis*, *Poa pratensis*, and *Agropyron cristatum*.

Assessments for federally listed endangered, threatened, and candidate species were conducted by evaluating historic and present occurrences, and by determining if potential habitat exists within the Project Area. Determinations were made concerning direct and cumulative effects of the proposed activity on each species and their habitat. Determinations made for federally listed species are:

- No effect
- Not not likely to adversely affect
- Is likely to adversely affect

Currently, five federally listed species have been documented in Williams County including interior least tern (*Sterna antillarum*), whooping crane (*Grus americana*), pallid sturgeon (*Scaphirhynchus albus*), gray wolf (*Canis lupus*), and piping plover (*Charadrius melodus*). In addition, critical habitat for the piping plover is listed as present in the county (USFWS 2011a). Suitable habitat for the interior least tern and pallid sturgeon is limited to the Missouri River system and since none of this habitat is located in the Project Area these species will not be addressed in this report (USFWS 2011b and 2011c). The proposed project will have *no effect* on the interior least tern and pallid sturgeon at this time.

The Sprague's pipit (*Anthus spagueii*) has been determined to be a candidate species under the Endangered Species Act. No legal requirement exists to protect candidate species; however, the U.S. Fish and Wildlife Service (USFWS) considers this species to have significant value and worth protecting.

#### 4.1 Endangered Species

##### 4.1.1 Gray Wolf (*Canis lupus*)

Gray wolves historically ranged throughout North America. With the exception of Minnesota, Wisconsin, Michigan, Montana, Idaho, Washington, and Wyoming, the gray wolf is absent from the lower 48 states. Gray wolves have been documented in North Dakota since 1990; however, their presence in North Dakota is sporadic, consisting of occasional dispersing animals from Minnesota and Manitoba (USFWS 2008). Gray wolf habitat varies from woodlands to grasslands, but they generally avoid populated areas and areas with high road densities (Johnson 1999).

Gray wolves were not observed during the habitat assessment and there is no potential habitat located in the Project Area due to the prevalence of agricultural fields. The proposed project will have *no effect* on this species at this time.

#### 4.1.2 Whooping Crane (*Grus americana*)

Whooping cranes historically nested in North Dakota in the 19<sup>th</sup> Century, but now only migrate through the state in the spring and fall. Along their migration route, whooping cranes use large shallow marshes for roosting and loafing while feeding in harvested grain fields. Twenty-five cranes were reported in the 2009 fall migration and twelve were reported in the 2010 spring migration through North Dakota (Stehn 2010).

Suitable habitat is within the Project Area. Whooping cranes may fly over, temporarily feed, or loaf in the area; however, whooping cranes were not observed during the field survey. The proposed project is *not likely to adversely affect* this species at this time.

### 4.2 Threatened Species / Critical Habitat

#### 4.2.1 Piping Plover (*Charadrius melodus*)

North Dakota's population of piping plovers (*Charadrius melodus*) was 496 breeding pairs in 1991 and was reduced to 399 breeding pairs by 1996. Approximately 75% of piping plovers in North Dakota nest on prairie alkali lakes, and 25% use the Missouri River (USFWS 2011d). The USFWS designated the piping plover as threatened in North Dakota and with specific areas in Williams County as designated Critical Habitat (USFWS 2010). Nest locations are most likely selected due to their sparse vegetation. In North Dakota, they nest on alkali lakes, sandy relatively narrow beaches (300 - 1,200 feet wide), and barren river sandbars.

There is no suitable nesting habitat within or adjacent to the Project Area. No individuals were sighted during the habitat assessment. The proposed project is *not likely to adversely affect* this species at this time and will have *no effect* on the designated critical habitat.

### 4.3 Candidate Species

#### 4.3.1 Sprague's pipit (*Anthus spragueii*)

The Sprague's pipit is a ground nesting bird that breeds and winters on open grasslands. It feeds mostly on insects, spiders, and some seeds. The Sprague's pipit is closely tied with native prairie habitat and breeds in the north-central United States in Minnesota, Montana, North Dakota and South Dakota as well as south-central Canada. Between 1996 and 2007, the population of Sprague's pipits in North Dakota has declined by 2% (Sauer et. al. 2008). During the breeding season, Sprague's pipits prefer large patches of native grassland with a minimum size requirement thought to be approximately 145 ha (358.3 ac). The species prefers to breed in well-drained, open grasslands and avoids grasslands with excessive shrubs. Preferred grass height is estimated to be between 10 and 30 cm. They may avoid roads, trails, and habitat edges.

Sprague's pipit were not observed during the habitat assessment; however, native grassland and potential habitat is located within and adjacent to the Project Area. The proposed project is *not likely to adversely affect* this species at this time.

#### **4.4 Raptor Survey**

No raptors or raptor nests were observed during the habitat assessment; however, nesting habitat is located within and adjacent to the Project Area. Due to the dates of the field survey, it is recommended that a raptor nest survey be conducted if construction of the project is delayed until the next nesting season.

## 5.0 REFERENCES

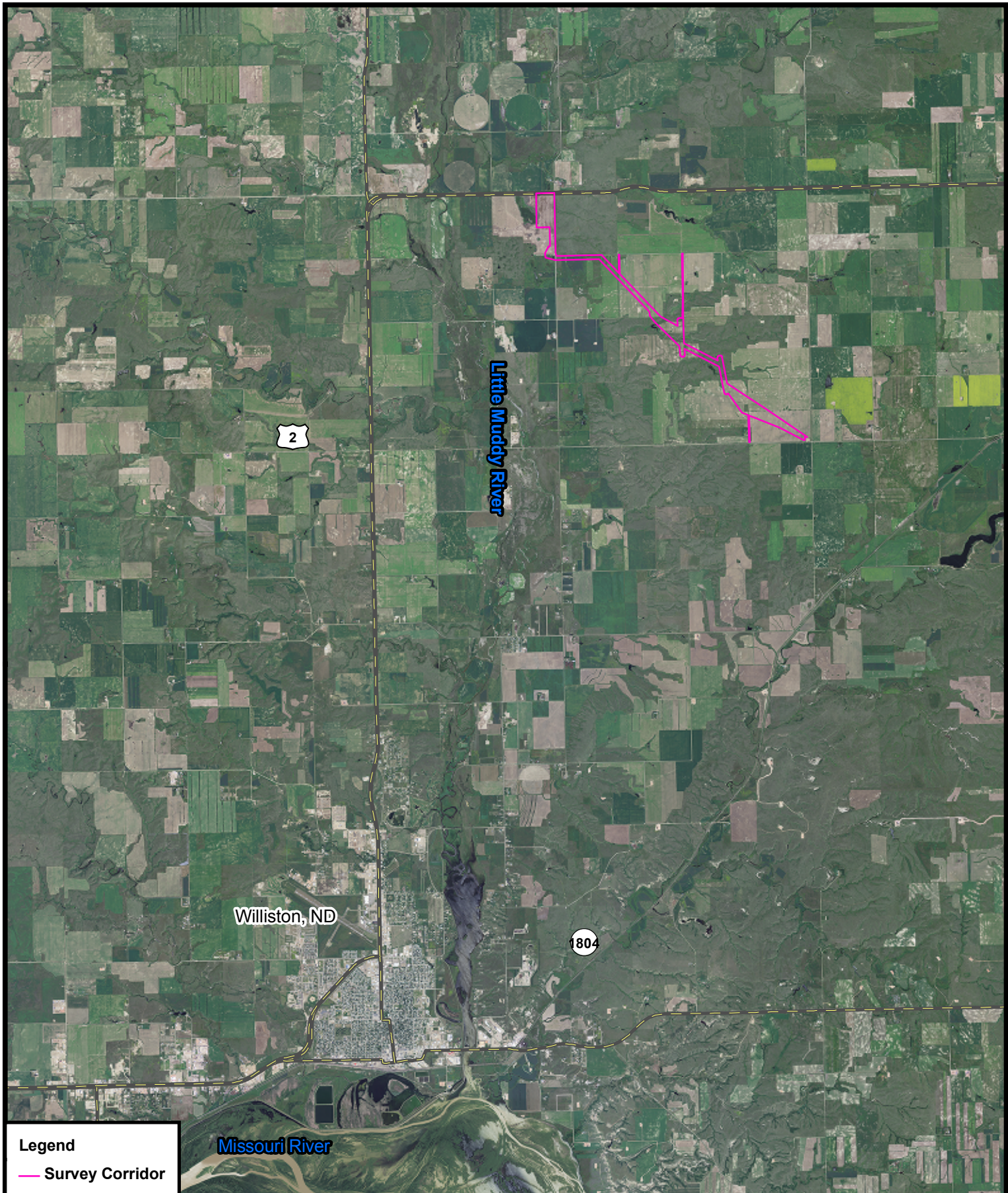
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*Wetland Delineation and Habitat Assessment Report*  
*Little Muddy Station and Pipeline Project*  
*Williams County, North Dakota*

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# APPENDIX A

Figures



**Figure 1**  
**GENERAL LOCATION**  
**Little Muddy Station and**  
**Pipeline Project**

1:126,720      1 inch = 2 miles  
 0      1      2  
 Miles  
 Source: NAIP Orthophoto 2010  
 Williams County, North Dakota



**Legend**

- Survey Corridor
- Little Muddy Wetlands
- Little Muddy Drainage Features
- Matchline
- Sections

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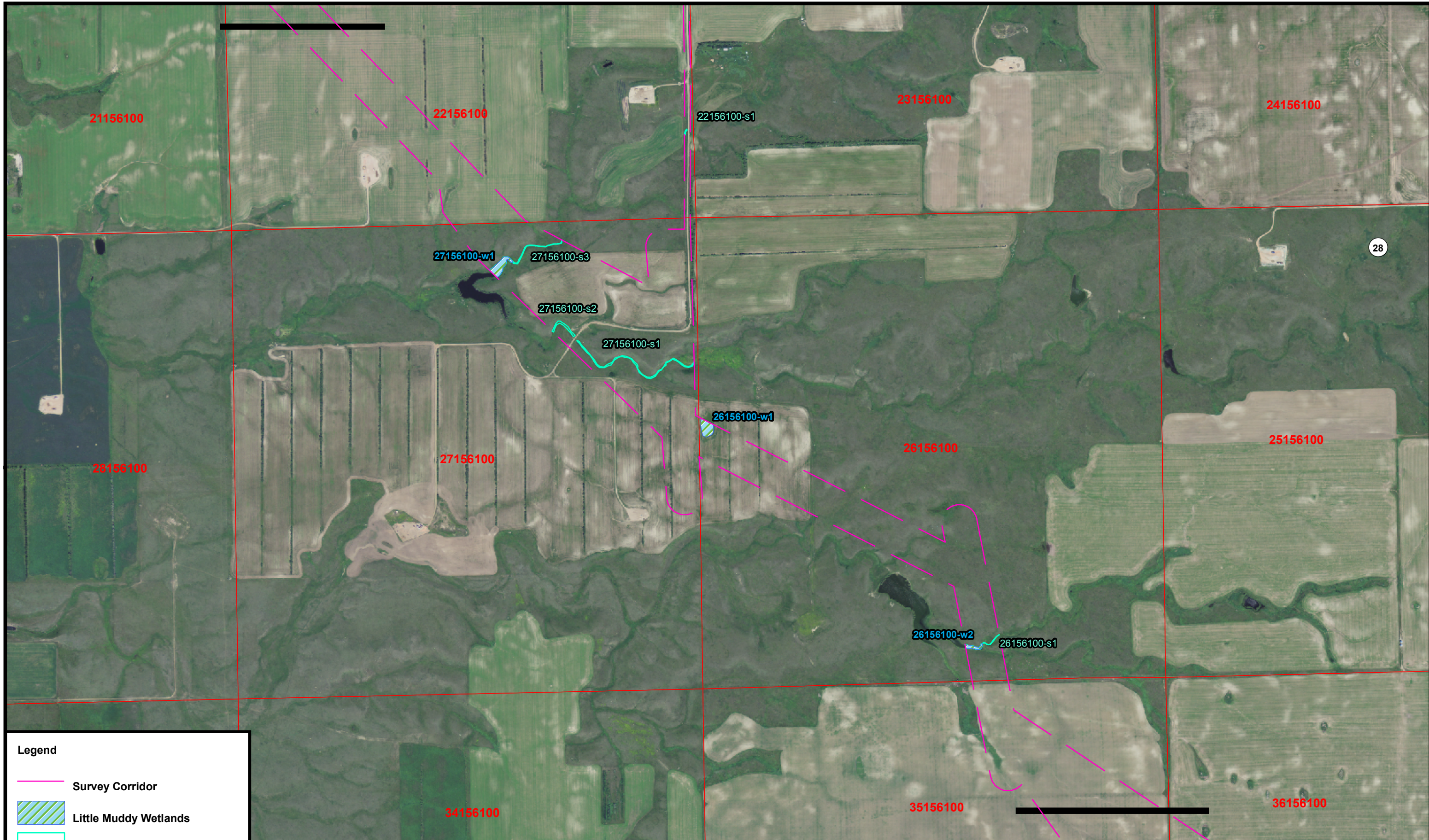
1:12,000      1 inch = 1,000 feet

0 250 500 750 1,000  
 Feet

Source: NAIP Orthophoto 2010  
 Williams County, North Dakota

**LITTLE MUDDY STATION AND  
 PIPELINE PROJECT  
 ENBRIDGE PIPELINES  
 (NORTH DAKOTA) LLC**

**FIGURE 2-1  
 WETLANDS AND  
 DRAINAGE FEATURES**



**Legend**

- Survey Corridor
- Little Muddy Wetlands
- Little Muddy Drainage Features
- Matchline
- Sections

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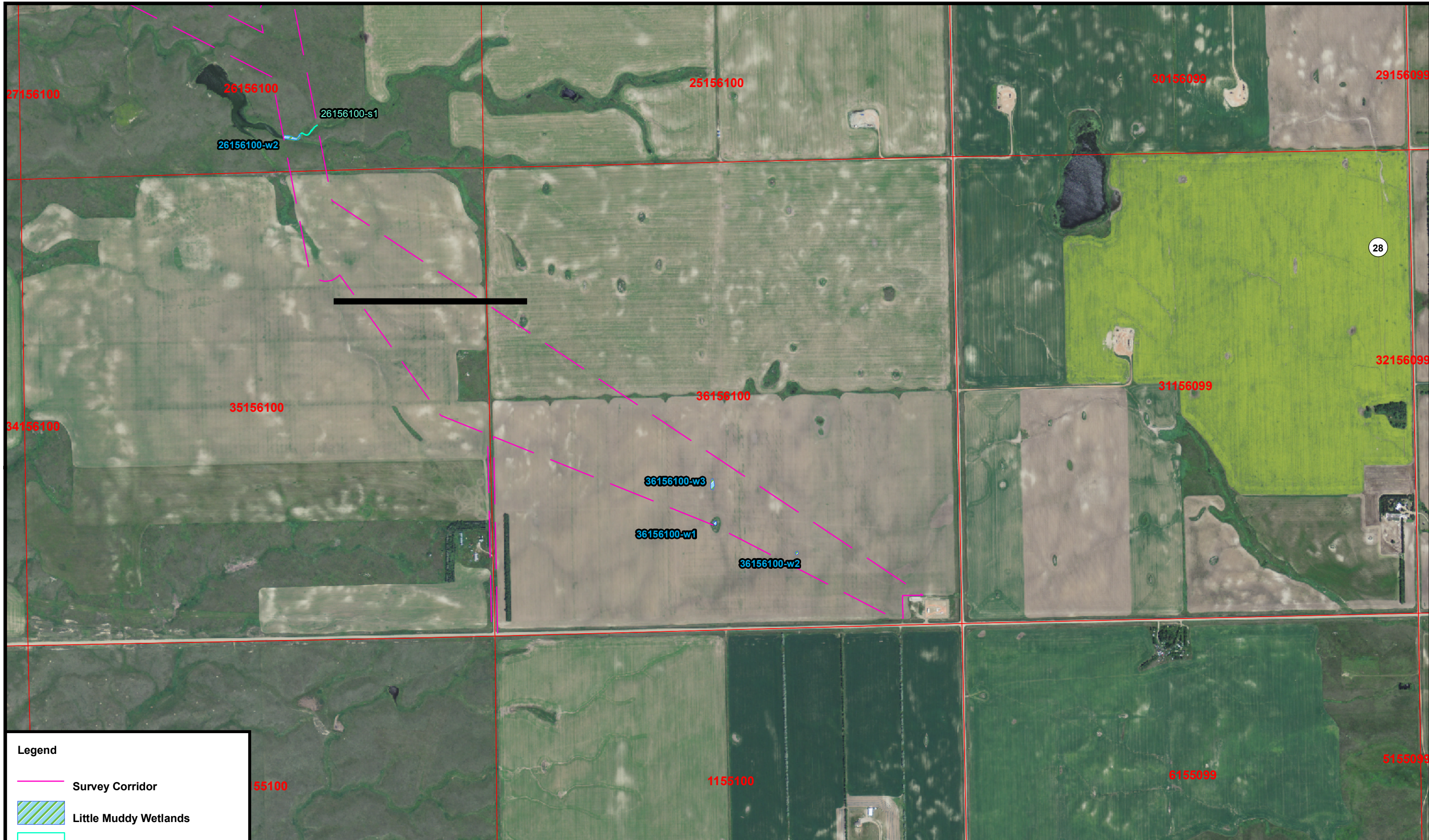
1:12,000      1 inch = 1,000 feet

0 250 500 750 1,000 Feet

Source: NAIP Orthophoto 2010  
Williams County, North Dakota

**LITTLE MUDDY STATION AND  
PIPELINE PROJECT  
ENBRIDGE PIPELINES  
(NORTH DAKOTA) LLC**

**FIGURE 2-2  
WETLANDS AND  
DRAINAGE FEATURES**



**Legend**

- Survey Corridor
- Little Muddy Wetlands
- Little Muddy Drainage Features
- Matchline
- Sections

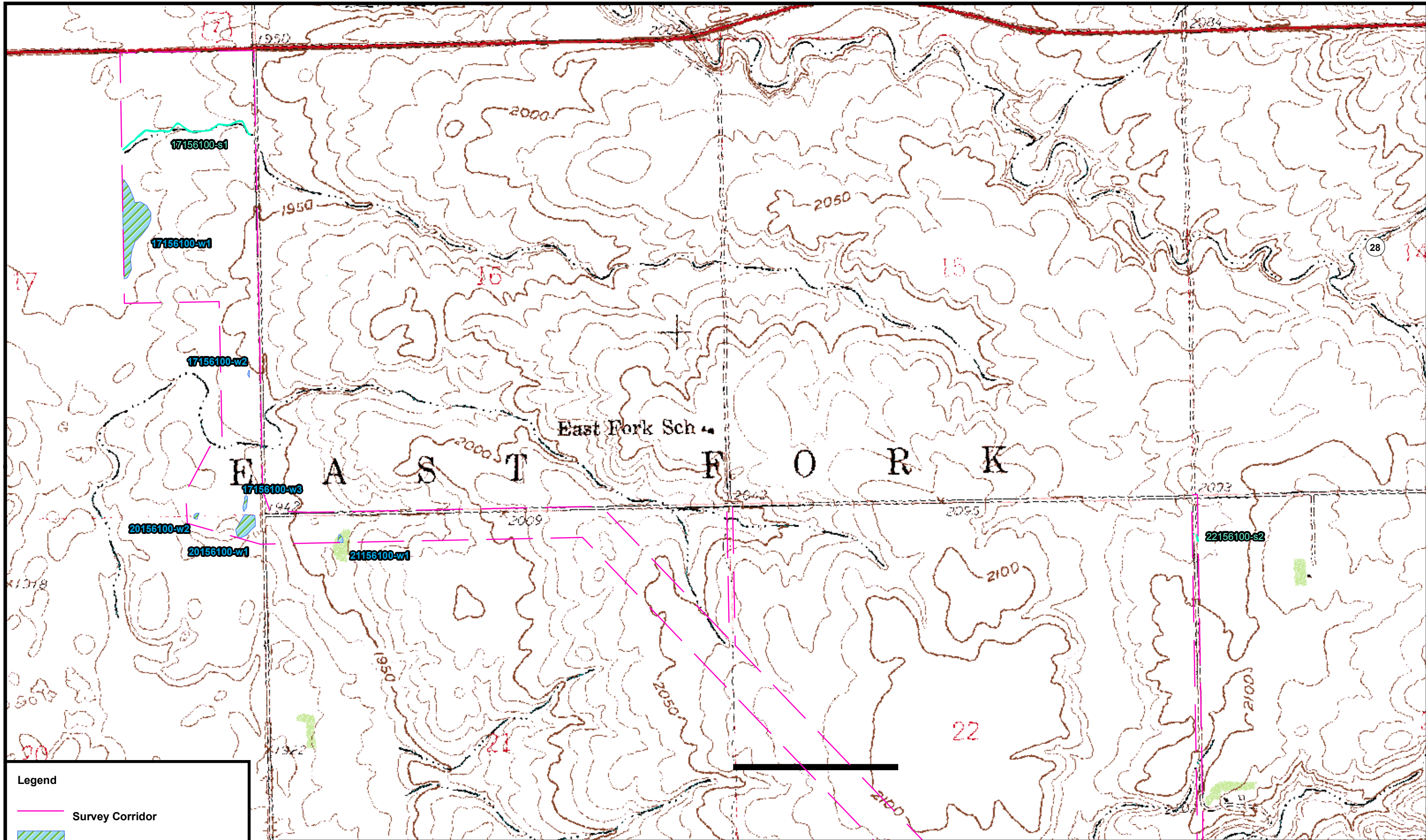
1:12,000      1 inch = 1,000 feet

0 250 500 750 1,000 Feet





Source: NAIP Orthophoto 2010  
Williams County, North Dakota

**LITTLE MUDDY STATION AND PIPELINE PROJECT**  
ENBRIDGE PIPELINES (NORTH DAKOTA) LLC

**FIGURE 2-3**  
**WETLANDS AND DRAINAGE FEATURES**



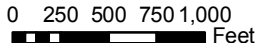
**Legend**

-  Survey Corridor
-  Little Muddy Wetlands
-  Little Muddy Drainage Features
-  Matchline



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1:12,000      1 inch = 1,000 feet

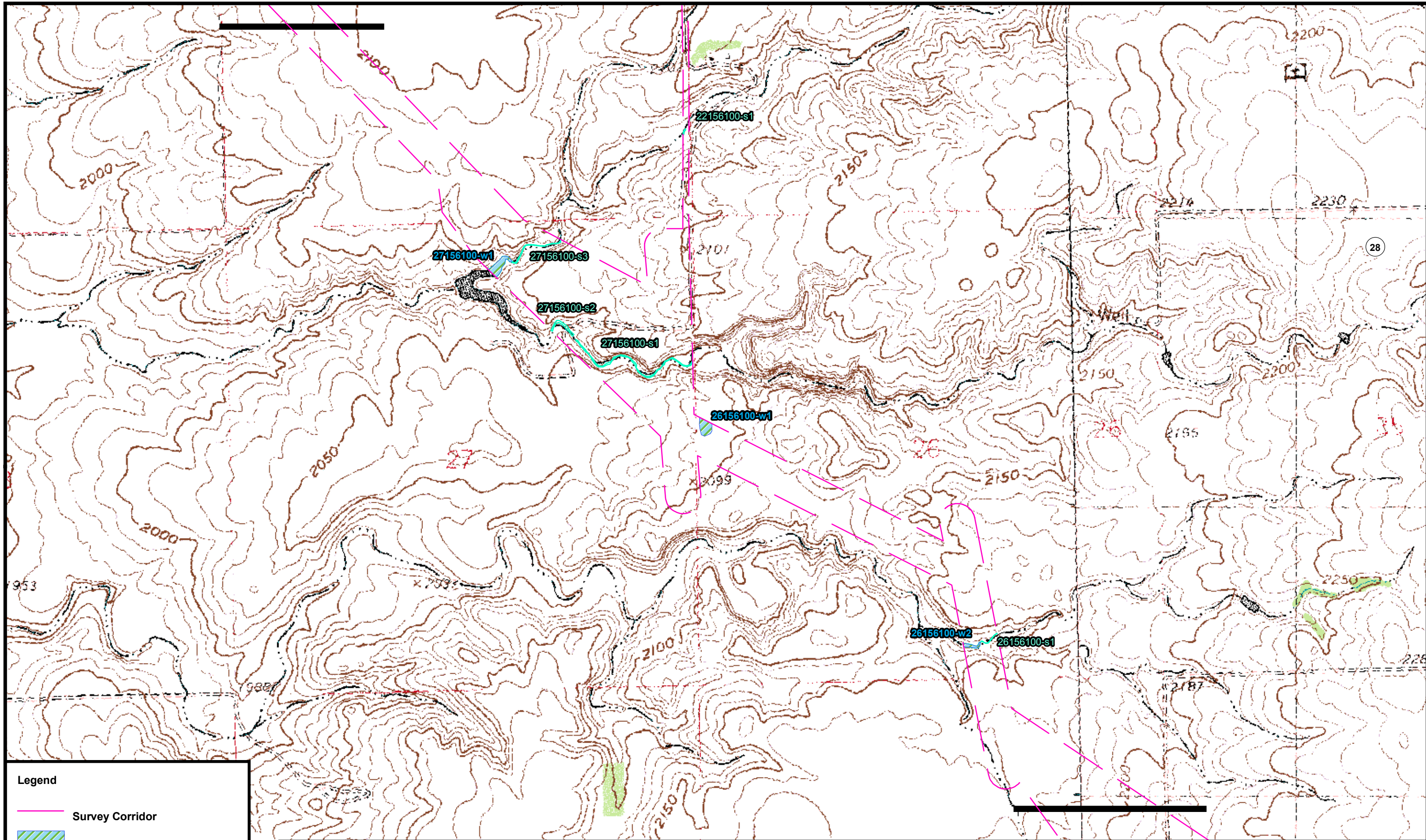


0 250 500 750 1,000 Feet





Source: USGS Topographical Quadrangle  
Blacktail Lake SE (Marm) (48103c5), 1976

**LITTLE MUDDY STATION AND  
PIPELINE PROJECT  
ENBRIDGE PIPELINES  
(NORTH DAKOTA) LLC**

**FIGURE 3-1  
TOPOGRAPY**



**Legend**

-  Survey Corridor
-  Little Muddy Wetlands
-  Little Muddy Drainage Features
-  Matchline



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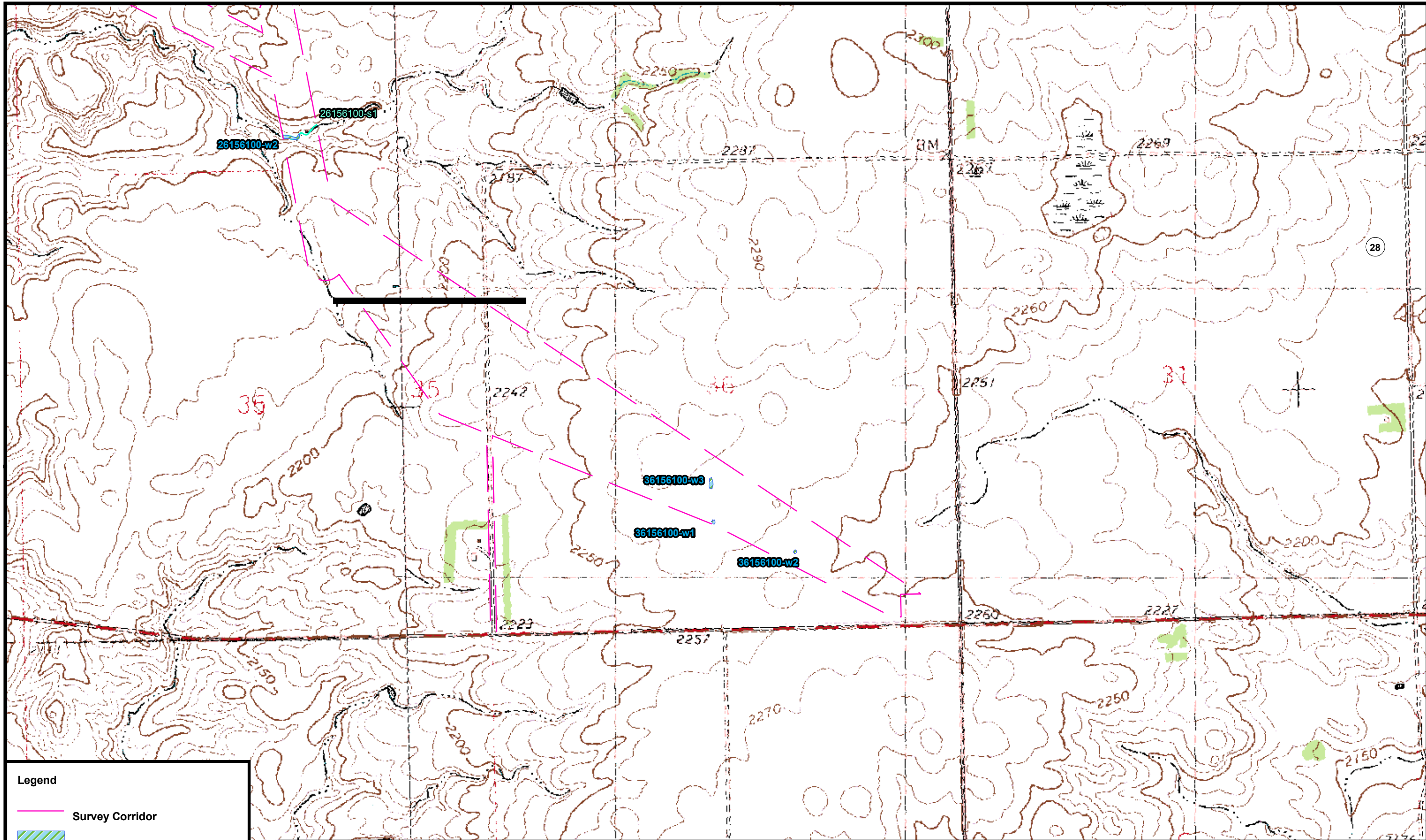
1:12,000      1 inch = 1,000 feet

0 250 500 750 1,000  
Feet





Source: USGS Topographical Quadrangle  
Blacktail Lake SE (Marm) (48103c5), 1976

**LITTLE MUDDY STATION AND  
PIPELINE PROJECT  
ENBRIDGE PIPELINES  
(NORTH DAKOTA) LLC**

**FIGURE 3-2  
TOPOGRAPHY**



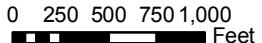
**Legend**

-  Survey Corridor
-  Little Muddy Wetlands
-  Little Muddy Drainage Features
-  Matchline



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1:12,000      1 inch = 1,000 feet



0 250 500 750 1,000 Feet

Source: USGS Topographical Quadrangle  
Blacktail Lake SE (Marm) (48103c5), 1976

**LITTLE MUDDY STATION AND  
PIPELINE PROJECT  
ENBRIDGE PIPELINES  
(NORTH DAKOTA) LLC**

**FIGURE 3-3  
TOPOGRAPHY**

# APPENDIX B

## USACE Wetland Determination Data Forms

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/6/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 17156100-w1  
 Investigator(s): GWM Section, Township, Range: 17, 156, 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.338100N Long: -103.567606W Datum: NAD 83  
 Soil Map Unit Name: 2349 - Lawther Silty clay 0 to 2 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>Depression wetland that is cultivated around.</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>3</b> (A)  Total Number of Dominant Species Across All Strata: <b>3</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>100</b> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
			= Total Cover	<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
			= Total Cover																	
<b>Herb Stratum (Plot Size: 5')</b>																				
1. <b><u>Aster brachyatis</u></b>	<b>10</b>	<b>yes</b>	<b>FACW</b>																	
2. <b><u>Artemisia biennis</u></b>	<b>20</b>	<b>yes</b>	<b>FAC</b>																	
3. <b><u>Rumex crispus</u></b>	<b>10</b>	<b>yes</b>	<b>FACW</b>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
			<b>40</b> = Total Cover																	
<b>Woody Vine Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
			= Total Cover																	
<b>% Bare Ground in Herb Stratum <b>60</b></b>																				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				

Remarks:  
**Typha angustifolia and Alisma plantago-aquatica in the interior of the wetland.**

**SOIL**

Sampling Point: 17156100-w1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-7	10YR 2/1	100					sicl	
7-18	2.5Y 4/2	95	7.5YR 5/6	2	c	m	sicl	
			2.5Y 6/2	3	d	m	sicl	

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR I, J)
- Coast Prairie Redox (A16) (LRR F, G, H)
- Dark Surface (S7) (LRR G)
- High Plains Depressions (F16)
- (LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/6/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 17156100-u1  
 Investigator(s): GWM Section, Township, Range: 17, 156, 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.338218N Long: -103.567420W Datum: NAD 83  
 Soil Map Unit Name: 2349 - Lawther silty clay 0 to 2 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>1</b> (A)  Total Number of Dominant Species Across All Strata: <b>2</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>50</b> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species <b>10</b> x3 = <b>30</b> FACU species <b>30</b> x4 = <b>120</b> UPL species                      _____ x5 = _____ Column Totals: <b>40</b> (A) <b>150</b> (B) Prevalence Index = B/A = <b>3.1</b>
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <b>5'</b> )				
1. <u>Iva xanthifolia</u>	<u>30</u>	<u>yes</u>	<u>FACU</u>	
2. <u>Kochia scoparia</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>40</b>			= Total Cover	
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
<b>% Bare Ground in Herb Stratum <u>60</u></b>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 17156100-u1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	100	_____	_____	_____	_____	sicl	_____
6-18	2.5Y 5/2	100	_____	_____	_____	_____	sicl	no redoximorphic features
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR I, J)
- Coast Prairie Redox (A16) (LRR F, G, H)
- Dark Surface (S7) (LRR G)
- High Plains Depressions (F16) (LRR H outside of MLRA 72 & 73)
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/6/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 17156100-w2  
 Investigator(s): GWM Section, Township, Range: 17, 156, 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.332441N Long: -103.561888W Datum: NAD 83  
 Soil Map Unit Name: 1249 - Appem sandy loam 0 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>Depression wetland that is cultivated around.</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>3</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Eleocharis palustris</u>	<u>10</u>	<u>yes</u>	<u>OBL</u>	
2. <u>Artemisia biennis</u>	<u>20</u>	<u>yes</u>	<u>FAC</u>	
3. <u>Ranunculus scleratus</u>	<u>10</u>	<u>yes</u>	<u>FACW</u>	
4. <u>Setaria glauca</u>	<u>5</u>	<u>no</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
= Total Cover				
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum <u>55</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				

Remarks:

**SOIL**

Sampling Point: 17156100-w2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-9	10YR 2/1	100					fsl	
9-16+	2.5Y 4/2	90	7.5YR 5/6	10	c	m	fsl	
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

Secondary Indicators (2 or more required)

- |  |  |  |
|--|--|--|
| <input checked="" type="checkbox"/> Surface Water (A1)             | <input checked="" type="checkbox"/> Salt Crust (B11)   | <input type="checkbox"/> Surface Soil Cracks (B6)  |
| <input type="checkbox"/> High Water Table (A2)                     | <input type="checkbox"/> Aquatic Invertebrates (B13)   | <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)                             |
| <input checked="" type="checkbox"/> Saturation (A3)                | <input type="checkbox"/> Hydrogen Sulfide Odor (C1)  | <input type="checkbox"/> Drainage Patterns (B10)   |
| <input type="checkbox"/> Water Marks (B1)                          | <input type="checkbox"/> Dry Season Water Table (C2)   | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <b>(where tilled)</b> |
| <input type="checkbox"/> Sediment Deposits (B2)                    | <input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3) <b>(where not tilled)</b> | <input type="checkbox"/> Crayfish Burrows (C8)   |
| <input type="checkbox"/> Drift Deposits (B3)                       | <input type="checkbox"/> Presence of Reduced Iron (C4)   | <input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)                |
| <input type="checkbox"/> Algal Mat or Crust (B4)                   | <input type="checkbox"/> Thin Muck Surface (C7)  | <input checked="" type="checkbox"/> Geomorphic Position (D2)                                 |
| <input type="checkbox"/> Iron Deposits (B5)                        | <input type="checkbox"/> Other (Explain in Remarks)  | <input type="checkbox"/> FAC-Neutral Test (D5)   |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) |  | <input type="checkbox"/> Frost-Heave Hummocks (D7) <b>(LRR F)</b>                            |
| <input type="checkbox"/> Water-Stained Leaves (B9)                 |  |  |

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 2  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/6/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 17156100-u2  
 Investigator(s): GWM Section, Township, Range: 17, 156, 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 2  
 Subregion (LRR): E Lat: 48.332534N Long: -103.561892W Datum: NAD 83  
 Soil Map Unit Name: 1249 -Appem sandy loam 0 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <b>5'</b> )				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>0</b> = Total Cover				
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum <b>100</b>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				

Remarks:  
**no vegetation at observaton point due to cultivation**

**SOIL**

Sampling Point: 17156100-u2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-10	10YR 3/1	100	_____	_____	_____	_____	fsl	_____
10-18+	2.5Y 4/1	100	_____	_____	_____	_____	fsl	<u>no redoximorphic features</u>
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

non-hydric vellers soil

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 17156100-w3  
 Investigator(s): GWM Section, Township, Range: 17, 156, 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.328174N Long: -103.562251W Datum: NAD 83  
 Soil Map Unit Name: 2354 - Livona-Zahl complex 6 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>Depression wetland that is cultivated around.</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
= Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
= Total Cover																				
<b>Herb Stratum (Plot Size: 5')</b>																				
1. <u>Typha angustifolia</u>	<u>5</u>	<u>no</u>	<u>OBL</u>																	
2. <u>Echinochloa crusgalli</u>	<u>10</u>	<u>yes</u>	<u>FACW</u>																	
3. <u>Polygonum amphibium</u>	<u>5</u>	<u>no</u>	<u>OBL</u>																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
<u>20</u>			= Total Cover																	
<b>Woody Vine Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
= Total Cover																				
% Bare Ground in Herb Stratum <u>80</u>																				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				
Remarks:																				

**SOIL**

Sampling Point: 17156100-w3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 2/1	100	_____	_____	_____	_____	sil	_____
4-8	10YR 2/1	90	7.5YR 5/6	10	c	m	sil	_____
8-16	10YR 2/1	100	_____	_____	_____	_____	sil	_____
16-24	10YR 3/1	100	_____	_____	_____	_____	sil	_____
24-30+	2.5Y 5/1	80	7.5YR 5/6	10	c	m	sil	_____
_____	10YR 3/1	10	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2)(LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)		

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	(where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input checked="" type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
(where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

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

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

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

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/6/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 17156100-u3  
 Investigator(s): GWM Section, Township, Range: 17, 156, 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.328169N Long: -103.562203W Datum: NAD 83  
 Soil Map Unit Name: 2354-Livona-Zahl complex 6 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Echinochloa crusgalli</u>	<u>10</u>	<u>yes</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <input checked="" type="checkbox"/> 1 – Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% _____ 3 – Prevalence Index is ≤3.0 <sup>1</sup> _____ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <u>Artemisia biennis</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>20</u>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>80</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 17156100-u3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-16	10YR 2/1	100	_____	_____	_____	_____	sil	_____
16-20	10YR 3/1	100	_____	_____	_____	_____	sil	_____
20-30	2.5Y 6/3	100	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): \_\_\_\_\_

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 20156100-w1  
 Investigator(s): GWM Section, Township, Range: 20, 156, 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.327851N Long: -103.562075W Datum: NAD 83  
 Soil Map Unit Name: 2354 - Livona-Zahl complex 6 to 9 percent slopes NWI classification: PABFx

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>Dug-out wetland.</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: 15')	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. <u>Populus deltoides</u>	<u>60</u>	<u>yes</u>	<u>FAC</u>	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>2</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
2. <u>Salix amygdaloides</u>	<u>30</u>	<u>yes</u>	<u>FACW</u>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
	<u>90</u>	= Total Cover		<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<u>Sapling/Shrub Stratum (Plot Size: _____)</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
	_____	= Total Cover		
<u>Herb Stratum (Plot Size: _____)</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
	_____	= Total Cover		
<u>Woody Vine Stratum (Plot Size: _____)</u>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
	_____	= Total Cover		
% Bare Ground in Herb Stratum _____				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 20156100-w1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/2	100	_____	_____	_____	_____	sl	_____
4-12+	10YR 4/4	100	_____	_____	_____	_____	sl	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2)(LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)		

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	(where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input checked="" type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
(where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 60

Water Table Present? Yes  No  Depth (inches): 6

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

**Wetland Hydrology Present?** Yes  No

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

Remarks:  
Water marks on trees nearly 48" above hydric boundary

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/6/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 20156100-u1  
 Investigator(s): GWM Section, Township, Range: 20, 156, 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 3  
 Subregion (LRR): E Lat: 48.327920N Long: -103.562062W Datum: NAD 83  
 Soil Map Unit Name: 2354 Livona-Zahl complex 6 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>2</b> (A)  Total Number of Dominant Species Across All Strata: <b>4</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>50</b> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species <b>30</b> x3 = <b>90</b> FACU species <b>40</b> x4 = <b>160</b> UPL species                      _____ x5 = _____ Column Totals: <b>70</b> (A)                      _____ (B)  Prevalence Index = B/A = <b>3.6</b>
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <b>5'</b> )				
1. <u>Artemisia biennis</u>	<u>10</u>	<u>yes</u>	<u>FAC</u>	
2. <u>Bromus inermis</u>	<u>30</u>	<u>yes</u>	<u>FACU</u>	
3. <u>Lactuca serriola</u>	<u>10</u>	<u>yes</u>	<u>FACU</u>	
4. <u>Apocynum cannabinum</u>	<u>20</u>	<u>yes</u>	<u>FAC</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>70</b>			= Total Cover	
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <b>30</b>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 20156100-u1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/2	100	_____	_____	_____	_____	sl	_____
4-12+	10YR 4/4	100	_____	_____	_____	_____	sl	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR I, J</b> )
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) ( <b>LRR F, G, H</b> )
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) ( <b>LRR G</b> )
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) ( <b>LRR F</b> )	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>
<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR F, G, H</b> )	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2) ( <b>LRR G, H</b> )	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) ( <b>LRR F</b> )	<b>(MLRA 72 &amp; 73 of LRR H)</b>	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) ( <b>LRR F</b> )
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<b>(where not tilled)</b>	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 20156100-w2  
 Investigator(s): GWM Section, Township, Range: 20, 156, 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.327941N Long: -103.564424W Datum: NAD 83  
 Soil Map Unit Name: 2354 - Livona-Zahl complex 6 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>depression wetland</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Echinochloa crusgalli</u>	<u>100</u>	<u>yes</u>	<u>FACW</u>	<b>Hydrophytic Vegetation Indicators:</b> <u>X</u> 1 – Rapid Test for Hydrophytic Vegetation _____                      2 - Dominance Test is >50% _____                      3 – Prevalence Index is ≤3.0 <sup>1</sup> _____                      4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____                      Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>100</u>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 20156100-w2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	100					sicl	
6-10	10YR 2/1	90	7.5YR 5/6	10	c	m	sicl	
10-18+	2.5YR 4/2	90	7.5YR 5/6	10	c	m	sicl	
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input checked="" type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2)(LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)		

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input checked="" type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input checked="" type="checkbox"/> Sediment Deposits (B2)	(where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input checked="" type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input checked="" type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input checked="" type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
(where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 2

Water Table Present? Yes  No  Depth (inches): 4

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

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 20156100-u2  
 Investigator(s): GWM Section, Township, Range: 20, 156, 100  
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.327947N Long: -103.564246W Datum: NAD 83  
 Soil Map Unit Name: 2354 Livona-Zahl complex 6 to 9 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>1</b> (A)  Total Number of Dominant Species Across All Strata: <b>2</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>50</b> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
= Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species <b>20</b></td> <td>x3 = <b>60</b></td> </tr> <tr> <td>FACU species <b>30</b></td> <td>x4 = <b>120</b></td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: <b>50</b></td> <td>(A) <b>180</b> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <b>3.6</b></td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species <b>20</b>	x3 = <b>60</b>	FACU species <b>30</b>	x4 = <b>120</b>	UPL species _____	x5 = _____	Column Totals: <b>50</b>	(A) <b>180</b> (B)	Prevalence Index = B/A = <b>3.6</b>	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species <b>20</b>	x3 = <b>60</b>																			
FACU species <b>30</b>	x4 = <b>120</b>																			
UPL species _____	x5 = _____																			
Column Totals: <b>50</b>	(A) <b>180</b> (B)																			
Prevalence Index = B/A = <b>3.6</b>																				
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
= Total Cover																				
<b>Herb Stratum (Plot Size: 5')</b>																				
1. <b>Artemisia biennis</b>	<b>20</b>	<b>yes</b>	<b>FAC</b>																	
2. <b>Symphoricarpos occidentalis</b>	<b>30</b>	<b>yes</b>	<b>FACU</b>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
<b>50</b>			= Total Cover																	
<b>Woody Vine Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
_____			= Total Cover																	
% Bare Ground in Herb Stratum <b>50</b>																				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>																				
Remarks:																				

**SOIL**

Sampling Point: 20156100-u2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/2	100	_____	_____	_____	_____	sil	_____
4-10	10YR 3/1	100	_____	_____	_____	_____	sil	_____
10-18+	10YR 3/3	100	_____	_____	_____	_____	sicl	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR I, J</b> )
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) ( <b>LRR F, G, H</b> )
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) ( <b>LRR G</b> )
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) ( <b>LRR F</b> )	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>
<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR F, G, H</b> )	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2) ( <b>LRR G, H</b> )	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) ( <b>LRR F</b> )	<b>(MLRA 72 &amp; 73 of LRR H)</b>	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) ( <b>LRR F</b> )
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<b>(where not tilled)</b>	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 21156100-w1  
 Investigator(s): GWM Section, Township, Range: 21, 156, 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.327108N Long: -103.558015W Datum: NAD 83  
 Soil Map Unit Name: 2352 - Lihen-Blanchard loamy fine sand, 6 to 15 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>depression wetland</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Phalaris arundinacea</u>	<u>40</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Urtica dioica</u>	<u>40</u>	<u>yes</u>	<u>FAC</u>	
3. <u>Cirsium arvense</u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks: <b>Cornus stolonifera drowned out from high water.</b>				

**SOIL**

Sampling Point: 21156100-w1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-16	10YR 2/1	100	_____	_____	_____	_____	sicl	_____
16-20	10YR 3/1	100	_____	_____	_____	_____	sicl	_____
20-26+	2.5YR 4/1	98	10YR 4/4	2	c	m	sicl	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR I, J)
- Coast Prairie Redox (A16) (LRR F, G, H)
- Dark Surface (S7) (LRR G)
- High Plains Depressions (F16)
- (LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 0

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 21156100-u1  
 Investigator(s): GWM Section, Township, Range: 21, 156, 100  
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.327265N Long: -103.558041W Datum: NAD 83  
 Soil Map Unit Name: 2352 Lihen-Blanchard loamy fine sands, 6 to 15 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>2</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B)  Prevalence Index = B/A = <u>6</u>
<u>Sapling/Shrub Stratum</u> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<u>Herb Stratum</u> (Plot Size: <u>5'</u> )				
1. <u>Cirsium arvense</u>	<u>70</u>	<u>yes</u>	<u>FACU</u>	
2. <u>Rumex crispus</u>	<u>10</u>	<u>no</u>	<u>FACW</u>	
3. <u>Euphorbia esula</u>	<u>20</u>	<u>yes</u>	<u>UPL</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<u>Woody Vine Stratum</u> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 21156100-u1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)								
Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-12	10YR 2/1	100	_____	_____	_____	_____	sicl	_____
12-16	10YR 3/1	100	_____	_____	_____	_____	sicl	_____
16-24+	2.5Y 4/1	100	_____	_____	_____	_____	sicl	<u>no redoximorphic features</u>
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)		Indicators for Problematic Hydric Soils <sup>3</sup> :	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>	
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2)(LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)		<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	<b>(MLRA 72 &amp; 73 of LRR H)</b>		

<b>Restrictive Layer (if present):</b>		
Type: _____		
Depth (Inches): _____		
Remarks: non-hydric vallers		<b>Hydric Soils Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

**HYDROLOGY**

Wetland Hydrology Indicators:		
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Dry Season Water Table (C2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<b>(where not tilled)</b>	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Presence of Reduced Iron (C4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)		<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)

<b>Field Observations:</b>		
Surface Water Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Water Table Present?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): _____
Saturation Present? (includes capillary fringe)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Depth (inches): 1
		<b>Wetland Hydrology Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 26156100-w1  
 Investigator(s): GWM Section, Township, Range: 26. 156. 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <1  
 Subregion (LRR): E Lat: 48.307420N Long: -103.517665W Datum: NAD 83  
 Soil Map Unit Name: 2015 Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>depression wetland in cultivated field</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
= Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species _____</td> <td>x2 = _____</td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species _____</td> <td>x4 = _____</td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: _____</td> <td>(A) _____ (B) _____</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = _____</td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species _____	x2 = _____	FAC species _____	x3 = _____	FACU species _____	x4 = _____	UPL species _____	x5 = _____	Column Totals: _____	(A) _____ (B) _____	Prevalence Index = B/A = _____	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species _____	x2 = _____																			
FAC species _____	x3 = _____																			
FACU species _____	x4 = _____																			
UPL species _____	x5 = _____																			
Column Totals: _____	(A) _____ (B) _____																			
Prevalence Index = B/A = _____																				
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
= Total Cover																				
<b>Herb Stratum (Plot Size: 5')</b>																				
1. <u>Echinochloa crusgalli</u>	<u>60</u>	<u>yes</u>	<u>FACW</u>																	
2. <u>Setaria glauca</u>	<u>10</u>	<u>no</u>	<u>FACU</u>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
= Total Cover																				
<b>Woody Vine Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
= Total Cover																				
% Bare Ground in Herb Stratum <u>30</u>																				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>																				
Remarks:																				

**SOIL**

Sampling Point: 26156100-w1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-7	10YR 2/1	100	_____	_____	_____	_____	sicl	_____
7-16	10YR 2/1	100	_____	_____	_____	_____	sil	_____
16-24	10 YR 3/1	100	_____	_____	_____	_____	sil	_____
24-30+	2.5Y 4/1	95	7.6YR 5/6	5	c	m	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>	
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) (LRR I, J)	
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) (LRR F, G, H)	
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) (LRR G)	
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)	
<input type="checkbox"/> Stratified Layers (A5) (LRR F)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	(LRR H outside of MLRA 72 & 73)	
<input type="checkbox"/> 1 cm Muck (A9) (LRR F, G, H)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)	
<input checked="" type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)	
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2)(LRR G, H)	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.	
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR F)	(MLRA 72 & 73 of LRR H)		

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input checked="" type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input checked="" type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	(where tilled)
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input checked="" type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F)
<input checked="" type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
(where not tilled)	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): \_\_\_\_\_

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 26156100-u1  
 Investigator(s): GWM Section, Township, Range: 26. 156. 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 2  
 Subregion (LRR): E Lat: 48.307477N Long: -103.517785W Datum: NAD 83  
 Soil Map Unit Name: 2015 Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <u>5'</u> )				
1. <u>wheat</u>	<u>10</u>	<u>yes</u>	<u>UPL</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
= Total Cover				
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum <u>90</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 261156100-u1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/2	100	_____	_____	_____	_____	sil	_____
6-15+	2.5Y 4/3	100	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 26156100-w2  
 Investigator(s): GWM Section, Township, Range: 26. 156. 100  
 Landform (hillslope, terrace, etc.): drainageway Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.300055N Long: -103.505650W Datum: NAD 83  
 Soil Map Unit Name: 2081 Zuhl-Williams loams, 9 to 15 percent slopes NWI classification: PABFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>stock dam along ephemeral stream</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>2</b> (A)  Total Number of Dominant Species Across All Strata: <b>3</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>67</b> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Phalaris arundinacea</u>	<u>60</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Hordeum jubatum</u>	<u>20</u>	<u>yes</u>	<u>FACW</u>	
3. <u>Poa pratensis</u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
= Total Cover				
% Bare Ground in Herb Stratum <b>0</b>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 26156100-w2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 2/1	100					sil	
6-10	2.5Y 4/1	80	7.5YR 5/6	20	c	m	sil	
10-13	10YR 3/1	90	10YR 4/6	10	c	m	sil	
13-18+	2.5Y 4/2	80	10YR 4/4	20	c	m	sil	
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR I, J)
- Coast Prairie Redox (A16) (LRR F, G, H)
- Dark Surface (S7) (LRR G)
- High Plains Depressions (F16)  
(LRR H outside of MLRA 72 & 73)
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 6  
 Water Table Present? Yes  No  Depth (inches): 0  
 Saturation Present?  
(includes capillary fringe) Yes  No  Depth (inches): 0

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 26156100-u2  
 Investigator(s): GWM Section, Township, Range: 26. 156. 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 3  
 Subregion (LRR): E Lat: 48.300083N Long: -103.505641W Datum: NAD 83  
 Soil Map Unit Name: 2081 Zehl-Williams loams, 9 to 15 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <u>5'</u> )				
1. <u>Stipa viridula</u>	<u>30</u>	<u>yes</u>	<u>UPL</u>	
2. <u>Symphoricarpos occidentalis</u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	
3. <u>Euphorbia esula</u>	<u>20</u>	<u>yes</u>	<u>UPL</u>	
4. <u>Bromus inermis</u>	<u>30</u>	<u>yes</u>	<u>FACU</u>	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 261156100-u2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-4	10YR 3/2	100	_____	_____	_____	_____	↓	_____
4-15+	2.5Y 4/3	100	_____	_____	_____	_____	↓	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 27156100-w1  
 Investigator(s): GWM Section, Township, Range: 27, 156, 100  
 Landform (hillslope, terrace, etc.): drainageway Local relief (concave, convex, none): Concave Slope (%): 1  
 Subregion (LRR): E Lat: 48.311966N Long: -103.527002W Datum: NAD 83  
 Soil Map Unit Name: 2176 - Zahl-Williams loams, 15 to 60 percent slopes NWI classification: PABFh

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>stock dam along ephemeral stream</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Phalaris arundinacea</u>	<u>90</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Rumex crispus</u>	<u>5</u>	<u>no</u>	<u>FACW</u>	
3. <u>Euphorbia esula</u>	<u>5</u>	<u>no</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 27156100-w1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-8	10YR 2/1	100					sicl	
8-16+	2.5Y 4/2 90	90	7.5YR 5/6	10	c	m	sil	
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR I, J)
- Coast Prairie Redox (A16) (LRR F, G, H)
- Dark Surface (S7) (LRR G)
- High Plains Depressions (F16)  
(LRR H outside of MLRA 72 & 73)
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): 36  
 Water Table Present? Yes  No  Depth (inches): 0  
 Saturation Present?  
(includes capillary fringe) Yes  No  Depth (inches): 0

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/20/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 27156100-u1  
 Investigator(s): GWM Section, Township, Range: 27, 156, 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 3  
 Subregion (LRR): E Lat: 48.311945N Long: -103.526970W Datum: NAD 83  
 Soil Map Unit Name: 2176 Zahl-Williams loams, 15 to 60 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>3</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B)  Prevalence Index = B/A = <u>6</u>
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Bromus inermis</u>	<u>50</u>	<u>yes</u>	<u>FACU</u>	
2. <u>Euphorbia esula</u>	<u>20</u>	<u>yes</u>	<u>UPL</u>	
3. <u>Symphoricarpos occidentalis</u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 271156100-u1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/1	100	_____	_____	_____	_____	sil	_____
6-12+	10YR 3/3	100	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR I, J</b> )
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) ( <b>LRR F, G, H</b> )
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) ( <b>LRR G</b> )
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) ( <b>LRR F</b> )	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>
<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR F, G, H</b> )	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2) ( <b>LRR G, H</b> )	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) ( <b>LRR F</b> )	<b>(MLRA 72 &amp; 73 of LRR H)</b>	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) ( <b>LRR F</b> )
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<b>(where not tilled)</b>	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 36156100-w1  
 Investigator(s): GWM Section, Township, Range: 36. 156. 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <1  
 Subregion (LRR): E Lat: 48.287892N Long: -103.486107W Datum: NAD 83  
 Soil Map Unit Name: 2015 Williams - Bowbells loams, 3 to 6 percent slopes NWI classification: PEMC

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>depression wetland that has rocky piled along it edge</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: _____ (A)  Total Number of Dominant Species Across All Strata: _____ (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <u>Polygonum amphibium</u>	<u>100</u>	<u>yes</u>	<u>OBL</u>	<b>Hydrophytic Vegetation Indicators:</b> <u>X</u> 1 – Rapid Test for Hydrophytic Vegetation _____                      2 - Dominance Test is >50% _____                      3 – Prevalence Index is ≤3.0 <sup>1</sup> _____                      4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____                      Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>100</u>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 36156100-w1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	2.5Y 4/2	98	7.5YR 5/6	2	ϕ	m	sil	_____
3-9	2.5Y 4/2	85	7.5YR 5/6	15	ϕ	m	sil	_____
9-12	10YR 3/1	90	7.5YR 5/6	10	ϕ	m	sil	_____
12-18+	2.5Y 4/2	75	7.5YR 5/6	25	ϕ	m	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR I, J</b> )
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) ( <b>LRR F, G, H</b> )
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) ( <b>LRR G</b> )
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) ( <b>LRR F</b> )	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>
<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR F, G, H</b> )	<input checked="" type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2)( <b>LRR G, H</b> )	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) ( <b>LRR F</b> )	<b>(MLRA 72 &amp; 73 of LRR H)</b>	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks:  
Buried A horizon in wetland.

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input checked="" type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input checked="" type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) ( <b>LRR F</b> )
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<b>(where not tilled)</b>	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): \_\_\_\_\_

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 36156100-u1  
 Investigator(s): GWM Section, Township, Range: 36. 156. 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.287994N Long: -103.486285W Datum: NAD 83  
 Soil Map Unit Name: 2015 Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <u>5'</u> )				
1. <u>Cirsium arvense</u>	<u>15</u>	<u>yes</u>	<u>FACU</u>	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<u>15</u>			= Total Cover	
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>85</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 361156100-u1

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/1	100	_____	_____	_____	_____	sil	_____
6-18+	10YR 3/2	100	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16) **(LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 36156100-w2  
 Investigator(s): GWM Section, Township, Range: 36. 156. 100  
 Landform (hillslope, terrace, etc.): shallow depression Local relief (concave, convex, none): Concave Slope (%): <1  
 Subregion (LRR): E Lat: 48.286982N Long: -103.482254W Datum: NAD 83  
 Soil Map Unit Name: 2014 Williams - Bowbells loams, 0 to 3 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>shallow depression in fallow field</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>1</b> (A)  Total Number of Dominant Species Across All Strata: <b>2</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>50</b> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	<b>Prevalence Index worksheet:</b> Total % Cover of:                      Multiply by: OBL species                      x1 = _____ FACW species <b>60</b> x2 = <b>120</b> FAC species                      x3 = _____ FACU species <b>40</b> x4 = <b>160</b> UPL species                      x5 = _____ Column Totals: <b>100</b> (A) <b>280</b> (B) Prevalence Index = B/A = <b>2.8</b>
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum (Plot Size: 5')</b>				
1. <b><u>Echinochloa crusgalli</u></b>	<b>60</b>	<b>yes</b>	<b>FACW</b>	<b>Hydrophytic Vegetation Indicators:</b> _____ 1 – Rapid Test for Hydrophytic Vegetation _____ 2 - Dominance Test is >50% <b>X</b> 3 – Prevalence Index is ≤3.0 <sup>1</sup> _____ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain) <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2. <b><u>Setaria glauca</u></b>	<b>40</b>	<b>yes</b>	<b>FACU</b>	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum (Plot Size: _____)</b>				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <b>0</b>				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Remarks:

**SOIL**

Sampling Point: 36156100-w2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	10YR 2/1	100					sil	
5-16+	2.5Y 4/2	90	7.5YR 5/6	10	c	m	sil	
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—
—	—	—	—	—	—	—	—	—

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) (LRR I, J)
- Coast Prairie Redox (A16) (LRR F, G, H)
- Dark Surface (S7) (LRR G)
- High Plains Depressions (F16)
- (LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

Tonka series

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 7

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 36156100-u2  
 Investigator(s): GWM Section, Township, Range: 36. 156. 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.287055N Long: -103.482198W Datum: NAD 83  
 Soil Map Unit Name: 2014 Williams-Bowbells loams, 0 to 3 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>1</b> (A)  Total Number of Dominant Species Across All Strata: <b>4</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>25</b> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species <b>30</b> x2 = <b>60</b> FAC species                      _____ x3 = _____ FACU species <b>60</b> x4 = <b>240</b> UPL species <b>10</b> x5 = <b>50</b> Column Totals: <b>100</b> (A) <b>350</b> (B) Prevalence Index = B/A = <b>3.5</b>
<u>Sapling/Shrub Stratum</u> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<u>Herb Stratum</u> (Plot Size: <b>5'</b> )				
1. <u>Echinochloa crusgalli</u>	<u>30</u>	<u>yes</u>	<u>FACW</u>	
2. <u>Lactuca serriola</u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	
3. <u>Setaria glauca</u>	<u>20</u>	<u>yes</u>	<u>FACU</u>	
4. <u>Salsola kali</u>	<u>10</u>	<u>no</u>	<u>UPL</u>	
5. <u>Conyza canadensis</u>	<u>20</u>	<u>no</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<u>Woody Vine Stratum</u> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>0</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 361156100-u2

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-3	10YR 3/1	100	_____	_____	_____	_____	sil	_____
3-16	10YR 3/2	100	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR I, J</b> )
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) ( <b>LRR F, G, H</b> )
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) ( <b>LRR G</b> )
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) ( <b>LRR F</b> )	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>
<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR F, G, H</b> )	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2) ( <b>LRR G, H</b> )	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) ( <b>LRR F</b> )	<b>(MLRA 72 &amp; 73 of LRR H)</b>	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) ( <b>LRR F</b> )
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<b>(where not tilled)</b>	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 36156100-w3  
 Investigator(s): GWM Section, Township, Range: 36. 156. 100  
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): Concave Slope (%): <1  
 Subregion (LRR): E Lat: 48.289263N Long: -103.486130W Datum: NAD 83  
 Soil Map Unit Name: 2015 Williams - Bowbells loams, 3 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hydric Soil Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Wetland Hydrology Present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Remarks: <b>depression wetland in fallow field</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:																
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <b>1</b> (A)  Total Number of Dominant Species Across All Strata: <b>2</b> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <b>50</b> (A/B)																
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
= Total Cover				<b>Prevalence Index worksheet:</b>  <table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Total % Cover of:</u></td> <td style="text-align: center;"><u>Multiply by:</u></td> </tr> <tr> <td>OBL species _____</td> <td>x1 = _____</td> </tr> <tr> <td>FACW species <b>80</b></td> <td>x2 = <b>160</b></td> </tr> <tr> <td>FAC species _____</td> <td>x3 = _____</td> </tr> <tr> <td>FACU species <b>20</b></td> <td>x4 = <b>80</b></td> </tr> <tr> <td>UPL species _____</td> <td>x5 = _____</td> </tr> <tr> <td>Column Totals: <b>100</b> (A)</td> <td><b>240</b> (B)</td> </tr> <tr> <td colspan="2" style="text-align: center;">Prevalence Index = B/A = <b>2.40</b></td> </tr> </table>	<u>Total % Cover of:</u>	<u>Multiply by:</u>	OBL species _____	x1 = _____	FACW species <b>80</b>	x2 = <b>160</b>	FAC species _____	x3 = _____	FACU species <b>20</b>	x4 = <b>80</b>	UPL species _____	x5 = _____	Column Totals: <b>100</b> (A)	<b>240</b> (B)	Prevalence Index = B/A = <b>2.40</b>	
<u>Total % Cover of:</u>	<u>Multiply by:</u>																			
OBL species _____	x1 = _____																			
FACW species <b>80</b>	x2 = <b>160</b>																			
FAC species _____	x3 = _____																			
FACU species <b>20</b>	x4 = <b>80</b>																			
UPL species _____	x5 = _____																			
Column Totals: <b>100</b> (A)	<b>240</b> (B)																			
Prevalence Index = B/A = <b>2.40</b>																				
<b>Sapling/Shrub Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
= Total Cover																				
<b>Herb Stratum (Plot Size: 5')</b>																				
1. <b><u>Echinochloa crusgalli</u></b>	<b>80</b>	<b>yes</b>	<b>FACW</b>																	
2. <b><u>Setaria glauca</u></b>	<b>20</b>	<b>yes</b>	<b>FACU</b>																	
3. _____	_____	_____	_____																	
4. _____	_____	_____	_____																	
5. _____	_____	_____	_____																	
6. _____	_____	_____	_____																	
7. _____	_____	_____	_____																	
8. _____	_____	_____	_____																	
9. _____	_____	_____	_____																	
10. _____	_____	_____	_____																	
<b>100</b>			= Total Cover																	
<b>Woody Vine Stratum (Plot Size: _____)</b>																				
1. _____	_____	_____	_____																	
2. _____	_____	_____	_____																	
_____			= Total Cover																	
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;"><b>Hydrophytic Vegetation Indicators:</b></td> <td></td> </tr> <tr> <td>_____ 1 – Rapid Test for Hydrophytic Vegetation</td> <td></td> </tr> <tr> <td>_____ 2 - Dominance Test is &gt;50%</td> <td></td> </tr> <tr> <td><b>X</b> 3 – Prevalence Index is ≤3.0<sup>1</sup></td> <td></td> </tr> <tr> <td>_____ 4 - Morphological Adaptations<sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)</td> <td></td> </tr> <tr> <td>_____ Problematic Hydrophytic Vegetation<sup>1</sup> (Explain)</td> <td></td> </tr> <tr> <td colspan="2"><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</td> </tr> </table>				<b>Hydrophytic Vegetation Indicators:</b>		_____ 1 – Rapid Test for Hydrophytic Vegetation		_____ 2 - Dominance Test is >50%		<b>X</b> 3 – Prevalence Index is ≤3.0 <sup>1</sup>		_____ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)		_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)		<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.				
<b>Hydrophytic Vegetation Indicators:</b>																				
_____ 1 – Rapid Test for Hydrophytic Vegetation																				
_____ 2 - Dominance Test is >50%																				
<b>X</b> 3 – Prevalence Index is ≤3.0 <sup>1</sup>																				
_____ 4 - Morphological Adaptations <sup>1</sup> (Provide supporting data in Remarks or on a separate sheet)																				
_____ Problematic Hydrophytic Vegetation <sup>1</sup> (Explain)																				
<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.																				
<table style="width: 100%; border: none;"> <tr> <td style="width: 30%;"><b>Hydrophytic Vegetation Present?</b></td> <td>Yes <input checked="" type="checkbox"/></td> <td>No <input type="checkbox"/></td> </tr> </table>				<b>Hydrophytic Vegetation Present?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>														
<b>Hydrophytic Vegetation Present?</b>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>																		
Remarks:																				

**SOIL**

Sampling Point: 36156100-w3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-6	10YR 3/1	100					sil	
6-16+	2.5Y 4/2	65	5YR 3/3	35	c	m	sil	
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

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

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

**Indicators for Problematic Hydric Soils<sup>3</sup>:**

- 1 cm Muck (A9) **(LRR I, J)**
- Coast Prairie Redox (A16) **(LRR F, G, H)**
- Dark Surface (S7) **(LRR G)**
- High Plains Depressions (F16)
- (LRR H outside of MLRA 72 & 73)**
- Reduced Vertic (F18)
- Red Parent Material (TF2)
- Very Shallow Dark Surface (TF 12)
- Other (Explain in Remarks)

<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

**Restrictive Layer (if present):**

Type: \_\_\_\_\_  
Depth (Inches): \_\_\_\_\_

**Hydric Soils Present?** Yes  No

Remarks:

Tonka series

**HYDROLOGY**

**Wetland Hydrology Indicators:**

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

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

Secondary Indicators (2 or more required)

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

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_  
 Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): \_\_\_\_\_

**Wetland Hydrology Present?** Yes  No

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

Remarks:

## WETLAND DETERMINATION DATA FORM – Great Plains Region

Project Site: Little Muddy Project City/County: Williams Sampling Date: 9/21/2011  
 Applicant/Owner: Enbridge State: ND Sampling Point: 36156100-u3  
 Investigator(s): GWM Section, Township, Range: 36. 156. 100  
 Landform (hillslope, terrace, etc.): toeslope Local relief (concave, convex, none): plane Slope (%): 1  
 Subregion (LRR): E Lat: 48.289314N Long: -103.486076W Datum: NAD 83  
 Soil Map Unit Name: 2015 Williams-Bowbells loams, 3 to 6 percent slopes NWI classification: none

Are climatic / hydrologic conditions on the site typical for this time of year? Yes  No  (If no, explain in Remarks.)  
 Are Vegetation , Soil , or Hydrology , significantly disturbed? Are "Normal Circumstances" present? Yes  No   
 Are Vegetation , Soil , or Hydrology , naturally problematic? (If needed, explain any answers in Remarks.)

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

Hydrophytic Vegetation Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	Is the Sampling Area within a Wetland? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Hydric Soil Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Wetland Hydrology Present?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	
Remarks: <b>upland comparison point above hydric boundary</b>			

### VEGETATION – Use scientific names of plants

Tree Stratum (Plot Size: _____)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:
1. _____	_____	_____	_____	Number of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A)  Total Number of Dominant Species Across All Strata: <u>1</u> (B)  Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0</u> (A/B)
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
= Total Cover				<b>Prevalence Index worksheet:</b>  Total % Cover of:                      Multiply by: OBL species                      _____ x1 = _____ FACW species                      _____ x2 = _____ FAC species                      _____ x3 = _____ FACU species                      _____ x4 = _____ UPL species                      _____ x5 = _____ Column Totals:                      _____ (A)                      _____ (B) Prevalence Index = B/A = _____
<b>Sapling/Shrub Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
3. _____	_____	_____	_____	
4. _____	_____	_____	_____	
5. _____	_____	_____	_____	
= Total Cover				
<b>Herb Stratum</b> (Plot Size: <u>5'</u> )				
1. <u>Avena fatua</u>	<u>60</u>	<u>yes</u>	<u>UPL</u>	
2. <u>Lactuca serriola</u>	<u>5</u>	<u>no</u>	<u>FACU</u>	
3. <u>Setaria glauca</u>	<u>10</u>	<u>no</u>	<u>FACU</u>	
4. <u>wheat</u>	<u>10</u>	<u>no</u>	<u>UPL</u>	
5. <u>Conyza canadensis</u>	<u>15</u>	<u>no</u>	<u>FACU</u>	
6. _____	_____	_____	_____	
7. _____	_____	_____	_____	
8. _____	_____	_____	_____	
9. _____	_____	_____	_____	
10. _____	_____	_____	_____	
<b>100</b>			= Total Cover	
<b>Woody Vine Stratum</b> (Plot Size: _____)				
1. _____	_____	_____	_____	
2. _____	_____	_____	_____	
_____			= Total Cover	
% Bare Ground in Herb Stratum <u>85</u>				
<b>Hydrophytic Vegetation Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Remarks:				

**SOIL**

Sampling Point: 361156100-u3

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

Depth (inches)	Matrix		Redox Features				Texture	Remarks
	Color (moist)	%	Color (Moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-5	10YR 3/1	100	_____	_____	_____	_____	sil	_____
5-18+	10YR 3/2	100	_____	_____	_____	_____	sil	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____	_____	_____	_____

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

<b>Hydric Soil Indicators:</b> (Applicable to all LRRs, unless otherwise noted.)		<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b>
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Gleyed Matrix (S4)	<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR I, J</b> )
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> Coast Prairie Redox (A16) ( <b>LRR F, G, H</b> )
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> Dark Surface (S7) ( <b>LRR G</b> )
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> High Plains Depressions (F16)
<input type="checkbox"/> Stratified Layers (A5) ( <b>LRR F</b> )	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<b>(LRR H outside of MLRA 72 &amp; 73)</b>
<input type="checkbox"/> 1 cm Muck (A9) ( <b>LRR F, G, H</b> )	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Redox Dark Surface (F6)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Depleted Dark Surface (F7)	<input type="checkbox"/> Very Shallow Dark Surface (TF 12)
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Redox Depressions (F8)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 2.5 CM Mucky Peat or Peat (S2) ( <b>LRR G, H</b> )	<input type="checkbox"/> High Plains Depressions (F16)	<sup>3</sup> Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.
<input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) ( <b>LRR F</b> )	<b>(MLRA 72 &amp; 73 of LRR H)</b>	

**Restrictive Layer (if present):**

Type: \_\_\_\_\_

Depth (Inches): \_\_\_\_\_

Remarks: \_\_\_\_\_

**Hydric Soils Present?** Yes  No

**HYDROLOGY**

<b>Wetland Hydrology Indicators:</b>	
Primary Indicators (minimum of one required; check all that apply)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Surface Soil Cracks (B6)
<input type="checkbox"/> High Water Table (A2)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Water Marks (B1)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)
<input type="checkbox"/> Sediment Deposits (B2)	<b>(where tilled)</b>
<input type="checkbox"/> Drift Deposits (B3)	<input type="checkbox"/> Crayfish Burrows (C8)
<input type="checkbox"/> Algal Mat or Crust (B4)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Iron Deposits (B5)	<input type="checkbox"/> Geomorphic Position (D2)
<input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> FAC-Neutral Test (D5)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Frost-Heave Hummocks (D7) ( <b>LRR F</b> )
<input type="checkbox"/> Salt Crust (B11)	
<input type="checkbox"/> Aquatic Invertebrates (B13)	
<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	
<input type="checkbox"/> Dry Season Water Table (C2)	
<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	
<b>(where not tilled)</b>	
<input type="checkbox"/> Presence of Reduced Iron (C4)	
<input type="checkbox"/> Thin Muck Surface (C7)	
<input type="checkbox"/> Other (Explain in Remarks)	

**Field Observations:**

Surface Water Present? Yes  No  Depth (inches): \_\_\_\_\_

Water Table Present? Yes  No  Depth (inches): \_\_\_\_\_

Saturation Present? (includes capillary fringe) Yes  No  Depth (inches): 1

**Wetland Hydrology Present?** Yes  No

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

Remarks: \_\_\_\_\_

## APPENDIX C

### Project Area Photographs



Photograph 1. Photograph of wetland 17156100-w1 taken facing west. The sprawling depression wetland is located on the west edge of the proposed Little Muddy Station.



Photograph 2. Photograph of drainage feature 17156100-s1 taken facing west. The drainage feature is classified as an intermittent stream by the USGS and is located in the proposed Little Muddy Station site.



Photograph 3. Photograph of wetland 20156100-w1 taken facing south from the section line road. Excavation created the wetland. Cottonwood (*Populus deltoides*) and peachleaf willow (*Salix amygdaloides*) trees grow along the edge of the wetland.



Photograph 4. Photograph of wetland 21156100-w1 taken facing east. The isolated depression wetland has patches of drowned red osier dogwood (*Cornus stolonifera*) in it.



Photograph 5. Photograph of drainage feature 22156100-s1 taken facing west from the section line road. The drainage feature is classified as an intermittent stream by the USGS.



Photograph 6. Photograph of drainage feature 22156100-s2 taken facing west from the section line road. The narrow channel is designated as an intermittent stream by the USGS.



Photograph 7. Photograph of drainage feature 27156100-s1 taken facing west. A small channel is present in this area. The channel is approximately 2-5 feet wide and 1-3 feet deep. Non-hydrophytic vegetation is present along the channel.



Photograph 8. Photograph of drainage feature 27156100-s2 and wetland 27156100-w1 taken facing north. The drainage feature is designated as an intermittent drainage by the USGS and the wetland has a NWI designation of PABFh.



Photograph 9. Photograph of drainage feature 26156100-s1 and wetland 26156100-w1 taken facing northwest. The drainage feature is designated as an intermittent drainage by the USGS and the wetland was formed by the construction of a stock dam that ponds water in the drainage.



Photograph 10. Photograph of wetland 36156100-w1 taken facing north. The isolated depression wetland has had rocks piled along its edge. Water smartweed (*Polygonum amphibium*) is prevalent in its interior.

# APPENDIX D

## Waterbody Data Sheets

<b>FEATURE ID:</b> 17156100-s1
<b>WATERBODY NAME:</b>

<b>SURVEY DATE:</b> 9/6/2011
<b>INVESTIGATOR:</b> GWM


FLOW CHARACTERISTICS
<input checked="" type="checkbox"/> EPHEMERAL <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 5 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE
<input type="checkbox"/> BEDROCK <input type="checkbox"/> SILT <input type="checkbox"/> GRAVEL <input checked="" type="checkbox"/> CLAY <input type="checkbox"/> SAND <input checked="" type="checkbox"/> OTHER _____ VEGETATED _____
<input checked="" type="checkbox"/> RUNS <input type="checkbox"/> POOLS <input type="checkbox"/> RIFFLES

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 1.5 FT	HEIGHT: 1 FT
SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 10 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: YES	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
RIPARIAN SPECIES PRESENT:
INVASIVES/NOXIOUS VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIES PRESENT:
ADJACENT WETLAND <input type="checkbox"/> YES <input type="checkbox"/> NO
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Ephemeral stream channel in cultivated field.</p>

<b>FEATURE ID:</b> 22156100-s1
<b>WATERBODY NAME:</b>

<b>SURVEY DATE:</b> 9/20/2011
<b>INVESTIGATOR:</b> GWM

FLOW CHARACTERISTICS
<input checked="" type="checkbox"/> EPHEMERAL <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 0 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE
<input type="checkbox"/> BEDROCK <input type="checkbox"/> SILT <input type="checkbox"/> GRAVEL <input checked="" type="checkbox"/> CLAY <input type="checkbox"/> SAND <input checked="" type="checkbox"/> OTHER _____ VEGETATED _____
<input checked="" type="checkbox"/> RUNS <input type="checkbox"/> POOLS <input type="checkbox"/> RIFFLES

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 0.5 FT	HEIGHT: 0.5 FT
SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 10 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: NONE	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
RIPARIAN SPECIES PRESENT:
INVASIVES/NOXIOUS VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIES PRESENT:
ADJACENT WETLAND <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Channel hard to define on east side of roadway.</p>

<b>FEATURE ID:</b> 22156100-s2
<b>WATERBODY NAME:</b>

<b>SURVEY DATE:</b> 9/20/2011
<b>INVESTIGATOR:</b> GWM


FLOW CHARACTERISTICS
<input checked="" type="checkbox"/> EPHEMERAL <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 0 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE
<input type="checkbox"/> BEDROCK <input type="checkbox"/> SILT <input type="checkbox"/> GRAVEL <input checked="" type="checkbox"/> CLAY <input type="checkbox"/> SAND <input checked="" type="checkbox"/> OTHER _____ VEGETATED _____
<input checked="" type="checkbox"/> RUNS <input type="checkbox"/> POOLS <input type="checkbox"/> RIFFLES

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 0.5 FT	HEIGHT: 0.5 FT
SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 5 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: NONE	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
RIPARIAN SPECIES PRESENT:
INVASIVES/NOXIOUS VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, SPECIES PRESENT:
ADJACENT WETLAND <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Channel cultivated in 2010..</p>

<b>FEATURE ID:</b> 26156100-s1
<b>WATERBODY NAME:</b>

<b>SURVEY DATE:</b> 9/21/2011
<b>INVESTIGATOR:</b> GWM

FLOW CHARACTERISTICS
<input type="checkbox"/> EPHEMERAL <input checked="" type="checkbox"/> INTERMITTENT <input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 10 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE
<input type="checkbox"/> BEDROCK <input type="checkbox"/> SILT <input type="checkbox"/> GRAVEL <input checked="" type="checkbox"/> CLAY <input type="checkbox"/> SAND <input checked="" type="checkbox"/> OTHER _____ VEGETATED _____
<input checked="" type="checkbox"/> RUNS <input type="checkbox"/> POOLS <input type="checkbox"/> RIFFLES

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 5 FT	HEIGHT: 4 FT
SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 25 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: YES	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
RIPARIAN SPECIES PRESENT: PHALARIS ARUNDINACEA / ELEOCHARIS PALUSTRIS
INVASIVES/NOXIOUS VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIES PRESENT: EUPHORBIA ESULA
ADJACENT WETLAND <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Intermittent stream that flows into a stock dam. Stock dam is located in the western portion of the corridor.</p>

<b>FEATURE ID:</b> 27156100-s1
<b>WATERBODY NAME:</b>

<b>SURVEY DATE:</b> 9/20/2011
<b>INVESTIGATOR:</b> GWM


FLOW CHARACTERISTICS
<input checked="" type="checkbox"/> EPHEMERAL <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 0 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE
<input type="checkbox"/> BEDROCK <input type="checkbox"/> SILT <input type="checkbox"/> GRAVEL <input checked="" type="checkbox"/> CLAY <input type="checkbox"/> SAND <input checked="" type="checkbox"/> OTHER _____VEGETATED_____
<input checked="" type="checkbox"/> RUNS <input type="checkbox"/> POOLS <input type="checkbox"/> RIFFLES

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 1 FT	HEIGHT: 1 FT
SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 10 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: YES	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
RIPARIAN SPECIES PRESENT:
INVASIVES/NOXIOUS VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIES PRESENT: EUPHORBIA ESULA
ADJACENT WETLAND <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Ephemeral stream channel located in deep ravine. Ravine is approximately 60-70 feet deep and 300 feet wide. Bromus inermis is the primary vegetation along the stream channel.</p>



Little Muddy Project  
Waterbody Data Sheet

<b>FEATURE ID: 27156100-s2</b>
<b>WATERBODY NAME:</b>

<b>SURVEY DATE: 9/20/2011</b>
<b>INVESTIGATOR: GWM</b>

FLOW CHARACTERISTICS
<input checked="" type="checkbox"/> EPHEMERAL
<input type="checkbox"/> INTERMITTENT
<input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 0 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE	
<input type="checkbox"/> BEDROCK	<input type="checkbox"/> SILT
<input type="checkbox"/> GRAVEL	<input checked="" type="checkbox"/> CLAY
<input type="checkbox"/> SAND	
<input checked="" type="checkbox"/> OTHER	
_____VEGETATED_____	
<input checked="" type="checkbox"/> RUNS	
<input type="checkbox"/> POOLS	
<input type="checkbox"/> RIFFLES	

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 1 FT	HEIGHT: 1 FT
SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 10 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: YES	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
RIPARIAN SPECIES PRESENT:
INVASIVES/NOXIOUS VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIES PRESENT: EUPHORBIA ESULA
ADJACENT WETLAND <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Ephemeral stream channel located in deep ravine. Ravine is approximately 60-70 feet deep and 300 feet wide. Bromus inermis is the primary vegetation along the stream channel. 27156100-s2 is continuation of 27156100-s1.</p>

<b>FEATURE ID: 27156100-s3</b>
<b>WATERBODY NAME:</b>

<b>SURVEY DATE: 9/20/2011</b>
<b>INVESTIGATOR: GWM</b>


FLOW CHARACTERISTICS
<input checked="" type="checkbox"/> EPHEMERAL <input type="checkbox"/> INTERMITTENT <input type="checkbox"/> PERENNIAL
CURRENT WATER WIDTH AT CROSSING: 0 FT
CURRENT WATER DEPTH AT CROSSING: 0 FT

SUBSTRATE
<input type="checkbox"/> BEDROCK <input type="checkbox"/> SILT <input type="checkbox"/> GRAVEL <input checked="" type="checkbox"/> CLAY <input type="checkbox"/> SAND <input checked="" type="checkbox"/> OTHER _____ VEGETATED _____
<input checked="" type="checkbox"/> RUNS <input type="checkbox"/> POOLS <input type="checkbox"/> RIFFLES

BANK CHARACTERISTICS	
LEFT BANK (WHEN FACING DOWNSTREAM)	RIGHT BANK (WHEN FACING DOWNSTREAM)
HEIGHT: 15 FT	HEIGHT: 2 FT
SLOPE <input type="checkbox"/> 0 - 30° <input checked="" type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°	SLOPE <input checked="" type="checkbox"/> 0 - 30° <input type="checkbox"/> 31 - 45° <input type="checkbox"/> 46 - 60° <input type="checkbox"/> 61 - 90°
WIDTH (HIGHEST BANK TO HIGHEST BANK): 30 FT	
EVIDENCE OF EROSION: NONE	
SCOUR POTENTIAL: YES	

RIPARIAN HABITAT
RIPARIAN VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
RIPARIAN SPECIES PRESENT: PHALARIS ARUNDINACEA
INVASIVES/NOXIOUS VEGETATION <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO IF YES, SPECIES PRESENT: EUPHORBIA ESULA
ADJACENT WETLAND <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO (WEST PORTION)
T & E SPECIES <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO IF YES, IDENTIFY SPECIES AND LOCATION:

OHWM CRITERIA		
<input type="checkbox"/> CLEAR, NATURAL LINE IMPRESSED ON BANK	<input type="checkbox"/> CHANGES IN SOIL CHARACTER	<input type="checkbox"/> SHELVING
<input type="checkbox"/> VEGETATION MATTED DOWN, BENT OR ABSENT	<input type="checkbox"/> SEDIMENT DEPOSITION	<input type="checkbox"/> SCOUR
<input type="checkbox"/> LEAF LITTER DISTURBED OR WASHED AWAY	<input type="checkbox"/> SEDIMENT SORTING	<input type="checkbox"/> WATER STAINING
<input checked="" type="checkbox"/> DESTRUCTION OF TERRESTRIAL VEGETATION	<input type="checkbox"/> PRESENCE OF LITTER OR DEBRIS	<input type="checkbox"/> OTHER:
<input checked="" type="checkbox"/> ABRUPT CHANGE IN PLANT COMMUNITY	<input type="checkbox"/> PRESENCE OF WRACK LINE	

PHOTOGRAPHS	
	<p>Ephemeral stream channel that flows into a stock dam. Stock dam is located in western portion of the corridor.</p>

**EXHIBIT D.2**

**U.S. Army Corps of Engineers – Omaha District  
Jurisdictional Determination**

**Not available at time of filing**

**EPND will supplement this filing upon receipt of this  
correspondence**