Zim Sod Wetland Mitigation Site Wetland Mitigation Plan

Preliminary Wetland Mitigation Plan 2011

Prepared for PolyMet Mining Inc.

November 2011



Zim Sod Wetland Mitigation Site Wetland Mitigation Plan

Preliminary Wetland Mitigation Plan 2011

Prepared for PolyMet Mining Inc.

November 2011



4700 West 77th Street Minneapolis, MN 55435-4803 Phone: (952) 832-2600 Fax: (952) 832-2601

Zim Sod Wetland Mitigation Site Wetland Mitigation Plan Preliminary Wetland Mitigation Plan 2011

November 2011

Table of Contents

1.0		Introduction	1
2.0		Wetland Mitigation Site Description	3
	2.1	Mitigation Site Selection.	3
	2.2	Zim Sod Site History	3
		2.2.1 Pre-Agricultural History	3
		2.2.2 Agricultural and Land Use History	4
	2.3	Zim Sod Geology, Hydrology, and Ecology	
		2.3.1 Geology and Soils	4
		2.3.2 Topography	4
		2.3.3 Climate	5
		2.3.4 Hydrology	5
		2.3.5 Natural Communities	6
		2.3.6 Site Constraints	6
	2.4	Existing Wetlands	
	2.5	Additional Site Information Needed	7
3.0		Wetland Mitigation Goals and Credit Allocation	8
	3.1	Target Plant Communities	8
		3.1.1 Coniferous Bog	9
		3.1.2 Coniferous Swamp	9
		3.1.3 Sedge Meadow or Open Bog	
		3.1.4 Shallow Open Water	
	3.2	Hydrologic Restoration	
	3.3	Partially-drained wetlands	
	3.4	Excavated Ponds	
	3.5	Wetland Preservation	
	3.6	Credit Allocation	13
4.0		Wetland Restoration Plan	
	4.1	General Site Preparation	
	4.2	Site Grading and Hydrology Restoration	
	4.3	Bog Restoration Methods	
	4.4	Tree and Shrub Installation	
	4.5	Excavated Ponds	
	4.6	Natural Regeneration and Bog Establishment	
	4.7	Supplemental Planting and Seeding.	20
5.0		Wetland Mitigation Performance Standards	
	5.1	Performance Standards	21

		5.1.1 General	21
		5.1.2 Coniferous Bog or Swamp	
		5.1.3 Sedge Meadow or Open Bog	
		5.1.4 Shallow Open Water	
6.0		Wetland Restoration and Management Schedule	23
	6.1	Preparation – Year 0	
		6.1.1 Fall and Winter	23
	6.2	Year 1	24
		6.2.1 Early Spring	
		6.2.2 Spring/Summer	
		6.2.3 Fall—End of First Full Growing Season	22
	6.3	Year 2	
		6.3.1 Spring/Summer	24
		6.3.2 Fall—End of Second Full Growing Season	22
	6.4	Year 3	
		6.4.1 Spring/Summer	25
		6.4.1 Fall—End of Third Full Growing Season	
	6.5	Years 4 through 20	
7.0		Wetland Mitigation Monitoring	26
	7.1	Hydrologic Monitoring	
	7.2	Vegetation Monitoring	
	7.3	Monitoring Report	
8.0		References	28

List of Tables

Table 1 Table 2 Table 3 Table 4	Wetland Mitigation Credits on the North Unit Wetland Mitigation Credits on the South Unit Potential tree species that may be planted at the Zim Sod Site Potentially problematic invasive species for the Zim Sod Site				
	List of Figures				
Figure 1	Zim Sod Location Map				
Figure 2	North Unit Soil, Topography, and Drainage Map				
Figure 3	South Unit Soil, Topography, and Drainage Map				
Figure 4	North Unit Conceptual Plan Credit Areas				
Figure 5	South Unit Conceptual Plan Credit Areas				
	List of Appendices				
Appendix A	Greenwood Soil Series Official Soil Description				
Appendix B	Wetland Mitigation Plan Drawings				
Appendix C	Ditch Lateral Effect Calculations				

Wetland Data Forms

Appendix D

On behalf of PolyMet Mining Inc. (PolyMet), Barr Engineering Company (Barr) has prepared the following project-specific wetland mitigation plan for the Zim Sod Wetland Mitigation Site (Site). The Site is located in two separate units on approximately 569 acres of land, much of which is proposed to be restored for wetland mitigation credits for the NorthMet Project (Project). The two units will be developed concurrently and are hereby collectively referred to as the Site. The Site is located in St. Louis County in the St. Louis River major watershed (#3) within the Lake Superior basin (Bank Service Area #1) and southwest of Eveleth (see Figure 1). The North Unit is about 481 acres and the South Unit is about 88 acres.

The Site is currently an active sod farm that has been drained with ditches and sub-surface drain tiles. The project-specific mitigation plan includes the following methods of restoration to receive wetland mitigation credits, additional details are provided in Tables 1 and 2:

- Restoration of 401.5 acres of drained wetland to receive 100 percent mitigation credit or 401.5 credits;
- Hydrologic restoration of 48.1 acres of partially-drained wooded wetlands to receive 50 percent credit or 24.1 credits;
- Restoration of natural surface grade and wetland conditions in 21.5 acres of ditches which will be filled to receive 50 percent credit or 10.7 credits; and
- Restoration of native vegetation on 22.6 acres of upland buffers within drained fields and filled ditches, each of which will remain drained due to open ditches that cannot be filled, for 5.7 credits based on the 25 percent credit calculation for upland buffer.
- Easement protection of 28.8 acres of native coniferous bog communities at 12.5 percent credit for a total of 3.6 credits for preservation.

A total of 454 compensatory wetland mitigation credits are proposed from the Site. A permanent conservation easement, including legal access, will be prepared and recorded to protect the Site within one year after initiating the restoration activities.

This mitigation plan includes discussions of the project-specific wetland mitigation site, wetland restoration goals, construction activities, and performance standards. The plan is being submitted to the U.S. Army Corps of Engineers (USACE) as part of the Section 404 Clean Water Act Permit

application and the Minnesota Department of Natural Resources (MNR), which acts as the administrator of the Minnesota Wetland Conservation Act (WCA) (Minnesota Rules 8420) for mining activities.

2.0 Wetland Mitigation Site Description

2.1 Mitigation Site Selection

The Site is within the same Bank Service Area and major watershed as the Project (Figure 1). The Project lies within the headwaters of the St. Louis River major watershed (#3) in St. Louis County and within Bank Service Area #1, which encompasses the watershed of Lake Superior.

The Site was selected for several reasons, including:

- 1. Private land ownership with wetland mitigation potential that is located near large areas of taxforfeit or state-owned land,
- 2. The lack of roads or other public infrastructure that could be affected by wetland restoration,
- 3. The presence of sub-surface drain tiles installed to lower the water table and prevent soil saturation at the ground surface thereby effectively draining wetlands,
- 4. A high density of ditching within the site, and
- 5. Minimal effect on neighboring properties by altering site drainage.

The Site is located in central St. Louis County, between the towns of Zim and Sax. The proposed wetland restoration area is located within Sections 2, 3, 10, 11, 26, 27, and 34; Township 55 North; Range 18 West. Currently the Site is owned by two parties, but the entirety will be acquired by one party following the issuance of permits for the Project and will be controlled by PolyMet for the sole purpose of wetland mitigation during the required monitoring period.

2.2 Zim Sod Site History

2.2.1 Pre-Agricultural History

Available data were reviewed to determine information on site history and pre-settlement conditions. The Original Public Lands Survey Plat Map from 1867 (Minnesota Historical Society) and a map created from the original plat maps (Marschner, 1974) each show that the majority of the area was a coniferous bog or swamp, with some areas of open bog. These data are reliable indicators of regional vegetation types, though are not accurate predictors of site-specific design parameters.

2.2.2 Agricultural and Land Use History

Based on a review of historic aerial photos, it is evident that ditches have been present at the Site since before 1939. Only some portions of the North Unit along County Highway 7 had been cleared and cultivated for agriculture as of 1939. In each photo reviewed since 1939, it is evident that additional areas were added to the cultivation on the North unit. By 1981, the majority of the agricultural portions of the South Unit were developed and under intensive management for crop or sod production; likewise for the North Unit in the 1989 photo. According to the current landowner, much of the Site has been in operation as a sod farm for 40-50 years, though some portions were developed within the last 10 years.

2.3 Zim Sod Geology, Hydrology, and Ecology

2.3.1 Geology and Soils

According to soil mapping by the United States Department of Agriculture – Natural Resources Conservation Service (USDA-NRCS), the entire Site is mapped as the Greenwood soil series (USDA, 2010). The Greenwood soil (Dysic, frigid Typic Haplohemist) is a very poorly drained hydric soil formed in organic deposits more than 51 inches thick. The official soil series description for this soil is provided in Appendix A. The organic deposits in the area accumulated over lacustrine sediment, mostly silt, deposited by Glacial Lake Upham (MDNR, 2010). However, at the Site, the underlying lacustrine deposits were observed to be gleyed clay. The Greenwood soil series is described as having a pH ranging from 3.5 to 4.5 and the typical vegetation is composed of bog species including: black spruce (*Picea mariana*), tamarack (*Larix laricina*), bog rosemary (*Andromeda polifolia*), bog laurel (*Kalmia polifolia*), leatherleaf (*Chamaedaphne calyculata*), blueberries (*Vaccinium* spp.), and sphagnum (*Sphagnum* spp.)

2.3.2 Topography

A topographic survey was completed in November 2010 and the one-foot contours based on the survey data are provided in Appendix B and in Figures 2 and 3. Ditches are the most noticeable topographic features on the Site, ranging from 2 to 9 feet in elevation lower than the surrounding field surface. The USGS quadrangle maps show ground elevations just northeast of the North Unit at 1330 feet Mean Sea Level (ft MSL) sloping downward, to the south and west, to about 1315 ft MSL within the South Unit (Figure 2). The on-site topographic survey indicates that ground surface elevations within the North Unit have subtle variations ranging from 1326 ft MSL along the north edge to 1321 ft MSL in the southwest corner of the Site. The county ditch along the western edge of the North Unit decreases from 1319 ft MSL at the northern end to about 1313 ft MSL at the southern

end. The field surface elevation within the South Unit varies from 1314 ft MSL in the northeast corner to 1308 ft MSL in the southwest corner. The lowest elevation within the South Unit is the bottom of the ditch in the southwest corner at 1300 ft MSL, which is eight feet lower than the adjacent field (Figure 3).

2.3.3 Climate

The average annual precipitation for Zim, Minnesota, is 27.9 inches based on the 30-year normal period 1971 to 2000. The average annual temperature in this area is about 37.7 degrees Fahrenheit.

2.3.4 Hydrology

The Site lies near the middle of a large peatland complex that encompasses approximately 130 square miles, which is roughly bound by the Swan River to the west, U.S. Routes 2 to the south, 169 to the north, and 53 on the east. The hydrology in the majority of the peatland system has not been significantly altered by ditching or draining, although the area immediately to the south and east of the Site has ditches approximately every mile (on the section lines). Hydrology on the Site is likely to be primarily driven by direct precipitation and localized shallow groundwater with predictable annual declines in groundwater elevations during the summer. Groundwater in this peatland likely would contain very low mineral nutrients. Without mineral nutrients to buffer it, the soil water tends to be very acidic, which supports conditions appropriate for a bog community. Soil and/or water pH analyses will be completed prior to restoration to provide additional soil information. In particular, if the soil is acidic (below pH 4.2) the Site is expected to support bog communities.

According to information from the current landowner, drain tiles are present throughout the Site within each field. The current landowner and operator of all sod production activities reports that the drain tiles are spaced 50 to 100 feet apart at depths of 4 to 5 feet and effectively drain the area for sod production. In some years, irrigation is necessary to maintain soil moisture for growing sod grasses. An estimated location of these drain tiles was created using a review of historic aerial photos (Figures 4 and 5). In many of these photos, distinct parallel signatures are evident within the fields that appear to be caused by subsurface drainage. Additional information will be gathered on-site to verify drain tile locations and abundance by locating outlets in the ditches and confirming their presence below ground.

The primary water discharge within the Site and the general area is to the south and west through a system of drainage ditches which receive water from the subsurface drain tiles. The majority of these ditches are private ditches that only affect the drainage on the Site and primarily transmit water into a

public, county ditch along County Highway 7 along the west edge of both units of the Site. The ditch along the eastern edge of the North Unit, flowing along the section line, is also a public ditch. Within the North Unit, the ditches along the north and south lines of Section 11 (along Dibbell Road and Ellsmere Road) are both public ditches. Public ditches and private ditches that facilitate drainage for the adjacent properties or the homesteads on the Site would not be impacted by restoration activities for this mitigation project as discussed later in this report. The South Unit has only one primary eastwest ditch, which flows directly west into the county ditch along Highway 7.

The ditches are generally between 2 and 6 feet deep relative to the adjacent fields and are mostly well-maintained to be clear of obstructions. The county ditch along Highway 7 is the deepest and widest ditch on the Site and at the southern end of the South Unit it is up to 9 feet lower in elevation than the adjacent field. Within the private ditches, there are several control structures that maintain water levels within about 18 inches of the soil surface for sod production.

2.3.5 Natural Communities

The MDNR Ecological Classification System (2010) considers this region of the state to be the Tamarack Lowlands Subsection. This area is characterized by the level peatlands that occur in the bed of former Glacial Lake Upham. Most of the natural communities in this sub-section are coniferous bog or swamp wetlands that are dominated by black spruce and tamarack as well as extensive open bogs and sedge meadows. The wetlands on-site and nearby are primarily tamarack and black spruce bog communities. This area is also identified as the Sax-Zim Bog Important Bird Area (IBA) (National Audubon Society, 2010) due to a rich diversity of bird species and a large number of owls residing in the area.

2.3.6 Site Constraints

One utility easement crossing a portion of the North Unit is a Northern Natural Gas (NNG) underground pipeline. Two utility easements cross portions of the South Unit: the NNG pipeline and a Minnesota Power overhead transmission line. Typically, within these types of easements, tree and shrub growth is not allowed. The companies holding these easements will be contacted prior to restoration activities for specific information regarding the easements and any limitations. If necessary, credit calculations will be adjusted to reflect the appropriate area of each of these utilities.

In the North Unit, two homes are located within the Site boundary and two additional properties with homes are outside of, but adjacent to the Site boundary. These homes are elevated above the wetland restoration areas and the drainage on each of these properties will be maintained to protect the

buildings from increased water levels. Additional analysis will be completed to ensure the homeowners will not be affected the hydrologic restoration on the Site.

2.4 Existing Wetlands

The site was evaluated for the presence of wetlands in November, 2010. Wetland data forms are provided in Appendix D, documenting that evaluation. All of the sod fields on the Site are identified as drained wetland, which is maintained by an intensive system of subsurface drain tiles and ditches (Figures 2 and 3). The fields have been systematically drained for many years and managed primarily for sod production. The ditches are considered degraded wetlands. Partially-drained wetlands on the Site are likely present within the wooded areas, which have not been cleared for sod farming, but have been affected by the drainage system.

2.5 Additional Site Information Needed

Prior to restoration, additional information will be collected for the final restoration design and planning. Ecologists will visit the Site to verify the effects and extent of existing drainage systems, soil, and vegetation. The following information will be collected:

- Drain tile outlets will be located and subsurface drain tiles mapped in representative portions of the Site.
- Shallow monitoring wells will be installed within some of the fields and in the forested areas to confirm the effects of the drainage.
- Vegetation will be reviewed in areas adjacent to the mitigation Site to help establish target communities.
- Soil and groundwater pH will be tested to determine suitability for bog restoration.

Information will be used for planning final restoration methods and to determine the final estimate of compensatory mitigation credits available for the Site.

3.0 Wetland Mitigation Goals and Credit Allocation

To the degree feasible, the primary goal of the wetland restoration on the Site is to restore a native wetland plant community. The plan for the restoration will also include an adaptive management plan to account for the natural development and to recognize changing conditions and unpredictable factors contributing to the dynamics of the Site. Restoration methods will be designed to restore a coniferous bog community (Eggers and Reed, 1997); however, developing a bog community is highly dependent on soil and groundwater parameters that are difficult to control. Therefore, a coniferous swamp community will be the contingent community if the soil and groundwater conditions are not adequate for bog regeneration. Coniferous bog or swamp is the target for the majority of the Site, from which 438 forested wetland credits will be established.

Historically, portions of this landscape were open, emergent wetland communities. Trees may not become established in some portions of the Site with excess soil moisture or where easements prevent planting. Where trees do not successfully establish, the target community will be an open bog or sedge meadow. Credit allocation may be modified in the future for areas where trees do not develop.

Shallow open water communities will be the target communities in the ponds created on the Site. These ponds will be excavated in order to gather borrow materials used to backfill ditches elsewhere on the Site to eliminate drainage. Shallow open water communities will be created on 8.3 acres.

The target communities described below include four primary wetland types that may become established. Credit allocation calculations are provided in Tables 1 and 2; a map of the conceptual restoration plan showing the anticipated restoration is provided in Figures 4 and 5.

3.1 Target Plant Communities

The majority of the Zim Sod Site will be restored to a coniferous bog or swamp community. The restoration of coniferous bogs and swamps are somewhat experimental in nature as few such projects have been successfully completed in Minnesota, making it difficult to determine realistic goals and performance criteria. As such, performance standards for the Site will be somewhat general in that the primary target is a forested native wetland community.

3.1.1 Coniferous Bog

Coniferous bogs occur where an accumulation of peat becomes isolated from mineral-rich groundwater such that the majority of the water and all mineral inputs come from precipitation. The peat continues to accumulate upward in the bog from the growth and deposition of sphagnum moss and other vegetation. Black spruce and several other bog species are sensitive to extended periods of high water, but are able to survive within the bog because the upper levels of peat remain aerated, especially in the middle of summer as the water table drops below the peat surface. The groundwater in the bog tends to be very acidic because there are very few minerals to act as a buffer (MDNR, 2010).

Sphagnum moss is difficult to establish and will be a limiting component for the restoration of a true bog community. A dense mat of sphagnum is an important component responsible for maintaining the appropriate soil pH, hydrologic, and peat conditions for the coniferous bog community. Coniferous bogs are dominated by black spruce and tamarack trees, though the trees are often stunted and slow-growing and canopy cover is often less than 50 percent. The ground layer is dominated by sphagnum mosses, sedges (*Carex* spp.), and various low ericaceous shrubs such as leather leaf and small cranberry (*Vaccinium oxycoccos*). Restoration of these and other bog dominants is difficult, because the species are difficult to propagate and many are not available commercially.

In order to restore sphagnum, the moss must be harvested from a donor site by shredding and collecting the upper 4 to 6 inches of sphagnum and applying the materials to the restoration site, which is still an unreliable practice. Furthermore, the accumulation of the sphagnum can be slow when applied to a heavily disturbed agricultural site, especially a site in which the soil has been regularly stripped for sod farming.

3.1.2 Coniferous Swamp

Although coniferous bog restoration techniques will be implemented throughout the Site, the development of the bog community is not guaranteed. Therefore, the coniferous swamp community will be the contingency community for development. Coniferous swamps have a poorly developed sphagnum mat and a greater predominance of minerotrophic species than a bog. Furthermore, many species present in a coniferous swamp are available commercially; whereas, bog species are much more difficult to re-introduce.

Coniferous swamp communities occur in peat soils with no direct contact to mineral soil, though mineral-rich groundwater contributes some nutrients to the plants and buffers the acidity of the peat.

Typically, in large peatland systems, this community type would occur adjacent to mineral-rich discharge or between bog communities and uplands. It generally occurs in areas where the high water table is more stable than that in a bog, leading to longer periods of surface soil saturation.

It is unlikely that mineral-rich groundwater is near the soil surface in the Site because it occurs within such a large complex of deep peat soil. However, there are two reasons a coniferous swamp may be more appropriate for the Site than a bog community. First, farming practices have physically and chemically altered the soil and hydrology and some of the peat topsoil has been stripped as part of the sod farming, thereby lowering the elevation relative to the regional groundwater table. Second, the residual mineral fertilizer is likely to favor species that would not otherwise thrive in a mineral-deficient peat soil. In this geomorphic setting, it is expected that a bog community will develop, but that process is difficult to control because it depends on the groundwater inputs and soil chemistry and may only occur after many years under natural conditions.

3.1.3 Sedge Meadow or Open Bog

The degree of soil moisture may be somewhat variable across the Site, though this is difficult to predict. It is expected that the majority of the Site will have saturated soil throughout most of the year, with seasonal draw-downs, especially during drought periods. Such hydrology will support black spruce and tamaracks, which tolerate considerable soil moisture, but require some periods of aerobic soil conditions. However, where the soil surface is saturated for the entire growing season, these tree species may not establish or growth will be slow. It is unclear which areas may not support trees, so the sedge meadow or open bog communities are presented as a contingency target community in the event that some areas are better suited for emergent wetland community types. Sphagnum would be a dominant ground cover in an open bog, though this may take many years to develop even with sphagnum introduction.

A community similar to a sedge meadow may develop if the soil and hydrology are more favorable to minerotrophic species and trees are unable to become established. The dominant plants in a sedge meadow include bluejoint grass (*Calamagrostis canadensis*), sedges (*Carex* spp.), and bulrushes (*Scirpus* spp.). Sedge meadows occur in a wide range of soils, including deep peats, though there is usually input from ground or surface water containing dissolved minerals. At the Site such mineral inputs are unlikely, though residual nutrients from fertilizer may provide this condition.

3.1.4 Shallow Open Water

Besides providing soil to restore hydrology and return ditches to natural condition, the open water will provide some additional wildlife habitat on the Site, ideal for waterfowl and amphibians. The ponds will receive full mitigation credit because each occurs in an area that naturally would be wetland. The shallow open water community would be dominated by submergent and floating-leaved plant species. Typical species would include pondweeds (*Potamogeton* spp.), coontail (*Ceratophyllum demersum*), and duckweeds (*Lemna* spp.). The fringes of these ponds would also support species commonly present in deep and shallow marsh communities.

3.2 Hydrologic Restoration

Restoration of the original hydrology is the primary goal at the Site. The majority of the internal private ditches on the Site will be filled with soil excavated from elsewhere on the Site. Filling these ditches will eliminate the drainage effects and plug the end of the drain tiles that discharge into the ditches. As a result, groundwater elevations are expected to rise within the fields and runoff from precipitation will no longer drain through subsurface tiles and the ditches. The majority of the water that will saturate the peat will come from precipitation that falls directly on the Site. Some groundwater will also contribute as it flows into the Site well as some groundwater flow from the large peatland complex to the north and east.

Ditches will be filled with soil excavated from areas adjacent to the ditches and from excavations on the Site. Material scraped from the edge of the ditches will not be excavated deeper than 1 foot below the presumed natural grade. Some ditches have shallow mounds from the ditch spoils; these will pushed back into the ditch to recreate the level peatland grade. Because natural hydrology is being restored within the filled ditches and the elimination of the ditches recreates the natural landscape, the ditches will receive partial credit (50 percent).

Mineral and peat soils will be place in appropriate layers within the backfilled ditches. Clay and other mineral soil will be placed in the bottom of the ditch to plug the drain tiles, ensuring that the artificial drainage will be eliminated. The majority of the mineral soils will come from the deeper portions of the excavations, though some may be present in spoil mounds adjacent to each ditch. Peat soils will be placed in the upper portions of the filled ditches. The peat will also effectively restrict flow and help return a near natural grade to the land. Much of the peat will come from the upper layers in the excavations, but may also be pushed in from the edge of each ditch.

Some ditches within or adjacent to the Site will not be filled because they are public ditches or protect neighboring private property from flooding. For ditches that cannot be filled, the drain tiles that flow into that ditch will be broken and removed near the outlet into the ditch. At least 20 feet of drain tile will be removed near the outlet into the ditch, and additional segments will be removed upslope when necessary. Because most of the tiles are placed in very level fields, removing a single segment should be sufficient for most tiles. Additional information on the tile location, flow, and elevation change will be reviewed prior to removal.

The lateral effect of the open ditches has been calculated to help determine wetland credits. Lateral effects are based on the van Schilfgaarde Equation (NRCS, 2011) and the results for ditches at varying drainage depths are provided in Appendix C. These drainage effects were calculated for the Greenwood and Wabuse soil series assuming there are no obstructions in the ditches and that they can drain free to the ditch bottom or to the bottom of the nearest downstream culvert. Ditches that remain open will not be eligible for mitigation credit and the adjacent areas drained by the lateral effect of these ditches will be eligible for the upland buffer credit (25 percent).

For wooded areas affected by the drainage system on the Site, hydrologic restoration will be the primary action for mitigation credit. These areas are already forested with coniferous bog or swamp species, but the adjacent drainage system has eliminated wetland hydrology or reduced the period of saturation. For the areas not surrounded by ditches, the lateral effects were calculated to determine how much the area is affected by the existing drainage. Ditch filling will restore these forested wetland areas. Because some portions of these wooded areas are still wetland but partially-drained, mitigation credits are projected based on restoration of partially-drained wetlands (50 percent).

3.3 Partially-drained wetlands

Several wooded areas occur within the scope and effect of the existing Zim Sod drainage system. These wooded areas are dominated by wetland trees, including tamaracks and black spruce, but are drained fully or partially by the nearby ditches and subsurface drain tiles. Once the drainage system is disabled, bog hydrology will return to these forests. Also, if necessary, portions of these forests may be managed to control invasive species or to encourage re-colonization by native species. The forests will also be within the area protected by a conservation easement and will be managed to eliminate invasive species. Therefore, these wooded are eligible for restoration of partially-drained wetlands

3.4 Excavated Ponds

In order to fill the ditches, soil will be collected from excavated ponds scattered throughout the Site, which will become shallow open water communities. The ponds will be shallow enough to maintain rooted vegetation which will be allowed to establish naturally. Each of the ponds will be odd-shaped and have uneven bottom contours to provide some variability and natural character to the ponds. Besides providing soil, the open water will provide some additional wildlife habitat on the Site, ideal for waterfowl and amphibians. The ponds will receive full mitigation credit.

3.5 Wetland Preservation

Two forested wetland areas outside the effects of the drainage system will be protected under an easement in order to receive credits for wetland preservation. These areas are currently subject to logging, peat harvest, and drainage, much like nearby sites have been used for peat harvest and logging activities. The preservation area is coniferous bog, which will be protected from potential future degradation by a permanent conservation easement. The preservation areas will also be managed to control invasive species as part of this plan.

3.6 Credit Allocation

Mitigation credits are based on acreages shown in Tables 1 and 2 and in Figures 4 and 5, which were calculated primarily based on the on-site topographic survey and site mapping from aerial photos as verified by on-site assessments. The majority of the credits are proposed from the restoration of drained wetlands that are currently used for sod farming, from which there will be 100 percent credit for the areas restored. Credit from the removal of drainage and subsequent management of the partially-drained forested wetlands currently on the Site is allocated at 50 percent. Filled ditches will also receive 50 percent credit because the ditches will be restored to the natural hydrology regime with native vegetation. Areas near the public ditches will still be drained by the lateral effect of the open ditches; these areas will still be preserved as upland buffer. Thus, the credit allocation within the area of the ditch lateral effect will be based on credits for upland buffers, or 25 percent of the total area. Preservation areas will receive 12.5 percent credit for the areas within the legal easement boundaries.

The summary of the credits is as follows (all numbers are approximate):

• 401.5 credits for drained wetland restoration on 351.5 acres within the North Unit and 50.0 acres within the South Unit;

- 8.3 credits for the excavated ponds: 7.0 acres in the North Unit and 1.3 acre in the South Unit.
- 10.8 credits for filling ditches: 18.3 acres in the North Unit and 3.2 acres in the South Unit;
- 24.1 credits for restoration of partially-drained wooded areas: 43.6 acres in the North Unit and 4.5 acres in the South Unit;
- 5.7 credits for upland buffers in the ditch lateral effect area: 12.3 acres in the North Unit and 10.4 acres in the South Unit; and
- 3.6 credits for preservation of forested wetland areas: 11.6 acres in the North Unit and 17.2 acres in the South Unit.

In addition, ditches that remain open and roads that will be used to maintain access to the Site will not be eligible for credit.

4.0 Wetland Restoration Plan

The vegetation and hydrology will be restored to the Site over a one- to two-year construction phase followed by 20 years of management. Coniferous bog or swamp communities will be established using bog restoration methods. The whole site will be treated with similar methods because soil and hydrology are expected to be quite similar throughout. The interior ditches will be filled, raised berms will be leveled, and drain tiles will be disabled to restore wetland hydrology. Native, harvested bog materials will be spread throughout the Site to facilitate the re-introduction of sphagnum mosses and other bog species that cannot be easily re-introduced by seed. Natural re-generation of the herbaceous ground cover, in combination with the addition of bog harvest materials, will be supported by intensive weed management. Tree and shrub seedlings will be installed by hand throughout the Site. The Site will be carefully monitored and managed and supplemental plantings and seeding may be used to encourage development until performance standards are met.

4.1 General Site Preparation

At the beginning of the restoration, it is expected that all of the sod will have been recently removed and bare soil will be present throughout the Site. For any areas that are not bare, the vegetation will be removed to bare soil, especially non-native and invasive species. Soils may be cultivated as part of the weed control and for surface preparation for sphagnum spreading. Prior to the start of construction and hydrologic alterations, water levels will be lowered using the existing control structures to provide dry soil for safe machinery access.

4.2 Site Grading and Hydrology Restoration

Construction activities on the Site are intended to remove or minimize the effect of the artificial drainage features and return the hydrology to the original conditions. The existing drainage is largely maintained by subsurface drain tiles that lead to a system of ditches. To minimize drainage, the majority of the ditches will be filled with soils obtained from elsewhere on the Site, which will plug the ends of the subsurface drain tiles and prevent flow in the ditches. Some of the ditches cannot be filled because they affect other properties, so any subsurface drain tiles that flow into these ditches will be broken and disabled. The plan for construction activities is shown on the plan sheets in Appendix B.

Restoration activities will be initiated through site grading to fill ditches and break drain tiles. Ditch fill material will be collected from existing spoil banks and from pond excavations identified

throughout the restoration area. Some topsoil may be pushed into the ditches from adjacent fields into the ditches, grading down no more than one-foot below existing surface elevation (except on spoil mounds). Mineral soils, preferably clay, will be placed in the bottom of the ditches up to the top of drain tile outlets or higher. Peat soils will be placed on top of the mineral soils, similar to the natural soil horizons. Ditches will be filled to near the existing grade or mounded higher to account for settling. Subsurface drain tiles that flow into ditches that will remain open will be broken and segments removed to prevent drainage into the ditches.

As soon as the ditches are filled and tiles are broken, bog materials will be spread onto the disturbed areas by side-casting as much as possible to minimize compaction. These activities will be performed immediately after the ditches are filled assuming the soil does not become too saturated for machinery access (see detailed bog restoration methods Section 4.3).

4.3 Bog Restoration Methods

The sphagnum moss restoration methods planned for the Site have been largely planned based on methods presented in the Peatland Restoration Guide (Quinty and Rochefort 2003) and based on information from peatland restoration projects by the Natural Resources Research Institute (NRRI), located near Zim. The study by Johnson, et al. (2000) to evaluate the effects of planting time, mulch application, and planting of companion *Carex* species on the establishment of sphagnum mosses was evaluated and considered in the development of this plan.

Suitable donor site(s) for bog harvest materials will be selected based on a review of sites on the proposed NorthMet mine (Mine Site) and from other sites near the mitigation Site. A suitable site would have a large area of a sphagnum mat, at least 12 inches thick and with relatively few trees and shrubs. The donor site would also need to be relatively accessible by machinery for harvest and loading the materials for transport. The ideal bog donor site(s) would occur at the proposed Mine Site in bogs that are proposed to be impacted by the mining activity. However, that would require transport of the bog materials from a considerable distance and may require many truckloads of materials. Therefore, sites closer to the mitigation Site would also be reviewed. If sufficient suitable sites are not found on the proposed Mine Site or transportation is considered to be impractical, a donor site closer to the mitigation Site may be used. For donor sites not located on the Mine Site, PolyMet would confer with the USACE and the MDNR before harvest of materials.

The donor site(s) will be characterized in the summer or fall prior to bog material harvest to identify existing cover of plants and mosses. Based on current research, the appropriate amount of sphagnum

plant material needed for application at the restoration site is the equivalent of what can be collected from an area approximately 1/10 the size of the restoration area. Therefore, approximately 42 acres will be required to collect sufficient plant material.

Bog restoration would be completed as follows:

1. Mitigation site surface preparation

- a. Existing vegetation will be removed by mechanical removal or herbicide treatment in the summer and fall prior to spreading bog harvest material in the spring.
- b. Loose sod remnants and peat will be removed to form a smooth soil surface.

2. Bog harvest material collection

- a. Plant material will be collected in late fall, winter, or early spring before the frost has melted. Sphagnum fragments and additional materials collected in late fall or winter will be stored over winter for use the following spring.
- b. The top 4 to 6 inches of the bog surface will be shredded with a Rotovator or other equipment appropriate to shred surface vegetation. Shredded bog vegetation will be windrowed using a dozer or back-scraper and will be loaded in trucks using a frontend loader.
- c. The plant material will be transported to the restoration site and stockpiled close to the restoration area to minimize multiple hauls.

3. Bog material spreading

- a. The plant fragments will be spread over the site with a standard box manure spreader, ideally in early spring over frozen ground.
- b. The restoration site soil surface will be covered with a uniform 1 to 5 cm thick, fluffy layer of plant fragments.

4. Straw spreading

a. Clean, fresh, straw mulch will be applied over plant fragments as soon as possible after plant spreading (the same day) to improve growing conditions for plant fragments by creating a wetter and cooler air layer at the peat surface.

- b. Attempts will be made to utilize equipment that allows straw to be spread without traveling on top of plant fragments, such as a sideways straw bale spreader with a mulch pass made after plant spreading from adjacent areas not yet completed.
- c. Straw application rate: 2,500 lbs/ac, 10 to 12 4-foot diameter round bales or 7 to 8 5-foot diameter round bales per acre.

5. Fertilizer application

- a. Slow-release phosphate rock fertilizer (P₂O₅) will be applied to approximately one-half of the restoration areas with a conic spreader at 17.5 pounds/acre available phosphate to provide adequate nutrients to favor a rapid establishment of a sphagnum mat. Because current research is not conclusive regarding the benefits of fertilizer, it will only be applied to one-half of the Site to determine the effectiveness of this treatment and the potential for deleterious effects of promoting invasive vegetation establishment. If additional information becomes available prior to restoration this treatment may be eliminated or added to the Site.
- b. Equipment that allows fertilizer to be spread without traveling on top of plant fragments and straw mulch will be used, such as with a conic spreader pulled behind an all-terrain vehicle, after mulch spreading has been completed.

4.4 Tree and Shrub Installation

Approximately, one to three years following bog harvest material installation, tree and shrub seedlings will be planted on the Site. The trees will be installed into the peat soil, through the newly establishing sphagnum and herbaceous community. After three years of monitoring the tree plantings, supplemental plantings may be recommended in certain areas, especially if maintenance activities or invasive species are problematic. Black spruce and tamarack will be the primary trees targeted for the planting, but other species may be considered based on their prevalence in bogs as shown in Table 3.

4.5 Excavated Ponds

Several ponds will be excavated to provide fill material for the existing ditches and will become shallow open water communities. Water in the ponds will be less than 6 feet deep, so that these still qualify as wetland communities and will still support rooted vegetation. The slopes within the ponds will be gradual, no steeper than 5:1 slopes (horizontal to vertical), ideally 8:1. The bottoms will be uneven and the shape of each pond will be irregular to maintain natural appearance and structure.

The majority of the substrate in the ponds will be mineral soil, primarily clay, though some peat will be returned after the excavation to provide a natural muck layer. However, this layer would likely settle into the deepest portions and could not be maintained evenly throughout the bottom.

The ponds will be managed similar to other portions of the Site except some herbaceous species will be planted to encourage establishment. Some emergent and floating-leaved species will be installed along the edges of the ponds. The majority of the vegetation is expected to colonize naturally and invasive species will be managed, when feasible and appropriate.

4.6 Natural Regeneration and Bog Establishment

The general restoration strategy for the majority of the native herbaceous community is to promote natural regeneration during the first two to three years after hydrologic restoration. To the extent practicable, the majority of the weed control will be completed by hand, ATV, or aerial application to minimize the impact on the developing sphagnum and the young trees. The proposed vegetation establishment and maintenance activities anticipated to meet the goals of the plan are listed for the conditions described, as appropriate for the restoration schedule:

- Presence of invasive species. Apply appropriate herbicides within wetland restoration areas
 containing more than 10% areal coverage of reed canary grass or other invasive species.

 Depending on the density of each species in a given area, selective or broad-spectrum
 herbicides may be used. A list of invasive species is provided in Table 4. Mowing may also
 be used to prevent seed set, especially for annuals.
- 2. **Vegetation characterization.** Characterize vegetation in each wetland restoration area twice each year between May and September to determine necessary management and establishment procedures. Vegetation characterization will include documenting problem species present and the approximate areal coverage of each species.
- 3. **Spot treatment.** Spot spray up to three times annually to control reed canary grass and other perennial non-native or invasive species for 10 years or longer following initial restoration. Extensive treatments may not be needed after a sustainable wetland dominated by characteristic native vegetation is established such that the performance standards are achieved.
- 4. **General weed control**. Continue treatments 1, 2, and 3 annually until non-native or invasive species are adequately controlled.

4.7 Supplemental Planting and Seeding

Careful monitoring of vegetation development on the Site will be completed annually to determine where problems are occurring and, to the degree possible, to determine the cause of those problems. Beginning in the third growing season after planting, supplemental trees and shrubs may be installed if performance standards are not met. Seed additions may also be used, beginning in the third growing season, if areas are present where suitable native vegetation has not developed. As such, native seed mixes would be used similar to those recommended by the Minnesota Board of Water and Soil Resources (BWSR) and applied after appropriate measures have been taken to control the invasive species.

5.0 Wetland Mitigation Performance Standards

Performance standards have been developed for the Site to guide the restoration activities and to measure success. The performance standards are appropriate for either a coniferous bog or swamp community because the conditions for each are generally similar. The performance criteria include measures to evaluate whether or not the hydrology and vegetation meet the plan goals. If the performance standards are not met during the 20-year monitoring period for the forested communities, a proposal will be submitted describing the corrective actions proposed and an implementation schedule or monitoring may continue for a longer duration.

5.1 Performance Standards

5.1.1 General

Nearby reference wetlands will be identified prior to monitoring of the restored wetlands. Reference wetlands will be used to provide local context to supplement available information, expertise, and knowledge on natural wetland communities that are similar types as the mitigation wetlands. It is expected that the Site will meet these minimum general performance standards:

- 1. More than 75 percent of the vegetation in each wetland shall be facultative (FAC) or wetter (FACW, OBL).
- 2. Invasive plant species shall not comprise more than 10 percent cumulative areal coverage within any wetland community by the end of the eighth full growing season. Invasive species include those provided in Table 4.
- 3. Vegetative coverage will comprise at least 90 percent areal coverage by the end of the second full growing season to ensure adequate soil coverage, except in shallow open water communities.

5.1.2 Coniferous Bog or Swamp

The coniferous bog or swamp community will meet these minimum performance standards:

1. There will be at least 108 living tree stems per acre by the end of the tenth full growing season. The trees will be dominated by tamarack and or black spruce, but other species may be present.

- 2. Invasive plant species shall not comprise more than 10 percent cumulative areal coverage within any wetland community by the end of the eighth full growing season. Invasive species include those provided in Table 4.
- 3. Vegetative coverage will comprise at least 90 percent areal cover by the end of the fifth full growing season to ensure adequate soil coverage, except in shallow open water communities.

5.1.3 Sedge Meadow or Open Bog

In the event that trees do not become well-established in certain portions of the Site and supplemental plantings are not expected to be successful, the target community will be modified to a sedge meadow or open bog and the new target area will be described and enumerated in the annual monitoring reports. The sedge meadow or open bog community will meet the following performance standard:

- 1. By the end of the fifth full growing season, the herbaceous plant coverage will be comprised of at least 10 native grass, sedge, fern, rush, and/or forb species in sedge meadow communities and 5 native, herbaceous species within open bog communities; or will have a vegetative diversity/integrity rating of high quality using the Minnesota Routine Assessment Method for Evaluating Wetland Functions (MnRAM).
- 2. Hydrology will be similar to that which is recorded in a nearby reference wetland site. This will likely consist of a water table within 12 inches of the soil surface for at least half of the growing season except during growing seasons with precipitation below the range of normal (driest 30 percent of most recent 30-year period of precipitation records).

5.1.4 Shallow Open Water

The ponds will be excavated below the groundwater table and therefore will have standing water throughout most of the area. The edges of the ponds will be more similar to a shallow or deep marsh community, but are not separated here for practical purposes. The majority of the ponds will meet the following performance standard:

- 1. By the end of the fifth full growing season, the plant coverage will be comprised of at least 4 native emergent or floating-leaved species.
- 2. Ponds shall be inundated by at least 36 inches of water (in the deepest part) throughout the growing season except during growing seasons with precipitation below the range of normal (driest 30 percent of most recent 30-year period of precipitation records).

6.0 Wetland Restoration and Management Schedule

The following schedule represents a preliminary plan of the expected activities to restore wetlands at the Site. However, with an adaptive management perspective, it should be recognized that the timing of specific establishment and management activities are likely to change as the restoration progresses. The overall schedule for restoration activities is to complete the restoration work within the first 2 years of the Project. Within the first year after permit issuance, the Year 1 restoration work will be completed. The remaining restoration activities will generally follow the conceptual schedule provided below.

The wetlands restored on the Site will require regular management to become established. This is critical in the first 5 to 8 years and should be recognized as integral to the wetland restoration success. Management will include eliminating invasive species, creating ideal conditions for the native plants to flourish, and seeding/planting to supplement natural regeneration. Weed removal and careful monitoring is important during the early stages of the restoration. All management activities described below apply to the management of the entire Site, including areas receiving credit for restoration of drained and partially-drained wetlands, preservation, and upland buffers.

After certification from the permitting agencies that construction was completed as planned, a permanent conservation easement will be recorded and documentation will be provided to the USACE, the WCA administrator, and other appropriate regulatory agencies.

6.1 Preparation - Year 0

6.1.1 Fall and Winter

- 1. Lower existing water control structures to reduce water levels in the ditches prior to being filled with soil.
- 2. Remove all existing sod or other crops from the Site and eliminate all vegetation down to bare soil using herbicide applications, mowing, and cultivation where needed.
- 3. Harvest sphagnum from the donor site, Mine Site or other local site, and store at the Site through the winter.
- 4. Fill ditches and break subsurface drain tiles to restore site hydrology.

6.2 Year 1

6.2.1 Early Spring

- 1. Spread donor sphagnum material onto the site prior to melting frost.
- 2. Monitor water levels in restored wetlands.

6.2.2 Spring/Summer

- 1. Assess the presence of potentially problematic weeds and implement appropriate management methods including spot treatments with selective herbicides.
- 2. Complete construction repairs, as needed.

6.2.3 Fall—End of First Full Growing Season

- 1. Complete monitoring report, including documentation of wetland establishment activities during the year in comparison to the plan and recommend actions for the following year.
- 2. Apply herbicides as necessary to control non-native and invasive species in all communities.
- 3. Report on water levels in restored wetlands from the full growing season.
- 4. Prepare as-built survey and report following construction completion and request certification of construction.
- 5. Complete construction repairs, as needed.

6.3 Year 2

6.3.1 Spring/Summer

- 1. Monitor water levels in wetlands.
- 2. If hydrologic conditions have stabilized and are appropriate, plant trees and shrubs, otherwise wait until spring of Year 3.
- 3. Apply appropriate herbicides to control invasive species.

6.3.2 Fall—End of Second Full Growing Season

- Complete monitoring report, including documentation of wetland establishment activities completed during the year in comparison to the plan and recommend actions for the following year.
- 2. Apply herbicides as necessary to control invasive species.
- 3. Report on water levels in restored wetlands from the full growing season.

6.4 Year 3

6.4.1 Spring/Summer

- 1. Monitor water levels in wetlands.
- 2. Apply appropriate herbicides to control invasive species.

6.4.1 Fall—End of Third Full Growing Season

- 1. Apply herbicides as necessary to control invasive species.
- Complete monitoring report, including documentation of wetland establishment activities completed during the year in comparison to the plan and recommend actions for the following year.
- 3. Report on water levels in restored wetlands from the full growing season. Determine if the hydrology performance standard has been met or if the groundwater has sufficiently stabilized such that no further groundwater monitoring is necessary.
- 4. If large areas of invasive species are still present, those areas should be aggressively controlled and seeding and/or other remedial activities should be planned.
- 5. If trees and shrubs are not meeting performance criteria, re-planting efforts should be planned for next spring. If high groundwater is problematic in certain areas, the target communities in those areas should be altered to sedge meadow or open bog.

6.5 Years 4 through 20

Many of the management activities described for Year 3 will be continued in Years 4-20. Monitoring reports will be completed in years 1, 3, 5, 10, and 20, if necessary. Hydrology monitoring wells will be removed from the Site at the end of year 5, assuming the hydrology performance standards are met. The monitoring report completed after the tenth growing season will assess whether or not the restoration is sufficiently complete and, if additional monitoring and reporting are warranted.

7.0 Wetland Mitigation Monitoring

The Site will be monitored for 20 years beginning in the first full growing season after completing hydrologic restoration. The purpose of the monitoring is to document the progress and condition of the restored wetland communities. Monitoring reports will be prepared and submitted in Years 1, 2, 3, 5, 10, and 20. The monitoring reports will assess whether or not the restored wetlands are in conformance with performance standards and determine whether continued monitoring is required. Monitoring visits will include review of the areas receiving credit for restoration of partially-drained wetlands and in the preservation areas to identify potential problems with invasive species or other forms of degradation.

Hydrologic parameters will be evaluated in the mitigation areas more intensively during the first two years and then at a level appropriate to the hydrologic characteristics of each area thereafter. Any significant modifications to the monitoring frequency proposed herein will be described in a revised monitoring plan to be submitted for review and approval prior to implementation. In addition to monitoring the restored wetlands, one reference wetland of each wetland restoration community type (if available) will be monitored within the general area of the restoration site in areas with relatively natural hydrologic conditions. A monitoring plan will be submitted for review and approval that will include proposed locations of reference wetlands prior to implementing the monitoring program. Continuous recording wells will be utilized to the extent feasible.

7.1 Hydrologic Monitoring

Hydrologic monitoring in these generally saturated wetland communities will be conducted using shallow wells placed throughout the Site sufficient to characterize hydrology through year 5. Water elevations will be recorded at least once per week from May through mid-July and monthly thereafter until the end of the growing season.

7.2 Vegetation Monitoring

A detailed vegetation survey will be conducted once per year (typically July-August) in each wetland mitigation community, as well as the reference wetland communities, to evaluate the success of the restoration during the appropriate monitoring period for each community type. At least 10 permanent monitoring points will be established throughout the Site (at least 2 plots in the South Unit). Vegetation sampling at each of these points will be completed based on guidance from the 1987 Wetland Delineation Manual (Environmental Laboratory, 1987) and the Northcentral and Northeast

Regional Supplement (Environmental Laboratory, 2009) or appropriate updated version. Monitoring within the established plots will include a count of living trees and shrubs to estimate survivorship rates. Meander surveys will also be incorporated during the site visits to identify the overall vegetation and the presence of invasive species throughout the Site. Documentation photographs will also be taken during monitoring from fixed reference points around each restored wetland area.

7.3 Monitoring Report

A monitoring report will be prepared following growing seasons in years 1, 2, 3, 5, 10, and 20. The report will describe the status of the wetland mitigation and summarize the results of the vegetative and hydrologic monitoring. Additionally, the report will document all management activities and corrective actions conducted during the previous year and describe those activities planned for the following year. The report will be submitted by January 31 of the year following monitoring. The annual report will include the following information at a minimum:

- A brief description of the wetland mitigation areas; including location, size, vegetative and hydrologic monitoring data, current wetland types, and desired wetland types.
- An as-built survey will be provided in the first-year report along with a comparison of the asbuilt survey to the approved plans.
- A summary of water level measurements taken to date and a determination whether the
 hydrology in the wetlands meets the design elevations and wetland hydrology criteria as
 defined in the performance standards.
- Vegetation survey information, including species and percent areal coverage within each restored wetland community and each upland buffer community and a determination of whether the vegetation meets the performance criteria.
- A map of the various plant communities present within the restoration areas will be prepared as distinctly different communities develop.
- Annual color photographs of the wetland mitigation sites taken during vegetation monitoring at designated photo-reference points.
- A summary of management activities and/or corrective actions conducted in the wetlands during the previous year and activities planned for the following year.

- Board of Water and Soil Resources. 2003. Minnesota Wetland Conservation Act Guidance Paper 2003-01. Approved by the Minnesota Interagency Wetland Group.
- Eggers, Steve D., and Donald M. Reed. 1997. Wetland plants and communities of Minnesota and Wisconsin. U.S. Army Corps of Engineers, St. Paul District. Jamestown, ND: Northern Prairie Wildlife Research Center Online. Available at URL: http://www.npwrc.usgs.gov/resource/plants/mnplant/index.htm (Version 03SEP1998). Accessed January 3, 2011.
- Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. Department of the Army: Waterways Experiment Station Corps of Engineers. Vicksburg, MS.
- Environmental Laboratory. 2009. Interim Regional Supplement to the Corps of Engineers Wetlands Delineation Manual. ERDC/EL TR-09-19. Vicksburg, MS: U.S. Army Corps of Engineers: Engineer Research and Development Center, Wetlands Regulatory Assistance Program.
- Johnson, K.W., C.C. Maly, and T.J. Malterer. 2000. Effects of mulch, companion species, and planting time on restoration of post-harvested Minnesota peatlands, U.S.A. In L. Rochefort and J-Y. Daigle (eds.) *Sustaining our Peatlands: Proceedings of the 11th International Peat Congress*, Quebec City, Canada, August 6-12, 2000, 699-704.
- Loesch, T. 1997. Geomorphology of Minnesota. University of Minnesota-Duluth, Minnesota Geological Survey, Minnesota Department of Natural Resources. DNR Data Deli landfne2 sam.gif.
- Loesch, T. 1998. LandSat-Based Land Use Land Cover. Minnesota Department of Natural Resources. DNR Data Deli lulc ic96ra3
- Marschner, F.J., 1974, The original vegetation of Minnesota, a map compiled in 1930 by F.J. Marschner under the direction of M.L. Heinselman of the U.S. Forest Service: St. Paul, Minnesota, Cartography Lab of the Department of Geography, University of Minnesota. GIS data available from the Minnesota Department of Natural Resources at URL: http://deli.dnr.state.mn.us/. Accessed February 9, 2011.

- Minnesota Department of Natural Resources. 1980. DNR 24K Streams. DNR Data Delidnrstln3_sam.gif
- Minnesota Department of Natural Resources. 2002. Vascular Plants of Minnesota. September 25, 2002. Ecological Services Division.
- Minnesota Department of Natural Resources. 2010. Ecological Classification System. Available at URL: http://www.dnr.state.mn.us/ecs/index.html. Accessed December 29, 2010.
- Minnesota Historical Society. 1867. Minnesota Maps Online: Original Land Survey Maps. Available at URL: http://www.mnhs.org/collections/digitalmaps/index.htm. Accessed February 9, 2011.
- Minnesota Land Management Information Center. 1983. Minnesota Public Lands, 1983. http://www.lmic.state.mn.us/pdf/MN Public Lands 1983.pdf
- Minnesota Land Management Information Center. 1999. Digital Elevation Model of Minnesota: statewide 1:24,000-scale raster. http://www.lmic.state.mn.us/bmap90/dem/dem.htm
- Morey, G.B. and J. Meints. 2000. Geologic Map of Minnesota Bedrock Geology. Third Edition. Minnesota Geological Survey, University of Minnesota. Available at URL: ftp://mgssun6.mngs.umn.edu/pub2/s-20_3ed/s-20_3ed.pdf. Accessed December 29, 2010.
- National Audubon Society 2010. Important Bird Areas in the U.S: Sax-Zim Bog IBA. Available at http://www.audubon.org/bird/iba. Accessed 28 December 2010
- Quinty, F. and L. Rochefort. 2003. Peatland Restoration Guide, second edition. Canadian Sphagnum Peat Moss Association and New Brunswick Department of Natural Resources and Energy, Quebec, Quebec.
- Soil Conservation Service. 1990. Lateral Effect of Open Ditches. August 1990.
- USDA-NRCS. 2009. Soil Survey Geographic (SSURGO) database for St. Louis County, Minnesota, Meadowlands Part. United States Department of Agriculture Natural Resources Conservation Service. Fort Worth, TX: mn619. URL: http://soildatamart.nrcs.usda.gov/

Tables

Table 1 Wetland Mitigation Credits on the North Unit of the Zim Sod Site NorthMet Project PolyMet Mining Inc. Hoyt Lakes, Minnesota

Field Number/Feature Type	Area (acres)	Credit
N01	16.1	16.1
N02	17.8	17.8
N03	2.2	2.2
N04	18.8	18.8
N05	21.1	21.1
N06	17.8	17.8
N07	17.6	17.6
N08	21.5	21.5
N09	23.1	23.1
N10	13.6	13.6
N11	19.0	19.0
N12	20.9	20.9
N13	19.2	19.2
N14	22.2	22.2
N15	22.9	22.9
N16	26.1	26.1
N17	21.9	21.9
N18	29.9	29.9
North Unit Drained Fields Total (100% Credit)	351.5	351.5
N03	2.1	2.1
N05	0.3	0.3
N10	2.4	2.4
N16	0.5	0.5
N17	1.7	1.7
North Unit Total Excavations (100% Credit)	7.0	7.0
Wooded areas - partially drained (50% Credit)	43.6	21.8
Ditch fill (50% Credit)	18.3	9.2
Upland Buffer - Ditch Lateral Effect (25% Credit)	12.3	3.1
Preservation areas	11.6	1.4
Open Ditches (0% Credit)	2.3	-
Road (0% Credit)	5.3	-
Additional land - no credits	28.7	-
North Unit Totals	480.6	394.0

Table 2 Wetland Mitigation Credits on the South Unit of the Zim Sod Site NorthMet Project PolyMet Mining Inc. Hoyt Lakes, Minnesota

Field Number/Feature Type	Area (acres)	Credit (acres)
S01	6.3	6.3
S02	39.6	39.6
S03	4.2	4.2
South Unit Drained Fields Total (100% Credit)	50.0	50.0
S02	1.3	1.3
South Unit Excavations Total (100% Credit)	1.3	1.3
Wooded areas - partially drained (50% Credit)	4.5	2.3
Ditch fill (50% Credit)	3.2	1.6
Upland Buffer - Ditch Lateral Effect (25% Credit)	10.4	2.6
Preservation (12.5% Credit)	17.2	2.2
Open Ditches (0% Credit)	1.5	-
Road (0% Credit)	0.4	-
South Unit Totals	88.5	59.9

Table 3 Potential tree species that may be planted at the Zim Sod Site NorthMet Project PolyMet Mining Inc. Hoyt Lakes, Minnesota

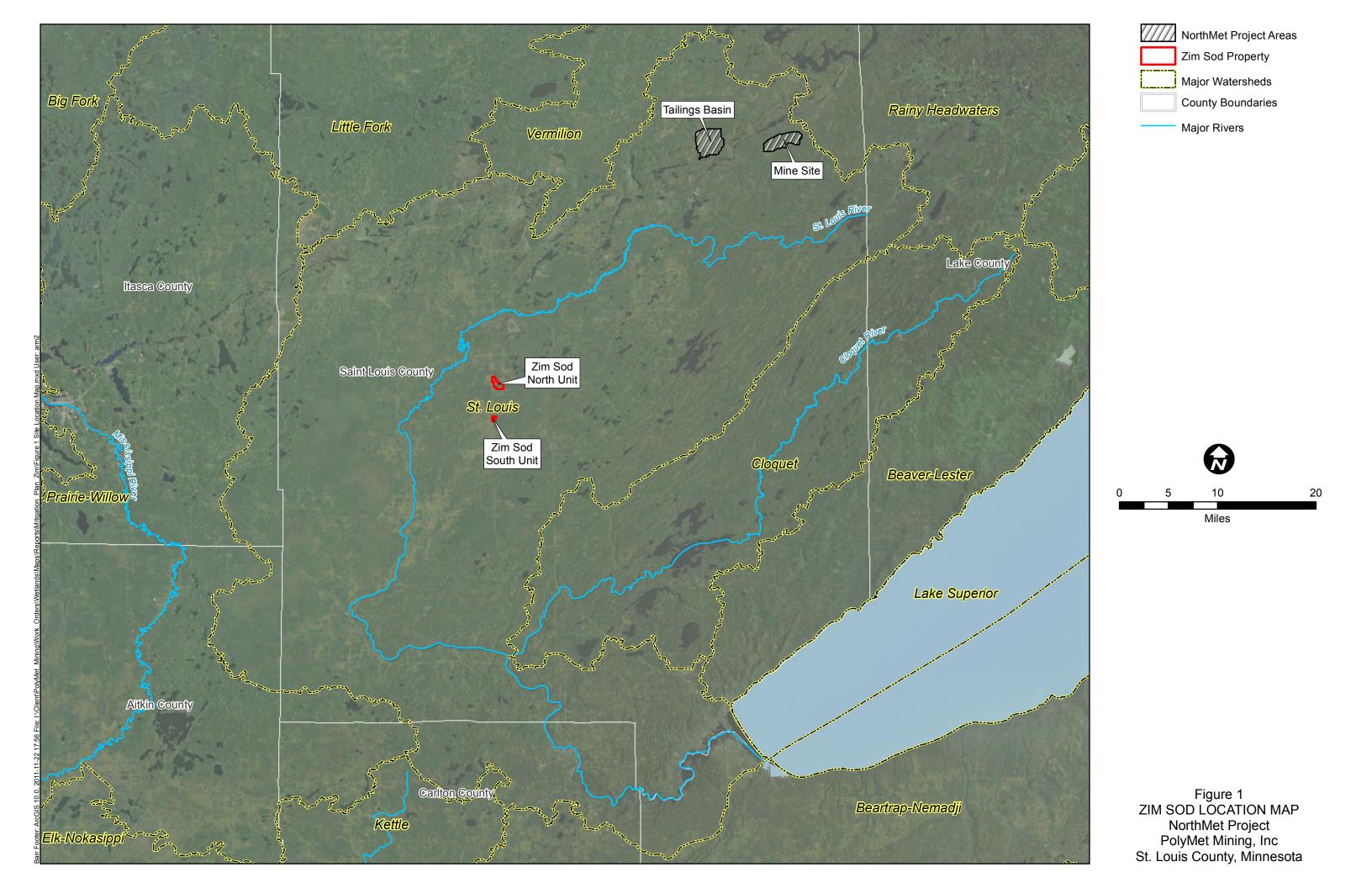
		Expected occ	urrence in:	
Scientific Name	Common Name	Coniferous Swamp	Coniferous Bogs	
Acer rubrum	Red Maple	Infrequent	Rare	
Betula papyrifera	Paper Birch	Common	Rare	
Fraxinus nigra	Black Ash	Infrequent	Rare	
Populus tremuloides	Quaking aspen	Infrequent	Rare	
Abies balsamifera	Balsam fir	Common	Rare	
Larix laricina	Tamarack	Abundant	Common	
Picea nigra	Black spruce	Abundant	Abundant	
Thuja occidentalis	White cedar	Common	Rare	
Alnus incana	Speckled alder	Common	Rare	
Betula pumila	Bog birch	Common	Rare	
Amelanchier spp.	Juneberries	Infrequent	Rare	

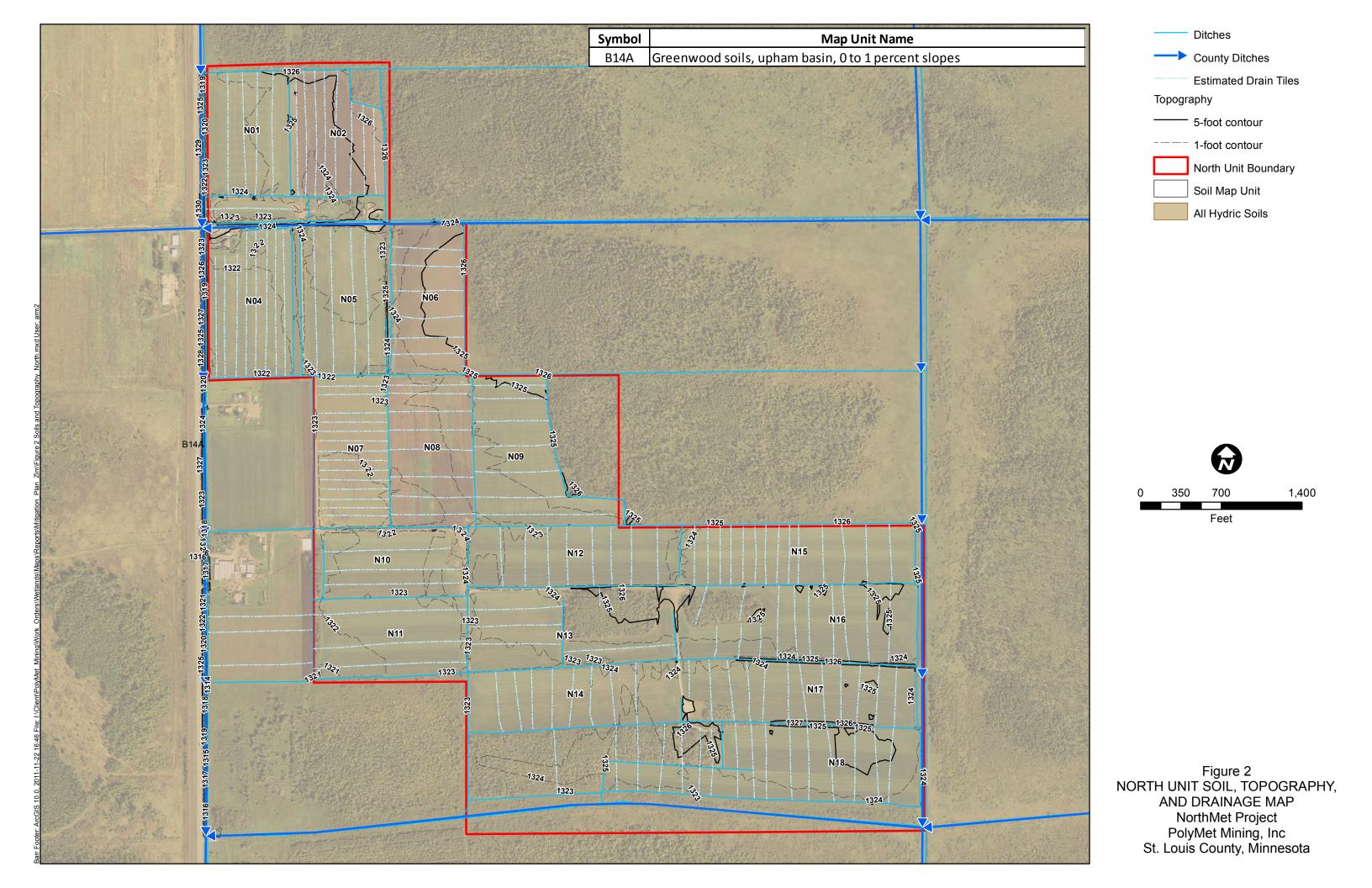
Table 4 Potentially problematic invasive species for the Zim Sod Site¹ NorthMet Project PolyMet Mining Inc. Hoyt Lakes, Minnesota

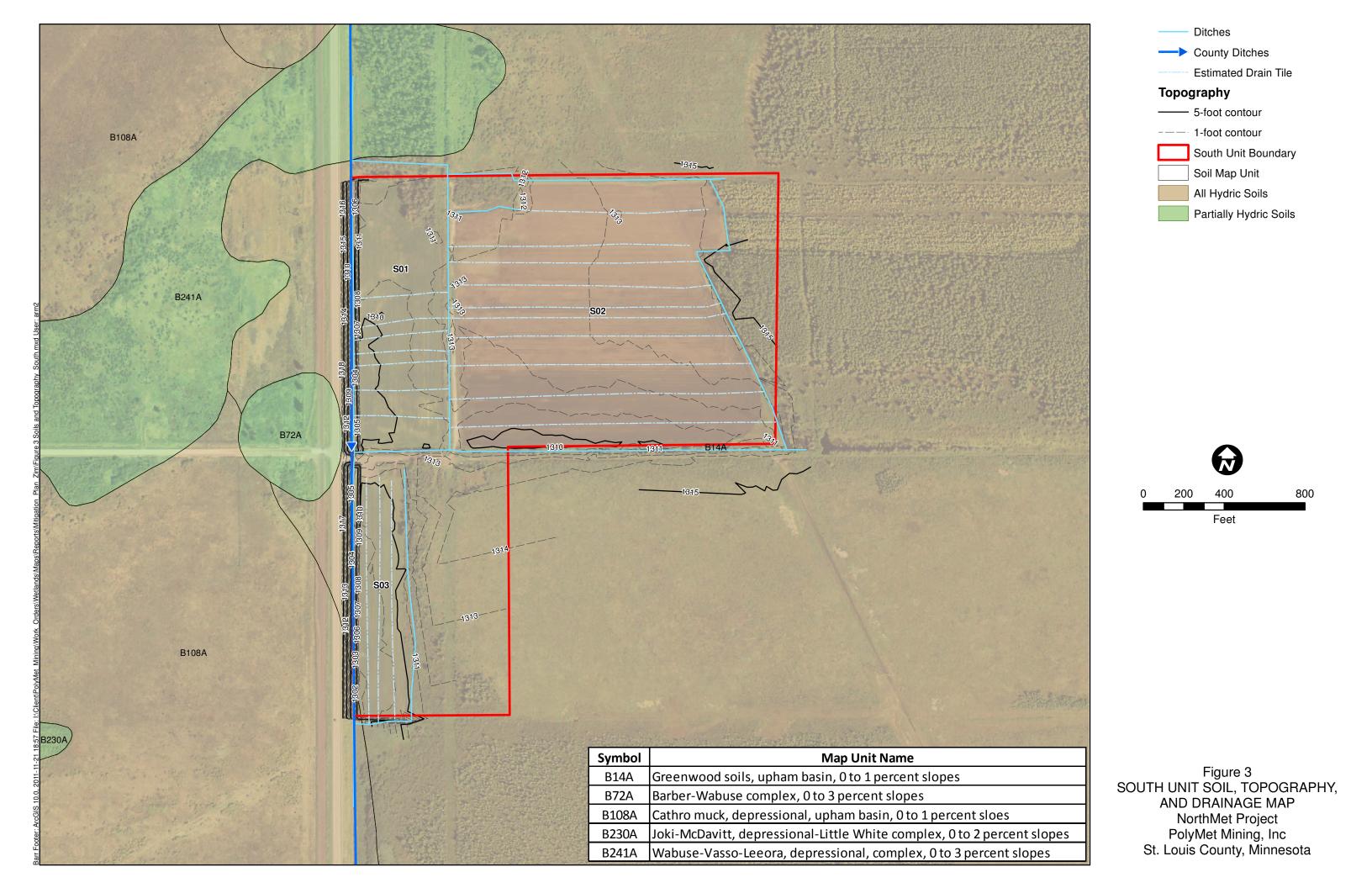
Common Name	Scientific Name
Flowering rush	Botomus umbellatus
Canada thistle	Cirsium arvense
Yellow iris	Iris pseudacorus
Bird's Foot trefoil	Lotus corniculatus
Purple loosestrife	Lythrum salicaria
Reed canary grass	Phalaris arundinacea
Buckthorns	Rhamnus spp
Curly dock	Rumex crispus
Foxtail	Setaria spp.
Common tansy	Tanacetum vulgare
Narrowleaf cattail	Typha angustifolia
Blue cattail	Typha x glauca
Common reed	Phragmites australis
Perennial sow thistle	Sonchus arvensis
Sweet clover	Melilotus alba
Smooth brome grass	Bromus inermis

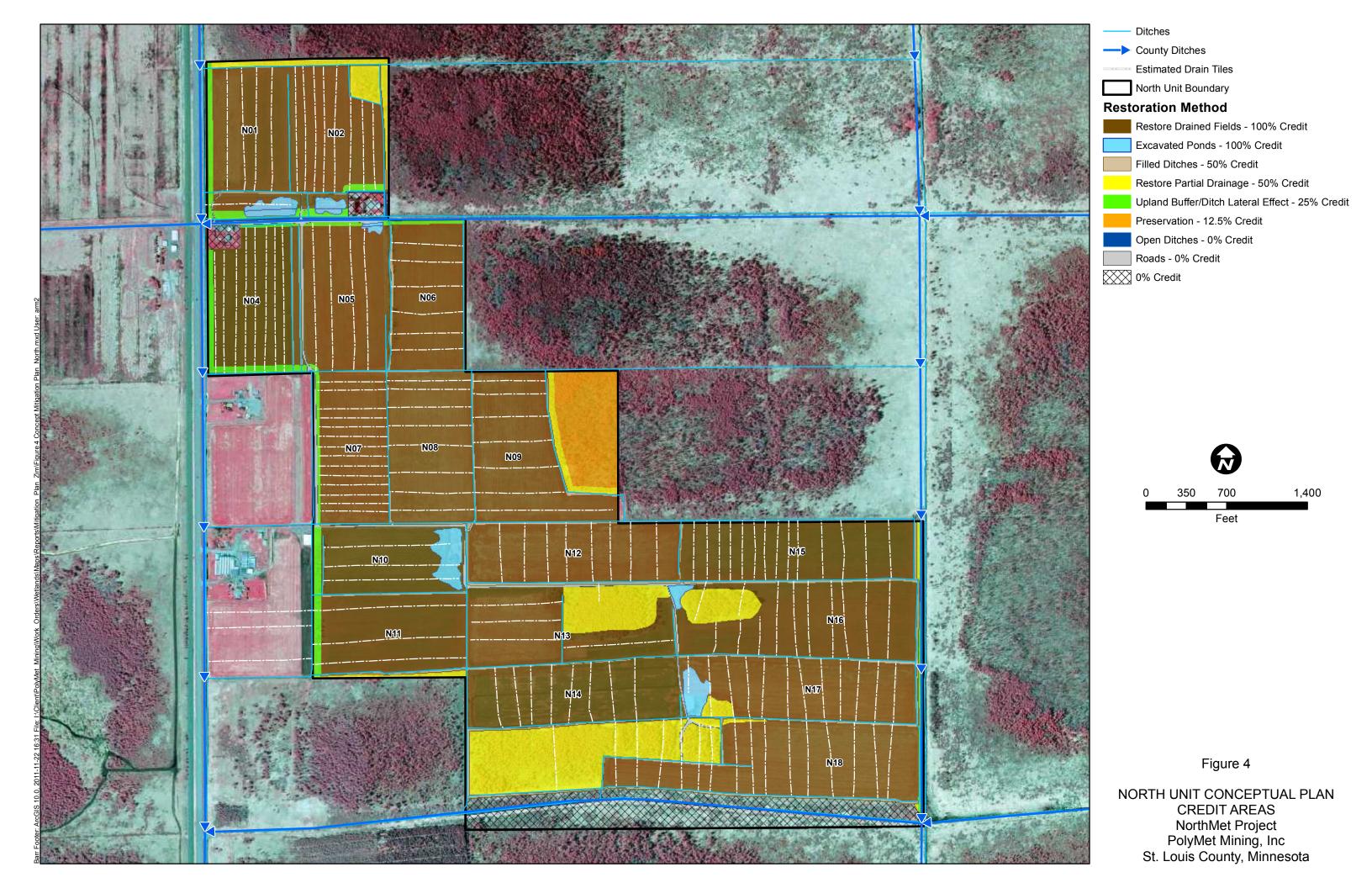
¹ Also includes other non-native species based on Minnesota Department of Natural Resources (2002).

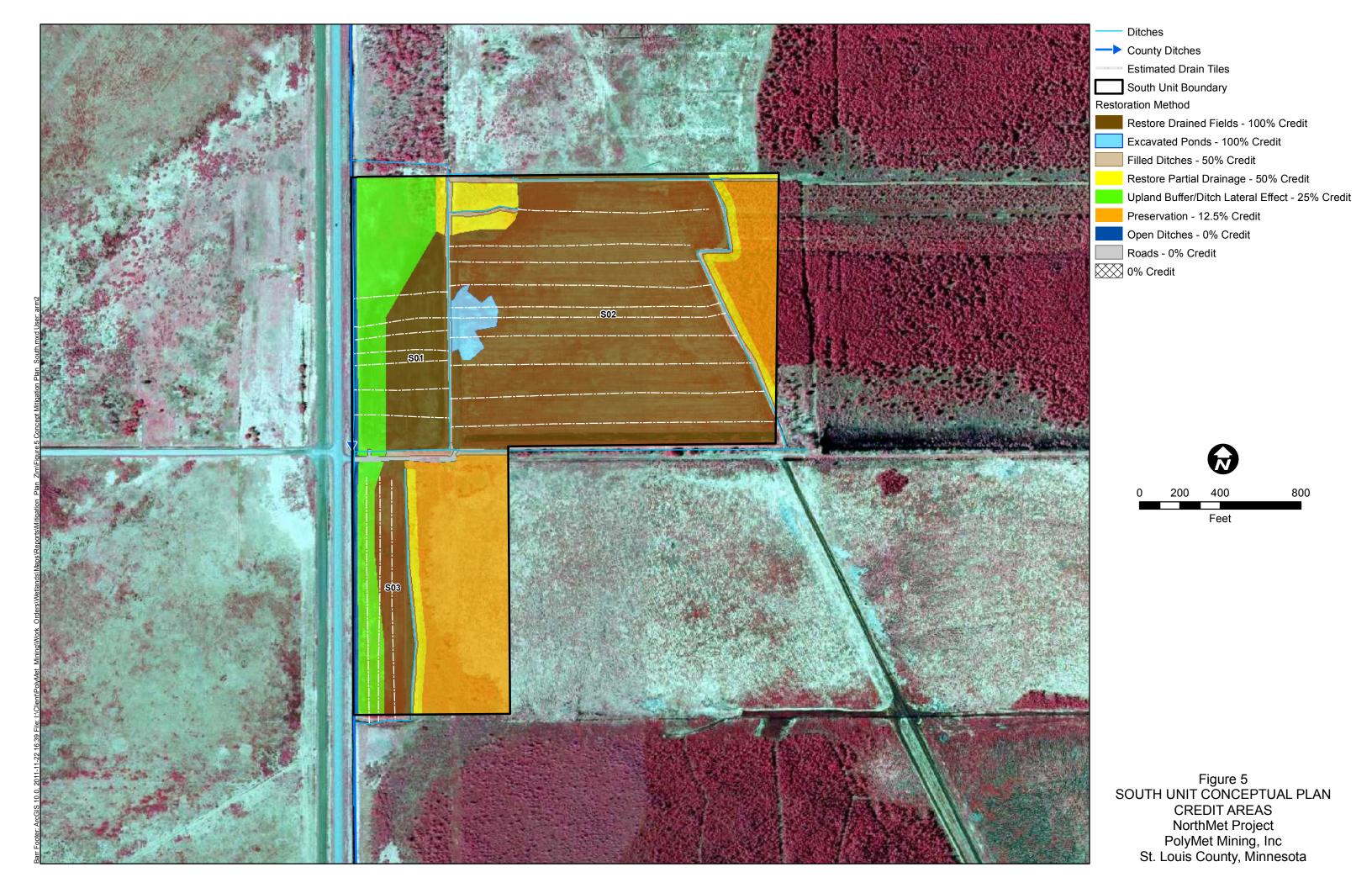
Figures











Appendices

Appendix A

Greenwood Soil Series Official Soil Description

LOCATION GREENWOOD

MI+MA ME MN NH NY WI

Established Series Rev. LWB-WEF-LMC 11/2004

GREENWOOD SERIES

The Greenwood series consists of very deep ,very poorly drained soils formed in organic deposits more than 51 inches thick on outwash plains, till floored lake plains, or lake plains. These soils have moderate or moderately rapid permeability. Slopes range from 0 to 2 percent. Mean annual precipitation is about 29 inches, and mean annual temperature is about 43 degrees F.

TAXONOMIC CLASS: Dysic, frigid Typic Haplohemists

TYPICAL PEDON: Greenwood mucky peat - on a 1 percent slope in a forested area. (Colors are for moist soil unless otherwise stated.)

Oi--0 to 6 inches; brown (7.5YR 4/4) peat (fibric material); about 95 percent fiber, about 90 percent rubbed; massive; friable; primarily live roots and sphagnum moss; extremely acid; clear smooth boundary.

Oe1--6 to 10 inches; very dark brown (10YR 2/2) broken face and rubbed mucky peat (hemic material); about 80 percent fiber, about 20 percent rubbed; massive; friable; primarily herbaceous fibers; extremely acid; gradual smooth boundary.

Oe2--10 to 35 inches; dark brown (7.5YR 3/2) broken face and rubbed mucky peat (hemic material); about 80 percent fibers, about 20 percent rubbed; massive; friable; primarily herbaceous fibers; extremely acid; gradual smooth boundary.

Oe3--35 to 60 inches; dark brown (7.5YR 3/2) broken face and rubbed mucky peat (hemic material); about 90 percent fibers, about 35 percent rubbed; massive; friable; primarily herbaceous fibers; very strongly acid.

TYPE LOCATION: Clare County, Michigan; about 5 miles south and 1 mile west of Temple; 300 feet east and 825 feet south of the northwest corner, sec. 16, T. 18 N., R. 6 W.

RANGE IN CHARACTERISTICS: The organic layers are more than 51 inches thick. The surface tier is commonly peat (fibric material) derived from sphagnum moss. In some places, these layers are largely undecomposed sphagnum moss and in others they are stratified muck, mucky peat, and peat derived from both herbaceous plants and sphagnum moss. Muck, mucky peat, and peat types have been recognized. The O layers have hue of 10YR to 5YR, value of 2 to 6, and chroma of 1 to 4; colors become darker upon brief exposure to air. Oi layers have the highest values and chromas. In some pedons, colors after rubbing change from 0.5 to 1 unit in value or chroma or both. The layers in the subsurface and bottom tiers are dominantly mucky peat (hemic material) derived from herbaceous plants. In some pedons, layers of peat or muck have a combined thickness of less than 10 inches in the lower two tiers. These layers have pH of 4.5 or less in 0.01M calcium chloride and commonly range from pH 3.5 to 4.5. Fragments of woody material ranging from about 1 to 8 inches in diameter are throughout the control section. Woody fibers comprise less than 50 percent of the organic volume after

rubbing. There is no mineral soil material recognized in the profile.

COMPETING SERIES: There are none. The <u>Burnt Vly</u>, <u>Citypoint</u>, <u>Dawson</u>, <u>Loxley</u> and <u>Pleasant Lake</u> soils are in closely related families. All of these soils are dominantly composed of sapric materials. In addition, the Citypoint series has a lithic or paralithic contact within 60 inches and the Burnt Vly and Dawson soils have sandy mineral soil within 51 inches of the surface.

GEOGRAPHIC SETTING: Greenwood soils are in depressions that range in size from small enclosed bogs in moraines to areas of about 1,000 acres in size. The larger areas commonly are on outwash plains, till floored lake plains, or lake plains. The mineral soils in the surrounding upland are generally derived from acid parent materials. Slopes range from 0 to 2 percent. Then mean annual precipitation ranges from about 22 to 35 inches, and the mean annual temperature is about 36 to 45 degrees F. Frost free days range from 88 to 150. Elevation above sea level ranges from 600 to 1,600 feet.

GEOGRAPHICALLY ASSOCIATED SOILS: These are the <u>Dawson</u>, <u>Deford</u>, <u>Kinross</u>, and <u>Roscommon</u> soils. Dawson soils are shallow organic soils in similar landscape positions underlain by sand at a depth of 16 to 50 inches. The Deford, Kinross and Roscommon soils are poorly or very poorly drained sandy mineral soils in slightly higher landscape positions.

DRAINAGE AND PERMEABILITY: Very poorly drained. The representative depth to wet soil moisture status is at the surface to 1 foot below the surface at some time throughout the year. The representative depth of ponding is from 0 to 1.0 foot at some time throughout the year. Surface runoff is negligible. Permeability is moderate or moderately rapid.

USE AND VEGETATION: Very little use is made of these soils because of the extreme acidity and high water table. Few trees except some black spruce and tamarack grow on these soils. Ground cover is blueberries, bog rosemary, laurel, leatherleaf, and sphagnum mosses.

DISTRIBUTION AND EXTENT: Minnesota, Wisconsin, New Hampshire, New York, and the northern Lower Peninsula and Upper Peninsula of Michigan. The soil is of large extent.

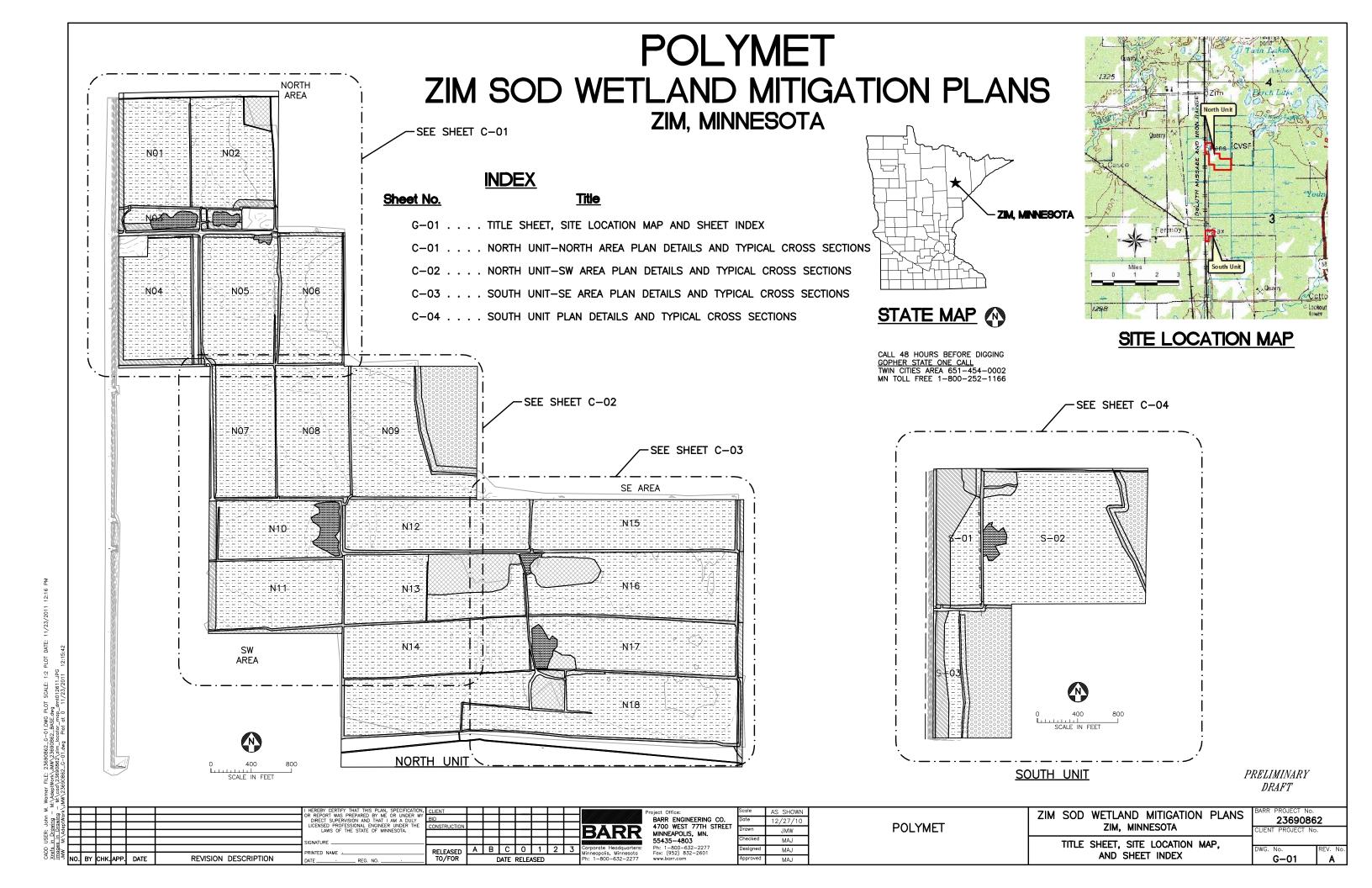
MLRA SOIL SURVEY REGIONAL OFFICE (MO) RESPONSIBLE: St. Paul, Minnesota

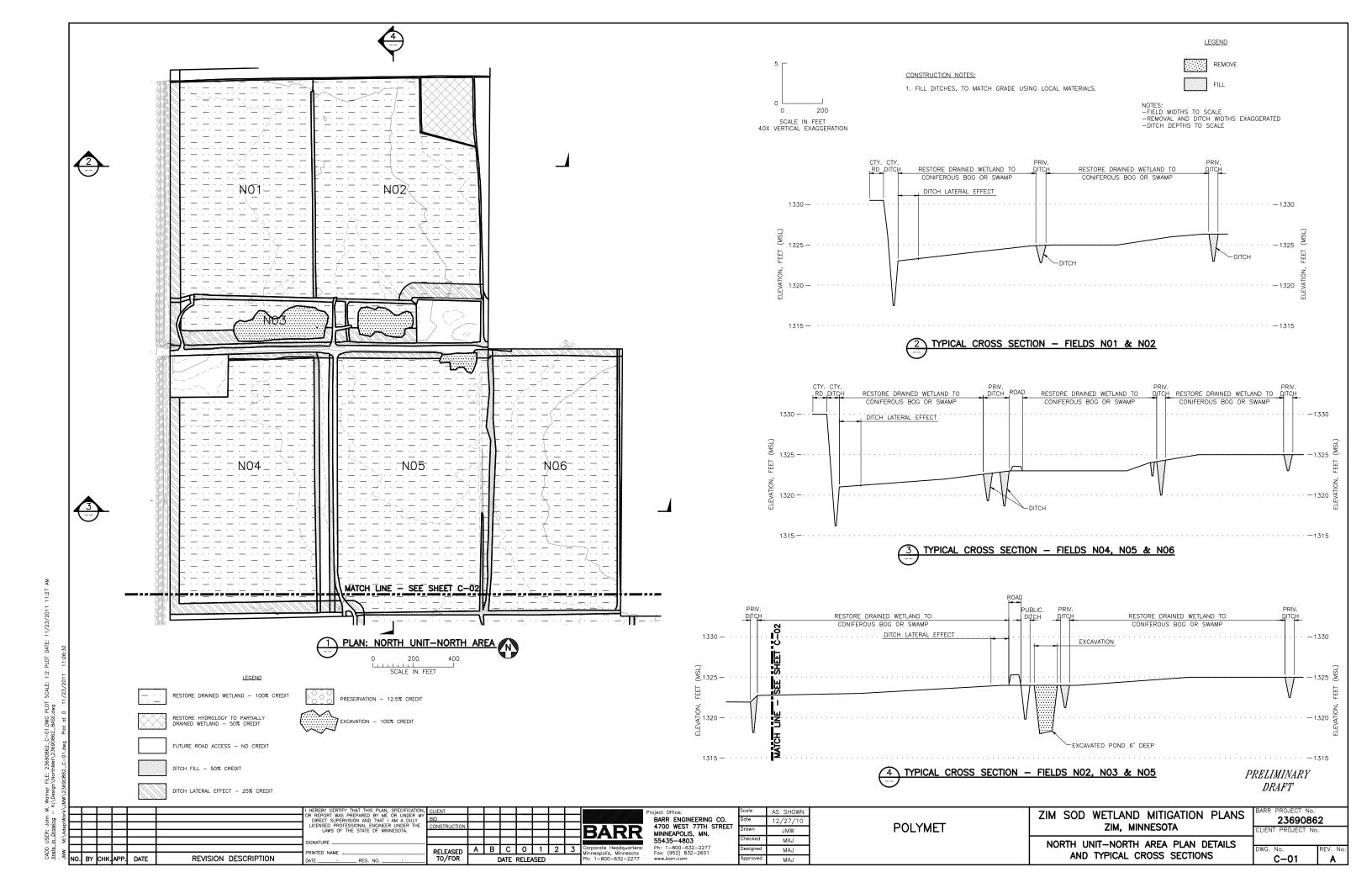
SERIES ESTABLISHED: Ogemaw County, Michigan, 1923.

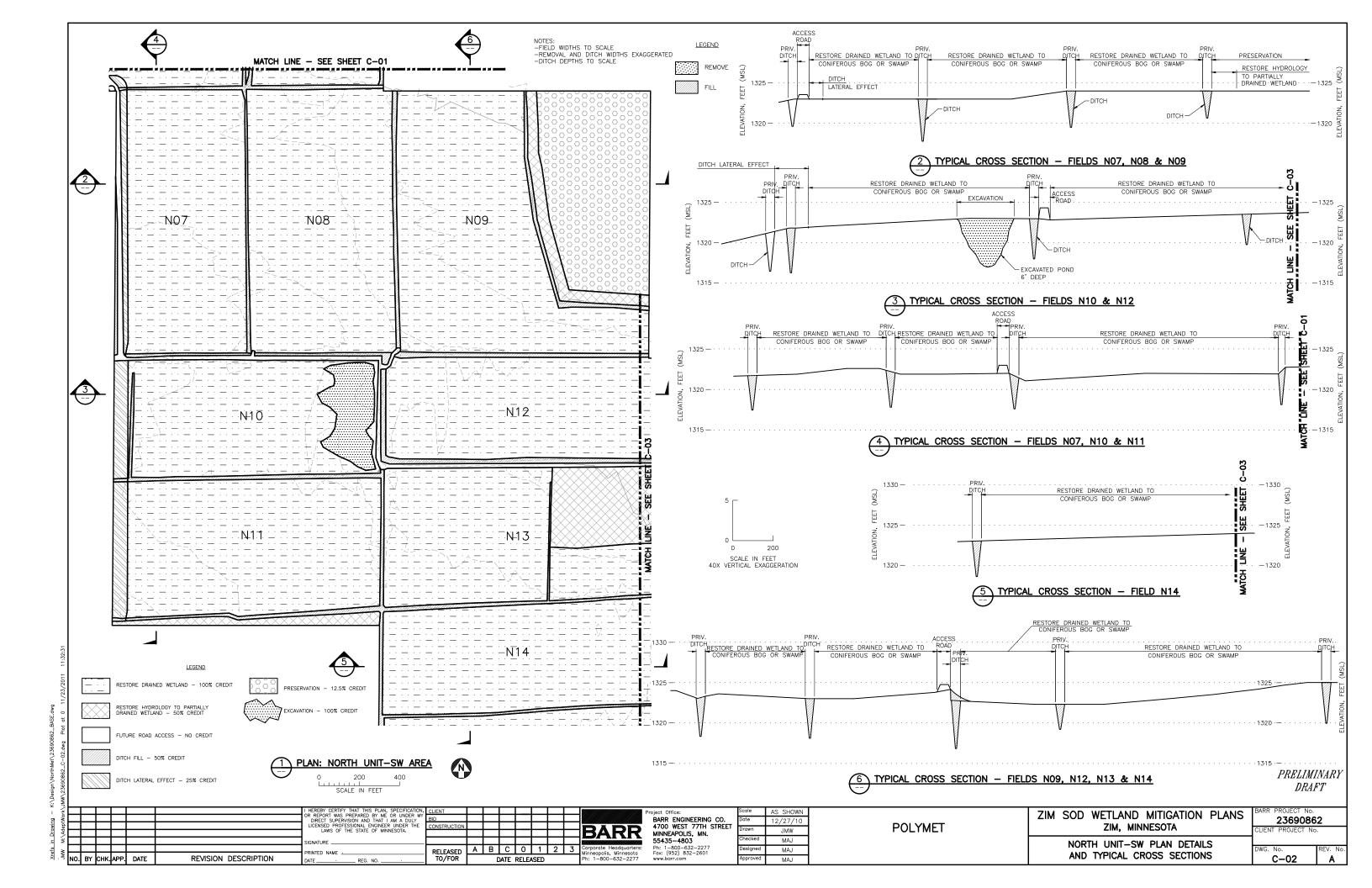
National Cooperative Soil Survey U.S.A.

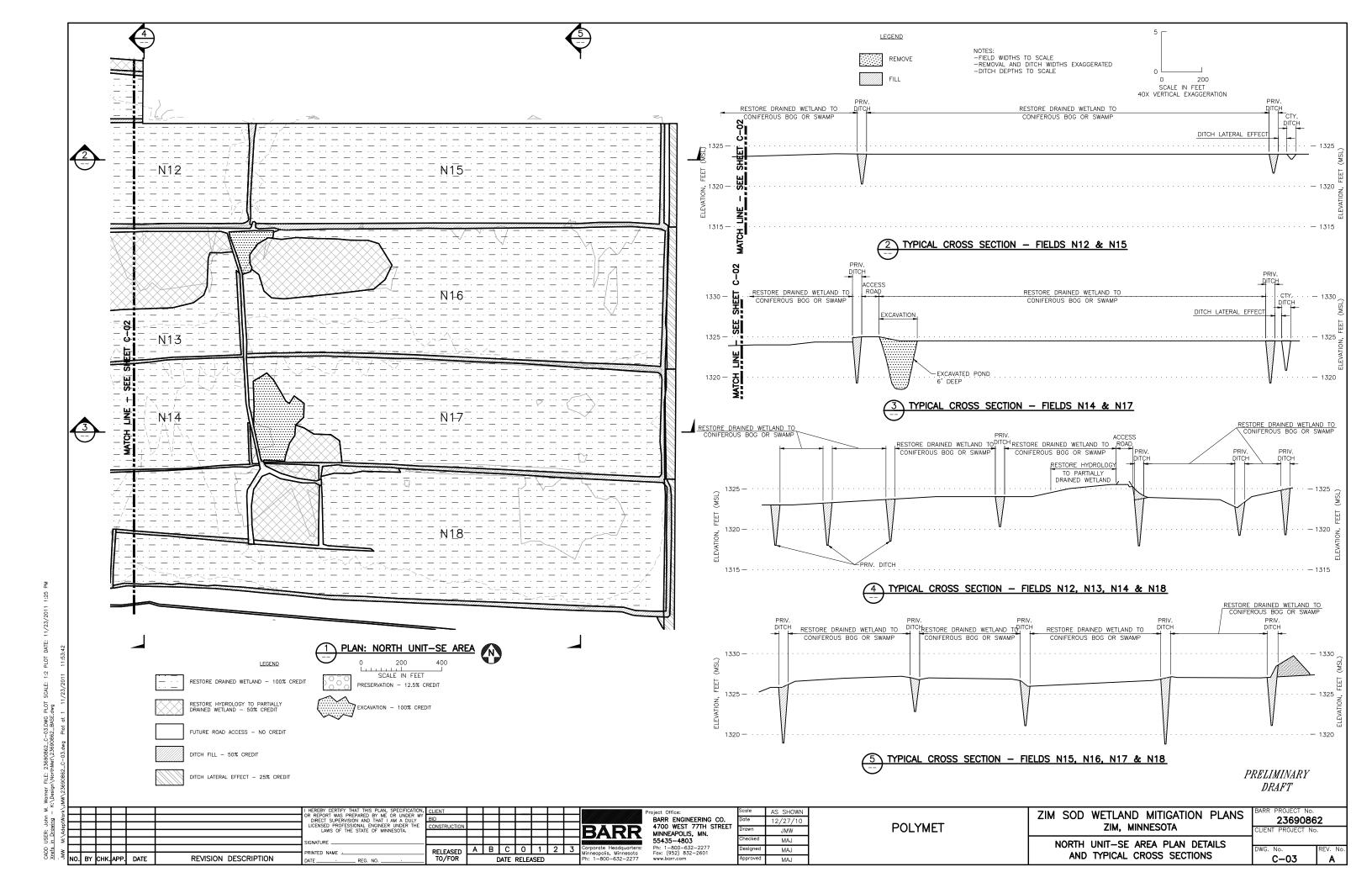
Appendix B

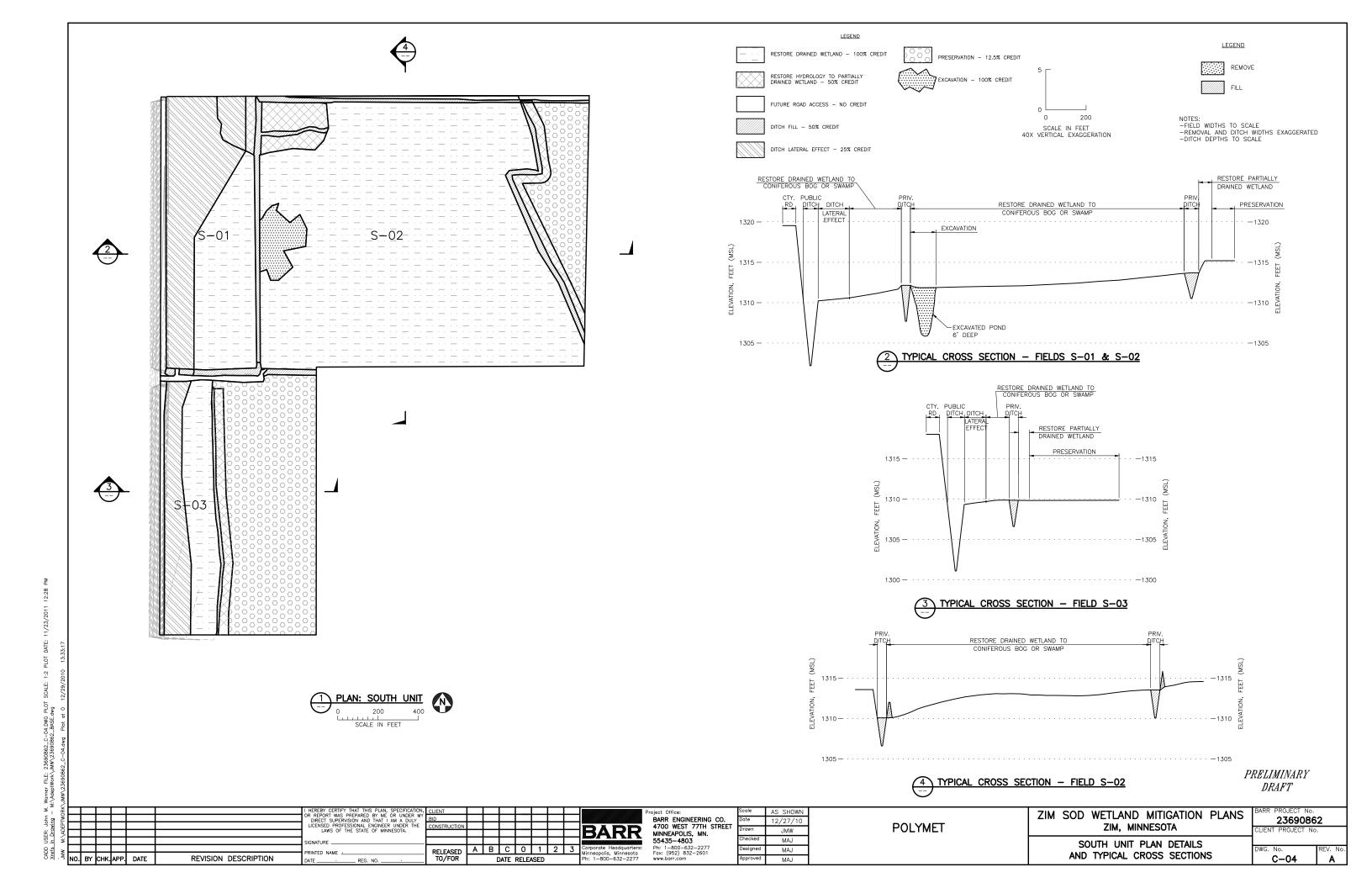
Wetland Mitigation Plan Drawings







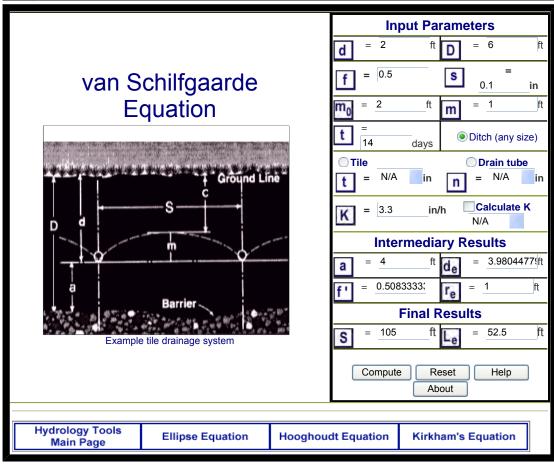




Appendix C

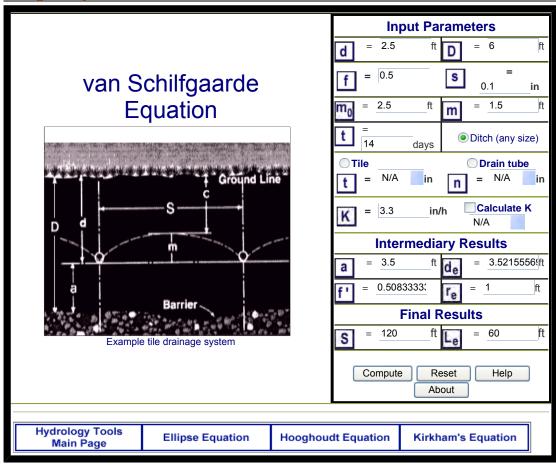
Ditch Lateral Effect Calculations









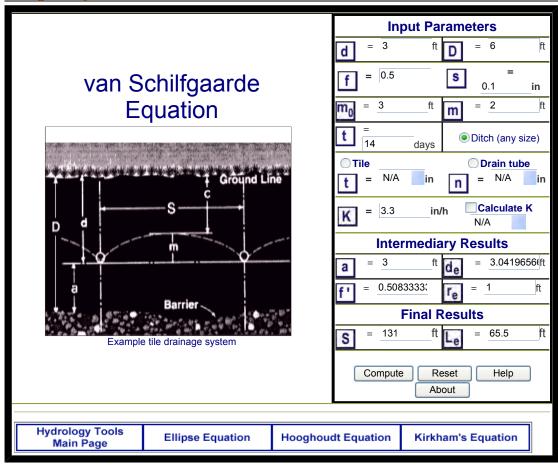


User Name: null
Reset Name

Session #: 2
Time: 13:08
Date:

11../../index.html16../../index.html2011

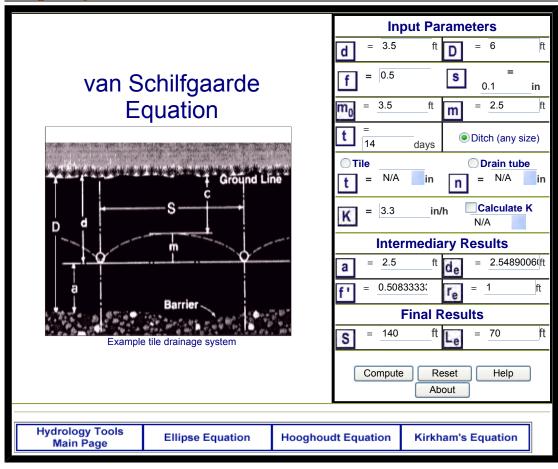






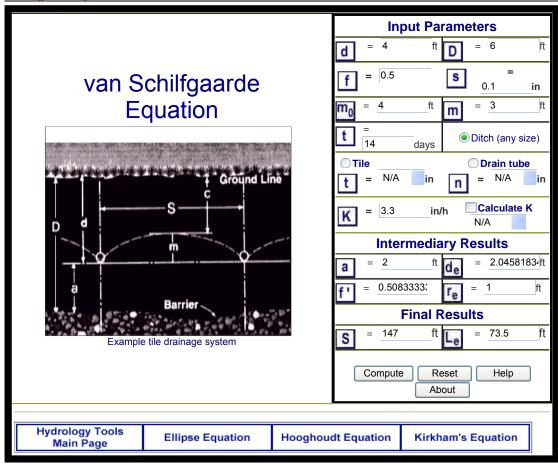










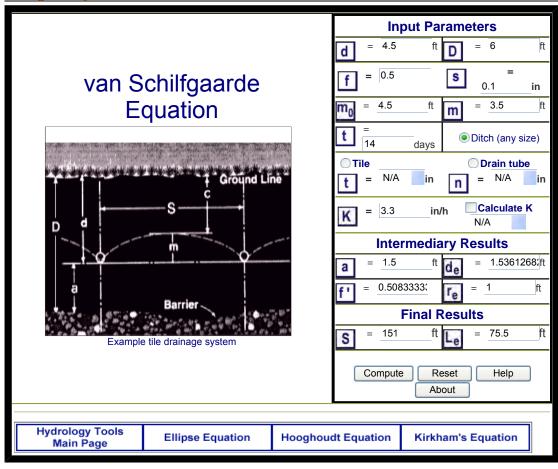


User Name: null
Reset Name

Session #: 2
Time: 13:08
Date:

11../../index.html16../../index.html2011



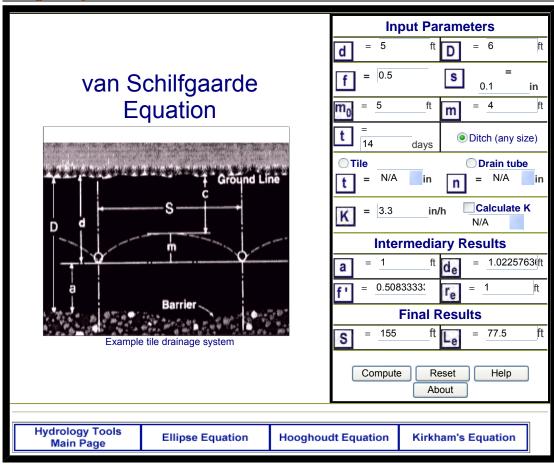


User Name: null
Reset Name

Session #: 2
Time: 13:08
Date:

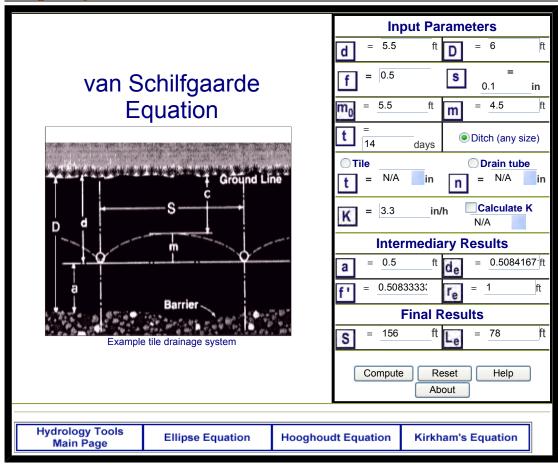
11../../index.html16../../index.html2011





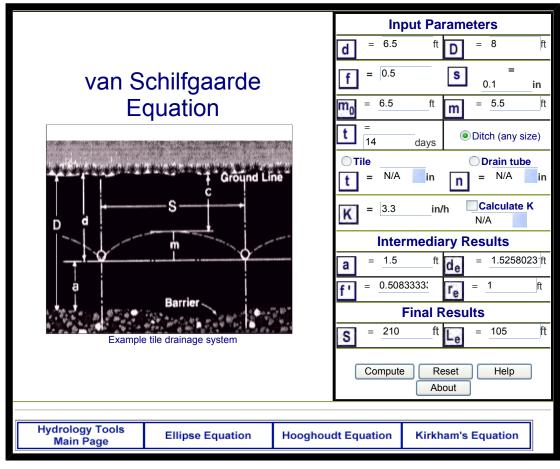
User Name: null
Reset Name
Session #: 2
Time: 13:08
Date:
11../../index.html16../../index.html2011





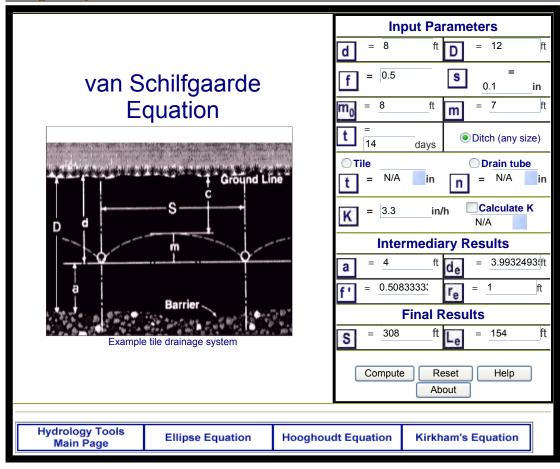






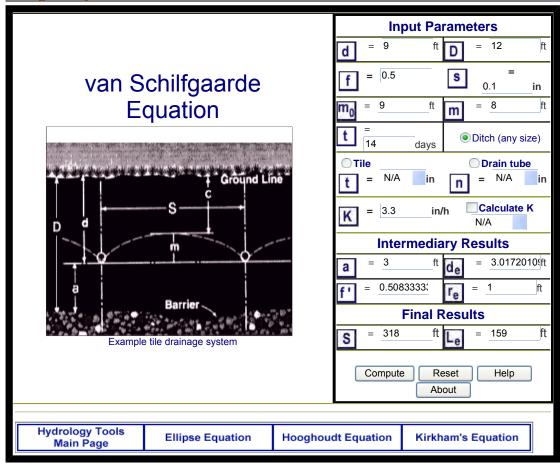






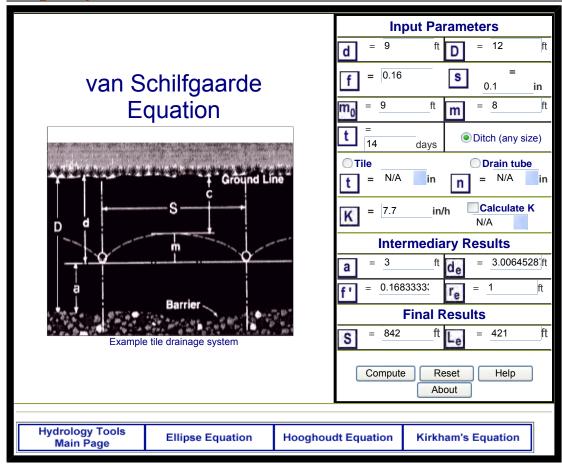














Appendix D Wetland Data Forms

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site:	Zim Sod				Applicant/O	wner: <u>2</u>	Zim Sod	Cit	ity/County: <u>St.</u>	Louis		State:	MN	Sam	pling Date:	<u>11/18/10</u>
Investigator(s):	<u>TPT</u>				Section:	<u>35</u>		To	ownship: <u>55</u>			Range:	<u>18</u>	Sam	pling Point:	#01 S03
Land Form:	Terrace				Local Relie	f: None		Slo	ope %:			Soil Map	Unit Nan	ne:	Greenwood	Soils B14A
Subregion (LRR):	<u>k</u>				Latitude:			Lo	ongitude:			Datum:				
NWI/Cowardin Cla	ssification:				Circular 39) Classific	cation: <u>up</u>									
Are climatic/hydrol	ogic condit	ions or	,,,			_		explain i	in remarks)			& Reed (p & Reed (s	orimary): secondary		<u>Upland</u>	
Are vegetation	<u>Yes</u>	Soil	<u>Yes</u>	Hydrology	<u>Yes</u>	significar	ntly disturbed?		re "normal rcumstances"	<u>Yes</u>	Eggers 8	& Reed (t	ertiary):			
Are vegetation	<u>No</u>	Soil	<u>No</u>	Hydrology	<u>No</u>	naturally	problematic?		resent?		Eggers 8	& Reed (d	quaternary	/):		
SUMMARY C	F FIND	ING	S - Atta	ch site	map sh	owing	g sampling	g po	int locatio	ns, t	ranse	cts, ir	nporta	nt i	features	, etc.

Hydrophytic vegetation present? Hydric soil present?	Yes Yes	Remarks (explain any answers if needed):	This is a sod field - Owl Field -with a managed drainage system and managed vegetation. Soil sample was taken in the field
Wetland hydrology present?	No		
Is the sampled area within a wetland?	<u>No</u>	If yes, optional Wetland	Site ID:

(Plot Size:	,	% Cover	Species?	Status *	<u>Dominance Test Worksheet:</u>
		0			Number of Dominant Species That Are OBL, FACW or FAC: 1 (A)
		0			Total Number of Dominant
		0			Species Across All Strata: 1 (B)
		0			Percent of Dominant Species That Are OBL FACW or FAC: 100.00% (A/B)
	Total Cover:	<u>0</u>			That Are OBL, FACW or FAC: 100.00% (A/B)
(Plot Size:)				Prevalence Index Worksheet:
		0			Total % Cover of: Multiply by:
					OBL Species 0 X 1 0
					FACW Species 0 X 2 0
		0			FAC Species 99 X 3 297
	Total Cover:	<u>0</u>			FACU Species 0 X 4 0
(Plot Size:)				UPL Species 0 X 5 0
		99	Yes	FAC	Column Totals: 99 (A) 297
		0			Prevalence Index = B/A = 3.00
					Hydrophytic Vegetation Indicators:
		0			No Rapid Test for Hydrophytic Vegetation
		0			Yes Dominance Test is >50%
		0			Yes Prevelance Index ≤ 3.0 [1]
	Total Cover:	<u>99</u>			No Morphological Adaptations [1] (provide supporting
(Plot Size:)				in vegetation remarks or on a separate sheet)
		0			No Problematic Hydrophytic Vegetation [1] (Explain)
		0			[1] Indicators of hydric soil & wetland hydrology must be present, unless disturbed or problematic.
	Total Cover:	<u>0</u>	* In USFWS I	Region 3	Hydrophytic vegetation present? Yes
	(Plot Size:	Total Cover: (Plot Size:) Total Cover:	O O O O O O O O O O	O O O O O O O O O O	O O O O O O O O O O

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

SOIL Sampling Point: #01 S03

Profile Description: (Describe Depth	to the depth needed to doc Matrix	ument the indicator or confirm the ab Redox Fe		icators).		
(inches) Co	olor (moist) %	Color (moist)	% Type	[1] Loc [2]		Remarks
0 10 10 2/1		 -			fibriancet	
1. 0 - 10 10yr 2/1 10yr 2/1					fibric peat fibric peat	5% had bright fibers
3. 20 - 28 10yr 2/1					fibric peat	15% bright fibers
4.		<u> </u>				
5						
6	=Depletion RM=Reduced M	atrix, CS=Covered or Coated Sand Gr	rains [2] Lo	cation: PI =Pore	Lining, M=Matrix.	
Hydric Soil Indicators: (applic	-		umo [2] 200		for Problematic Hydric So	 oils [3]:
✓ Histosol (A1)		tripped Matrix (S6)		_	ıck (A10) (LRR K, L, MLRA	
Histic Epipedon (A2)		ark Surface (S7) (LRR R, MLRA 149B)		_	rairie Redox (A16) (LRR K	
Black Histic (A3)		olyvalue Below Surface (S8) (LRR R, MI	LRA 149B)	_	icky Peat or Peat (S3) (LR	•
Hydrogen Sulfide (A4)		hin Dark Surface (S9) (LRR R, MLRA 14			rface (S7) (LRR K, L)	• • •
Stratified Layers (A5)		pamy Mucky Mineral (F1) (LRR K, L)	,	_	ue Below Surface (S8) (LR	R K. L)
Depleted Below Dark Surface		pamy Gleyed Matrix (F2)			rk Surface (S9) (LRR K, L)	
Thick Dark Surface (A12)	_	epleted Matrix (F3)		_	nganese Masses (F12) (LF	
Sandy Mucky Mineral (S1)	<u> </u>	edox Dark Surface (F6)			nt Floodplain Soils (F19) (N	
Sandy Gleyed Matrix (S4)		epleted Dark Surface (F7)		_	podic (TA6) (MLRA 144A,	,
Sandy Redox (S5)		edox Depressions (F8)			rent Material (TF2)	
			. I. I C .		allow Dark Surface (TF12)	Other (explain in soil remarks)
	etation and wetiand nydrology	must be present, unless disturbed or pre	obiematic.		anon Bark Gariago (11 12)	•
Restrictive Layer (if present):	Type:	Depth (inches):			Judria cail procent?	Voc
	· · · · · · · · · · · · · · · · · · ·				Hydric soil present?	<u>Yes</u>
Remarks: Soil was moist but not s	aturated.			•	ryunc son present:	165
	aturated.				ryunc son present?	165
HYDROLOGY					tyunc son present:	165
HYDROLOGY Wetland Hydrology Indicators:	:					
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of	:	at apply)		econdary Indica	tors (minimum of two req	juired)
HYDROLOGY Wetland Hydrology Indicators:	:	at apply) Water-Stained Leaves (B9)		econdary Indica	tors (minimum of two req	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of	:	at apply)		econdary Indica	tors (minimum of two req acks (B6) rns (B10)	juired)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of Surface Water (A1)	:	at apply)] Water-Stained Leaves (B9)] Aquatic Fauna (B13)] Marl Deposits (B15)		econdary Indica	tors (minimum of two req acks (B6) rns (B10) is (B16)	juired)
Wetland Hydrology Indicators: Primary Indicators (minimum of Surface Water (A1) High Water Table (A2)	:	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1)		econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W	tors (minimum of two req acks (B6) rns (B10) is (B16) ater Table (C2)	juired)
Wetland Hydrology Indicators: Primary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3)	:	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo		econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov	tors (minimum of two req acks (B6) rns (B10) as (B16) ater Table (C2) vs (C8)	juired)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of the content of the conte	:	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3)		econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov Saturation Visil	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ble on Aerial Imagery (C9)	juired)
Wetland Hydrology Indicators: Primary Indicators (minimum of Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	:	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4)	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov Saturation Visil	tors (minimum of two req acks (B6) rns (B10) as (B16) ater Table (C2) vs (C8)	juired)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of the content of the cont	:	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov Saturation Visil	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ole on Aerial Imagery (C9) ssed Plants (D1)	juired)
Wetland Hydrology Indicators: Primary Indicators (minimum of this primary Indicators (Male Mater (Male Indicators (Male	: of one required; check all th	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Thin Muck Surface (C7)	ots	econdary Indica] Surface Soil Cr] Drainage Patte] Moss Trim Line] Dry-Season W.] Crayfish Burrov] Saturation Visil	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ble on Aerial Imagery (C9) ssed Plants (D1)	juired)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of the content of the conte	tmagery (B7)	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov Saturation Visit Stunted or Stre	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ble on Aerial Imagery (C9) ssed Plants (D1) bistion (D2) rd (D3)	juired)
Wetland Hydrology Indicators: Primary Indicators (minimum of the primary Indicators (Material Indicators) Water Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Indicators	tmagery (B7)	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Thin Muck Surface (C7)	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov Saturation Visil Stunted or Stre Geomorphic Po Shallow Aquita Microtopograpi	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ole on Aerial Imagery (C9) ssed Plants (D1) osition (D2) rd (D3) nic Relief (D4)	quired) FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of the content of the conte	tmagery (B7)	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Thin Muck Surface (C7)	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W. Crayfish Burrov Saturation Visil Stunted or Stre Geomorphic Po Shallow Aquita Microtopograpi	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ble on Aerial Imagery (C9) ssed Plants (D1) bistion (D2) rd (D3)	juired)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of the content of the conte	tmagery (B7)	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Thin Muck Surface (C7) Other (explain in remarks)	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W Crayfish Burrov Saturation Visit Stunted or Stre Geomorphic Po Shallow Aquita Microtopograpi	tors (minimum of two requacks (B6) rns (B10) rs (B16) ater Table (C2) vs (C8) ole on Aerial Imagery (C9) ssed Plants (D1) osition (D2) rd (D3) nic Relief (D4)	quired) FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of the primary Indicators (Max Indicators (M	end one required; check all the	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Thin Muck Surface (C7) Other (explain in remarks)	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W Crayfish Burrov Saturation Visit Stunted or Stre Geomorphic Po Shallow Aquita Microtopograpi	tors (minimum of two requacks (B6) rns (B10) rs (B10) ater Table (C2) vs (C8) ble on Aerial Imagery (C9) assed Plants (D1) bistion (D2) rd (D3) hic Relief (D4)	quired) FAC-Neutral Test (D5)
Wetland Hydrology Indicators: Primary Indicators (minimum of p	capillary fringe)	at apply) Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roo (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (Thin Muck Surface (C7) Other (explain in remarks) Surface Water Depth (inches): Water Table Depth (inches):	ots	econdary Indica Surface Soil Cr Drainage Patte Moss Trim Line Dry-Season W Crayfish Burrov Saturation Visit Stunted or Stre Geomorphic Po Shallow Aquita Microtopograpi	tors (minimum of two requacks (B6) rns (B10) rs (B10) ater Table (C2) vs (C8) ble on Aerial Imagery (C9) assed Plants (D1) bistion (D2) rd (D3) hic Relief (D4)	quired) FAC-Neutral Test (D5)

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site:	Zim Sod				Applicant/O	wner: Zim Sod	City/County: St. I	<u>Louis</u>		State:	MN	Sampling Date:	11/18/10
Investigator(s):	<u>TPT</u>				Section:	<u>35</u>	Township: <u>55</u>			Range:	<u>18</u>	Sampling Point:	#02 East of S03
Land Form:	<u>Terrace</u>				Local Relie	: None	Slope %:			Soil Map	Unit Nan	ne: <u>Greenwood</u>	d Soils B14A
Subregion (LRR):	<u>K</u>				Latitude:		Longitude:			Datum:			
NWI/Cowardin Cla	ssification:				Circular 39	Classification: 6							
Are climatic/hydrole	ogic conditi	ons on	the site typi	cal for this	time of year	? Yes (If no, expla	ain in remarks)		Eggers	& Reed (p	orimary):	Shrub-Carr	
		o "			,				Eggers	& Reed (s	econdary,):	
Are vegetation	<u>No</u>	Soil	No I	Hydrology	<u>No</u>	significantly disturbed?	Are "normal circumstances"	<u>Yes</u>	Eggers	& Reed (t	ertiary):		
Are vegetation	<u>No</u>	Soil	No I	Hydrology	<u>No</u>	naturally problematic?	present?		Eggers	& Reed (q	quaternary	<i>y</i>):	
SUMMARY O	F FIND	ING	S - Attac	ch site	map sh	owing sampling _l	point locatio	ns, t	ranse	cts, in	nporta	nt features	s, etc.

Hydrophytic vegetation present? Hydric soil present?	Yes Yes	Remarks (explain any answers if needed):	Comparable wetland behind Owl field on the back side of the pipeline r/w
Wetland hydrology present?	Yes		
Is the sampled area within a wetland?	<u>Yes</u>	If yes, optional Wetland	Site ID:

VEGETATION

Tree Stratum	(Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status *	<u>Dominance Test Worksheet:</u>		
Larix laricina	·	<u> </u>	10	Yes	FACW	Number of Dominant Species That Are OBL, FACW or FAC:	4	(A)
			0			Total Number of Dominant	_	·
			0			Species Across All Strata:	4	(B)
			0			Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)
		Total Cover:	<u>10</u>			That Are OBL, FACW or FAC:		•
Sapling/Shrub Stratum	(Plot Size:)				Prevalence Index Worksheet:		
Betula pumila			15	Yes	OBL	Total % Cover of:	М	ultiply by:
Rubus idaeus ssp. strig	josus		20	Yes	FACW	OBL Species 15	X 1	15
			0			FACW Species 45	X 2	90
			0			FAC Species 0	Х3	0
		Total Cover:	<u>35</u>			FACU Species 0	X 4	0
Herb Stratum	(Plot Size:)				UPL Species 0	X 5	0
Phalaris arundinacea			15	Yes	FACW	Column Totals: 60	(A)	105
			0			Prevalence Index =	= R/A =	1.75
			0			Prevalence index -	- D/A -	1.75
			0			Hydrophytic Vegetation Indicators	<u>s:</u>	
			0			Yes Rapid Test for Hydrop	hytic Vegetatio	on
			0			Yes Dominance Test is >50)%	
			0			Yes Prevelance Index ≤ 3.0	[1]	
		Total Cover:	<u>15</u>			No Morphological Adapta		ide supporting
Woody Vine Stratum	(Plot Size:)	_			in vegetation remarks	or on a separa	te sheet)
			0			No Problematic Hydrophy	tic Vegetation	[1] (Explain)
			0			[1] Indicators of hydric soil & wetland h	ydrology must be	e present, unless
		Total Cover:	<u>0</u>	* In USFWS I	Region 3	disturbed or problematic.		
						Hydrophytic vegetation present?	<u>Yes</u>	

SOIL Sampling Point: #02 East of S03

Profile Description: (Describe to the del		cator or confirm the abscen Redox Feature				
(inches) Color (mois		olor (moist) %		Loc [2]	Texture	Remarks
1. 0 - 4 2. 4 - 9 3 10yr 2/1					c peat c peat	saturated to surface
4	n, RM=Reduced Matrix, CS=Cove	ered or Coated Sand Grains			, M=Matrix. Ilematic Hydric S	oils (31:
Histosol (A1)	Stripped Matrix (S6))) (LRR K, L, MLR)	
Histic Epipedon (A2)	,	, 7) (LRR R, MLRA 149B)			edox (A16) (LRR K	
✓ Black Histic (A3)		Surface (S8) (LRR R, MLRA	149B)		at or Peat (S3) (LR	,
Hydrogen Sulfide (A4)		e (S9) (LRR R, MLRA 149B)	_	Dark Surface (S	. , , ,	
Stratified Layers (A5)	Loamy Mucky Mi	neral (F1) (LRR K, L)		Polyvalue Below	v Surface (S8) (LR	R K, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed M	atrix (F2)		Thin Dark Surfa	ce (S9) (LRR K, L)	
Thick Dark Surface (A12)	Depleted Matrix	(F3)		Iron-Manganese	e Masses (F12) (LI	RR K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Surf	ace (F6)		Piedmont Flood	plain Soils (F19) (I	MLRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark S	urface (F7)		Mesic Spodic (T	A6) (MLRA 144A,	145, 149B)
Sandy Redox (S5)	Redox Depression	ons (F8)		Red Parent Mat	erial (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation and	wetland hydrology must be presen	nt, unless disturbed or problem	natic.	Very Shallow Da	ark Surface (TF12)	
Restrictive Layer (if present): Type.		Depth (inches):		Hydric s	oil present?	<u>Yes</u>
Remarks: Peat has brightly colored fibers 15%	5 10yr 5/8 below 4 inches					
HYDROLOGY						
Wetland Hydrology Indicators:						
Primary Indicators (minimum of one req	uired; check all that apply)		Secondar	y Indicators (mi	nimum of two red	quired)
Surface Water (A1)	Water-Staine	ed Leaves (B9)	Surfac	e Soil Cracks (B	6)	FAC-Neutral Test (D5)
High Water Table (A2)	Aquatic Faul	na (B13)	Draina	ge Patterns (B10))	
✓ Saturation (A3)	Marl Deposit	s (B15)	Moss 7	Trim Lines (B16)		
Water Marks (B1)	Hydrogen St	ılfide Odor (C1)	Dry-Se	eason Water Tab	le (C2)	
Sediment Deposits (B2)		zospheres on Living Roots	Crayfis	sh Burrows (C8)		
Drift Deposits (B3)	(where not ti	lled) (C3)	Satura	tion Visible on A	erial Imagery (C9)	
Algal Mat or Crust (B4)	Presence of	Reduced Iron (C4)	Stunte	d or Stressed Pla	ants (D1)	
Iron Deposits (B5)	Recent Iron	Reduction in Tilled Soils (C6)	Geomo	orphic Position (L	02)	
☐ Inundation Visible on Aerial Imagery (B	Thin Muck S	urface (C7)	Shallo	w Aquitard (D3)		
Sparsely Vegetated Concave Surface (′ Other (expla	in in remarks)	Microto	opographic Relie	f (D4)	
Field Observations:					_	
Surface water present?	✓ Surface Wate.	Depth (inches):	0	Wetland hyd	rology present?	<u>Yes</u>
Water table present?	Water Table D	lepth (inches):	_	Describe Red	corded Data:	
Saturation present? (includes capillary				1		
	fringe) 🗸 Saturation De	pth (inches):	0			
Recorded Data: Aerial Photo Hydrology Remarks: Saturated to surface	fringe)		_			

Project/Site:	Zim Sod				Applicant/Ov	wner: Zim Sod	City/County: St. Lou	<u>iis</u>	State:	<u>MN</u>	Sampling Date:	11/18/10
Investigator(s):	<u>TPT</u>				Section:	<u>26</u>	Township: 55		Range:	<u>18</u>	Sampling Point:	#03 East of S02
Land Form:	Terrace				Local Relief:	None	Slope %:		Soil Ma	o Unit Nan	ne: <u>Greenwoo</u>	d Soils B14A
Subregion (LRR):	<u>K</u>				Latitude:		Longitude:		Datum:			
NWI/Cowardin Cla	ssification.				Circular 39	Classification: 7						
Are climatic/hydrol	ogic condi	tions oi	the site ty	pical for this	time of year?	Yes (If no, expl	ain in remarks)	00	& Reed (orimary): secondary	<u>Coniferous</u>	<u>Swamp</u>
Are vegetation	<u>No</u>	Soil	<u>No</u>	Hydrology	<u>No</u> s	ignificantly disturbed?	Are "normal Ye	s	& Reed (• • • • • • • • • • • • • • • • • • • •	<i>,</i> -	
Are vegetation	<u>No</u>	Soil	<u>No</u>	Hydrology	<u>No</u> n	aturally problematic?	present?	Eggers	& Reed (quaternary	y):	
SUMMARY C	F FINE	DING	S - Atta	ach site	map sh	owing sampling	point locations	s, trans	ects, ii	mporta	nt feature	s, etc.

Hydrophytic vegetation present? Hydric soil present?	Yes Yes	Remarks (explain any answers if needed):	There is some ditching within 100 feet of this sample.
Wetland hydrology present?	Yes		
Is the sampled area within a wetland?	<u>Yes</u>	If yes, optional Wetland	Site ID:

	Tree Stratum	(Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status *	<u>Dominance Test Worksheet:</u>			
·	Larix laricina			90	Yes	FACW	Number of Dominant Species That Are OBL, FACW or FAC:	3	(A)	
Ļ	Picea mariana			3	No	FACW	- 			
Ļ	ricea manana			0	NO	FACVV	Total Number of Dominant Species Across All Strata:	4	(B)	
İ				0			Percent of Dominant Species			
			Total Cover:	<u>93</u>			That Are OBL, FACW or FAC:	75.00%	(A/B)	
5	Sapling/Shrub Stratum	(Plot Size:)				Prevalence Index Worksheet:			
	Ledum groenlandicum			50	Yes	OBL	Total % Cover of:	Mu	Itiply by:	
	Rubus idaeus ssp. strigosi	us		15	Yes	FACW		X 1		_
L				0			OBL Species50	_	50	
L				0			FACW Species108	X 2	216	
				0			FAC Species0	X 3	0	
			Total Cover:	<u>65</u>			FACU Species0	X 4	0	
I	<u>lerb Stratum</u>	(Plot Size:)				UPL Species0	X 5	0	
	Sphagnum sp.			90	Yes		Column Totals: 158	(A)	266	(1
L				0			Prevalence Index =	R/A =	1.68	
L				0			T Tevalence index		1.00	
Ļ				0			Hydrophytic Vegetation Indicators			
L				0			Yes Rapid Test for Hydroph	vtic Vegetatio	n	
Ļ				0			Yes Dominance Test is >50			
Ļ				0			Yes Prevelance Index ≤ 3.0			
L			Total Cover:	90			Morphological Adaptet		do ounnortina	~ ~
	Voody Vine Stratum	(Plot Size:)	90			No in vegetation remarks of			j u
: [voody vine Stratum	(1 101 0120.					No Problematic Hydrophyt	ic Vegetation I	[1] (Explain)	
Ļ				0			 			
L			Total Cover:	<u>0</u>	* In USFWS F	Danier 2	[1] Indicators of hydric soil & wetland hy disturbed or problematic.	arology must be	present, uniess	į
				-	"IN USFWS I	Region 3	Hydrophytic vegetation present?	Yes		

SOIL Sampling Point: #03 East of S02

Profile Description: (Describe to the d	lepth needed to document the in			ators).		
Depth Ma (inches) Color (mod	ist) %	Redox Features Color (moist) %	Type [1] Loc [2]	Texture	Remarks
1. 0 - 18 10yr 2/1 2					Fibric peat	
5			[2] Loca		Lining, M=Matrix. or Problematic Hydric Sc	nils [3]:
✓ Histosol (A1)	Stripped Matrix	x (S6)		2 cm Mud	ck (A10) (LRR K, L, MLRA	149B)
Histic Epipedon (A2)	☐ Dark Surface ('S7) (LRR R, MLRA 149B)		Coast Pra	airie Redox (A16) (LRR K,	L, R)
Black Histic (A3)	Polyvalue Belo	ow Surface (S8) (LRR R, MLRA 14	49B)	5 cm Mud	cky Peat or Peat (S3) (LRI	R K, L, R)
☐ Hydrogen Sulfide (A4)	☐ Thin Dark Surf	face (S9) (LRR R, MLRA 149B)		Dark Sur	face (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky	Mineral (F1) (LRR K, L)		Polyvalue	e Below Surface (S8) (LRF	R K, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed	Matrix (F2)		Thin Dark	k Surface (S9) (LRR K, L)	
Thick Dark Surface (A12)	Depleted Matri	ix (F3)		Iron-Man	ganese Masses (F12) (LR	P.R. K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Su	urface (F6)		Piedmon	t Floodplain Soils (F19) (M	ILRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark	Surface (F7)		Mesic Sp	odic (TA6) (MLRA 144A,	145, 149B)
Sandy Redox (S5)	Redox Depres	sions (F8)		Red Pare	ent Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation ar	nd wetland hydrology must be pres	sent, unless disturbed or problema	atic.	Very Sha	llow Dark Surface (TF12)	remarks)
Restrictive Layer (if present): Typ	oe:	Depth (inches):		H	ydric soil present?	<u>Yes</u>
			-			
HYDROLOGY Wetland Hydrology Indicators:						
HYDROLOGY			_	•	ors (minimum of two req	
HYDROLOGY Wetland Hydrology Indicators:	Water-Stai	ined Leaves (B9)		Surface Soil Cra	cks (B6)	uired) FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one re	☐ Water-Stai	auna (B13)		Surface Soil Cra Drainage Patteri	cks (B6) ns (B10)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one re	☐ Water-Stai ☐ Aquatic Fa ☐ Marl Depo	auna (B13) sits (B15)		Surface Soil Cra Drainage Patteri Moss Trim Lines	cks (B6) ns (B10) (B16)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one re Surface Water (A1) High Water Table (A2)	☐ Water-Stai ☐ Aquatic Fa ☐ Marl Depo ☐ Hydrogen	auna (B13) sits (B15) Sulfide Odor (C1)		Surface Soil Cra Drainage Pattern Moss Trim Lines Dry-Season Wa	cks (B6) ns (B10) (B16) ter Table (C2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one re Surface Water (A1) High Water Table (A2) Saturation (A3)	☐ Water-Stal ☐ Aquatic Fa ☐ Marl Depo ☐ Hydrogen ☐ Oxidized R	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow	cks (B6) ns (B10) (B16) ter Table (C2) s (C8)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one recognition of the primary Indicators (Minimum of one recognition of the primary Indicators (Minimum of one recognition of the primary Indicators (Minimum of the primary Indicators (Mi	☐ Water-Stai ☐ Aquatic Fa ☐ Marl Depo ☐ Hydrogen ☐ Oxidized R (where not	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3)		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow Saturation Visibl	cks (B6) ns (B10) (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one recognition of the primary Indicators (minimum of one recognition of the primary Indicators (M1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	☐ Water-Star ☐ Aquatic Fa ☐ Marl Depo ☐ Hydrogen ☐ Oxidized Fa (where not) ☐ Presence of	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4)		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow. Saturation Visibl Stunted or Stres	cks (B6) ns (B10) le (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Water-Star Aquatic Fa Marl Depo Hydrogen Oxidized R (where not	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4) n Reduction in Tilled Soils (C6)		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow. Saturation Visibl Stunted or Stres Geomorphic Pos	cks (B6) ns (B10) (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Water-Star Aquatic Fa Marl Depo Hydrogen Oxidized Fa (where not) Presence of Recent Iro Thin Muck	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4) n Reduction in Tilled Soils (C6) Surface (C7)		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow. Saturation Visibl Stunted or Stres Geomorphic Pos Shallow Aquitare	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) 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)	Water-Stai Aquatic Fa Marl Depo Hydrogen Oxidized R (where not) Presence o Recent Iro Thin Muck	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4) n Reduction in Tilled Soils (C6)		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow. Saturation Visibl Stunted or Stres Geomorphic Pos	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) 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 (Construction) Sparsely Vegetated Concave Surfaces Field Observations:	Water-Stai Aquatic Fa Marl Depo Hydrogen Oxidized F (where not Presence of Recent Iro Thin Muck (B7) Other (exp	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4) In Reduction in Tilled Soils (C6) Surface (C7) Islain in remarks)		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow Saturation Visibl Stunted or Stres Geomorphic Pos Shallow Aquitare Microtopographi	cks (B6) ns (B10) le (B16) se (C8) le on Aerial Imagery (C9) sed Plants (D1) sition (D2) lf (D3) cc Relief (D4)	FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) 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 Sparsely Vegetated Concave Surface Field Observations: Surface water present?	Water-Stai Aquatic Fa Marl Depo Hydrogen Oxidized R (where not Presence of Recent Iro Thin Muck (B7) Other (exp	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4) in Reduction in Tilled Soils (C6) Surface (C7) olain in remarks) ter Depth (inches):		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow Saturation Visibl Stunted or Stres Geomorphic Pos Shallow Aquitare Microtopographi	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) 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 (Sparsely Vegetated Concave Surface) Field Observations: Surface water present? Water table present?	Water-Stai Aquatic Fa Marl Depo Hydrogen Oxidized R (where not) Presence of Recent Iro Thin Muck (B7) Other (exp	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots tilled) (C3) of Reduced Iron (C4) in Reduction in Tilled Soils (C6) Surface (C7) blain in remarks) ter Depth (inches):		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow Saturation Visibl Stunted or Stres Geomorphic Pos Shallow Aquitare Microtopographi	cks (B6) ns (B10) le (B16) se (C8) le on Aerial Imagery (C9) sed Plants (D1) sition (D2) lf (D3) cc Relief (D4)	FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) 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 Sparsely Vegetated Concave Surface Field Observations: Surface water present?	Water-Stai Aquatic Fa Marl Depo Hydrogen Oxidized R (where not) Presence of Recent Iro Thin Muck (B7) Other (exp	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots t tilled) (C3) of Reduced Iron (C4) in Reduction in Tilled Soils (C6) Surface (C7) olain in remarks) ter Depth (inches):		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow Saturation Visibl Stunted or Stres Geomorphic Pos Shallow Aquitare Microtopographi	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one reconstruction) 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 (Construction) Sparsely Vegetated Concave Surface (Construction) Field Observations: Surface water present? Water table present? Saturation present? (includes capillary (Construction)) Recorded Data: Aerial Photo	Water-Stai Aquatic Fa Marl Depo Hydrogen Oxidized R (where not Presence of Recent Iro Thin Muck Other (exp e (B8) Surface Wa Water Table y fringe)	auna (B13) sits (B15) Sulfide Odor (C1) Rhizospheres on Living Roots tilled) (C3) of Reduced Iron (C4) in Reduction in Tilled Soils (C6) Surface (C7) blain in remarks) ter Depth (inches):		Surface Soil Cra Drainage Patteri Moss Trim Lines Dry-Season Wa Crayfish Burrow Saturation Visibl Stunted or Stres Geomorphic Pos Shallow Aquitare Microtopographi	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	FAC-Neutral Test (D5)

Project/Site:	Zim Sod		Applican	t/Owner:	Zim Soc	<u>d</u>	City/County:	St. Louis	<u>S</u> Stai	e: <u>MN</u>	Samp	oling Date:	<u>11/18/10</u>	
Investigator(s):	<u>TPT</u>		Section:	26			Township: 5	55	Ran	ge: <u>18</u>	Samp	oling Point:	#04 S01	
Land Form:	Terrace		Local Re	elief: Nor	<u>ie</u>		Slope %:			Map Unit Na	me:	Greenwood	soils B14A	
Subregion (LRR):	<u>K</u>		Latitude:	•			Longitude:		Date	um:				
NWI/Cowardin Cla			Circular	⁻ 39 Class	ification:	up	Ü							
Are climatic/hydro		on the site tvpica	I for this time of v	ear?	Yes	(If no. expla	ain in remarks)		Eggers & Re	ed (primary):	<u>U</u>	<u>Jpland</u>		
Are vegetation	Yes Soil		rdrology <u>Yes</u>		antly dist		Are "normal	<u>Yes</u>	Eggers & Re	ed (secondar)	y):			
-							circumstance		Eggers & Re					
Are vegetation	No Soil		drology <u>No</u>		lly problei		present?		Eggers & Re					
SUMMARY (OF FINDING	GS - Attach	site map s	showii	ng sar	mpling	point loca	ations,	transects	, importa	ant f	eatures	, etc.	
Hydrophytic veget Hydric soil presen Wetland hydrolog Is the sampled are	t? y present? ea within a wetla	<u>Yes</u> <u>No</u>	Remarks (explain answers if needed If yes, optional We	d):	Tile drained	d sod field								
/EGETATIO)N			Λ.	solute	Dominan	t Indicator		ominance Tes	t Workshoot:				
Tree Stratu	<u>m</u>	(Plot Size:			Cover	Species?			lumber of Dom hat Are OBL, F	inant Specie	s		1 (A)	
1. 2. 3.					0 0				otal Number of	Dominant			1 <i>(B)</i>	
4.			Total Cov	er:	0 0			F	ercent of Domi hat Are OBL, F	nant Species		100.00%	% (A/B)	
Sapling/Shr	ub Stratum	(Plot Size:)				늗	revalence Inde	v Markahaat				
1.					0			^	Total % (•		Multiply by	,.
2.					0			_ -		, , , , , , , , , , , , , , , , , , ,	0	X 1	rarapiy by	0
3. 4.					0			II	BL Species ACW Species		0	X 2		0
5.					0				AC Species		99	X 3		297
			Total Cov	er:	<u>0</u>				ACU Species		0	X 4		0
Herb Stratu	<u>m</u>	(Plot Size:)					IPL Species		0	X 5		0
Poa praten:	sis				99	Yes	FAC	0	Column Totals:		99	(A)		297 (B)
 3. 					0				P	revalence Inc	dex = L	B/A =	3	3.00
4. 5 .					0			<u>H</u>	/drophytic Veg	etation Indic	ators:			
6.					0			─ _	No Rapio	Test for Hy	drophy	ytic Vegetat	ion	
7.					0					nance Test is				
8.			Total Cov	or:	0			_ -		lance Index		-		
Woody Vine	Stratum .	(Plot Size:	Total Cov))	<u>99</u>			_	in veg	hological Ad getation rema	arks o	r on a sepai	rate sheet)	
1. 2.					0				No Probl	ematic Hydro Iric soil & wetla		-		
			Total Cov	er:	<u>0</u>	* In USFW	S Region 3		sturbed or proble					
								Hy	drophytic veget	ation present	?	<u>Yes</u>		
Remarks:	umbore bore or	an a concrete c	Veg	jetation adja	acent to fie	eld - 30% popu	ılus trem. With as	spen unders	story 30%, willow s	p15% and rubus	s sp15%	. Reed canary	grass 30%	

SOIL Sampling Point: #04 S01

Profile Description: (Describe to the depth need Depth Matrix	led to docu	ment the indicator or confirm the al		of indicators	s).		
(inches) Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 - 9 10yr 2/2						loamy sand	
1. 0 - 9 10yr 2/2 2. 9 - 20 10yr 4/2	70	10yr 4/6	30			sandy loam	
3							
4							
5				 -			
6	educed Mat	rix, CS=Covered or Coated Sand G	rains	[2] Location	: PL=Pore	Lining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs, t	unless other	rwise noted)		lı	ndicators fo	or Problematic Hydric So	oils [3]:
Histosol (A1)	Stri	pped Matrix (S6)			2 cm Mud	ck (A10) (LRR K, L, MLRA	149B)
Histic Epipedon (A2)	☐ Dai	rk Surface (S7) (LRR R, MLRA 149B)			Coast Pra	airie Redox (A16) (LRR K	L, R)
Black Histic (A3)	☐ Pol	yvalue Below Surface (S8) (LRR R, M	ILRA 149	В) [5 cm Mud	cky Peat or Peat (S3) (LR	R K, L, R)
☐ Hydrogen Sulfide (A4)	Thi	in Dark Surface (S9) (LRR R, MLRA 1	49B)		Dark Sur	face (S7) (LRR K, L)	
Stratified Layers (A5)	Loa	nmy Mucky Mineral (F1) (LRR K, L)] Polyvalue	e Below Surface (S8) (LRI	R K, L)
Depleted Below Dark Surface (A11)	Loa	amy Gleyed Matrix (F2)			Thin Darl	k Surface (S9) (LRR K, L)	
Thick Dark Surface (A12)	✓ De	oleted Matrix (F3)] Iron-Man	ganese Masses (F12) (LF	PR K, L, R)
Sandy Mucky Mineral (S1)	Red	dox Dark Surface (F6)			Piedmon	t Floodplain Soils (F19) (N	ILRA 149B)
Sandy Gleyed Matrix (S4)	Dej	oleted Dark Surface (F7)			Mesic Sp	odic (TA6) (MLRA 144A,	145, 149B)
Sandy Redox (S5)	Red	dox Depressions (F8)			Red Pare	ent Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation and wetland	l hydrology n	oust be present unless disturbed or p	roblemati	, [Very Sha	llow Dark Surface (TF12)	remarks)
-	.,	Depth (inches):		-	и	ydric soil present?	Voc
Restrictive Layer (if present): Type:		Depin (inches).				yune son present:	<u>Yes</u>
Remarks:							
HYDROLOGY							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of one required; cl	heck all that	t apply)		Second	ary Indicate	ors (minimum of two req	uired)
Surface Water (A1)		Water-Stained Leaves (B9)		Surfa	ace Soil Cra	cks (B6)	FAC-Neutral Test (D5)
☐ High Water Table (A2)		Aquatic Fauna (B13)		Draii	nage Patteri	ns (B10)	
Saturation (A3)		Marl Deposits (B15)		Mos	s Trim Lines	: (B16)	
Water Marks (B1)		Hydrogen Sulfide Odor (C1)		Dry-	Season Wa	ter Table (C2)	
Sediment Deposits (B2)		Oxidized Rhizospheres on Living Ro	ots	Cray	fish Burrow	s (C8)	
Drift Deposits (B3)		(where not tilled) (C3)		Satu	ıration Visibl	e on Aerial Imagery (C9)	
Algal Mat or Crust (B4)		Presence of Reduced Iron (C4)		Stun	ted or Stres	sed Plants (D1)	
☐ Iron Deposits (B5)		Recent Iron Reduction in Tilled Soils	(C6)	Geo	morphic Pos	sition (D2)	
☐ Inundation Visible on Aerial Imagery (B7)		Thin Muck Surface (C7)		Shal	llow Aquitar	d (D3)	
Sparsely Vegetated Concave Surface (B8)		Other (explain in remarks)		Micro	otopographi	c Relief (D4)	
Field Observations:					147	at all a	
Surface water present?	s	Surface Water Depth (inches):			Wetlar	nd hydrology present?	<u>No</u>
Water table present?	v	Vater Table Depth (inches):			Descri	be Recorded Data:	
Saturation present? (includes capillary fringe)	□ S	Saturation Depth (inches):					
, , , , , , , , , , , , , , , , ,		- · · · · -					
	ring Well	Stream Gauge Previous	Inspecti	ons	\dashv		

VV	EILANL	DEIL	=HIVIII\	IAII	JN	DATA	FUR	IVI - INORTI	icer	itrai and	i Norti	ieast	Reg	jion	
Project/Site:	Zim Sod			Applicant	t/Owne	r: Zim So	<u>d</u>	City/County: St	t. Louis	State.	MN_	Sampling L	Date: <u>1</u>	<u>1/18/10</u>	
Investigator(s):	<u>TPT</u>			Section:	<u>2</u>	<u>6</u>		Township: 55		Rang	e: <u>18</u>	Sampling I	Point: <u>#</u>	05 S01	
Land Form:				Local Rei	lief:			Slope %:		Soil N	lap Unit Nan	ne: <u>Greer</u>	nwood s	oils B14A	
Subregion (LRR)): <u>K</u>			Latitude:				Longitude:		Datur	n:				
NWI/Cowardin C	lassification:			Circular	39 Cla	ssification:	<u>up</u>								
Are climatic/hydro	ologic conditions	on the site ty	oical for this	time of ye	ear?	Yes	(If no, expla	ain in remarks)		Eggers & Reed	d (primary):	<u>Uplano</u>	<u>d</u>		
Are vegetation	Yes Soil	<u>Yes</u>	Hydrology			ificantly dist		Are "normal	Yes	Eggers & Reed):			
· ·								circumstances"	<u> </u>	Eggers & Reed					
Are vegetation	<u>No</u> Soil	<u>No</u>	Hydrology			rally proble		present?		Eggers & Reed					
SUMMARY	OF FINDIN	GS - Atta	nch site	map s	show	ing sai	mpling	point locati	ons,	transects,	importa	nt feat	ures,	etc.	
Hydrophytic vege Hydric soil presei Wetland hydrolog Is the sampled ai	nt? gy present? rea within a wetla	Yes Yes No nd? No	answers	s (explain if needed otional We	1):	Tile draine	d sod field								
VEGETATIO	<u> </u>														
Tree Stratu	<u>ım</u>	(Plot Size:				Absolute % Cover	Dominan Species?			minance Test V					
1.						0				mber of Domin at Are OBL, FA			1	(A)	
2.						0				tal Number of L				(B)	
3.						0			-III '	ecies Across A			1	(B) -	
4.			7	otal Cove	er:	0				rcent of Domin at Are OBL, FA			0.00%	(A/B)	
Sapling/Sh	rub Stratum	(Plot Size:)	_			╠						
1.						0			Pre	valence Index Total % Co			14	ultiply by:	
2.						0			∭_		iver or.	0 X 1	IVI		0
3. 4.						0			-	SL Species		0 X 2	_		<u>0</u> 0
5.						0			-	CW Species C Species		99 X 3	_	29	_
			Т	otal Cove	er:	<u>0</u>				CU Species		0 X4		-	0
Herb Stratu	<u>um</u>	(Plot Size:)				Ш	L Species		0 X 5	-	-	0
Poa prater	nsis					99	Yes	FAC	111	lumn Totals:		99 (A)	-	29	7 (B)
2.						0] "		valence Ind		_	3.00	_
3.						0			-		14101100 1114	OX D // 1	-	0.0	
4. 5.						0			<u>Hyo</u>	Irophytic Veget	ation Indica	tors:			
6.						0			╢_	No Rapid	Test for Hyd	rophytic V	egetatio	on	
7.						0			<u> </u>	es Domina	ance Test is	>50%			
8.						0] `	es Prevela	nce Index ≤	3.0 [1]			
			Т	otal Cove	er:	99				No Morpho	ological Ada	ptations [1] (prov	vide support	ing data

Woody Vine Stratum

(include photo numbers here or on a separate sheet)

1.

2.

Remarks:

(Plot Size:

)

Total Cover:

0

<u>0</u>

* In USFWS Region 3

in vegetation remarks or on a separate sheet)

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

No

Hydrophytic vegetation present?

Problematic Hydrophytic Vegetation [1] (Explain)

Yes

SOIL Sampling Point: #05 S01

Profile Description: (Describe to the depth need Depth Matrix		the abscence of i	ndicators).			
(inches) Color (moist)	% Color (moist)	% Ту	pe [1]	Loc [2]	Texture	Remarks
0 - 16 10yr 2/1					Fibric peat	
·					i ibiic peat	
·						
<u> </u>						
i -						
1] Type: C=Concentration, D=Depletion, RM=R	educed Matrix, CS=Covered or Coated Sa	and Grains [2] L	Location: F	L=Pore	Lining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs,	unless otherwise noted)		Indi	cators fo	r Problematic Hydric So	ils [3]:
Histosol (A1)	Stripped Matrix (S6)			2 cm Mud	ck (A10) (LRR K, L, MLRA	149B)
Histic Epipedon (A2)	Dark Surface (S7) (LRR R, MLRA 1	149B)		Coast Pra	airie Redox (A16) (LRR K,	L, R)
Black Histic (A3)	Polyvalue Below Surface (S8) (LRF	R R, MLRA 149B)		5 cm Mud	cky Peat or Peat (S3) (LRF	R K, L, R)
Hydrogen Sulfide (A4)	Thin Dark Surface (S9) (LRR R, ML	LRA 149B)		Dark Surf	face (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K,	, L)		Polyvalue	Below Surface (S8) (LRF	R K, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)			Thin Dark	Surface (S9) (LRR K, L)	
Thick Dark Surface (A12)	Depleted Matrix (F3)			Iron-Man	ganese Masses (F12) (LR	R K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)			Piedmont	Floodplain Soils (F19) (M	ILRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)			Mesic Sp	odic (TA6) (MLRA 144A, 1	145, 149B)
Sandy Redox (S5)	Redox Depressions (F8)			Red Pare	nt Material (TF2)	Other (explain in soil
3] Indicators of hydrophytic vegetation and wetland	hydrology must be present, unless disturbed	d or problematic.		Very Sha	llow Dark Surface (TF12)	remarks)
Restrictive Layer (if present): Type:	Depth (inch	es): -		Н	ydric soil present?	<u>Yes</u>
Remarks:			_			
YDROLOGY						
Netland Hydrology Indicators:						
Primary Indicators (minimum of one required; c	heck all that apply)		Secondary	Indicato	ors (minimum of two req	uired)
Surface Water (A1)	Water-Stained Leaves (B9)		Surface	Soil Cra	cks (B6)	FAC-Neutral Test (D5)
High Water Table (A2)	Aquatic Fauna (B13)		Draina	ge Patterr	ns (B10)	
Saturation (A3)	Marl Deposits (B15)		Moss 7	rim Lines	(B16)	
Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)		Dry-Se	ason Wat	ter Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Livin	ng Roots	Crayfis	h Burrows	s (C8)	
Drift Deposits (B3)	(where not tilled) (C3)		Saturat	ion Visibl	e on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4))	Stunted	or Stres	sed Plants (D1)	
☐ Iron Deposits (B5)	Recent Iron Reduction in Tilled	Soils (C6)	Geomo	rphic Pos	sition (D2)	
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)		Shallov	v Aquitaro	I (D3)	
Sparsely Vegetated Concave Surface (B8)	Other (explain in remarks)		Microto	pographi	c Relief (D4)	
ield Observations:				W. d.	ad baseline la sur construir	N.
Surface water present?	Surface Water Depth (inches):			vvetlan	d hydrology present?	<u>No</u>
Vater table present?	Water Table Depth (inches):			Descri	be Recorded Data:	
Saturation present? (includes capillary fringe)	Saturation Depth (inches):					
Recorded Data: Aerial Photo Monito	ring Well Stream Gauge Prev	vious Inspections		1		
Hydrology Remarks: Tile Drained field						

W	ETLAN	D DE	TERI	MINATIO	N DATA	FORI	M - North	cent	tral and North	neast Re	gion
Project/Site:	Zim Sod			Applicant/C	Owner: Zim Sod	Ī	City/County: St	Louis	State: MN	Sampling Date:	<u>11/18/10</u>
Investigator(s):	<u>TPT</u>			Section:	<u>11</u>		Township: 55		Range: <u>18</u>	Sampling Point:	#06 N18 in
Land Form:				Local Relie	d:		Slope %:		Soil Map Unit Nam	ne: <u>Greenwood</u>	I soils B14A
Subregion (LRR)	<u>K</u>			Latitude:			Longitude:		Datum:		
Are vegetation Are vegetation	No So. No So. No So. OF FINDIN tation present?	il <u>No</u> il <u>No</u> IGS - A	Hydr Hydr Attach	for this time of year rology <u>No</u> rology <u>No</u>	r? Yes significantly distu- naturally problen nowing san	urbed? matic?		Yes	Eggers & Reed (primary): Eggers & Reed (secondary, Eggers & Reed (tertiary): Eggers & Reed (quaternary, ransects, importa):	
Is the sampled ar	, ,	land?		yes, optional Wetla	and Site ID:						
/EGETATIO	ON										
1. Larix laricin		(Plot S	Size:		Absolute	<u>Dominant</u> <u>Species?</u> Yes	Indicator Status *	Num That	ninance Test Worksheet: ther of Dominant Species Are OBL, FACW or FAC: Number of Dominant		3 (A)

Indicator Status * Dominance Test Worksheet:	Multiply by: 0 210 0 0 0
FACW FACW FACW FACW FACW FACW FACW FACW	3 (B) 00% (A/B) Multiply by: 0 210 0 0
Total Number of Dominant Species Across All Strata: Percent of Dominant Species That Are OBL, FACW or FAC: 100.0	3 (B) 00% (A/B) Multiply by: 0 210 0 0
Species Across All Strata: Percent of Dominant Species 100.0 That Are OBL, FACW or FAC: 100.0 Prevalence Index Worksheet:	Multiply by: 0 210 0 0 0
Percent of Dominant Species 100.0	Multiply by: 0 210 0 0 0
That Are OBL, FACW or FAC: 100.0 Prevalence Index Worksheet: Total % Cover of: OBL Species	Multiply by: 0 210 0 0 0
FACW FACW FACW FACW FACW FACW Species 105 X 2 FAC Species 0 X 4 UPL Species 0 X 5 X 5 X 6 X 7 X	0 210 0 0
FACW FACW FACW OBL Species	0 210 0 0
FACW FACW OBL Species	0 210 0 0
FACW OBL Species	210 0 0
FACW OBL Species 105 X 2 FAC Species 0 X 3 FAC Species 0 X 4 UPL Species 0 X 5	210 0 0
FAC Species 0 X 3 FACU Species 0 X 4 UPL Species 0 X 5	0 0
FACU Species 0 X 4 UPL Species 0 X 5	0
UPL Species 0 X 5	0
OPL Species	
	040 (D)
Column Totals: (A)	210 (B)
Prevalence Index = B/A =	2.00
Hydrophytic Vegetation Indicators:	
Yes Rapid Test for Hydrophytic Vege	etation
Yes Dominance Test is >50%	
Yes Prevelance Index ≤ 3.0 [1]	
Marshalagical Adaptations (41.7)	nrovide supporting dat
No Problematic Hydrophytic Vegeta	tion [1] (Explain)
	ist be present, unless
disturbed or problematic.	
	No Morphological Adaptations [1] (

SOIL Sampling Point: #06 N18 in Tamaracks

Profile Description: (Describe to the depth ne		the abscence of indicated	ors).		
(inches) Color (moist)	% Color (moist)	% Type [1]	Loc [2]	Texture	Remarks
1. 0 - 16 10yr 2/1 2 3				Fibric peat	Saturated at 12"
4	=Reduced Matrix, CS=Covered or Coated S	Sand Grains [2] Location	Indicators fo	Lining, M=Matrix. or Problematic Hydric S ck (A10) (LRR K, L, MLR	
☐ Histic Epipedon (A2) ☐ Black Histic (A3) ☐ Hydrogen Sulfide (A4) ☐ Stratified Layers (A5)	☐ Dark Surface (S7) (LRR R, MLRA ☐ Polyvalue Below Surface (S8) (LR ☐ Thin Dark Surface (S9) (LRR R, M ☐ Loamy Mucky Mineral (F1) (LRR R	RR R, MLRA 149B) MLRA 149B)	5 cm Muc	airie Redox (A16) (LRR F cky Peat or Peat (S3) (LF face (S7) (LRR K, L) e Below Surface (S8) (LF	RR K, L, R)
Depleted Below Dark Surface (A11) Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Sandy Redox (S5)	Loamy Gleyed Matrix (F2) Depleted Matrix (F3) Redox Dark Surface (F6) Depleted Dark Surface (F7) Redox Depressions (F8)	, .,	☐ Thin Dan ☐ Iron-Man ☐ Piedmon ☐ Mesic Sp	k Surface (S9) (LRR K, L ganese Masses (F12) (L t Floodplain Soils (F19) (podic (TA6) (MLRA 144A, ent Material (TF2)) RR K, L, R) MLRA 149B)
[3] Indicators of hydrophytic vegetation and wetland Restrictive Layer (if present): Type: Remarks: HYDROLOGY	nd hydrology must be present, unless disturbe			ullow Dark Surface (TF12 ydric soil present?	
Wetland Hydrology Indicators: Primary Indicators (minimum of one required;	check all that apply) Water-Stained Leaves (B9)		ndary Indicate	ors (minimum of two re	quired) — FAC-Neutral Test (D5)
Surface Water (A1) ☐ High Water Table (A2) ☐ Saturation (A3) ☐ Water Marks (B1) ☐ Sediment Deposits (B2) ☐ Drift Deposits (B3)	Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Liv (where not tilled) (C3) Presence of Reduced Iron (C-	DI D	rainage Patten oss Trim Lines ry-Season Wa rayfish Burrow aturation Visibi	ns (B10) s (B16) ter Table (C2)	
☐ Algal Mat or Crust (B4) ☐ Iron Deposits (B5) ☐ Inundation Visible on Aerial Imagery (B7) ☐ Sparsely Vegetated Concave Surface (B8)	Recent Iron Reduction in Tille Thin Muck Surface (C7) Other (explain in remarks)	d Soils (C6) G	eomorphic Pos hallow Aquitare icrotopographi	sition (D2) d (D3)	
Field Observations: Surface water present? Water table present? Saturation present? (includes capillary fringe) Recorded Data:		: 12 evious Inspections		nd hydrology present? ibe Recorded Data:	<u>Yes</u>
Hydrology Remarks: This stand may be affected	by tile drainage in adjacent sod fields.	<u>-</u>			

Proje	ect/Site:	Zim Sod					Applican	ıt/Owne	er: Zim S	<u>od</u>		City/County:	St. Louis		State:	MN	San	npling Date:	11/18/	<u>′10</u>	
Inve	stigator(s):	<u>MAJ</u>					Section:	<u>1</u>	<u>1</u>			Township: 5	<u>5</u>		Range	: <u>18</u>	San	npling Point:	#07 C	enter of N	10 <u>9</u>
Land	d Form:	Terrace					Local Re	elief:				Slope %:				ap Unit Nai	me:	Greenwood	B14A		
Subi	region (LRR)	: <u>k</u>					Latitude:					Longitude:			Datum	: :					
NWI	/Cowardin C	_ lassification	<u>: up</u>	land			Circular	r 39 Clá	assification	: uplan	<u>d</u>										
Are	climatic/hydr	ologic condi	itions o	n the si	te typi	cal for this	time of ye	ear?	<u>Yes</u>	(If no, e.	xplaiı	n in remarks)				(primary): (secondary		<u>Upland</u>			
Are	vegetation	<u>Yes</u>	Soil	Yes		Hydrology	<u>Yes</u>	sign	ificantly dis	sturbed?		Are "normal circumstances	Yes Yes		s & Reed		,,.				
Are	vegetation	<u>No</u>	Soil	No		Hydrology	<u>No</u>	natu	ırally probl	ematic?		present?	5			(quaternar	y):				
SUN	<i>MARY</i>	OF FINE	DING	is - A	Atta	ch site	map s	shov	ving sa	mplin	g p	oint loca	tions,	trans	ects, i	importa	ant	features	, etc) <u>.</u>	
Hydi Weti	rophytic vege ric soil prese and hydrolog e sampled a	nt? gy present?		d?	Yes Yes No No		s (explain if needed	d):		ed sod field	I. Mido	dle of Bear Paw	field.								
/EC	ETATI	ON																			
									Absolute % Cover	<u>Domir</u> Specie		Indicator Status *	De	ominan	ce Test W	orksheet:					
1.	Tree Stratu	<u>ım</u>		(Plot S	ize:)	0	Opcon		<u>otatao</u>				nt Specie CW or FAC			1 <i>(A</i>)	
2.									0				To	otal Nun	nber of D	ominant					
3.									0				II '		Across Al				1 <i>(B</i>	יי	
4.						T	otal Cov	er:	<u>0</u>							nt Species W or FAC		100.00	% (A	/B)	
	Sapling/Sh	rub Stratur	<u>n</u>	(Plot S	ize:)					Pr	evalenc	e Index V	Vorksheet.	:				
1. 2.									0				$-\parallel$ $_{-}$	To	tal % Cov	ver of:			Multipl	ly by:	
3.									0				— o	BL Spec	cies .		0	X 1		0	
4.									0				F/	4CW Sp	ecies .		0	X 2		0	
5.						-	-4-1 0		0				F/	AC Spec	cies .		95	Х3		285	
	Harb Strate			(Plot S	izo:	- 1	otal Cove	er:	<u>0</u>				F	ACU Sp	ecies .		0	X 4		0	
1	Herb Stratu Poa prater			(FIOL S	1126.				95	Yes	,	FAC	U	PL Spec	ies .		0	X 5		0	
1. 2.	roa prater	1515							0	163	,	FAC	C	olumn 1			95	(A)		285	•
3.									0						Prev	alence Inc	dex =	B/A =		3.00	
4.									0				Hy	drophyt	tic Vegeta	tion Indic	ators	<u>:</u>			
5. 6.									0				$- \parallel _$	No	Rapid To	est for Hyd	droph	nytic Vegeta	tion		
7.									0				$\exists \mathbb{I}_{\underline{}}$	Yes	Domina	nce Test is	s >50	%			
8.									0				□ _	Yes	Prevelar	nce Index	≤ 3.0	[1]			
	Woody Vin	e Stratum		(Plot S	ize:	Т	otal Cove	er:)	<u>95</u>					No				ions [1] (pro or on a sepa			ng data
1.									0				$\neg \parallel$	No	Problem	atic Hydro	ophy	tic Vegetatio	on [1] (l	Explain)	
2.						T	otal Cov	er:	0 <u>0</u>	* In 1191	EIM/S	Region 3			s of hydric problema		and hy	drology must	be pres	sent, unles	is
									_	III USI	773	Negion 3	Hyd	drophytic	c vegetatio	on present:	?	Yes			
	narks: lude photo i	numbers he	ere or o	on a se	parat	e sheet)															

SOIL Sampling Point: #07 Center of N09

-		ed to docum	ent the indicator or confirm the		of indicat	fors).		
Depth (inches)	Matrix Color (moist)	%	Color (moist)	Features %	Type [1]	Loc [2]	Texture	Remarks
1. 0 - 10 2. 10 - 32 3. 32 - 36 4	10yr2/1 10yr2/1 10yr2/1						hemic peat fibric peat hemic peat	woody frags at 18" moist at 36" not sat
	tors: (applicable to all LRRs, un	nless otherw	c, CS=Covered or Coated Sand ise noted) ned Matrix (S6) Surface (S7) (LRR R, MLRA 1498	,	[2] Locati	Indicators fo	Lining, M=Matrix. r Problematic Hydric Sock (A10) (LRR K, L, MLRA irie Redox (A16) (LRR K,	149B)
Thick Dark Surf	de (A4) s (A5) v Dark Surface (A11) face (A12) fineral (S1) Matrix (S4)	Thin Loam Loam Peple Redo Redo	alue Below Surface (S8) (LRR R, Dark Surface (S9) (LRR R, MLRA y Mucky Mineral (F1) (LRR K, L) y Gleyed Matrix (F2) eted Matrix (F3) x Dark Surface (F6) eted Dark Surface (F7) x Depressions (F8) st be present, unless disturbed or	149B)		Dark Surfa Polyvalue Thin Dark Iron-Mang Piedmont Mesic Spo	ky Peat or Peat (S3) (LR ace (S7) (LRR K, L) Below Surface (S8) (LRI Surface (S9) (LRR K, L) ganese Masses (F12) (LF Floodplain Soils (F19) (N odic (TA6) (MLRA 144A, nt Material (TF2)	R K, L) PR K, L, R) MLRA 149B)
Restrictive Layer ((if present): Type:		Depth (inches):			Ну	dric soil present?	<u>Yes</u>
Surface Water (High Water Tab	Y ny Indicators: s (minimum of one required; cho (A1) ble (A2)	□ <i>V</i> □ <i>A</i>	pply) Vater-Stained Leaves (B9) quatic Fauna (B13) flarl Deposits (B15) lydrogen Sulfide Odor (C1)		□ S □ D □ M	ndary Indicato urface Soil Crac rainage Pattern loss Trim Lines try-Season Wat	(B16)	uired) ☐ FAC-Neutral Test (D5)
	ust (B4)		exidized Rhizospheres on Living R where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soi Whin Muck Surface (C7)			rayfish Burrows aturation Visible	s (C8) e on Aerial Imagery (C9) sed Plants (D1) ition (D2)	
Field Observations Surface water pres Water table presen Saturation presen	sent?	☐ Wa	face Water Depth (inches): ter Table Depth (inches): turation Depth (inches):				d hydrology present? be Recorded Data:	<u>No</u>
Recorded Data:	Aerial Photo Monitor			s Inspecti	ons			

Project/Site:	Zim Sod		Applicant/Own	er: Zim Soo	<u>d</u>	City/County:	St. Louis	State	: <u>MN</u> S	Sampling Date:	11/18/10	
Investigator(s):	<u>TPT</u>		Section:	11		Township: 5	55	Rand	_{re: 18} S	Sampling Point	: #08 N16 west	<u>end</u>
Land Form:	Terrace		Local Relief:			Slope %:	_		Map Unit Name	- Greenwoo	od soils B14A	
Subregion (LRR):			Latitude:			Longitude:		Datu	•	,. <u></u>		
NWI/Cowardin Cl			Circular 39 Cl	assification:	7	Longitudo.		Data				
		un the cite tunical for th			_	in in romarke)		Eggers & Ree	d (primary):	Coniferous	Swamp	
		on the site typical for th		<u>Yes</u>		in in remarks)		Eggers & Ree	d (secondary):			
Are vegetation	No Soil	<u>No</u> Hydrolog		nificantly dist		Are "normal circumstance	Yes s"	Eggers & Ree	d (tertiary):			
Are vegetation	No Soil	<u>No</u> Hydrolog	y <u>No</u> nati	ırally problei	matic?	present?		Eggers & Ree	d (quaternary):			
SUMMARY	OF FINDING	SS - Attach site	e map show	ving sar	mpling p	oint loca	ations, t	ransects,	importar	nt feature	s, etc.	
Hydrophytic vege Hydric soil preser Wetland hydrolog Is the sampled an	nt? ny present?	Yes answe	ks (explain any rs if needed):		of Moosehorn f	ield.						
VEGETATION NECESTATION NECESTA	ON		,									
				Absolute	Dominant	Indicator	Doi	ninance Test	Worksheet:			
Tree Stratu	<u>m</u>	(Plot Size:)	% Cover	Species?	Status *		nber of Domir				
Larix laricir	na			30	Yes	FACW		t Are OBL, FA			2 (A)	
2.				0				al Number of I			2 (B)	
3. 4.				0				ecies Across A				
4.			Total Cover:	30				cent of Domin t Are OBL, FA		100.00	0% (A/B)	
Sapling/Shi	rub Stratum	(Plot Size:)	_			H	.1 1 . 1 .	III. d. b d			
Larix laricin	na			80	Yes	FACW		valence Index			Marking to have	
2. Picea maria	ana			10	No	FACW	<u> </u>	Total % Co		- V.4	Multiply by:	
3. Chamaeda	phne calyculata			5	No	OBL	ОВ	L Species		<u>5</u> X1	- 5	_
4.				0				CW Species	12	_	240	_
5.			Total Cover:	9 5			FA	C Species		<u>0</u> X3		-
Herb Stratu	m	(Plot Size:	1	<u></u>				CU Species		0 X 4 0 X 5		_
1.			,	0				Species	12	_	245	-
2.				0			Col	umn Totals:		-		_
3.				0				Pre	evalence Inde	x = B/A =	1.96	<u> </u>
4.				0			Hydi	ophytic Vege	tation Indicate	ors:		
5.				0					Test for Hydro		ation	
6. 7.				0					ance Test is >			
8.				0			II		ance Index ≤ :			
0.			Total Cover:	<u>0</u>				Mornh			rovide supporti	ina data
Woody Vine	e Stratum	(Plot Size:)	<u>u</u>					etation remark			y uata
1.				0				lo Proble	matic Hydrop	hytic Vegetati	ion [1] (Explain))
2.				0						d hydrology mus	st be present, unle	ess
			Total Cover	0	_	L	distu	rbed or problem	atic.			

0 * In USFWS Region 3

Hydrophytic vegetation present?

Total Cover:

Remarks:

(include photo numbers here or on a separate sheet)

Yes

SOIL Sampling Point: #08 N16 west end

Profile Description: Depth	: (Describe to the depth need Matrix	led to documen		abscence Features	of indicate	ors).		
(inches)	Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0.6	40. m 9/4						Fibric poet	maint
l	10yr 2/1 10yr 2/1						Fibric peat Fibric peat	moist saturated
3.	,						· isino pour	
5								
6	ntration, D=Depletion, RM=R	educed Matrix,	CS=Covered or Coated Sand	Grains	[2] Locatio	on: PL=Pore I	ining, M=Matrix.	
Hydric Soil Indicato	ors: (applicable to all LRRs, ເ	ınless otherwis	e noted)			Indicators fo	r Problematic Hydric So	ils [3]:
✓ Histosol (A1)		Strippe	d Matrix (S6)			2 cm Muc	k (A10) (LRR K, L, MLRA	149B)
Histic Epipedon ((A2)	☐ Dark S	ırface (S7) (LRR R, MLRA 149	B)		Coast Pra	nirie Redox (A16) (LRR K,	L, R)
☐ Black Histic (A3)		Polyval	ue Below Surface (S8) (LRR R,	, MLRA 149	B)	5 cm Muc	ky Peat or Peat (S3) (LRI	R K, L, R)
☐ Hydrogen Sulfide	e (A4)	☐ Thin Da	ark Surface (S9) (LRR R, MLRA	A 149B)		Dark Surf	ace (S7) (LRR K, L)	
Stratified Layers	(A5)	Loamy	Mucky Mineral (F1) (LRR K, L)			Polyvalue	Below Surface (S8) (LRF	R K, L)
Depleted Below	Dark Surface (A11)	Loamy	Gleyed Matrix (F2)			Thin Dark	Surface (S9) (LRR K, L)	
Thick Dark Surfa	ce (A12)	Deplete	d Matrix (F3)			Iron-Man	ganese Masses (F12) (LR	R K, L, R)
Sandy Mucky Min	ineral (S1)	Redox	Dark Surface (F6)			Piedmont	Floodplain Soils (F19) (M	ILRA 149B)
Sandy Gleyed M	latrix (S4)	Deplete	d Dark Surface (F7)			Mesic Sp	odic (TA6) (MLRA 144A,	145, 149B)
Sandy Redox (Sa	5)	Redox	Depressions (F8)			Red Pare	nt Material (TF2)	Other (explain in soil
[3] Indicators of hydro	ophytic vegetation and wetland	hydrology must	be present, unless disturbed or	r problemati	C.	Very Sha	llow Dark Surface (TF12)	remarks)
Restrictive Layer (if	f present): Type:		Depth (inches).	:		H	dric soil present?	<u>Yes</u>
Remarks: Saturated	at -6"				•			
HYDROLOGY	/							
Wetland Hydrology	Indicators:							
Primary Indicators	(minimum of one required; cl	heck all that ap	oly)		Secor	ndary Indicato	rs (minimum of two req	uired)
Surface Water (A	A1)	☐ Wa	ter-Stained Leaves (B9)		Su	ırface Soil Cra	cks (B6)	FAC-Neutral Test (D5)
High Water Table	e (A2)	Aqu	ıatic Fauna (B13)		Dr	ainage Patterr	ıs (B10)	
Saturation (A3)		Ma	rl Deposits (B15)		Mo	oss Trim Lines	(B16)	
Water Marks (B1	')	☐ Hy	drogen Sulfide Odor (C1)		☐ Di	y-Season Wat	er Table (C2)	
Sediment Depos	rits (B2)		dized Rhizospheres on Living F	Roots	Cr	ayfish Burrows	s (C8)	
Drift Deposits (B3	3)	,	ere not tilled) (C3)		Sa	aturation Visible	e on Aerial Imagery (C9)	
Algal Mat or Crus	st (B4)		sence of Reduced Iron (C4)		St	unted or Stress	sed Plants (D1)	
☐ Iron Deposits (B5	5)	_	cent Iron Reduction in Tilled So	oils (C6)	G	eomorphic Pos	ition (D2)	
☐ Inundation Visible	le on Aerial Imagery (B7)		n Muck Surface (C7)		St	allow Aquitard	(D3)	
	ted Concave Surface (B8)	∐ Oth	er (explain in remarks)		Mi	crotopographic	Relief (D4)	
Field Observations	:					14/04/04	d booden la mora a m42	V
Surface water prese	ent?	Surfa	ce Water Depth (inches):			vvetian	d hydrology present?	<u>Yes</u>
Water table present			r Table Depth (inches):			Descri	be Recorded Data:	
Saturation present?	? (includes capillary fringe)	✓ Satu	ration Depth (inches):	6				
Recorded Data:	Aerial Photo Monito	ring Well	Stream Gauge Previou	us Inspecti	ons			
Hydrology Remarks	s: Saturated at -6"							

Project/Site:	Zim Sod				Applicant/0	Owner:	Zim So	<u>d</u>	City/County: S	t. Louis		State:	<u>MN</u>	Sam	oling Date:	11/18/10
Investigator(s):	<u>TPT</u>				Section:	<u>11</u>			Township: 55			Range:	<u>18</u>	Samı	oling Point:	#09 N16
Land Form:	Terrace				Local Relie	ef:			Slope %:			Soil Map	Unit Nar	ne:	Greenwood	soils B14A
Subregion (LRR):	<u>k</u>				Latitude:				Longitude:			Datum:				
NWI/Cowardin Cla	assification:	:			Circular 3	9 Class	sification:	<u>up</u>								
Are climatic/hydro	loaic condi	tions or	n the site tvi	oical for this	time of vea	ar?	Yes	(If no. expla	ain in remarks)		Eggers	& Reed (p	orimary):	<u>L</u>	<u>Jpland</u>	
,	Ü		,,						,		Eggers	& Reed (s	secondary	y):		
Are vegetation	<u>Yes</u>	Soil	<u>Yes</u>	Hydrology	<u>Yes</u>	signitio	cantly dist	urbed?	Are "normal circumstances"	<u>Yes</u>	Eggers	& Reed (t	ertiary):			
Are vegetation	<u>No</u>	Soil	<u>No</u>	Hydrology	<u>No</u>	natura	lly proble	matic?	present?		Eggers	& Reed (d	quaternary	/) :		
																4

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

Hydrophytic vegetation present?	Yes	Remarks (explain any	Tile drained sod field - in Moosehorn field
Hydric soil present?	Yes	answers if needed):	
Wetland hydrology present?	No		
Is the sampled area within a wetland?	<u>No</u>	If yes, optional Wetland	Site ID:

Tree Stratum	(Plot Size:)	Absolute % Cover	Dominant Species?	Indicator Status *	Dominance Test Worksheet:		
	(**************************************		0			Number of Dominant Species That Are OBL, FACW or FAC:	1	(A)
			0			Total Number of Dominant		
			0			Species Across All Strata:	1	(B) -
			0			Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)
		Total Cover:	<u>0</u>			That Are OBL, I ACW OF I AC.		• ' '
Sapling/Shrub Stratum	(Plot Size:)				Prevalence Index Worksheet:		
			0			Total % Cover of:	М	ultiply by:
			0			OBL Species 0	X 1	0
			0			FACW Species0	X 2	0
			0			FAC Species 99	Х3	297
		Total Cover:	<u>0</u>			FACU Species 0	X 4	0
Herb Stratum	(Plot Size:)				UPL Species 0	X 5	0
Poa pratensis			99	Yes	FAC	Column Totals: 99	(A)	297 (B)
			0			Prevalence Index =	B/A =	3.00
			0				-,,,	
			0			Hydrophytic Vegetation Indicators:		
			0			No Rapid Test for Hydroph	ytic Vegetati	on
			0			Yes Dominance Test is >50%	%	
			0			Yes Prevelance Index ≤ 3.0	[1]	
		Total Cover:	<u>99</u>			No Morphological Adaptati		
Woody Vine Stratum	(Plot Size:)				in vegetation remarks o	•	•
			0			No Problematic Hydrophyt		
		Total Cover:	0			[1] Indicators of hydric soil & wetland hyddic disturbed or problematic.	drology must b	e present, unless
		rotal Gover:	<u>0</u>	* In USFWS I	Region 3	Hydrophytic vegetation present?	Yes	
narks:						11		

SOIL Sampling Point: #09 N16

Profile Description: (Describe to the depth needs	ed to documer		abscence Features	of indicate	ors).		
(inches) Color (moist)	%	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
2			· —			Fibric peat	very moist @ 12"
4	duced Matrix, nless otherwis Strippe Dark S	CS=Covered or Coated Sand	В)		Indicators fo 2 cm Muc	Lining, M=Matrix. r Problematic Hydric Sook (A10) (LRR K, L, MLRA Airie Redox (A16) (LRR K, kky Peat or Peat (S3) (LRF	149B) L, R)
 ☐ Hydrogen Sulfide (A4) ☐ Stratified Layers (A5) ☐ Depleted Below Dark Surface (A11) ☐ Thick Dark Surface (A12) ☐ Sandy Mucky Mineral (S1) ☐ Sandy Gleyed Matrix (S4) ☐ Sandy Redox (S5) [3] Indicators of hydrophytic vegetation and wetland in the surface of the sur	Loamy Loamy Deplete Redox Redox	ark Surface (S9) (LRR R, MLRA Mucky Mineral (F1) (LRR K, L) Gleyed Matrix (F2) ad Matrix (F3) Dark Surface (F6) ad Dark Surface (F7) Depressions (F8) be present, unless disturbed or		с.	Polyvalue Thin Dark Iron-Mang Piedmont Mesic Sp Red Pare	ace (S7) (LRR K, L) Below Surface (S8) (LRF Surface (S9) (LRR K, L) ganese Masses (F12) (LR Floodplain Soils (F19) (N odic (TA6) (MLRA 144A, nt Material (TF2)	R K, L, R) ILRA 149B)
Restrictive Layer (if present): Type:		Depth (inches).	·		Н	ydric soil present?	Yes
Remarks: Very moist at 12" but not saturated HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch Surface Water (A1) High Water Table (A2)	☐ Wa	ply) ter-Stained Leaves (B9) uatic Fauna (B13) rl Deposits (B15)		☐ Sι	ndary Indicate urface Soil Cra ainage Pattern	os (B10)	uired) FAC-Neutral Test (D5)
 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) Sparsely Vegetated Concave Surface (B8) 	☐ Hy ☐ Ox (w) ☐ Pre ☐ Re ☐ Th	drogen Sulfide Odor (C1) idized Rhizospheres on Living Flere not tilled) (C3) esence of Reduced Iron (C4) cent Iron Reduction in Tilled So in Muck Surface (C7) her (explain in remarks)		DI Cr	y-Season Wat ayfish Burrows turation Visibl	er Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2)	
Field Observations:		ace Water Depth (inches):			Wetlan	d hydrology present?	<u>No</u>
Surface water present? Water table present? Saturation present? (includes capillary fringe) Recorded Data: Aerial Photo Monitor Hydrology Remarks: Very moist at 12" but not satura	Wate	r Table Depth (inches): ration Depth (inches): Stream Gauge Previou	us Inspecti	ons		be Recorded Data:	<u></u>

Project/Site:	Zim Sod				Applicant/C	Owner:	Zim So	<u>od</u>	City/County: <u>St</u>	. Louis		State:	MN	Sam	pling Date:	11/18/10
Investigator(s):	<u>TPT</u>				Section:	<u>11</u>			Township: 55			Range:	<u>18</u>	Sam	pling Point:	#10 N07
Land Form:	Terrace				Local Relie	ef:			Slope %:			Soil Map	Unit Nar	ne:	Greenwood	soils B14A
Subregion (LRR):	<u>k</u>				Latitude:				Longitude:			Datum:				
NWI/Cowardin Cla	ssification:				Circular 3	9 Clas	sification	: <u>up</u>								
Are climatic/hydrol	oaic condit	ions or	n the site tvi	oical for this	time of vea	r?	Yes	(If no. expl	ain in remarks)		Eggers	& Reed (p	rimary):	<u>l</u>	<u>Jpland</u>	
,	Ü		,,		,				,	.,	Eggers	& Reed (s	econdary	<i>ı</i>):		
Are vegetation	<u>Yes</u>	Soil	<u>Yes</u>	Hydrology	<u>Yes</u>	signiti	cantly dis	sturbed?	Are "normal circumstances"	<u>Yes</u>	Eggers	& Reed (to	ertiary):			
Are vegetation	<u>No</u>	Soil	<u>No</u>	Hydrology	<u>No</u>	natura	ally proble	ematic?	present?		Eggers	& Reed (q	uaternary	y):		

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

Hydrophytic vegetation present?	Yes	Remarks (explain any	Tile Drained Field (Otter field) with a managed drainage system and managed vegetation.
Hydric soil present?	Yes	answers if needed):	
Wetland hydrology present?	No		
Is the sampled area within a wetland?	<u>No</u>	If yes, optional Wetland	Site ID:

Tree Stratum	(Plot Size:	1	Absolute % Cover	Dominant Species?	Indicator Status *	Dominance Test Worksheet:	
	(7 101 0120.					Number of Dominant Species That Are OBL, FACW or FAC:	1 <i>(A)</i>
			0				
			0			Total Number of Dominant Species Across All Strata:	1 <i>(B)</i>
			0			Percent of Dominant Species	
		Total Cover:	<u>0</u>			That Are OBL, FACW or FAC:	0.00% (A/B)
Sapling/Shrub Stratum	(Plot Size:)				Prevalence Index Worksheet:	
			0			Total % Cover of:	Multiply by:
			0				
			0			OBL Species	
			0			FACW Species	
		Total Cover:	<u>0</u>				
Hank Ofrictions	(Plot Size:	rotal Cover.	<u>u</u>			FACU Species0 X 4	
Herb Stratum	(Piot Size.					UPL Species0 X 5	0
Poa pratensis			99	Yes	FAC	Column Totals:99 (A)	297 (B)
			0			Prevalence Index = B/A =	3.00
			0				
			0			Hydrophytic Vegetation Indicators:	
			0			No Rapid Test for Hydrophytic V	egetation
			0			Yes Dominance Test is >50%	
			0			Yes Prevelance Index ≤ 3.0 [1]	
		Total Cover:				Marabalanias Adamtatians (1] (provide supporting dat
Woody Vine Stratum	(Plot Size:	Total Cover:	9 <u>9</u>			Yes Prevelance index ≤ 3.0 [1] No Morphological Adaptations [1] in vegetation remarks or on a	
Woody Vine Stratum	(Plot Size:	Total Cover:				No Morphological Adaptations [separate sheet)
	(Plot Size:	Total Cover:	99			No Morphological Adaptations [*in vegetation remarks or on a Problematic Hydrophytic Veg	n separate sheet) netation [1] (Explain)
Woody Vine Stratum	(Plot Size:	Total Cover:	99	* In USFWS I	Region 3	No Morphological Adaptations [: in vegetation remarks or on a	n separate sheet) netation [1] (Explain)
Woody Vine Stratum	(Plot Size:)	99	* In USFWS I	Region 3	No Morphological Adaptations ['in vegetation remarks or on a No Problematic Hydrophytic Veg	separate sheet) petation [1] (Explain) y must be present, unless

SOIL Sampling Point: #10 N07

Profile Description: (Describe to the Depth	e depth needed to documen		e abscence x Features	of indicato	ers).		
(inches) Color (moist) %	Color (moist)	%	Type [1]	Loc [2]	Texture	Remarks
0 10 10 10 11						File de la cat	
1. 0 - 12 10yr 2/1 2. 12 - 20 10yr 2/1			-			Fibric peat Fibric peat	bright fibers10%
3			-			· · · · · · · · · · · · · · · · · · ·	
4							
5							
6	letion, RM=Reduced Matrix,	CS=Covered or Coated Sand	d Grains	[2] Locatio	n: PL=Pore I	Lining, M=Matrix.	
Hydric Soil Indicators: (applicable	to all LRRs, unless otherwis	e noted)			Indicators fo	r Problematic Hydric So	ils [3]:
✓ Histosol (A1)	Strippe	d Matrix (S6)			2 cm Muc	k (A10) (LRR K, L, MLRA	149B)
Histic Epipedon (A2)	☐ Dark St	ırface (S7) (LRR R, MLRA 149	9B)		Coast Pra	airie Redox (A16) (LRR K,	L, R)
Black Histic (A3)	Polyval	ue Below Surface (S8) (LRR F	R, MLRA 149	B)	5 cm Mud	ky Peat or Peat (S3) (LRF	R K, L, R)
☐ Hydrogen Sulfide (A4)	☐ Thin Da	ark Surface (S9) (LRR R, MLR	A 149B)		Dark Surf	ace (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy	Mucky Mineral (F1) (LRR K, L))		Polyvalue	Below Surface (S8) (LRF	? K, L)
Depleted Below Dark Surface (A1	1) Loamy	Gleyed Matrix (F2)			Thin Dark	Surface (S9) (LRR K, L)	
Thick Dark Surface (A12)	Deplete	d Matrix (F3)			Iron-Mang	ganese Masses (F12) (LR	R K, L, R)
Sandy Mucky Mineral (S1)	Redox	Dark Surface (F6)			Piedmont	Floodplain Soils (F19) (M	LRA 149B)
Sandy Gleyed Matrix (S4)	Deplete	d Dark Surface (F7)			Mesic Sp	odic (TA6) (MLRA 144A, 1	(45, 149B)
Sandy Redox (S5)	Redox	Depressions (F8)			Red Pare	nt Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation	n and wetland hydrology must	be present, unless disturbed o	or problemati	c.	Very Sha	llow Dark Surface (TF12)	remarks)
Restrictive Layer (if present):	Гуре:	Depth (inches):		H	ydric soil present?	<u>Yes</u>
Remarks:							
HYDROLOGY							
Wetland Hydrology Indicators:							
Primary Indicators (minimum of on	e required; check all that app	oly)		Secon	dary Indicato	rs (minimum of two requ	uired)
Surface Water (A1)		ter-Stained Leaves (B9)		_	rface Soil Cra	,	FAC-Neutral Test (D5)
☐ High Water Table (A2)	Aqu	uatic Fauna (B13)		Dra	ainage Patterr	ns (B10)	
Saturation (A3)	<i>M</i> a	rl Deposits (B15)		Mo	ss Trim Lines	(B16)	
Water Marks (B1)	□ Нус	drogen Sulfide Odor (C1)		Dry	y-Season Wat	er Table (C2)	
Sediment Deposits (B2)		dized Rhizospheres on Living ere not tilled) (C3)	Roots	Cra	ayfish Burrows	s (C8)	
Drift Deposits (B3)		, , ,		Sa	turation Visible	e on Aerial Imagery (C9)	
Algal Mat or Crust (B4)		sence of Reduced Iron (C4)	-: (00)	Stu	inted or Stres	sed Plants (D1)	
☐ Iron Deposits (B5)		cent Iron Reduction in Tilled So	olis (C6)	_	omorphic Pos	, ,	
☐ Inundation Visible on Aerial Image	erv (B7)	n Muck Surface (C7)			allow Aquitard	,	
Sparsely Vegetated Concave Sur	face (B8)	er (explain in remarks)		Mic	crotopographic	c Relief (D4)	
Field Observations:					Motion	d hydrology present?	No.
Surface water present?		ce Water Depth (inches):					<u>No</u>
Water table present?		r Table Depth (inches):			Descri	be Recorded Data:	
Saturation present? (includes capil		ration Depth (inches):					
Recorded Data: Aerial Photo	Monitoring Well	Stream Gauge Previo	us Inspecti	ons			
Hydrology Remarks: Tile drained fie	eld						

Project/Site:	Zim Sod		Applica	nt/Owner:	Zim So	<u>d</u>	City/County:	St. Louis	State:	<u>MN</u> Sa	ampling Date:	<u>11/18/10</u>	
Investigator(s):	<u>TPT</u>		Section	: 11			Township: 5	55	Range:	- <u>18</u> Sá	ampling Point:	#11East of N06	
Land Form:	Terrace		Local R	_			Slope %:	_		p Unit Name:	Greenwood	d soils B14A	
							•			•	Orcenwood	2 30113 15 1474	
Subregion (LRR):	: <u>k</u>		Latitude				Longitude:		Datum:				
NWI/Cowardin Cl	lassification:		Circula	ır 39 Class	ification:	<u>8</u>			5 05 4	· · · ·	0 ''	_	
Are climatic/hydro	ologic conditions	on the site typica	al for this time of y	/ear?	Yes	(If no, explai	n in remarks)		Eggers & Reed (Coniferous I	<u>30g</u>	
Are vegetation	No Soil	No H	ydrology <u>No</u>	sianific	antly dist	turbed?	Are "normal	Yes	Eggers & Reed (
-	_						circumstance		Eggers & Reed (
Are vegetation	No Soil	<u>No</u> Hy	ydrology <u>No</u>	natura	lly proble	mauc?	present?		Eggers & Reed ((quaternary):			
SUMMARY (OF FINDING	GS - Attacl	h site map	showii	ng sai	mpling p	oint loca	ations,	transects, i	mportan	t features	s, etc.	
Hydrophytic vege Hydric soil preser Wetland hydrolog Is the sampled an	nt? ny present?	<u>Yes</u> <u>Yes</u>	Remarks (explain answers if neede If yes, optional W	ed):	East of Ma	allard field							
VEGETATIO	ON												
Tues Stuate		(Diet Sies)			osolute Cover	Dominant Species?	Indicator Status *	<u>Do</u>	minance Test W	orksheet:			
Tree Stratu		(Plot Size:							mber of Domina			6 <i>(A)</i>	
Larix laricir	na				30	Yes	FACW		at Are OBL, FAC	W or FAC:			
2.					0				tal Number of Do ecies Across All			7 <i>(</i> B)	
3. 4.					0			—II '	rcent of Dominal			_ ` ′	
4.			Total Co	ver:	30				at Are OBL, FAC		85.71	% (A/B)	
Sapling/Shi	ruh Stratum	(Plot Size:)	<u> </u>			⊩					
Larix laricin		(1.101.01201			10	Yes	FACW		valence Index W	<u>'orksheet:</u>			
Picea maria					10	Yes	FACW		Total % Cov	er of:		Multiply by:	
3. Betula pum					10	Yes	OBL	OE	BL Species _	35	X 1	35	
<u> </u>	enlandicum				25	Yes	OBL	FA	CW Species _	60	X 2	120	
5. Rubus idae	eus ssp. strigosus	<u> </u>			10	Yes	FACW	_{FA}	C Species _	() X3	0	
			Total Cov	ver:	<u>65</u>				CU Species	(X 4	0	
<u>Herb Stratu</u>	<u>m</u>	(Plot Size:)					L Species	(X 5	0	
1. Sphagnum	sp.				30	Yes			lumn Totals: _	95	- 5 (A)	155	(B)
2.					0				_	alence Index	- ` ´	1.60	
3.					0				Pievo	alence muex	- b/A -	1.63	
4.					0			Hyd	Irophytic Vegeta	tion Indicato	rs:		
5.					0						— ohytic Vegeta	ntion	
6.					0					ice Test is >			
7. 8.				_	0			-		ce Index ≤ 3			
·			Total Cov	ver:	<u>30</u>			_ -	No Morphol	ogical Adapt	ations [1] (pr	ovide supportin	ıg data
Woody Vine	e Stratum	(Plot Size:)				_	in vegeta		or on a sepa	•	
1.					0			$\square \parallel _$	No Problem	atic Hydroph	ytic Vegetation	on [1] (Explain)	
2.					0				ndicators of hydric		hydrology mus	t be present, unles	s
			Total Cov	er:	<u>0</u>	* In USFWS	Region 3	aist	urbed or problemati	C.			

(include photo numbers here or on a separate sheet)

Yes

Hydrophytic vegetation present?

SOIL Sampling Point: #11East of N06

	ded to document the indicator or confirm the absce		rs).		
Depth Matrix (inches) Color (moist)	% Color (moist) %	es Type [1]	Loc [2]	Texture	Remarks
1. 0 - 12 10yr 2/1				Fibric peat	saturated at 4"
2. 12 - 18 10yr 2/1				Fibric peat	10% bright fibers
3					 , -
5					
6					
[1] Type: C=Concentration, D=Depletion, RM=F	Reduced Matrix, CS=Covered or Coated Sand Grains	[2] Location	: PL=Pore	Lining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs,	unless otherwise noted)	ı	ndicators fo	or Problematic Hydric S	oils [3]:
✓ Histosol (A1)	Stripped Matrix (S6)		2 cm Mu	ck (A10) (LRR K, L, MLR	A 149B)
Histic Epipedon (A2)	☐ Dark Surface (S7) (LRR R, MLRA 149B)		Coast Pr	airie Redox (A16) (LRR F	(, L, R)
Black Histic (A3)	Polyvalue Below Surface (S8) (LRR R, MLRA	149B)	5 cm Mu	cky Peat or Peat (S3) (LF	RR K, L, R)
☐ Hydrogen Sulfide (A4)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)		Dark Sur	face (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K, L)		Polyvalue	e Below Surface (S8) (LR	RR K, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)		Thin Dan	k Surface (S9) (LRR K, L)
☐ Thick Dark Surface (A12)	Depleted Matrix (F3)		Iron-Man	ganese Masses (F12) (L	RR K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)		Piedmon	t Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)		Mesic Sp	oodic (TA6) (MLRA 144A,	145, 149B)
Sandy Redox (S5)	Redox Depressions (F8)		Red Pare	ent Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic yeaetation and wetland	d hydrology must be present, unless disturbed or proble	matic.	Very Sha	allow Dark Surface (TF12	
Restrictive Layer (if present): Type:	Depth (inches):	-	Н	ydric soil present?	<u>Yes</u>
Remarks:					
HYDROLOGY					
Wetland Hydrology Indicators:					
Primary Indicators (minimum of one required; of	check all that apply)	Second	lary Indicate	ors (minimum of two re	quired)
Surface Water (A1)	Water-Stained Leaves (B9)	Sun	face Soil Cra	ncks (B6)	FAC-Neutral Test (D5)
☐ High Water Table (A2)	Aquatic Fauna (B13)	Dra	inage Patter	ns (B10)	
✓ Saturation (A3)	Marl Deposits (B15)	☐ Mos	ss Trim Lines	s (B16)	
Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	Dry	-Season Wa	ter Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living Roots	Cra	yfish Burrow	s (C8)	
Drift Deposits (B3)	(where not tilled) (C3)	☐ Sati	uration Visib	le on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)	Stu	nted or Stres	sed Plants (D1)	
☐ Iron Deposits (B5)	Recent Iron Reduction in Tilled Soils (C6)	Geo	omorphic Po	sition (D2)	
Inundation Visible on Aerial Imagery (B7)	☐ Thin Muck Surface (C7)	Sha	llow Aquitar	d (D3)	
Sparsely Vegetated Concave Surface (B8)	Other (explain in remarks)	Mic	rotopographi	ic Relief (D4)	
Field Observations: Surface water present?	Surface Water Depth (inches):		Wetlar	nd hydrology present?	<u>Yes</u>
Water table present?	Water Table Depth (inches):			ibe Recorded Data:	
Saturation present? (includes capillary fringe)		4	Descri	necorded Dala.	
		_			
Recorded Data: Aerial Photo Monito	oring Well 🦳 Stream Gauge 🦳 Previous Insp	ections			
Hydrology Remarks: Saturation at -4"					

VV	CILA	IND	DE	ILN	IVIII V	AIIO	IN L	JAI	A FUR	IVI - IVOI (I	icei	ılıaı	anu	NOI	He	a51 n	gion	
Project/Site:	Zim Sod				A	Applicant/0	Owner.	Zim S	<u>od</u>	City/County: St	. Louis		State:	MN	San	npling Date	11/18/10	
Investigator(s):	<u>TPT</u>				5	Section:	<u>3</u>			Township: 55			Range	18	San	mpling Point	#12 N of I	<u>N01</u>
Land Form:	Terrace				L	Local Relie	ef:			Slope %:			Soil Ma	ap Unit Na	ame:	Greenwoo	d soils B14/	<u>A</u>
Subregion (LRR):	<u>k</u>				L	Latitude:				Longitude:			Datum					
NWI/Cowardin Cla	assification:					Circular 3	9 Clas	sification	ı: <u>8</u>			C	0 Dane	/ N		0	Dan	
Are climatic/hydrol	logic condi	tions o	n the si	ite typical	for this t	ime of yea	r?	Yes	(If no, expl	ain in remarks)				(primary):		Coniferous	B0g	
Are vegetation No Soil No Hydrology No significantly distribution									sturhad?	Are "normal	Yes	Eggers	& Reed	(seconda	ry):			
Are regulation	110	Oon	140	riyo	irology	140	Sigitiii	carrily ar	starbou:	circumstances"	103	Eggers	& Reed	(tertiary):				
Are vegetation	<u>No</u>	Soil	<u>No</u>	Hyd	drology	<u>No</u>	natura	ally prob	lematic?	present?		Eggers	& Reed	(quaterna	ry):			
SUMMARY ()F FINE	DING	is - A	Attach	site ı	map sl	now	ing sa	ampling	point location	ons, i	trans	ects, i	mport	ant	feature	s, etc.	
Hydrophytic vegetation present? Hydric soil present? Wetland hydrology present? Yes Remarks (explain any answers if needed): Yes North of Bald eagle fiel answers if needed):																		
Is the sampled are	d?		yes, opt	tional Wetl	and Si	te ID:												
VEGETATIO)N																	

Tree	Stratum	(Plot Size:)	Absolute % Cover	<u>Dominant</u> <u>Species?</u>	Indicator Status *	Dominance Test Wor	Species	_	(4)	
Pic	ea mariana			60	Yes	FACW	That Are OBL, FACM	or FAC:	5	(A)	
Lar	rix laricina			40	Yes	FACW	Total Number of Don	ninant	_	(5)	
				0			Species Across All S	Strata:	6	(B)	
				0			Percent of Dominant		83.33%	(A/B)	
			Total Cover:	<u>100</u>			That Are OBL, FACM	or FAC:	03.33 /6	(A/D)	
Sap	ling/Shrub Stratum	(Plot Size:)				Prevalence Index Wo	rkshoot:			
Sal	ix sp.			15	Yes	FAC	Total % Cove		1.11	dink bu	
Lec	dum groenlandicum			35	Yes	OBL	Total % Cove			ıltiply by:	
Rul	bus idaeus ssp. strigos	us		15	Yes	FACW	OBL Species	35	X 1 _	35	-
				0			FACW Species	115	X 2	230	
				0			FAC Species	15	X 3	45	
			Total Cover:	<u>65</u>			FACU Species	0	X 4	0	
Hert	Stratum	(Plot Size:)				UPL Species	0	X 5	0	
Spł	nagnum sp.			20	Yes		Column Totals:	165	(A)	310	- (E
				0				ence Index =	D/A =	4.00	•
				0			Prevai	ence maex -	B/A -	1.88	
				0			Hydrophytic Vegetation	on Indicators	•		
				0					ytic Vegetatio	an.	
				0			 -	• •		· · · ·	
				0			<u> </u>	e Test is >50			
				0			Yes Prevelanc	e Index ≤ 3.0	[1]		
Woo	ody Vine Stratum	(Plot Size:	Total Cover:	<u>20</u>					ions [1] (prov or on a separa		ng d
WOO	ouy vine Stratum	(1 101 0126.	,						ic Vegetation		
				0			<u> </u>		_		
			Total Cover:	0 <u>0</u>	* 1. 11051110	D	[1] Indicators of hydric so disturbed or problematic		drology must be	e present, unles	SS
				-	* In USFWS	Region 3	Hydrophytic vegetation	present?	<u>Yes</u>		
	<u> </u>						11				

SOIL Sampling Point: #12 N of N01

Profile Description: (Describe to the depth need Depth Matrix	led to document the indicator or confirm the abscend Redox Feature		ors).		
(inches) Color (moist)	% Color (moist) %	Type [1]	Loc [2]	Texture	Remarks
1. <u>0 - 18</u> <u>10yr 2/1</u>				Fibric peat	sat to surface
2 -					
3 4 -				-	
5					
6					
	educed Matrix, CS=Covered or Coated Sand Grains	[2] Locatio	n: PL=Pore	Lining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs, เ —			_	or Problematic Hydric S	
✓ Histosol (A1)	Stripped Matrix (S6)		2 cm Mu	ck (A10) (LRR K, L, MLR	A 149B)
Histic Epipedon (A2)	Dark Surface (S7) (LRR R, MLRA 149B)		Coast Pi	rairie Redox (A16) (LRR I	K, L, R)
Black Histic (A3)	Polyvalue Below Surface (S8) (LRR R, MLRA 1	(49B)	5 cm Mu	cky Peat or Peat (S3) (LF	RR K, L, R)
Hydrogen Sulfide (A4)	Thin Dark Surface (S9) (LRR R, MLRA 149B)		Dark Su	rface (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K, L)		Polyvalu	e Below Surface (S8) (LF	RR K, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)		Thin Dar	rk Surface (S9) (LRR K, L)
Thick Dark Surface (A12)	Depleted Matrix (F3)		Iron-Mar	nganese Masses (F12) (L	RR K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)		Piedmor	nt Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)		Mesic S _l	oodic (TA6) (MLRA 144A	145, 149B)
Sandy Redox (S5)	Redox Depressions (F8)		Red Par	ent Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation and wetland	hydrology must be present, unless disturbed or problem	atic.	Very Sha	allow Dark Surface (TF12) remarks)
Restrictive Layer (if present): Type:	Depth (inches):	-	H	lydric soil present?	<u>Yes</u>
Remarks:					
HYDROLOGY					
Wetland Hydrology Indicators:					
Primary Indicators (minimum of one required; cl	neck all that apply)	Secon	dary Indicat	ors (minimum of two re	quired)
Surface Water (A1)	Water-Stained Leaves (B9)	☐ Su	rface Soil Cra	acks (B6)	FAC-Neutral Test (D5)
High Water Table (A2)	Aquatic Fauna (B13)	☐ Dra	ainage Patter	rns (B10)	
✓ Saturation (A3)	Marl Deposits (B15)	☐ Mo	ss Trim Line	s (B16)	
Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	☐ Dr	y-Season Wa	ater Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living Roots	Cra	ayfish Burrow	vs (C8)	
Drift Deposits (B3)	(where not tilled) (C3)	☐ Sa	turation Visib	le on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)	Stu	ınted or Stres	ssed Plants (D1)	
☐ Iron Deposits (B5)	Recent Iron Reduction in Tilled Soils (C6)	Ge	omorphic Po	sition (D2)	
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	☐ Sh	allow Aquitar	rd (D3)	
Sparsely Vegetated Concave Surface (B8)	Other (explain in remarks)	Mid	crotopograph	ic Relief (D4)	
Field Observations:					
Surface water present?	Surface Water Depth (inches):	_	Wetla	nd hydrology present?	<u>Yes</u>
Water table present?	Water Table Depth (inches):	_	Descr	ibe Recorded Data:	
Saturation present? (includes capillary fringe)	Saturation Depth (inches):	0			
Recorded Data: Aerial Photo Monito	ring Well Stream Gauge Previous Inspe	ctions			
Hydrology Remarks: Saturated to surface					

	V	'E I LAN	D DE I	ERIVIIN	IAIIC	JN	DATA	FORI	W - Norti	ncer	itral ar	nd North	ieast Reg	lion	
Pro	ject/Site:	Zim Sod			Applicant	/Owne	er: Zim Soo	<u>d</u>	City/County: S	t. Louis	Sta	ate: MN	Sampling Date: 1	<u>1/18/10</u>	
Inve	estigator(s):	<u>TPT</u>			Section:	<u>1</u>	<u>1</u>		Township: 55		Ra	ange: <u>18</u>	Sampling Point: <u>#</u>	13 E of N02	
Lan	nd Form:	Terrace			Local Rel	lief:			Slope %:		So	oil Map Unit Nam	e: Greenwood s	oils B14A	
Sub	oregion (LRR)): k			Latitude:				Longitude:		Da	atum:			
	/I/Cowardin C					39 Cla	assification:		3						
		ologic conditions	on the site	typical for this			<u>Yes</u>	_	ain in remarks)			eed (primary):	Coniferous Sw	<u>amp</u>	
Are	vegetation	No So	il <u>No</u>	Hydrology	No	sign	ificantly dist	urbed?	Are "normal	Yes		eed (secondary)	:		
Δre	vegetation	No So	il <u>No</u>	Hydrology	No	natu	rally problei	matic?	circumstances" present?			eed (tertiary):			
	•			,					,	_		eed (quaternary)			
SUI	MMARY	OF FINDIN	GS - At	tach site	map s	hov	ving sar	mpling p	point locati	ons,	transect	s, importa	nt features,	etc.	
Hyd	dric soil prese tland hydrolog	gy present?	<u>Y</u> <u>Y</u>	es answers	s (explain a if needed):	East of Os	prey field							
Is th	ne sampled a	rea within a weti	and? <u>Y</u>	<u>es</u> If yes, op	otional We	tland S	Site ID:								
VE	GETATI	ON													
							Absolute	Dominant		Do	minance Te	st Worksheet:			
	Tree Stratu	<u>ım</u>	(Plot Siz	re:)	% Cover	Species?	Status *	ll Nu	ımber of Dor	ninant Species			
1.	Picea mar	iana					90	Yes	FACW			FACW or FAC:	5	(A)	
2.							0					of Dominant	6	(B)	
3.							0			-III ′	ecies Acros			. (<i>D)</i>	
4.				7	otal Cove		0 90					ninant Species FACW or FAC:	83.33%	(A/B)	
	Sanling/Sh	rub Stratum	(Plot Siz		otal Cove	η. 1	90				,				
1.		•	(FIOT 312	.e.			25	Yes	OBL	Pre	evalence Ind	ex Worksheet:			
2.	_	penlandicum aphne calyculata					10	Yes	OBL	╢_	Total %	Cover of:	Mi	ultiply by:	
3.		ricea ssp. serice					10	Yes	FACW	OE	BL Species		45 X 1	45	_
4.	Betula pur	nila					10	Yes	OBL	FA	CW Species	1(00 X2	200	_
5.			-				0			FA	C Species		0 X3	0	
				T	otal Cove	r:	<u>55</u>			FA	CU Species		0 X4	0	
	Herb Stratu	<u>um</u>	(Plot Siz	re:)				UF	L Species		0 X5	0	_
1.	Sphagnum	1 sp.					30	Yes		Co	lumn Totals	14	45 (A)	245	(B)
2.							0			_		Prevalence Inde	ex = B/A =	1.69	_
3.							0			-	•		-		
4. 5.							0			Hy0	rophytic Ve	getation Indica	tors:		
6.							0			$-\parallel \parallel _{-}$	Yes Rap	id Test for Hydi	ophytic Vegetatio	on	
7.							0				Yes Dom	ninance Test is	>50%		
8.							0			-	Yes Pre v	relance Index ≤	3.0 [1]		
				Т	otal Cove	r:	<u>30</u>			<u> </u>			ptations [1] (prov		ng data
1	Woody Vin	e Stratum	(Plot Siz	re:)				Ш	in ve	egetation remar	ks or on a separa	te sheet)	

0

<u>0</u>

* In USFWS Region 3

Total Cover:

Woody Vine Stratum

(include photo numbers here or on a separate sheet)

1.

2.

Remarks:

11/23/2011 1:47:56 PM

Problematic Hydrophytic Vegetation [1] (Explain)

Yes

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

No

Hydrophytic vegetation present?

SOIL Sampling Point: #13 E of N02

Color (moist)	Profile Description: (Describe to the depth need Depth Matrix	ed to document the indicator or confirm the abs Redox Fea		tors).		
12 - 22	·			Loc [2]	Texture	Remarks
17 Type: C-Concentration, D-Depletion, RM-Reduced Matrix, CS-Covered or Coated Sand Grains [2] Location: PL-Pore Lining, M-Matrix.	0 - 12 10yr 2/1				Fibric peat	
17 Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains [2] Location: PL=Pore Lining, M=Matrix.	12 - 22 10yr 2/2				Fibric peat	
Type: C-Concentration, D-Depletion, RM-Reduced Matrix, CS-Covered or Coated Sand Grains IZ Location: PL-Pore Lining, M-Matrix,	3 -				-	
Type: C-Concentration, D-Depletion, RM-Reduced Matrix, CS-Covered or Coated Sand Grains IZ Location: PL-Pore Lining, M-Matrix,	l			-	· 	
Indicators (applicable to all LRRs, unless otherwise noted))			<u> </u>		
Histosof (A1) Stripped Matrix (S6) Derk Surface (S7) (LRR K, MLRA 1498) Desk Surface (S7) (LRR K, MLRA 1498) Desk Surface (S8) (LRR K, MLRA 1498) Desk Prairie Redox (A16) (LRR K, L, R)	1] Type: C=Concentration, D=Depletion, RM=Re	educed Matrix, CS=Covered or Coated Sand Gra	ins [2] Locati	on: PL=Pore	Lining, M=Matrix.	
Histic Epipedon (A2)	lydric Soil Indicators: (applicable to all LRRs, u	inless otherwise noted)		Indicators fo	or Problematic Hydric S	oils [3]:
Black Histic (A3)	Histosol (A1)	Stripped Matrix (S6)		2 cm Mu	ck (A10) (LRR K, L, MLR.	A 149B)
Hydrogen Sulfide (A4)	Histic Epipedon (A2)	☐ Dark Surface (S7) (LRR R, MLRA 149B)		Coast Pr	airie Redox (A16) (LRR k	C, L, R)
Stratified Layers (A5) Loamy Mucky Mineral (F1) (LRR K, L) Polyvalue Below Surface (S8) (LRR K, L) Depleted Below Dark Surface (A11) Loamy Gleyed Matrix (F2) Thin Dark Surface (S9) (LRR K, L) Thick Dark Surface (A12) Depleted Matrix (F3) Iron-Manganese Masses (F12) (LRR K, L, R) Thick Dark Surface (A12) Depleted Matrix (F3) Iron-Manganese Masses (F12) (LRR K, L, R) Sandy Mucky Mineral (S1) Redox Dark Surface (F6) Pleatmont Floodplain Soils (F19) (MLRA 144A, 145, 149B) Sandy Gelyed Matrix (S4) Depleted Dark Surface (F7) Mesic Spodic (TA6) (MLRA 144A, 145, 149B) Sandy Redox (S5) Redox Depressions (F8) Red Parent Material (TF2) Other (explain in startace for problematic. Wery Shallow Dark Surface (TF12) remarks) Restrictive Layer (if present): Type: Depth (inches): Mydric soil present? Yes Remarks: Saturated to surface YDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) Wetler-Stained Leaves (B9) Surface Soil Cracks (B6) FAC-Neutral Test (Matrix (B16) Proposition (A3) Presence of Reduced Iron (C1) Dry-Gasson Water Table (C2) Sediment Deposits (B3) Presence of Reduced Iron (C4) Sutnet of Stressed Plants (D1) Iron Deposits (B3) Presence of Reduced Iron (C4) Sutnet of Stressed Plants (D1) Iron Deposits (B6) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Shallow Anditard (D3) Inundation Visible on Aerial Imagery (B7) Shallow Adultard (D3) Iron Deposits (B6) Cartific Present? Surface Water Table Depth (inches): Describe Recorded Data:	Black Histic (A3)	Polyvalue Below Surface (S8) (LRR R, ML	RA 149B)	5 cm Mu	cky Peat or Peat (S3) (LR	RR K, L, R)
Depleted Below Dark Surface (A11)	☐ Hydrogen Sulfide (A4)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149	9B)	Dark Sur	face (S7) (LRR K, L)	
Thick Dark Surface (A12)	Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K, L)		Polyvalue	e Below Surface (S8) (LR	R K, L)
Sandy Mucky Mineral (S1)	Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)		Thin Dar	k Surface (S9) (LRR K, L,)
Sandy Gleyed Matrix (S4) Depleted Dark Surface (F7) Mesic Spodic (TA6) (MLRA 144A, 145, 149B) Sandy Redox (S5) Redox Depressions (F8) Red Parent Material (TF2) Other (explain in streamerks) Solidicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Very Shallow Dark Surface (TF12) remarks) Setrictive Layer (if present): Type: Depth (inches): Hydric soil present? Yes Promarks: Saturated to surface Seturation (As) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)	Thick Dark Surface (A12)	Depleted Matrix (F3)		Iron-Man	ganese Masses (F12) (Li	RR K, L, R)
Sandy Redox (S5) Redox Depressions (F8) Red Parent Material (TF2) Other (explain in streams of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Restrictive Layer (if present): Type: Depth (inches): Hydric soil present? Yes Remarks: Saturated to surface YPROLOGY Vertand Hydrology Indicators: Vertinary Indicators (minimum of one required; check all that apply) Surface Water (A1) Water-Stained Leaves (B9) High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10) Surface Soil Cracks (B6) FAC-Neutral Test (Marks (B1) Hydrogen Sulfidio Odor (C1) Dry-Season Water Table (C2) Sediment Deposits (B2) Oxidized Rhizospheras on Living Roots (where not tilled) (C3) Saturation Visible on Aerial Imagery (C9) Into Deposits (B3) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) Into Deposits (B5) Microtopographic Relief (D4) Field Observations: Forface Water Table (D4) Wetland hydrology present? Yes Describe Recorded Data:	Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)		Piedmon	t Floodplain Soils (F19) (MLRA 149B)
Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Very Shallow Dark Surface (TF12) remarks	Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)		Mesic Sp	oodic (TA6) (MLRA 144A,	145, 149B)
Restrictive Layer (if present): Type: Depth (inches): Hydric soil present? Yes Remarks: Saturated to surface YOROLOGY Wetland Hydrology Indicators: Intimary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1)	Sandy Redox (S5)	Redox Depressions (F8)		Red Pare	ent Material (TF2)	Other (explain in soil
YDROLOGY	3] Indicators of hydrophytic vegetation and wetland	hydrology must be present, unless disturbed or pro-	blematic.	Very Sha	allow Dark Surface (TF12	remarks)
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Secondary Indicators (minimum of two required) Surface Water (A1) High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10) Saturation (A3) Marl Deposits (B15) Moss Trim Lines (B16) Dry-Season Water Table (C2) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Presence of Reduced Iron (C4) Iron Deposits (B5) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Presence Water Depth (inches): Water Table Depth (inches): Surface Water Depth (inches): Saturation Present? (includes capillary fringe) Secondary Indicators (minimum of two required) Surface Soil Cracks (B6) FAC-Neutral Test (B4) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Saturation Visible on Aerial Imagery (C9) Shallow Aquitard (D3) Microtopographic Relief (D4) Wetland hydrology present? Yes Describe Recorded Data:	Restrictive Layer (if present): Type:	Depth (inches):	-	Н	ydric soil present?	<u>Yes</u>
Wetland Hydrology Indicators: Primary Indicators (minimum of one required; check all that apply) Surface Water (A1) High Water Table (A2) Aquatic Fauna (B13) Marl Deposits (B15) Water Marks (B1) Drift Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Water Table Depth (inches): Water Table Depth (inches): Water Table Depth (inches): Saturation (A3) Surface Soil Cracks (B6) FAC-Neutral Test (B10) FAC-Neutral	Remarks: Saturated to surface					
Surface Water (A1)	YDROLOGY					
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6) FAC-Neutral Test (B16) High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10) Saturation (A3) Marl Deposits (B15) Moss Trim Lines (B16) Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2) Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Saturation Visible on Aerial Imagery (C9) Drift Deposits (B3) Presence of Reduced Iron (C4) Stunted or Stressed Plants (D1) Iron Deposits (B5) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) Inundation Visible on Aerial Imagery (B7) Other (explain in remarks) Microtopographic Relief (D4) Field Observations: Surface water present? Surface Water Depth (inches): Wetland hydrology present? Yes Describe Recorded Data: Describe Re	Vetland Hydrology Indicators:					
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10) Saturation (A3) Marl Deposits (B15) Moss Trim Lines (B16) Dry-Season Water Table (C2) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Presence of Reduced Iron (Cancer Water Depth (inches): Surface water present? Water Table (D2) Aquatic Fauna (B13) Drainage Patterns (B10) Moss Trim Lines (B16) Dry-Season Water Table (C2) Crayfish Burrows (C8) Crayfish Burrows (C8) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) Wetland hydrology present? Wetland hydrology present? Wetland hydrology present? Saturation Depth (inches): Describe Recorded Data:	Primary Indicators (minimum of one required; ch	neck all that apply)	Seco	ndary Indicate	ors (minimum of two red	quired)
Algal Mat or Crust (B4) Introduction Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Marl Deposits (B3) Marl Deposits (B15) Moss Trim Lines (B16) Dry-Season Water Table (C2) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Recent Iron Reduction in Tilled Soils (C6) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Nater table present? Water Table Depth (inches): Water Table Depth (inches): Saturation Depth (inches): Saturation Depth (inches): Saturation Depth (inches): Describe Recorded Data:	Surface Water (A1)	Water-Stained Leaves (B9)	□ S	urface Soil Cra	ncks (B6)	FAC-Neutral Test (D5)
Water Marks (B1)	☐ High Water Table (A2)	Aquatic Fauna (B13)	D	rainage Patter	ns (B10)	
Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Teled Observations: Surface water present? Water Table Depth (inches): Saturation Depth (inches): Saturation Living Roots (where not tilled) (C3) Saturation Visible on Aerial Imagery (C9) Stunted or Stressed Plants (D1) Geomorphic Position (D2) Thin Muck Surface (C7) Shallow Aquitard (D3) Microtopographic Relief (D4) Wetland hydrology present? Yes Describe Recorded Data:	Saturation (A3)	Marl Deposits (B15)	<i>M</i>	loss Trim Lines	s (B16)	
Counter Deposits (B2)	Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)		ry-Season Wa	ter Table (C2)	
Drift Deposits (B3) Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Fresence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Shallow Aquitard (D3) Microtopographic Relief (D4) Field Observations: Surface water present? Water Table Depth (inches): Water Table Depth (inches): Saturation present? (includes capillary fringe) Saturation Depth (inches): Saturation Depth (inches	Sediment Deposits (B2)		s C	rayfish Burrow	s (C8)	
Algal Mat or Crust (B4) Iron Deposits (B5) Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present? Water Table Depth (inches): Saturation present? (includes capillary fringe) Recent Iron Reduction in Tilled Soils (C6) Geomorphic Position (D2) Shallow Aquitard (D3) Microtopographic Relief (D4) Wetland hydrology present? Yes Describe Recorded Data:	Drift Deposits (B3)		□ S	aturation Visibi	le on Aerial Imagery (C9)	
Iron Deposits (B5)	☐ Algal Mat or Crust (B4)			tunted or Stres	sed Plants (D1)	
Inundation Visible on Aerial Imagery (B7) Sparsely Vegetated Concave Surface (B8) Other (explain in remarks) Microtopographic Relief (D4) Wetland hydrology present? Water Table Depth (inches): Describe Recorded Data:	☐ Iron Deposits (B5)		^{C6)}	eomorphic Pos	sition (D2)	
Sparsely Vegetated Concave Surface (B8) Other (explain in remarks) Microtopographic Relief (D4) Field Observations: Surface water present? Wetland hydrology present? Water Table Depth (inches): Describe Recorded Data:	Inundation Visible on Aerial Imagery (B7)	<u> </u>	□ S	hallow Aquitar	d (D3)	
Surface water present? Surface Water Depth (inches): Water table present? Water Table Depth (inches): Describe Recorded Data: Saturation present? (includes capillary fringe) Saturation Depth (inches): 0	_	Other (explain in remarks)	<i>M</i>	licrotopographi	ic Relief (D4)	
Vater table present?	Field Observations:					
Saturation present? (includes capillary fringe) Saturation Depth (inches): 0	Surface water present?	Surface Water Depth (inches):		Wetlar	nd hydrology present?	<u>Yes</u>
	Water table present?	Water Table Depth (inches):		Descri	ibe Recorded Data:	
Recorded Data: Aerial Photo Monitoring Well Stream Gauge Previous Inspections	Saturation present? (includes capillary fringe)	Saturation Depth (inches):	0			
	Recorded Data: Aerial Photo Monito	ring Well Stream Gauge Previous In	spections			

															•		
Project/Site:	Zim Sod				Applicant/0	Owner: <u>Z</u>	im Soc	<u>d</u>	City/County:	St. Louis		State:	MN	Samı	pling Date:	<u>11/18/10</u>	
Investigator(s)	: <u>TPT</u>				Section:	<u>11</u>			Township: 5	<u>55</u>		Range:	<u>18</u>	Samı	pling Point:	#14 E of N13	<u>3</u>
Land Form:	Terrace				Local Relie	ef:			Slope %:			Soil Map	o Unit Nai	me:	Greenwood	soils B14A	
Subregion (LR	?R): <u>K</u>				Latitude:				Longitude:			Datum:					
	Classification:				Circular 3	39 Classific	ation:	<u>7</u>									
	drologic conditio	ons on the	site typica	al for this					in in remarks))	Eggers	& Reed (p	orimary):	<u>C</u>	Coniferous S	<u>wamp</u>	
Are vegetation	No S	Soil No	Н	ydrology	No	significan	tlv disti	urbed?	Are "normal	Yes	-	& Reed (s		/) :			
Are vegetation	_			ydrology	_	naturally _l			circumstance			& Reed (t					
-	_	_			<u>No</u>				present?			& Reed (d			_		
SUMMAR	Y OF FIND	NGS -	Attaci	h site	map si	howing	sar	npling p	point loca	ations,	transe	ects, ir	nporta	ant f	features	, etc.	
Hydric soil pre Wetland hydro			Yes Yes	answers	(explain a if needed). tional Wetl		D:										
VEGETA1	TION																
						Abso	olute	<u>Dominant</u>		. <u>D</u>	ominance	Test Wo	rksheet:				
Tree Str	atum_	(Plot	Size:) <u>% Co</u>	<u>over</u>	Species?	Status *		umber of	Dominan	t Species	s			
1. Larix lar	ricina						40	Yes	FACW		hat Are O					3 <i>(A)</i>	
2.							0				otal Numb					3 <i>(B)</i>	
3.							0			II	pecies Ac					_ (2)	
4.				To	otal Cover		40				ercent of I hat Are Ol				100.009	% (A/B)	
Sapling/	Shrub Stratum	(Plot	Size:)	_			늗		11. 141					
1. Larix lar	icina						60	Yes	FACW		revalence			:		M. 14	
2. Rubus i	daeus ssp. strigo	sus					15	Yes	FACW			al % Cove	er or:		X 1	Multiply by:	0
3.							0				BL Specie			0 115		23	_
4.5.							0				ACW Spe			0	X 2 X 3		0
J.				To	otal Cover		75				AC Specie			0	X 4		0
Herb Str	atum_	(Plot	Size:)	_			ll ll	ACU Spec			0	X 5		0
1.						_	0				PL Specie olumn To		-	115	(A)	2;	30 (B)
2.							0				oiuiiiii 10		lence Inc			2.0	_
3.							0					11074	ience inc	JOX I	<i>D/A</i>		
4.5.							0			— <u>Ну</u>	drophytic	: Vegetati	ion Indica	ators:			
6.							0			-11_	Yes I	Rapid Tes	st for Hyd	droph	ytic Vegetat	ion	
7.							0			$\exists \parallel_{-}$	Yes L	Dominan	ce Test is	s >50%	%		
8.							0			_ _	Yes I	Preveland	e Index :	≤ 3.0 [[1]		
		(DL: (0'	To	otal Cover	"	<u>0</u>								ons [1] (pro r on a sepa	vide suppor	rting data
. —	/ine Stratum	(Plot	Size:			<u>,</u>	0			-		_			•	n [1] (Explai	n)
1. 2.							0						-		-	be present, un	
				To	otal Cover		•	* In USFWS	Region 3		turbed or p			u nyt	arology must	ve present, un	
							_	III USEVVS	negion s	Ну	drophytic v	vegetation	present?	?	Yes		
Remarks:										11 -		-			-		
	o numbers here	or on a s	separate :	sheet)													

SOIL Sampling Point: #14 E of N13

Depth Matrix	ded to document the indicator or confirm the abscence Redox Features	e of indicators).			
(inches) Color (moist)	% Color (moist) %	Type [1]	Loc [2]	Texture	Remarks
1 0 - 8 10yr 2/1				Fibric peat	
8 - 18 10yr 2/1				Fibric peat	Saturated to 8"
3 -					
k - -				-	
5 6					
 [1] Type: C=Concentration, D=Depletion, RM=R	Peduced Matrix, CS=Covered or Coated Sand Grains	[2] Location: I	PL=Pore L	ining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs, (unless otherwise noted)	Ind	licators fo	r Problematic Hydric S	oils [3]:
✓ Histosol (A1)	Stripped Matrix (S6)		2 cm Muc	k (A10) (LRR K, L, MLR	A 149B)
☐ Histic Epipedon (A2)	☐ Dark Surface (S7) (LRR R, MLRA 149B)		Coast Pra	irie Redox (A16) (LRR F	K, L, R)
Black Histic (A3)	Polyvalue Below Surface (S8) (LRR R, MLRA 14	9B)	5 cm Muc	ky Peat or Peat (S3) (LF	RR K, L, R)
Hydrogen Sulfide (A4)	Thin Dark Surface (S9) (LRR R, MLRA 149B)		Dark Surfa	ace (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K, L)		Polyvalue	Below Surface (S8) (LR	RK, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)		Thin Dark	Surface (S9) (LRR K, L)
Thick Dark Surface (A12)	Depleted Matrix (F3)		Iron-Mang	ganese Masses (F12) (L	RR K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)		Piedmont	Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)		Mesic Spo	odic (TA6) (MLRA 144A,	145, 149B)
Sandy Redox (S5)	Redox Depressions (F8)		Red Pare	nt Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation and wetland	I hydrology must be present, unless disturbed or problema	tic.	Very Shall	low Dark Surface (TF12	remarks)
Restrictive Layer (if present): Type:	Depth (inches): -		Ну	dric soil present?	Yes
Remarks: Saturated to 8"					
YDROLOGY					
Wetland Hydrology Indicators:					
Primary Indicators (minimum of one required; c	heck all that apply)	Secondar	y Indicato	rs (minimum of two re	quired)
Surface Water (A1)	Water-Stained Leaves (B9)	Surfac	e Soil Crad	cks (B6)	FAC-Neutral Test (D5)
☐ High Water Table (A2)	Aquatic Fauna (B13)	Draina	ge Pattern	s (B10)	
✓ Saturation (A3)	Marl Deposits (B15)	Moss 7	Trim Lines	(B16)	
Water Marks (B1)	☐ Hydrogen Sulfide Odor (C1)	Dry-Se	eason Wate	er Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living Roots	Crayfis	sh Burrows	: (C8)	
Drift Deposits (B3)	(where not tilled) (C3)	Satura	tion Visible	e on Aerial Imagery (C9)	
Algal Mat or Crust (B4)	Presence of Reduced Iron (C4)	Stunte	d or Stress	sed Plants (D1)	
☐ Iron Deposits (B5)	Recent Iron Reduction in Tilled Soils (C6)	Geomo	orphic Pos	ition (D2)	
Inundation Visible on Aerial Imagery (B7)	Thin Muck Surface (C7)	Shallo	w Aquitard	(D3)	
Sparsely Vegetated Concave Surface (B8)	Other (explain in remarks)	Microto	opographic	Relief (D4)	
Field Observations:					
	— • • · · · · · · · · · · · · · · · · ·		Wetlan	d hydrology present?	<u>Yes</u>
Surface water present?	Surface Water Depth (inches):	_			
•	Water Table Depth (inches):	-	Describ	be Recorded Data:	
Water table present?		-	Describ	be Recorded Data:	
Surface water present? Water table present? Saturation present? (includes capillary fringe) Recorded Data:	Water Table Depth (inches):	tions	Descrik	pe Recorded Data:	

Project/Sit	e: Zim So	<u>d</u>			Applicant/	Owner.	Zim Sc	<u>od</u>	City/County:	St. Louis	s Sta	te:	<u>MN</u>	Sam	npling Date:	<u>11/18/10</u>	
Investigato	or(s): MAJ				Section:	<u>11</u>			Township:	<u>55</u>	Rar	nge:	<u>18</u>	Sam	npling Point:	#15 NE Corner of	f N08
Land Form	n: <u>Terrace</u>	<u>)</u>			Local Reli	ef:			Slope %:		Soil	І Мар	Unit Na	me:	Greenwood	B14A	
Subregion	(LRR): <u>k</u>				Latitude:				Longitude:		Dat	um:					
NWI/Cowa	ardin Classificatio	n: up	oland_		Circular 3	39 Clas	sification	upland									
Are climati	ic/hydrologic con	ditions o	n the site t	ypical for this	time of yea	ar?	Yes	(If no, expla	ain in remarks))	Eggers & Re				<u>Upland</u>		
Are vegeta	ation <u>Yes</u>	Soil	Yes	Hydrology	Yes	signifi	icantly dis	sturbed?	Are "normal	Yes	Eggers & Re			y):			
Are vegeta		Soil	No	Hydrology	No	-	ally proble		circumstance present?		Eggers & Re	,	• • • • • • • • • • • • • • • • • • • •				
-									•		Eggers & Re						
SUMMA	RY OF FIN	IDING	S - Att	ach site	map s	how	ing sa	mpling	point loca	ations,	transects	s, im	port	ant	features	, etc.	
Hydric soil Wetland h	ic vegetation pre present? ydrology present pled area within	?	<u>Ye</u> <u>Ye</u> <u>No</u> nd? <u>No</u>	answers	s (explain a if needed) ational Wet):		ed sod field. NE	E corner of Red F	Fox field.							
VEGET	ATION																
						_	bsolute	Dominan		<u> </u>	Oominance Tes	t Wor	ksheet	<u> </u>			
<u>Tree</u>	<u>Stratum</u>		(Plot Size):) 2	6 Cover	Species?	Status *		lumber of Dom					1 (4)	
1.							0				hat Are OBL, F	ACW	or FAC): 		1 (A) —	
2. 3.							0				otal Number of Species Across					1 <i>(B)</i>	
4.							0				Percent of Dom			s		_	
				7	otal Cove	r:	<u>0</u>			7	hat Are OBL, F	ACW	or FAC); 	100.00	% (A/B) —	
Sapl	ing/Shrub Strati	<u>um</u>	(Plot Size):)				P	revalence Inde	x Woı	rksheet	t:			
1.							0				Total % (-		Multiply by:	
2. 3.							0			$-\parallel$	OBL Species			0	X 1	0	
4.							0				ACW Species			0	X 2	0	
5.							0				AC Species			95	X 3	285	
				Т	otal Cove	r:	<u>0</u>				ACU Species			0	X 4	0	
<u>Herb</u>	Stratum		(Plot Size):)				lι	IPL Species			0	X 5	0	
	pratensis						95	Yes	FAC	0	Column Totals:			95	(A)	285	(B)
 3. 							0				P	revale	ence In	dex =	B/A =	3.00	
4.							0			Н	ydrophytic Veg	etatio	n Indic	ators	:		
5. c						_ -	0			_ -					- nytic Vegeta	tion	
6. 7.							0			-11 -	Yes Domi	inance	e Test i	s >50	%		
8.							0			-11-	Yes Preve	elance	Index	≤ 3.0	[1]		
147	4 15 - 00 - 0		(Diet Size		otal Cove	r:	<u>95</u>								ions [1] (pro or on a sepa	ovide supporting	data
	dy Vine Stratun	!	(Plot Size			<i>,</i>	0			_ -					•	n [1] (Explain)	
1. 2.							0						-		_	be present, unless	
				Т	otal Cove		<u>0</u>	* In USFW	S Region 3	dis	sturbed or proble	matic.		 y		p. ceenig amood	
								551 77		Hy	ydrophytic veget	tation _i	present	?	<u>Yes</u>		
Remarks: (include p	hoto numbers	here or	on a sepai	rate sheet)													

SOIL Sampling Point: #15 NE Corner of N08

Profile Description: (Describe to the depth need Depth Matrix	ed to document the indicator or confirm the abscenc Redox Features).		
(inches) Color (moist)	% Color (moist) %	Type [1]	Loc [2]	Texture	Remarks
1. 0 - 36 10yr2/1 2				fibric peat mostly	some hemic below 30"
3					
	duced Matrix, CS=Covered or Coated Sand Grains				. // . 101
Hydric Soil Indicators: (applicable to all LRRs, u		In		r Problematic Hydric S	
✓ Histosol (A1)	Stripped Matrix (S6)			ck (A10) (LRR K, L, MLR)	
Histic Epipedon (A2)	☐ Dark Surface (S7) (LRR R, MLRA 149B)		-	airie Redox (A16) (LRR K	,
☐ Black Histic (A3)	Polyvalue Below Surface (S8) (LRR R, MLRA 14	19B)		cky Peat or Peat (S3) (LR	R K, L, R)
Hydrogen Sulfide (A4)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)		-	face (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K, L)		_	e Below Surface (S8) (LR	
Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)		_	k Surface (S9) (LRR K, L)	
Thick Dark Surface (A12)	Depleted Matrix (F3)		Iron-Man	ganese Masses (F12) (LI	RR K, L, R)
Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)		Piedmon	t Floodplain Soils (F19) (I	MLRA 149B)
Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)		Mesic Sp	odic (TA6) (MLRA 144A,	145, 149B)
Sandy Redox (S5)	Redox Depressions (F8)		Red Pare	ent Material (TF2)	Other (explain in soil
[3] Indicators of hydrophytic vegetation and wetland	hydrology must be present, unless disturbed or problema	atic.	Very Sha	llow Dark Surface (TF12)	remarks)
Restrictive Layer (if present): Type:	Depth (inches):		H	ydric soil present?	<u>Yes</u>
Remarks: Saturated at 34"					
		I			
HYDROLOGY		I			
HYDROLOGY Wetland Hydrology Indicators:	andrall that analys	Cassarda			in all
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch		_		ors (minimum of two red	
HYDROLOGY Wetland Hydrology Indicators:	Water-Stained Leaves (B9)	Surfa	ce Soil Cra	cks (B6)	quired) FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch	☐ Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13)	Surfa Drain	ce Soil Cra age Patteri	cks (B6) ns (B10)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch	Water-Stained Leaves (B9)☐ Aquatic Fauna (B13)☐ Marl Deposits (B15)	Surfa Drain Moss	ce Soil Cra age Patteri Trim Lines	cks (B6) ns (B10) (B16)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. Surface Water (A1) High Water Table (A2)	 Water-Stained Leaves (B9) ☐ Aquatic Fauna (B13) ☐ Marl Deposits (B15) ☐ Hydrogen Sulfide Odor (C1) 	Surfa Drain Moss Dry-S	ce Soil Cra age Patteri Trim Lines Season Wa	cks (B6) ns (B10) (B16) ter Table (C2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. Surface Water (A1) High Water Table (A2) Saturation (A3)	 Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots 	Surfa Drain Moss Dry-S Crayfi	ce Soil Cra age Patteri Trim Lines Season Wa	cks (B6) ns (B10) (B16) ter Table (C2) s (C8)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1)	 Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) 	Surfa Drain Moss Dry-S Crayfi	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow	cks (B6) ns (B10) (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2)	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4)	Surfa Drain Moss Dry-S Crayfi	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow	cks (B6) ns (B10) (B16) ter Table (C2) s (C8)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3)	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6)	Surfa Drain Moss Dry-S Crayfi Satur	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow	cks (B6) ns (B10) (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. Surface Water (A1) High Water Table (A2) Saturation (A3) Water Marks (B1) Sediment Deposits (B2) Drift Deposits (B3) Algal Mat or Crust (B4)	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7)	Surfa Drain Moss Dry-S Crayfi Satur Geon	ce Soil Cra age Patteri Trim Lines Season Wa ish Burrow ation Visible	cks (B6) ns (B10) (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. 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)	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6)	Surfa Drain Moss Dry-S Crayfi Saturt Stunte Geon Shalle	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow ation Visibled or Stres norphic Pos	cks (B6) ns (B10) (B16) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. 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) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7)	Surfa Drain Moss Dry-S Crayfi Saturt Stunte Geon Shalle	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow ation Visibl ed or Stres norphic Pos ow Aquitaro topographi	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. 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) Sparsely Vegetated Concave Surface (B8)	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7)	Surfa Drain Moss Dry-S Crayfi Saturt Stunte Geon Shalle	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow ation Visibl ed or Stres norphic Pos ow Aquitaro topographi	cks (B6) ns (B10) left (B16) set (C2) set (C8) e on Aerial Imagery (C9) set Plants (D1) sition (D2)	
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. 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) Sparsely Vegetated Concave Surface (B8) Field Observations:	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (explain in remarks)	Surfa Drain Moss Dry-S Crayfi Saturt Stunte Geon Shalle	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow ation Visibled or Stres porphic Pos topographi Wetlar	cks (B6) ns (B10) ter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. 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) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present?	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (explain in remarks)	Surfa Drain Moss Dry-S Crayfi Saturt Stunte Geon Shalle	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow ation Visibled or Stres porphic Pos topographi Wetlar	cks (B6) ns (B10) leter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	FAC-Neutral Test (D5)
HYDROLOGY Wetland Hydrology Indicators: Primary Indicators (minimum of one required; ch. 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) Sparsely Vegetated Concave Surface (B8) Field Observations: Surface water present? Water table present? Saturation present? (includes capillary fringe)	Water-Stained Leaves (B9) Aquatic Fauna (B13) Marl Deposits (B15) Hydrogen Sulfide Odor (C1) Oxidized Rhizospheres on Living Roots (where not tilled) (C3) Presence of Reduced Iron (C4) Recent Iron Reduction in Tilled Soils (C6) Thin Muck Surface (C7) Other (explain in remarks) Surface Water Depth (inches): Water Table Depth (inches):	Surfa Drain Moss Dry-S Crayfi Saturt Stunte Geon Micro	ce Soil Cra age Pattern Trim Lines Season Wa ish Burrow ation Visibled or Stres porphic Pos topographi Wetlar	cks (B6) ns (B10) leter Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) sition (D2) d (D3) c Relief (D4)	FAC-Neutral Test (D5)

Proj	ect/Site:	Zim Sod					Applicant	/Own	er: Zim So	<u>d</u>	City/County:	St. Louis	8	State:	MN	San	npling Date:	11/18	<u>3/10</u>
Inve	stigator(s):	<u>MAJ</u>					Section:		11		Township: 5	55	I	Range:	<u>18</u>	San	npling Point:		NW Corner of
Land	d Form:	Terrace					Local Rel	ief:	_		Slope %:				o Unit Na	me:	Greenwood	N12 Soils	B14A
	region (LRR):						Latitude:				Longitude:			Datum:					
	/Cowardin Cl	_	· up	land				39 CI	assification:	upland	3								
	climatic/hydro				te typi	ical for this			<u>Yes</u>		ain in remarks))	Eggers & Eggers &		• • • • • • • • • • • • • • • • • • • •		<u>Upland</u>		
Are	vegetation	<u>Yes</u>	Soil	Yes		Hydrology	Yes	sigr	nificantly dist	turbed?	Are "normal	Yes	Eggers &			,,-			
Are	vegetation	<u>No</u>	Soil	No		Hydrology	No	nati	urally proble	matic?	circumstance present?	78	Eggers &			y):			
SUN	ΛΜΔRY (OF FIN	DING	:S - 4	\tta	ch site	man s	hov	vina sa	mplina i	point loca	ations					features	et e	c
Hydi Hydi Weti Is th	rophytic vege ric soil presen land hydrolog e sampled an	tation pres t? y present? ea within a	ent?		Yes Yes No No	Remarks answers	s (explain if needed tional We	any):	Tile draine	d sod field		,							
VEC	SETATIO	ON																	
	Tree Stratu	m_		(Plot S	Size:)	Absolute % Cover	Dominan Species?			ominance 1			•			
1.				<u> </u>					0				umber of Do hat Are OBL					1 (A)
2.									0				otal Numbe	r of Do	minant			_	
3.									0				pecies Acro					1 (/	B)
4.									0				ercent of Do				100.00	% (/	A/B)
	Carlina/Cha			/DI-4 0	·	1	otal Cove	er:	<u>0</u>				nat Are Obl	., I AUI	VOLTAG	,. 			,
4	Sapling/Shr	ud Stratui	<u>n</u>	(Plot S	ize:				0			<u>Pr</u>	<u>revalence In</u>	dex W	<u>orksheet</u>	<u>:</u>			
1. 2.									0			$-\parallel$	Total	% Cove	er of:			Multip	oly by:
3.									0			o	BL Species	_		0	X 1		0
4.									0			F/	ACW Specie	es _		0	X 2		0
5.									0			F/	AC Species	_		95	X 3		285
	Hart Orac			/DIa4 C	·:	10	otal Cove	r:	<u>0</u>			F/	ACU Specie	s _		0	X 4		0
	Herb Stratu			(Plot S	ize:)	0.5	Yes	F40	U	PL Species	_		0	X 5		0
1. 2.	Poa praten	SIS							95	168	FAC	C	olumn Tota	ls: _		95	(A)		285 (B)
3.									0					Preva	lence In	dex =	B/A =		3.00
4.									0			Hv	drophytic V	/egetat	ion Indic	ators			
5.									0								- hytic Vegeta	tion	
6. 7.									0			_ -		•	ce Test i	•			
7. 8.									0			-			ce Index				
	Woody Vine	Stratum		(Plot S	Size:	T	otal Cove	r:	<u>95</u>			_ -	No Mo	orpholo	gical Ad	aptat			supporting data heet)
1.	**OOGY VIIIE	Juatuili		1, 101.0				′	0					•			tic Vegetatio		
2.						T	otal Cove	r:	0 <u>0</u>	* In 1105W	O Bassian 2		Indicators of turbed or pro			and hy	/drology mus	t be pre	esent, unless
									<u>*</u>	* In USFW	o kegion 3	Ну	drophytic ve	getatior	n present	?	Yes		
	narks: lude photo n	umbers h	ere or o	on a se	parat	e sheet)													

SOIL Sampling Point: #16 NW Corner of N12

-	(Describe to the depth needs	ed to document			f indicate	ors).				
Depth (inches)	Matrix Color (moist)	%	Color (moist)	x Features %	Type [1]	Loc [2]	Texture	Remarks		
1. 0 - 36 1	10yr2/1						fibric & hemic peat	woody frags 30-36"		
2										
_										
6 [1] Type: C=Concer	ntration, D=Depletion, RM=Re	duced Matrix, C	CS=Covered or Coated Sand	d Grains [2	2] Locatio	on: PL=Pore	Lining, M=Matrix.			
Hydric Soil Indicato	rs: (applicable to all LRRs, u	nless otherwise	noted)			Indicators fo	or Problematic Hydric So	oils [3]:		
✓ Histosol (A1)		Stripped	Matrix (S6)			2 cm Mu	ck (A10) (LRR K, L, MLRA	A 149B)		
Histic Epipedon (A2)	Dark Su	rface (S7) (LRR R, MLRA 149	9B)		Coast Pr	airie Redox (A16) (LRR K	, L, R)		
☐ Black Histic (A3)		Polyvalu	e Below Surface (S8) (LRR F	R, MLRA 149E	3)	5 cm Mu	cky Peat or Peat (S3) (LR	R K, L, R)		
☐ Hydrogen Sulfide	(A4)	Thin Da	rk Surface (S9) (LRR R, MLR	A 149B)		Dark Sur	face (S7) (LRR K, L)			
Stratified Layers	(A5)	Loamy N	Mucky Mineral (F1) (LRR K, L))		Polyvalue	e Below Surface (S8) (LR	R K, L)		
Depleted Below L	Dark Surface (A11)	Loamy (Gleyed Matrix (F2)			Thin Dan	k Surface (S9) (LRR K, L)			
Thick Dark Surface	ce (A12)	Depleted	d Matrix (F3)			Iron-Man	ganese Masses (F12) (LF	RR K, L, R)		
Sandy Mucky Mir	neral (S1)	Redox D			Piedmon	t Floodplain Soils (F19) (N	MLRA 149B)			
Sandy Gleyed Ma	atrix (S4)	Depleted	d Dark Surface (F7)			Mesic Sp	oodic (TA6) (MLRA 144A,	145, 149B)		
Sandy Redox (S5	5)	Redox D	Pepressions (F8)			Red Pare	ent Material (TF2)	Other (explain in soil		
[3] Indicators of hydro	ophytic vegetation and wetland i	hydrology must b	pe present, unless disturbed o	or problematic		Very Sha	allow Dark Surface (TF12)	remarks)		
Restrictive Layer (if	present): Type:		Depth (inches):	_	Н	ydric soil present?	Yes		
Remarks: Nearly sate	urated @ 36" but not above									
HYDROLOGY	,									
Wetland Hydrology	Indicators:									
Primary Indicators (minimum of one required; ch	eck all that app	ly)		Seco	ndary Indicate	ors (minimum of two req	uired)		
Surface Water (A	1)	☐ Wat	er-Stained Leaves (B9)		☐ Sι	ırface Soil Cra	icks (B6)	FAC-Neutral Test (D5)		
High Water Table		Aqu	atic Fauna (B13)		☐ Di	ainage Patter	ns (B10)			
Saturation (A3)		Man	Deposits (B15)		Mo	oss Trim Lines	s (B16)			
Water Marks (B1))	☐ Hyd	rogen Sulfide Odor (C1)		DI	ry-Season Wa	ter Table (C2)			
Sediment Deposi	its (B2)		lized Rhizospheres on Living	Roots	CI	ayfish Burrow	s (C8)			
☐ Drift Deposits (B3	3)	(whe	ere not tilled) (C3)		Sá	aturation Visib	le on Aerial Imagery (C9)			
☐ Algal Mat or Crus	et (B4)	Pres	sence of Reduced Iron (C4)		St	unted or Stres	sed Plants (D1)			
☐ Iron Deposits (B5	☐ Iron Deposits (B5) ☐ Recent Iron Reduction in Tilled Soils (C6) ☐ Geomorphic Position (D2)									
☐ Thin Muck Surface (C7) ☐ Shallow Aquitard (D3)										
	ed Concave Surface (B8)	Othe	er (explain in remarks)		Mi	icrotopographi	ic Relief (D4)			
Field Observations:										
Surface water prese	ent?	Surfa	ce Water Depth (inches):			Wetlai	nd hydrology present?	<u>No</u>		
Water table present	?	Water	Table Depth (inches):			Descri	ibe Recorded Data:			
Saturation present?	(includes capillary fringe)	Satura	ation Depth (inches):							
Recorded Data:	Aerial Photo Monitor	ing Well	Stream Gauge Previo	us Inspectio	ns					
Hydrology Remarks										

Pro	ject/Site:	Zim Sod					Applican	ıt/Own	er: Zim So	o <u>d</u>	City/County:	St. Louis	<u>s</u> Sta	ate: MN	. Sa	ampling Date:	11/18/10
Inv	estigator(s):	MAJ					Section:		<u>11</u>		Township: 5	<u>55</u>	Ra	nge: <u>18</u>	Sá	ampling Point:	#17 S of SW corner of
Lar	nd Form:	Terrace					Local Re	elief:			Slope %:		So	il Map Un	it Name:	Greenwoo	
Sul	bregion (LRR):	<u>k</u>					Latitude:				Longitude:		Da	tum:			
NN	/I/Cowardin Cl	assification	:				Circular	r 39 Cl	assification:	<u>7</u>							
Are	climatic/hydro	ologic condi	tions o	n the si	te typi	cal for this	time of y	ear?	<u>Yes</u>	(If no, expla	ain in remarks))	Eggers & Re		• /	Coniferous	<u>Swamp</u>
Are	vegetation	<u>No</u>	Soil	<u>No</u>		Hydrology	No	sigi	nificantly dis	turbed?	Are "normal	Yes	Eggers & Re		• •		
Are	vegetation	<u>No</u>	Soil	<u>No</u>	ı	Hydrology	<u>No</u>	nat	urally proble	ematic?	circumstance present?	es"	Eggers & Re				
SU	MMARY (OF FINE	DING	S - A	Attac	ch site	map s	shov	wing sa	mpling	point loca	ations,	transects			t feature:	s, etc.
Hyd We	drophytic vege dric soil preser tland hydrolog he sampled an	nt? ry present?		d?	Yes Yes Yes Yes	Remarks answers If yes, op	if needed	d):		Porcupine field							
/E	GETATIO	ON															
	Tree Stratu	<u>m</u>		(Plot S	Size:)	Absolute % Cover	Dominan Species?		_ <u>_</u>	ominance Tes				
1.	Larix laricir	na							60	Yes	FACW		hat Are OBL,				2 (A)
2.	Picea mari	ana							20	Yes	FACW		otal Number o				3 <i>(B)</i>
3.4.									0				pecies Across Percent of Dom				
7.						Т	otal Cov	er:	80				hat Are OBL, I			66.67	7% (A/B)
	Sapling/Shi	ub Stratur	<u>n</u>	(Plot S	ize:)				F	revalence Inde	y Works	heet:		
1.									0					Cover of			Multiply by:
2.									0			_ -	BL Species		20	X 1	20
 4. 									0				ACW Species		80	X 2	160
5.									0				AC Species		(X 3	0
						T	otal Cov	er:	<u>0</u>			F	ACU Species		(<u>X 4</u>	0
	Herb Stratu			(Plot S	ize:)					IPL Species		(<u> X 5</u>	0
1.	Calamagro		nsis						10 60	No Yes	OBL	c	olumn Totals:		100	<u>O</u> (A)	180 (B)
 3. 	Sphagnum Carex lasio								10	No	OBL		F	Prevalenc	e Index	r = B/A =	1.80
4.									0			Н	/drophytic Ved	netation I	ndicato	rs·	
5.									0			"				<u>rs.</u> phytic Vegeta	ation
6. 7.									0			-		inance T	•		
8.									0			$-\parallel$	Yes Prev	elance In	dex ≤ 3	.0 [1]	
	Woody Vine	Ctuatum		(Plot S	izo:	T	otal Cov	er:	<u>80</u>							ations [1] (pass or on a sep	rovide supporting data arate sheet)
1.	woody vine	Stratum		(FIOL C	1126.				0			-		•		•	on [1] (Explain)
2.						T	otal Cov	er:	0 <u>0</u>	***************************************			Indicators of hy sturbed or proble		wetland	hydrology mus	st be present, unless
						,	507		<u>v</u>	^ In USFW	S Region 3	Hy	vdrophytic vege	tation pre	sent?	Yes	
	marks: clude photo n	umbers he	ere or o	on a se	parate	e sheet)						• •					

SOIL Sampling Point: #17 S of SW corner of N14

Profile Description: (Descri	ibe to the depth needed	I to document the inc	licator or confirm the a	bscence	of indicato	ors).		
Depth (inches)	Matrix Color (moist)		Redox F	eatures %	Type [1]	Loc [2]	Texture	Remarks
(<i>inches)</i>	Obioi (moist)				Type [1]		Texture	- Nomarks
1. 0 - 8 10yr2/1 8 - 36 10yr2/1							hemic peat fibric peat	
2. <u>8 - 36</u> 10912/1						-	libric peat	
4								
5								<u> </u>
6	De Daniella in Diffe Danie							
[1] Type: C=Concentration	-			arains [-		Lining, M=Matrix.	:In 191.
Hydric Soil Indicators: (app	DIICADIE TO AII LKKS, UNI	_					or Problematic Hydric So	• •
✓ Histosol (A1)		Stripped Matrix		١		_	ck (A10) (LRR K, L, MLRA	
Histic Epipedon (A2)			7) (LRR R, MLRA 149B,		D)		airie Redox (A16) (LRR K,	,
Black Histic (A3)			/ Surface (S8) (LRR R, I		В)		cky Peat or Peat (S3) (LRI	₹ K, L, K)
Hydrogen Sulfide (A4)			ce (S9) (LRR R, MLRA	1496)			face (S7) (LRR K, L)	ווער
Stratified Layers (A5)	face (A11)	_ · ·	lineral (F1) (LRR K, L)			_ ′	Below Surface (S8) (LRF	Λ Λ, <i>L)</i>
Depleted Below Dark Sur Thick Dark Surface (A12)	. ,	Loamy Gleyed I	. ,				k Surface (S9) (LRR K, L)	ו א פו
Sandy Mucky Mineral (S		☐ Depleted Matrix☐ Redox Dark Sui	• •				ganese Masses (F12) (LR t Floodplain Soils (F19) (N	•
Sandy Gleyed Matrix (S4	•	Depleted Dark S					odic (TA6) (MLRA 144A,	
Sandy Redox (S5)	<i>'</i>	Redox Depressi					ent Material (TF2)	_
			, ,				llow Dark Surface (TF12)	Other (explain in soil remarks)
[3] Indicators of hydrophytic v	egetation and wetland hy	drology must be prese	nt, unless disturbed or p	problemation	C.	very ona	now bank durace (11 12)	,
Restrictive Layer (if presen	t): Type:		Depth (inches):			Н	ydric soil present?	<u>Yes</u>
Remarks: saturated to surface	, waterlogged at surface.							
HYDROLOGY								
Wetland Hydrology Indicate	ors:							
Primary Indicators (minimu		ck all that apply)			Secon	dary Indicate	ors (minimum of two req	uired)
Surface Water (A1)	•		ed Leaves (B9)		Su	rface Soil Cra	cks (B6)	FAC-Neutral Test (D5)
☐ High Water Table (A2)		Aquatic Fau	na (B13)		Dra	ainage Patteri	ns (B10)	
✓ Saturation (A3)		Marl Depos	its (B15)		Mo	ss Trim Lines	(B16)	
Water Marks (B1)		Hydrogen S	ulfide Odor (C1)		☐ Dr	y-Season Wa	ter Table (C2)	
Sediment Deposits (B2)			izospheres on Living Ro	oots	Cra	ayfish Burrow	s (C8)	
Drift Deposits (B3)		(where not	illed) (C3)		Sa	turation Visibl	e on Aerial Imagery (C9)	
Algal Mat or Crust (B4)		Presence o	Reduced Iron (C4)		Stu	unted or Stres	sed Plants (D1)	
Iron Deposits (B5)		Recent Iron	Reduction in Tilled Soils	s (C6)	☐ Ge	omorphic Pos	sition (D2)	
☐ Thin Muck Surface (C7) ☐ Shallow Aquitard (D3)								
Sparsely Vegetated Cond		Other (expla	nin in remarks)		Mid	crotopographi	c Relief (D4)	
Field Observations:								
Surface water present?		Surface Water	er Depth (inches):			Wetlar	d hydrology present?	<u>Yes</u>
Water table present?		Water Table	Depth (inches):			Descri	be Recorded Data:	
Saturation present? (includ	les capillary fringe)	✓ Saturation D	epth (inches):	0				
Recorded Data: Aeria	I Photo Monitorin	g Well Stream	Gauge Previous	Inspection	ons			
Hydrology Remarks: Satu	rated to surface, waterlogged	1 at curface						

Pro	ject/Site:	Zim Sod					Applican	ıt/Owne	er: Zim So	<u>od</u>	City/Coun	nty: St. Lou	<u>iis</u>	State:	MN	Sam	pling Date:	<u>11/18/</u>	<u>10</u>	
Inve	estigator(s):	<u>MAJ</u>					Section:	<u>1</u>	<u>11</u>		Township	: <u>55</u>		Range	e: <u>18</u>	Sam	pling Point:		of N14/E	<u>Isner</u>
Lan	nd Form:	Terrace					Local Re	elief:			Slope %:				ap Unit Naı	ne:	Greenwood	Rd B14A		
Sub	oregion (LRR).	: k					Latitude:				Longitude):		Datum):					
NW	/I/Cowardin CI	_ lassification	:				Circular	r 39 Cla	assification	: <u>6</u>										
	climatic/hydro			n the si	te typi	cal for this	time of ye	ear?	<u>Yes</u>	(If no, exp	lain in rema	rks)	-	gers & Reed gers & Reed			Shrub-Carr			
Are	vegetation	<u>No</u>	Soil	<u>No</u>	ı	Hydrology	<u>No</u>	sign	nificantly dis	turbed?	Are "norm circumsta		s Egg	gers & Reed	(tertiary):					
Are	vegetation	<u>No</u>	Soil	No	ı	Hydrology	<u>No</u>	nati	urally proble	ematic?	present?		Egg	gers & Reed	(quaternar	y):				
SUI	MMARY (OF FINE	DING	is - A	\tta	ch site	map s	shov	ving sa	mpling	point lo	cations	s, trai	nsects,	importa	ant	features	, etc.		
Hyd We	drophytic vege dric soil preser tland hydrolog he sampled ar	nt? ny present?			Yes Yes Yes Yes	Remarks answers If yes, op	if needed	d):		orcupine field	I									
/E	GETATIO	ON																		
	Tree Stratu	<u>m</u>		(Plot S	ize:)	Absolute % Cover	<u>Dominal</u> Species				ance Test W						
1.	Larix laricir	na							10	Yes	FA	CW		re OBL, FAC				2 (A))	
2.									0					umber of D				4 (B))	
3.4.									0				•	s Across Al t of Domina					•	
•						Т	otal Cov	er:	<u>10</u>					re OBL, FAC			50.00°	% (A)	/B)	
	Sapling/Shi	rub Stratur	<u>n</u>	(Plot S	ize:)				l⊨	Prevale	nce Index V	Vorksheet:					
1.	Salix sp.								0		F.A	AC		Total % Co		•		Multiply	y by:	
 3. 									0		-		OBL Si	pecies		20	X 1		20	
 4. 									0					Species		10	X 2		20	
5.									0				FAC S	•		0	X 3		0	
						T	otal Cov	er:	<u>0</u>				FACUS	Species		0	X 4		0	
	Herb Stratu			(Plot S	ize:)			¬ —		UPL Sp	ecies		0	X 5		0	
1. 2.	Calamagro		ensis						20 15	Yes Yes	IO N		Columi	n Totals:		30	(A)		40	(B)
3.	Spirea alba Sphagnum								30	Yes		NI .		Prev	valence Inc	lex =	<i>B</i> / <i>A</i> =		1.33	
4.									0				Hydroni	nytic Vegeta	ation Indic:	ators				
5.									0				No				<u>:</u> rytic Vegeta	tion		
6.7.									0		-		No		nce Test is	•				
7. 8.									0				Yes	_	nce Index :					
	Woody Vine	e Stratum		(Plot S	ize:	T	otal Cov	er:	<u>65</u>			-	No	 Morpho	logical Ada	aptat	 ions [1] (pro or on a sepa			ıg data
1.								$\stackrel{\prime}{\Box}$	0				No	Problem	natic Hydro	phyt	tic Vegetatio	n [1] (E	xplain)	
2.						T	otal Cov	er:	0 <u>0</u>	* In USFW	VS Region 3			tors of hydric or problema		nd hy	drology must	be pres	ent, unles	s
										001 11	. J . logion (lydroph	ytic vegetati	on present?	?	<u>Yes</u>			
	marks: clude photo n	numbers he	ere or o	on a se	parate	e sheet)														

SOIL Sampling Point: #18 W of N14/Elsner Rd

Profile Description: (Describe to the depth need	ded to document the indicator or confirm the absc	ence of indicators).		
Depth Matrix (inches) Color (moist)	Redox Featu % Color (moist) %		.oc [2] Texture	Remarks
			hemic peat	 -
2. 10 - 36 10yr2/1			mostly fibric peat	
3				
4 5				
6				
[1] Type: C=Concentration, D=Depletion, RM=R	educed Matrix, CS=Covered or Coated Sand Grain	s [2] Location: P	L=Pore Lining, M=Matrix.	
Hydric Soil Indicators: (applicable to all LRRs, (unless otherwise noted)	Indi	cators for Problematic Hydric S	Soils [3]:
✓ Histosol (A1)	Stripped Matrix (S6)		2 cm Muck (A10) (LRR K, L, MLR	RA 149B)
Histic Epipedon (A2)	Dark Surface (S7) (LRR R, MLRA 149B)		Coast Prairie Redox (A16) (LRR	K, L, R)
Black Histic (A3)	Polyvalue Below Surface (S8) (LRR R, MLRA	A 149B)	5 cm Mucky Peat or Peat (S3) (Li	RR K, L, R)
☐ Hydrogen Sulfide (A4)	☐ Thin Dark Surface (S9) (LRR R, MLRA 149B)	Dark Surface (S7) (LRR K, L)	
Stratified Layers (A5)	Loamy Mucky Mineral (F1) (LRR K, L)		Polyvalue Below Surface (S8) (LF	RR K, L)
Depleted Below Dark Surface (A11)	Loamy Gleyed Matrix (F2)		Thin Dark Surface (S9) (LRR K, L	_)
Thick Dark Surface (A12)	Depleted Matrix (F3)		ron-Manganese Masses (F12) (L	•
Sandy Mucky Mineral (S1)	Redox Dark Surface (F6)		Piedmont Floodplain Soils (F19)	,
Sandy Gleyed Matrix (S4)	Depleted Dark Surface (F7)		Mesic Spodic (TA6) (MLRA 144A	, 145, 149B)
Sandy Redox (S5)	Redox Depressions (F8)		Red Parent Material (TF2)	Other (explain in soil remarks)
[3] Indicators of hydrophytic vegetation and wetland	I hydrology must be present, unless disturbed or proble	ematic.	Very Shallow Dark Surface (TF12) remarks)
Restrictive Layer (if present): Type:	Depth (inches):	-	Hydric soil present?	<u>Yes</u>
Remarks: saturated at 6"				
HYDROLOGY				
Wetland Hydrology Indicators:				
Primary Indicators (minimum of one required; ca	heck all that apply)	Secondary	Indicators (minimum of two re	equired)
Surface Water (A1)	Water-Stained Leaves (B9)		Soil Cracks (B6)	FAC-Neutral Test (D5)
☐ High Water Table (A2)	Aquatic Fauna (B13)		ne Patterns (B10)	
✓ Saturation (A3)	Marl Deposits (B15)	_	rim Lines (B16)	
Water Marks (B1)	Hydrogen Sulfide Odor (C1)	_ ,	ason Water Table (C2)	
Sediment Deposits (B2)	Oxidized Rhizospheres on Living Roots (where not tilled) (C3)		n Burrows (C8)	1
Drift Deposits (B3)	Presence of Reduced Iron (C4)	<u> </u>	ion Visible on Aerial Imagery (C9))
Algal Mat or Crust (B4)	Recent Iron Reduction in Tilled Soils (C6	·	or Stressed Plants (D1) rphic Position (D2)	
Iron Deposits (B5)	Thin Muck Surface (C7)		r Aquitard (D3)	
Inundation Visible on Aerial Imagery (B7)	Other (explain in remarks)	_	pographic Relief (D4)	
Sparsely Vegetated Concave Surface (B8)			•	
Field Observations:			Wetland hydrology present?	<u>Yes</u>
Surface water present?	Surface Water Depth (inches):			103
Water table present?	Water Table Depth (inches):		Describe Recorded Data:	
Saturation present? (includes capillary fringe)	Saturation Depth (inches):	6		
	oring Well Stream Gauge Previous Ins	pections		
Hydrology Remarks: saturated at 6 inches				

Pro	ject/Site:	Zim Sod				Appli	cant/Owr	ner: Zim So	<u>od</u>	City/County:	St. Louis	S	State:	MN	Sam	pling Date:	11/18/10	<u>)</u>
Inve	estigator(s):	<u>MAJ</u>				Secti	on:	<u>11</u>		Township: 5	<u>55</u>	F	Range:	<u>18</u>	Sam	pling Point:		land East of
Lan	nd Form:	Terrace				Local	l Relief:			Slope %:				Unit Na	me:	Greenwood	N09 B14A	
Sub	oregion (LRR).	k .				Latitu	ıde:			Longitude:		E	Datum:					
NW	/I/Cowardin CI	assification	:			Circ	ular 39 C	lassification	: <u>8</u>									
	climatic/hydro			n the site	typical for t	his time o	of year?	Yes	(If no, expl	lain in remarks)		Eggers & I		• •		Coniferous E	Bog	
Are	vegetation	<u>No</u>	Soil	<u>No</u>	Hydrolo	gy <u>No</u>	sig	nificantly dis	sturbed?	Are "normal circumstance	Yes Yes	Eggers & I			,			
Are	vegetation	<u>No</u>	Soil	<u>No</u>	Hydrolo	gy <u>No</u>	na	turally proble	ematic?	present?	3	Eggers & I	Reed (q	uaternar	y):			
SUI	MMARY (OF FINE	DING	S - At	tach si	te ma	p sho	wing sa	mpling	point loca	ations,	transec	ts, in	nporta	ant i	features	, etc.	
Hyd We	drophytic vege dric soil preser tland hydrolog he sampled ar	nt? ny present?		<u>Y</u> <u>Y</u>	es answ es	arks (exp ers if nee , optional			ear Paw field									
/E(GETATIO	DN																
				/Dlat Cia	20 # "	dina		Absolute % Cover	<u>Dominar</u> Species:			ominance T	est Wo	rksheet:				
	Tree Stratu			(Plot Siz	e: <u>30 ft ra</u>	<u>iaius</u>	,					umber of Do					3 (A)	
1. 2.	Larix laricir Picea mari							75 15	Yes No	FACW FACW	.—II	otal Number			•		_	
3.	1 loca man	unu						0		17.01		pecies Acro					4 (B)	
4.								0				ercent of Do				75.00	— % (A/E	:)
						Total (Cover:	<u>90</u>				hat Are OBL	., FACV	V or FAC	:		70 (1.112	,
4	Sapling/Shi			(Plot Siz	e: <u>15 ft ra</u>	<u>adius</u>)		NI.	FA0141		evalence In	dex Wo	orksheet:				
1. 2.	Cornus ser		ericea					10	No Yes	FACW FACU	$-\parallel$	Total 9	% Cove	r of:			Multiply	by:
3.	Ledum gro		1					30	Yes	OBL	o	BL Species			45	X 1		45
4.								0			F.	ACW Specie	es _		95	X 2		190
5.								0			F.	AC Species			0	X 3		0
	Hart Orac			(DI=4 C:=		Total C	over:	<u>45</u>			F.	ACU Specie	s _		10	X 4		40
4	Herb Stratu		!.	(PIOL SIZ	e: <u>5 ft rac</u>	<u>lius</u>)	45	Yes	ODI	∪	PL Species	_		0	X 5		0
1. 2.	Calamagro Sphagnum		ensis					15	162	OBL	c	olumn Total	ls:	1	150	(A)		275 (B)
3.	- γg	-r·						0					Preva	lence Ind	dex =	<i>B</i> / <i>A</i> =		1.83
4.								0			Hv	drophytic V	/egetati	on Indica	ators			
5.								0			_ "					: ytic Vegeta	tion	
6. 7.								0			- -		•	e Test is	•			
8.								0			$-\parallel$	Yes Pre	evelanc	e Index :	≤ 3.0	[1]		
	Woody Vine	Stratum		(Plot Siz	·o·	Total C	Cover:	<u>15</u>			_ -	No Mo	orpholo	gical Ad	aptati			pporting data et)
1.	vvoouy ville	Juatuiii		1, 101 012	···		,	0			- -		•			ic Vegetatio		•
2.						Total C	Cover:	0 <u>0</u>	* In 110514	(S Posice 2		Indicators of I turbed or prol			and hy	drology must	be preser	nt, unless
								-	111 USFW	/S Region 3	Ну	drophytic veg	getation	present:	?	<u>Yes</u>		
	marks: clude photo n	umbers he	ere or o	on a sepa	arate shee	·)												

SOIL Sampling Point: #19 Wetland East of N09

Profile Description: (Describe to the				indicators).			
Depth (inches) Color (moist) %	Color (moist)	eatures % T	ype [1]	Loc [2]	Texture	Remarks
1. 0 - 10 10yr2/1 2. 10 - 32 10yr2/1 3. 32 - 36 10yr2/1 4						hemic peat fibric peat hemic peat	
5	to all LRRs, unless otherw. Stripp Dark Polyv. Thin L		8) MLRA 149B)		licators fo 2 cm Muc Coast Pra 5 cm Muc Dark Surfa Polyvalue	Lining, M=Matrix. r Problematic Hydric So k (A10) (LRR K, L, MLRA hirie Redox (A16) (LRR K, ky Peat or Peat (S3) (LRF face (S7) (LRR K, L) Below Surface (S8) (LRR is Surface (S9) (LRR K, L)	149B) L, R) R K, L, R)
Thick Dark Surface (A12) Sandy Mucky Mineral (S1) Sandy Gleyed Matrix (S4) Sandy Redox (S5) [3] Indicators of hydrophytic vegetatio	Deple Redo:	ted Matrix (F3) x Dark Surface (F6) ted Dark Surface (F7) x Depressions (F8)	problematic. -		Iron-Mang Piedmont Mesic Spo Red Pare Very Shal	ganese Masses (F12) (LR Floodplain Soils (F19) (M odic (TA6) (MLRA 144A, 1 nt Material (TF2) llow Dark Surface (TF12) vdric soil present?	LRA 149B)
Remarks: saturated to surface							
Wetland Hydrology Indicators: Primary Indicators (minimum of on 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 Image Sparsely Vegetated Concave Sur	W A A A A A A A A A	pply) /ater-Stained Leaves (B9) quatic Fauna (B13) larl Deposits (B15) ydrogen Sulfide Odor (C1) xidized Rhizospheres on Living Rowner not tilled) (C3) resence of Reduced Iron (C4) ecent Iron Reduction in Tilled Soils hin Muck Surface (C7) tther (explain in remarks)		Surface Draina Moss Dry-Se Crayfis Satura Stunte Geome	e Soil Crace ge Pattern Trim Lines eason Wate sh Burrows tion Visible d or Stress orphic Pos w Aquitard	es (B10) (B16) er Table (C2) s (C8) e on Aerial Imagery (C9) sed Plants (D1) ition (D2)	uired) FAC-Neutral Test (D5)
Surface water present? Water table present? Saturation present? (includes capit	☐ Wa llary fringe) ☑ Sat	face Water Depth (inches): ter Table Depth (inches): uration Depth (inches):	0			d hydrology present? be Recorded Data:	Yes
Recorded Data: Aerial Photo Hydrology Remarks: Saturated to s	Monitoring Well urface	Stream Gauge Previous	s Inspection	s			