



Detailed Survey Report

Roseau River Watershed District
Watershed Ditch #4

Roseau County, MN
September 7, 2022



Detailed Survey Report

ROSEAU RIVER WATERSHED DISTRICT WATERSHED DITCH #4

Roseau River Watershed district

September 7, 2022

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.



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Appendices

- Appendix A: Petition for establishment of Roseau River Watershed District Watershed Ditch #4
- Appendix B: Whitney Lake Subwatershed Project Fact sheet
- Appendix C: Engineer's Opinion of Probable Cost
- Appendix D: Preliminary Hearing Findings and Order
- Appendix E: Wetland Delineation
- Appendix F: MnDNR & BWSR Preliminary Survey Report comment letters
- Appendix G: Detailed Viewer's Report – Exhibit 1

Executive Summary

A petition to the Roseau River Watershed District (RRWD) was filed for the establishment of a new ditch along Roseau County Road 115 (hereafter referred to as Roseau River Watershed District Watershed Ditch #4 or WD 4).

The petition states that the “proposed ditch be built and designed up to a 10-year event capacity in order to improve agricultural drainage” (see Appendix A for the complete petition). HDR submitted a Preliminary Survey Report on January 6th, 2021. The following document outlines the Detailed Survey Report for the proposed Roseau River Watershed Ditch #4.

The proposed design would provide all new culvert crossings and gentler side slopes of 4:1 (H:V) that can easily be maintained. The ditch bottom would be 8 feet wide from the Roseau River to Roseau County State Aid Highway 10 (CSAH 10) and transition to a 10 feet wide bottom from CSAH 10 to the upstream extents of the petitioned ditch system (Approximately 1,100 feet south of 300th St.). The available spoil would be constructed into a berm adjacent to the ditch. The berm will have a variable top width, 10:1 (H:V) slopes, and be set at a maximum elevation which will contain the 10-year 24-hour runoff within the established ditch. The berm will allow for water to breakout during larger rainfall events at the road crossings. Side inlets will be installed where berms are constructed through east-west roadside ditches, and at every major field ditch inlet as appropriate. Figure 1 displays the typical cross section of WD 4.

The recommended alternative is one that meets the design goals by keeping the water surface elevation for a 10-year rainfall event below the adjacent landscape or protected by a berm while also reducing roadway damages.

The Engineer’s Opinion of Probable Cost for the establishment of WD 4 is approximately \$1,237,399. This cost is based on 2022 rates. Additional cost savings could occur through future discussions with the petitioners during the preparation of the design and construction documents.

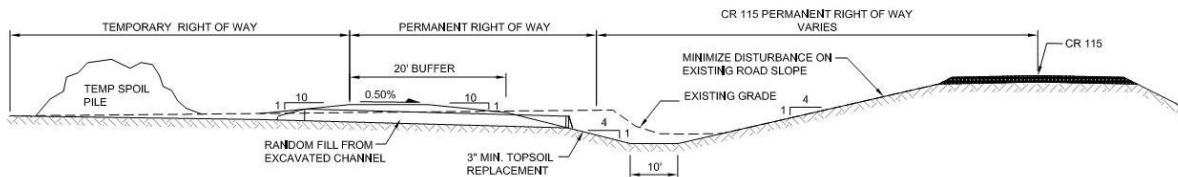


Figure 1. WD 4 Typical Cross-section

Introduction

The RRWD has received a 'Petition for Ditch' (Appendix A) according to Minnesota Statute 103E.212. This Detailed Survey Report for the establishment of Watershed Ditch 4 (WD 4) complies with Minnesota Statute 103E.285. WD 4 is located in Dieter and Ross Townships in Roseau County and has a drainage area of approximately 5.7 square miles as displayed in Figure 2 and Figure 3 below. WD 4 will begin approximately 1,100 feet south of 300th Street, which is approximately one mile north of Minnesota Highway 11, and outlets into the Roseau River (River) in Section 29 of Dieter Township. The overall length of WD 4 is approximately 5.5 miles and will be located on the east side of Roseau County Road 115 (CR 115) until it reaches Roseau County State Aid Highway 10 (CSAH 10). WD 4 will then flow northwest to the west side of CR 115 and continue north to the Roseau River.

Establishing WD 4 (along CR 115) is a preferred alternative of the ongoing Whitney Lake Project (Appendix B). The RRWD has identified the Whitney Lake Subwatershed as an area to improve water management. A Project Work Team was created to explore alternatives that could reduce flood risk to local landowners and enhance environmental conditions within the Whitney Lake subwatershed. The Project Work Team consists of local landowners, RRWD, and several local, state, and federal agencies, including the Minnesota Pollution Control Agency (MPCA), Minnesota Department of Natural Resources (MNDNR), Board of Water & Soil Resources (BWSR), and United States Army Corps of Engineers (USACE). The Project Work Team developed 11 alternatives that incorporated four strategies: retention, diversion, protection, and drainage.

A Preliminary Survey Report was prepared by HDR and submitted to the Roseau River Watershed District on January 6th, 2021. Comments on the report were received from the Minnesota Department of Natural Resources (MnDNR) on January 28th, 2021 and the Minnesota Board of Water and Soil Resources (BWSR) on February 3rd, 2021. Each of the comment letters are in Appendix F. A Preliminary Hearing was held on February 3rd, 2021 and the Findings and Order can be found in Appendix D.

Project Need

The WD 4 drainage area and Whitney Lake subwatershed have a well-documented history of economic losses due to agricultural and roadway flood damages. One of the unique problems with this subwatershed is in the pattern of flooding. With relatively steep topography in the southeastern portion of the Whitney Lake subwatershed, the runoff moves quickly to the northwest where the landscape becomes extremely flat adjacent to the Roseau River.

Backwater from the Roseau River currently occurs within the Whitney Lake subwatershed ditch systems that outlet to the River during a 2-year 24-hour rainfall event (2.2") within the Roseau River watershed. This Project is not designed to prevent that from occurring but instead is focused on providing drainage for events up to a 10-year 24-hour rainfall when the Roseau River is at the normal summer stage.

Design Goals/Criteria

The goal of the WD 4 establishment is to reduce the frequency of flooding and roadway damage along the system without increasing downstream flood impacts. The primary design considerations are Project function, cost, and impacts to the environment. The proposed design must not only meet the functionality required by the Petitioners, but also have an acceptable cost to provide feasible implementation. Impacts to the environment, such as draining of wetlands, must be avoided, minimized, or mitigated. The Red River of the North Basin Technical and Scientific Advisory Committee provided their Briefing Paper #3 in September 2014. This document provides guidance for designing an adequate and equitable ditch that balances channel and culvert capacity in a way that also mitigates downstream effects for larger events (such as 50-year and 100-year floods). The design follows this guidance whenever possible. Specific design goals/criteria include:

- Channel capacity for a 10-year, 24-hour event
- Head loss at culverts of 0.5 feet (preferred) for a 10-year event
- Water surface elevations below the adjacent natural ground (or protected by berm)
- Flows above a 10-year, 24-hour event will access the floodplain at road crossings via lower berm elevations

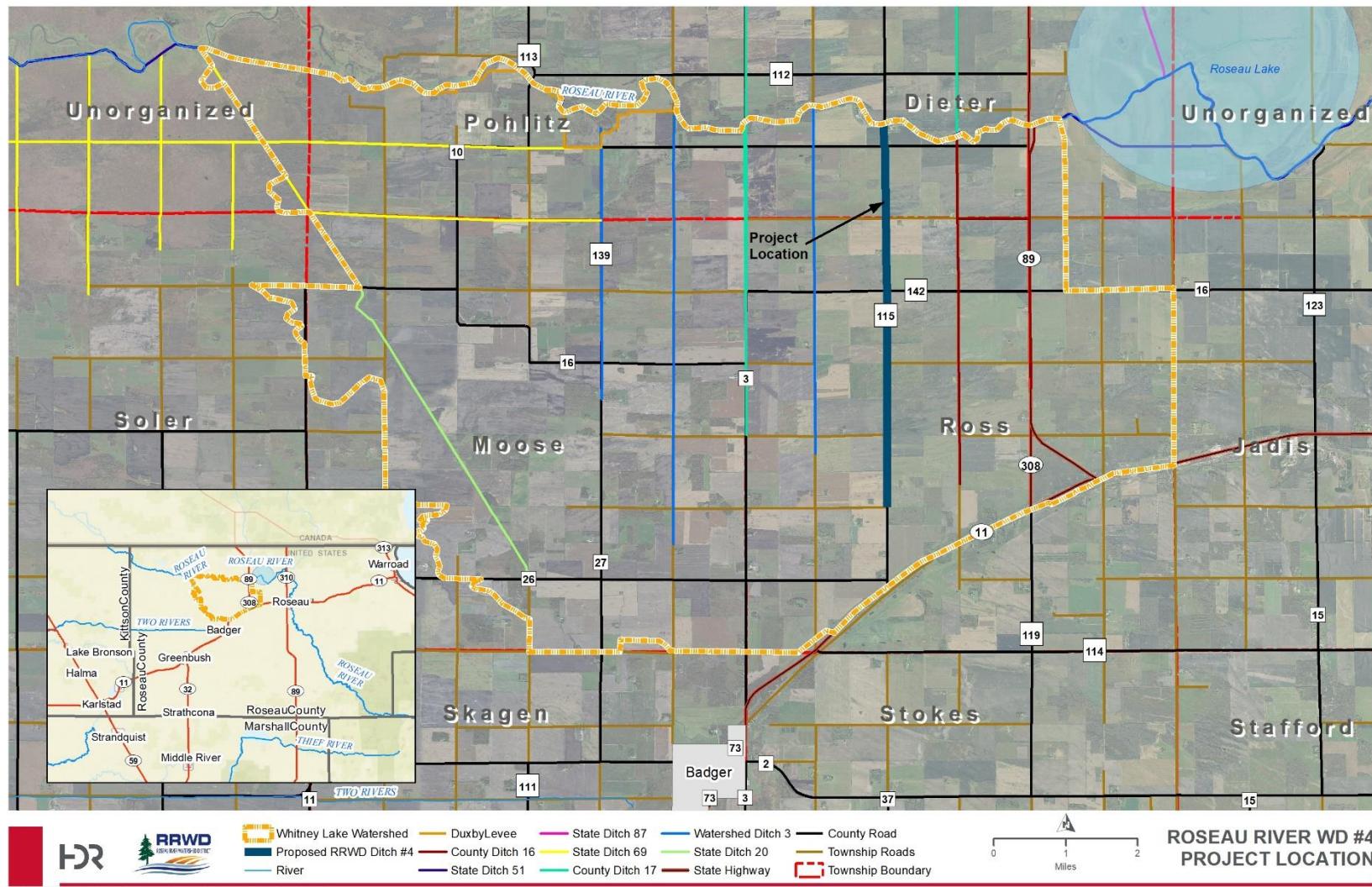


Figure 2. Project Location – Roseau River Watershed District Watershed Ditch #4

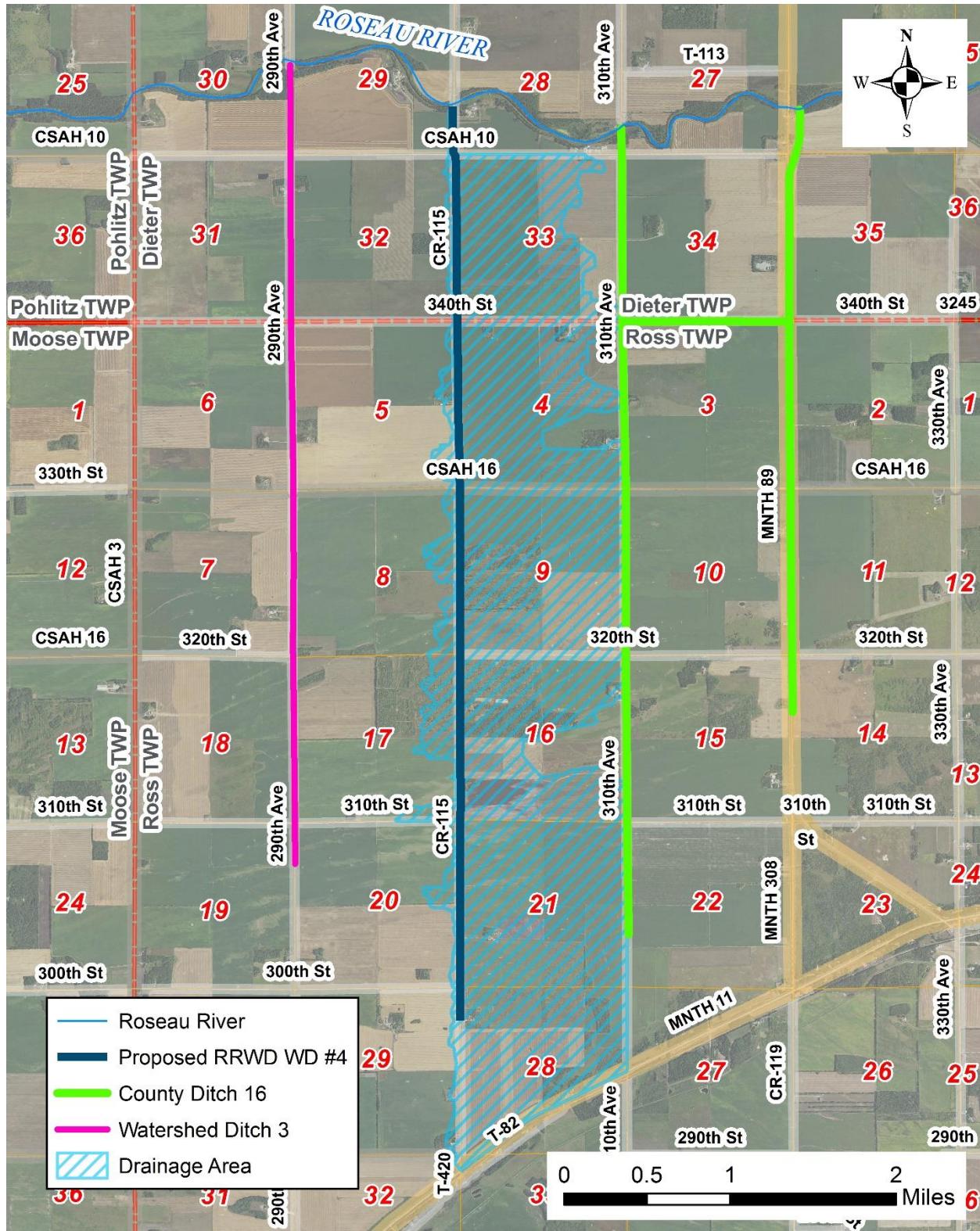


Figure 3. Roseau River Watershed District Watershed Ditch #4 Drainage Area

Project Investigation

Investigation of the survey data revealed that the roadside ditch adjacent to CR 115 does not have a uniform channel geometry, ditch grade, or culvert sizing. Drainage can be improved by widening the channel bottom, flattening the side slopes, lowering the channel bottom profile, and addressing culvert deficiencies. The following sections discuss the details of the survey, hydrologic and hydraulic modeling results, and related design issues. Data collected to evaluate the proposed geometry are listed in Table 1.

Table 1. Data Sources

| Data | Date | Source | Vertical Datum | Description |
|-----------------------|------|-------------------------------|----------------|--------------------------------------------------------------------------------------|
| Survey Data | 2020 | HDR | NAVD 1988 | Survey of existing drainage system including ditch geometry, culverts, and utilities |
| Utilities | 2020 | Gopher One Call | NAVD 1988 | Documentation of existing utilities along CR 115 |
| LiDAR | 2008 | International Water Institute | NAVD 1988 | 1 Meter DEM and 2-foot contours |
| Construction Drawings | 1986 | Roseau County | NGVD 1929 | Construction drawings for CR 115 between CSAH 16 and CSAH 10 |
| Construction Drawings | 1961 | Roseau County | NGVD 1929 | Construction drawings for CR 115 between MN Hwy 11 & CSAH 16 |

Survey

The surveys were completed by HDR. Survey was performed using real time kinetic processing on the Minnesota Continuously Operating Reference Station Network. All elevations in this report are referenced to the North American Vertical Datum of 1988 (NAVD 88). Cross sections were taken at regular intervals along the entire proposed Roseau River WD #4 location, and all culverts and crossings were surveyed. The existing channel located on the east side, parallel to CR 115 has an average roadside slope of 4:1 (H:V), bottom width between 5 and 13 feet, and a depth of 3 to 6 feet. A representative cross section at station 55+00 is shown below (Figure 4).

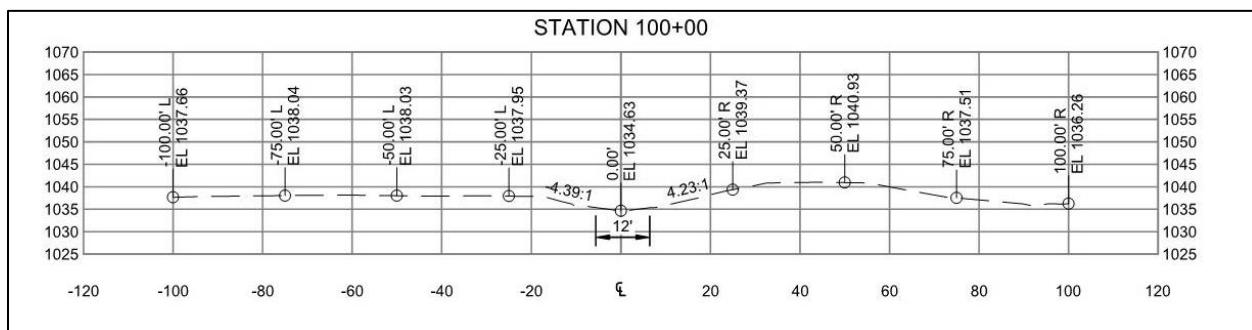


Figure 4. Station 100+00 Surveyed Cross Section

Alignment & Stationing

The proposed alignment of WD 4 is displayed in Figure 5. Project stationing was set so that station 0+00 is located at the confluence of the Roseau River and the proposed WD 4.

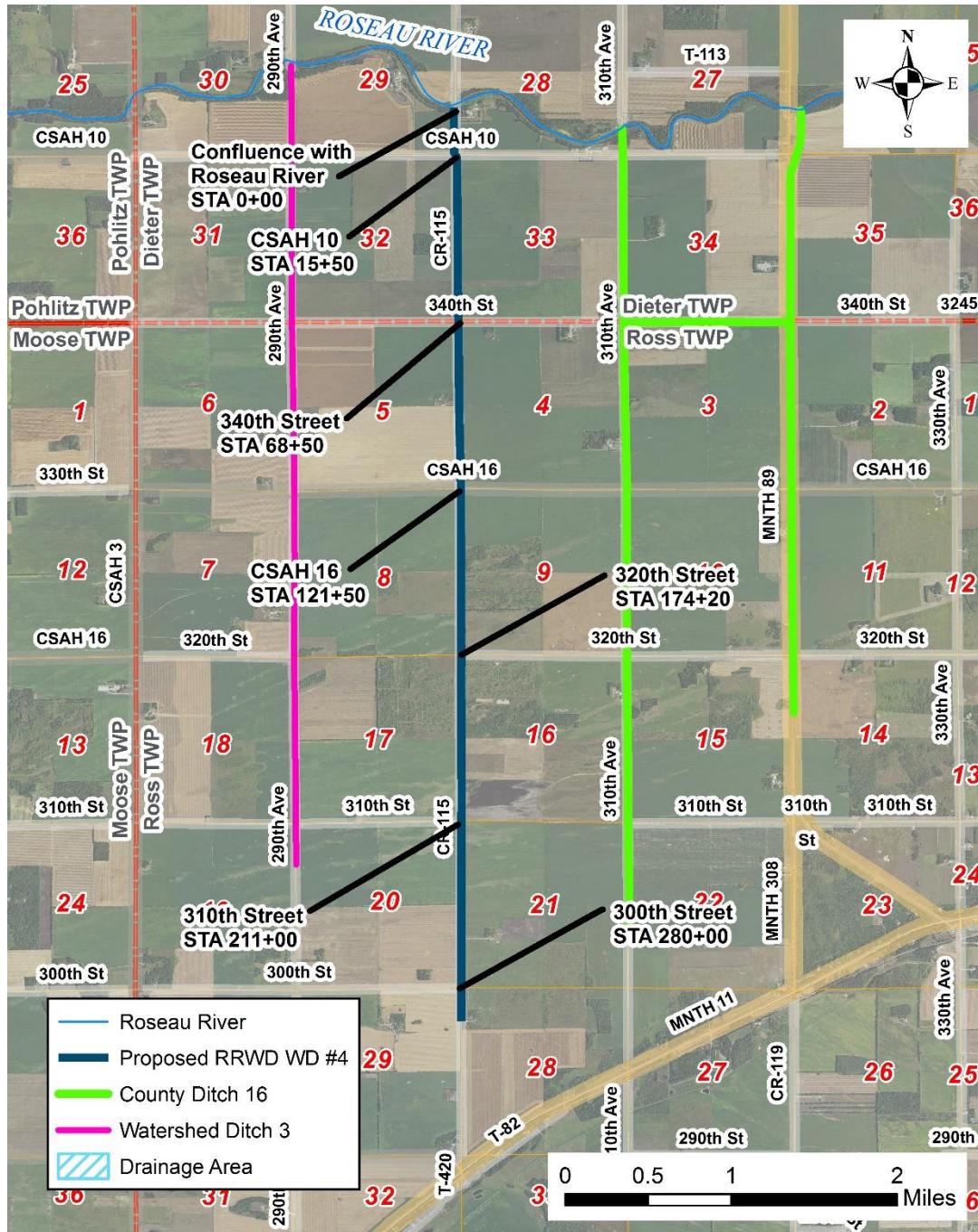


Figure 5. Roseau River Watershed District Watershed Ditch #4 Alignment and Stationing

Existing Right-of-Way

CR 115 runs parallel to the proposed WD 4 alignment. The existing road right-of-way along CR 115 was estimated based on construction drawings obtained from Roseau County. Table 2 summarizes the approximate existing right-of-way along CR 115 and its location.

Table 2. Existing Right-of-Way

| Station | Permanent R.O.W. |
|------------------|------------------|
| 0+00 to 55+30 | 65' |
| 55+30 to 82+00 | 60' |
| 82+00 to 109+95 | 65' |
| 109+95 to 110+85 | 55' |
| 110+85 to 111+75 | 33' |
| 111+75 to 121+50 | 55' |
| 121+50 to 290+80 | 50' |

Soils

Based on the soils investigation, lean clay likely extends to the bottom of the proposed ditches and the soils are relatively competent in strength and stiffness. There should be no concerns of potential slope instability or excessive sloughing. A trapezoidal ditch with 3:1 (H:V) side slopes or flatter is recommended for maximum stability.

WD 4 is located within the glacial lake plain of Lake Agassiz. Lake Agassiz was created during the most recent glaciation 2 million years ago during the retreat of the Des Moines lobe, and the existing topography slopes slightly north at approximately 0.1%. Three of the four beach ridges from Lake Agassiz are present in Roseau County. Over time, the ridges filled with peat deposits resting on till, although in some areas there are thin layers of sand or gravel in between the peat and the till. Roseau County was originally peatland, hardwood forest to the east, and tall grass prairie to the west. In the twentieth century, as agriculture was on the rise, ditching systems were created to reduce the inundation of fields due to the characteristic poorly drained soils of the area.

Figure 6 is a general soils map for WD 4 (obtained from the USDA NRCS web soil survey), and Figure 7 shows the project area with Unified Soil Classifications at the surface. Soil I84A, described as a Percy Loam, 0 to 1 percent slopes, very cobbly, dominate the project area. Soil I127A, described as Percy loam, 0 to 1 percent slopes, is located in the north-central area of the Project. Soil I741A, described as Boash clay loam, dense till, 0 to 2 percent slopes, is located intermittently in the northern Project area, while soil I117A described as Skagen loam, 0 to 3 percent slopes, very cobbly, is located intermittently in the southern Project area. The Boash Clay Loam and Percy Loam occur on the characteristic flat lake plains/lake swale geography of this county and are generally considered Prime Farmland if drained. The texture is clayey to

loamy. The major uses of these soils are cropland, hay, and pasture. The land is also frequently ponded.

One soil boring (BH-11) was completed at the south end of the proposed WD 4. The borehole data indicates that the soil at this borehole location is stiff to rather stiff lean clay to the maximum depth explored (31 feet). This data compares similarly to the soil survey data discussed above. Groundwater was not encountered during the borehole investigations. It should be noted that groundwater levels will fluctuate seasonally and in response to climatic conditions.

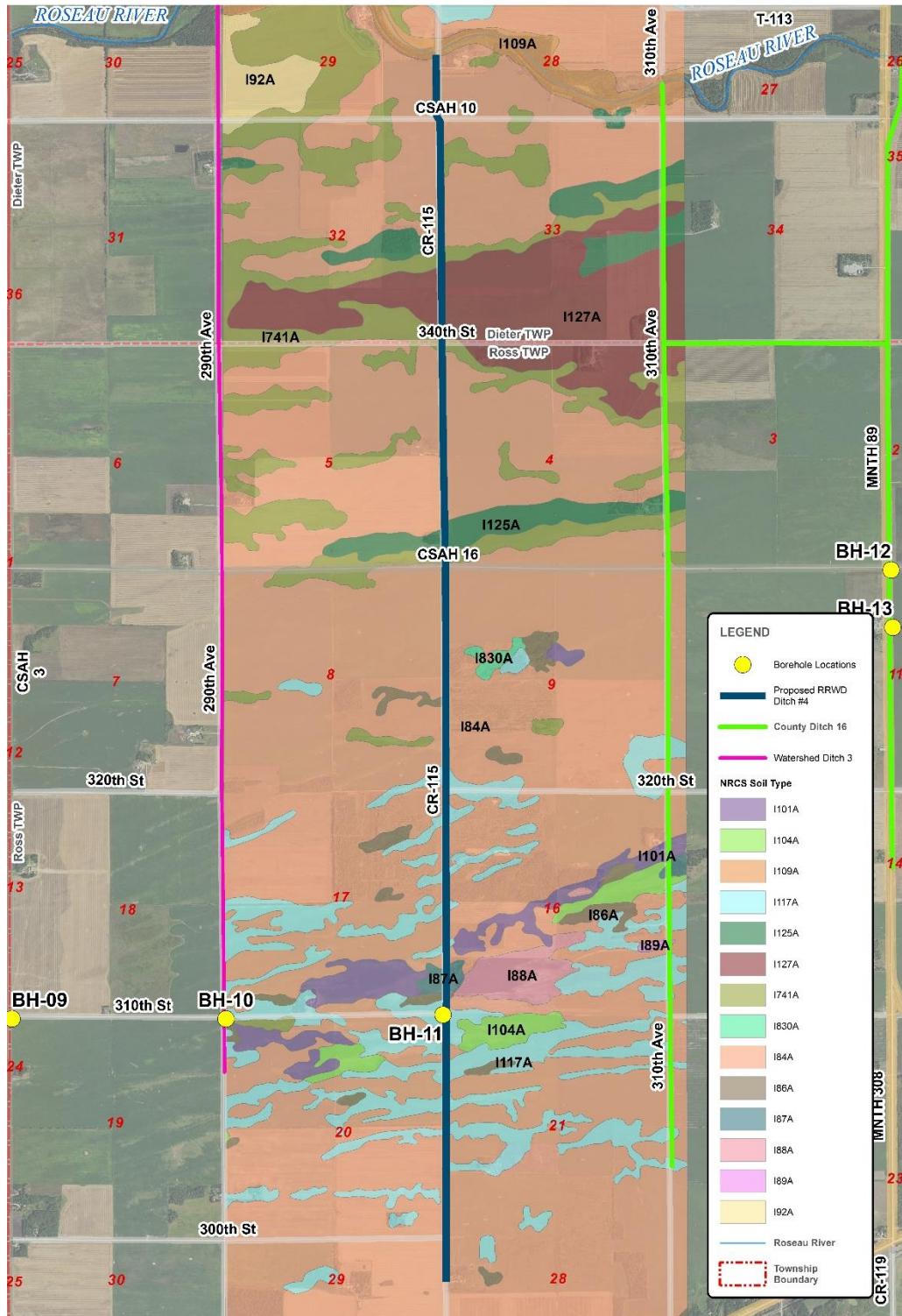


Figure 6. Roseau River Watershed District Watershed Ditch #4 Soils – NRCS Data

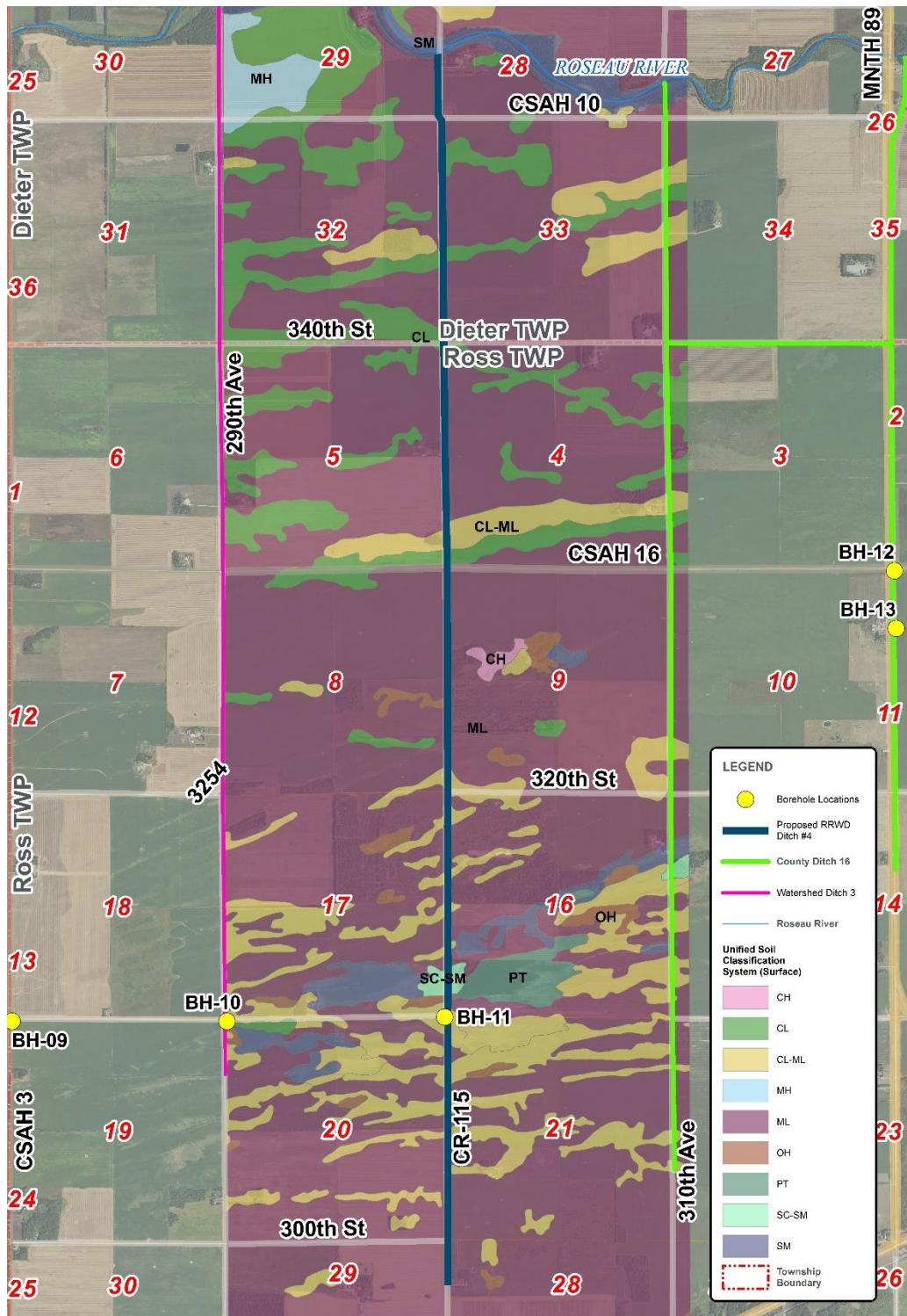


Figure 7. Roseau River Watershed District Watershed Ditch #4 Soils - Unified Soil Classification System

Hydrologic Modeling

The HEC-HMS hydrologic model of the Roseau River Watershed that was developed for the U.S. Army Corps of Engineers (USACE) in 2012 as part of the Red River Basin-Wide Modeling Approach (RRBWMA) project was used as a base model for the hydrologic analysis. Guidance developed since the creation of the base HEC-HMS model has been used to revise the model and develop the hydrologic analysis for this Project. The following sub-sections describe the revisions made to the model.

Subwatersheds

The proposed WD 4 drainage area was divided into seven subwatersheds with a total contributing area of approximately 5.7 square miles. The drainage area for each subwatershed is displayed in Figure 8 and Table 3.

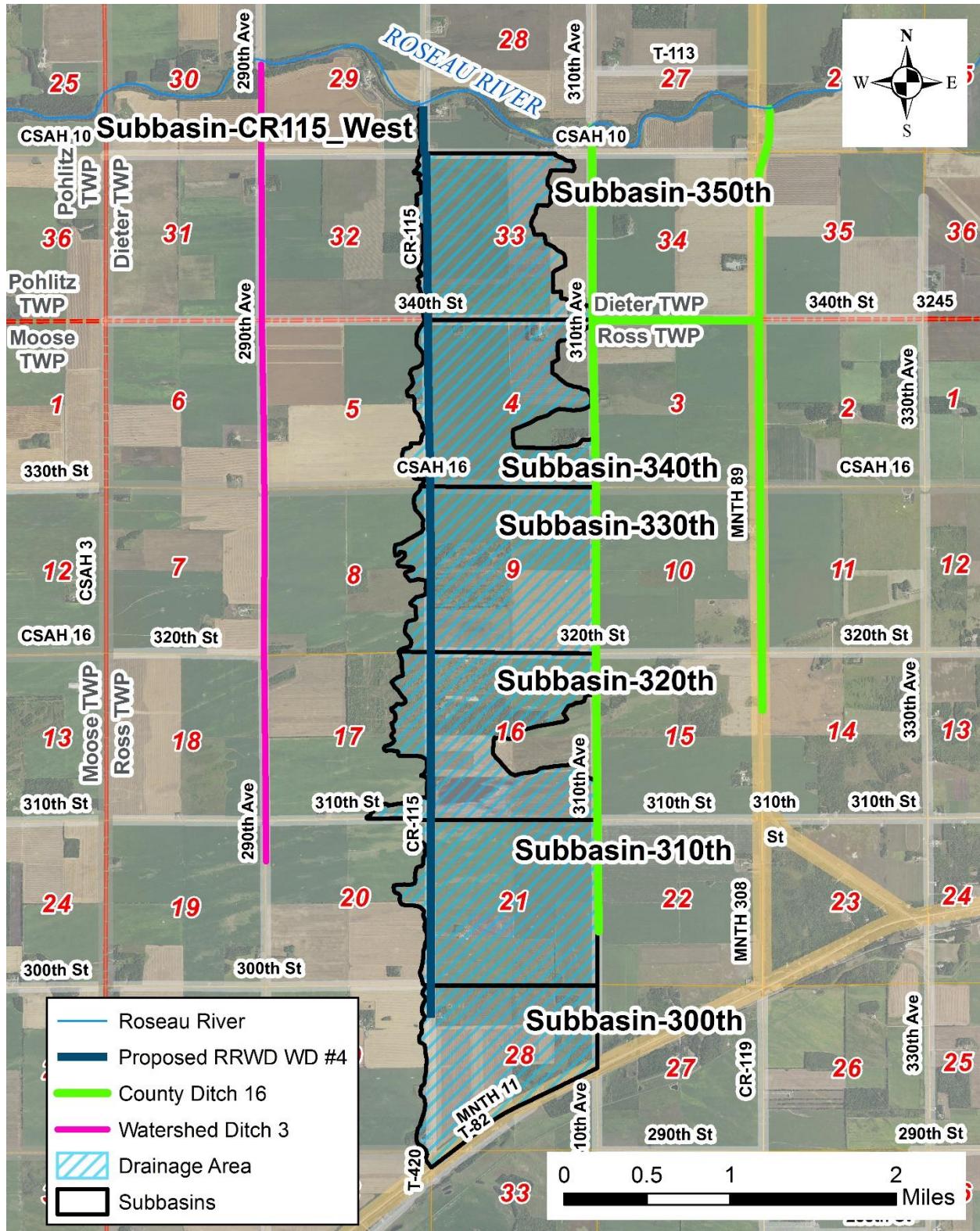


Figure 8. Subwatershed Drainage Areas

Table 3. Subwatershed Drainage Areas

| HEC-HMS Subwatershed | Drainage Area (Sq. Mi.) |
|----------------------|-------------------------|
| Subbasin-300th | 0.81 |
| Subbasin-310th | 1.08 |
| Subbasin-320th | 1.00 |
| Subbasin-330th | 1.10 |
| Subbasin-340th | 0.90 |
| Subbasin-350th | 0.80 |
| Subbasin-CR 115_West | 0.01 |

Design Storm Data

The Project design is based on the 10-year 24-hour rainfall event. The precipitation depths for the 24-hour event were based on the Precipitation Frequency Atlas from the National Oceanic and Atmospheric Administration (NOAA) Atlas 14 Volume 8 data. This data was obtained at the central location of each subwatershed within the proposed WD 4 drainage area.

The subwatersheds and correlating rainfall depth used in the HEC-HMS analysis are displayed in Table 4.

Table 4. 10-Year 24-Hour Rainfall Depths

| HEC-HMS Subwatershed | Frequency | 24-Hour Duration |
|----------------------|-----------|------------------|
| Subbasin-300th | 10-Year | 3.34" |
| Subbasin-310th | 10-Year | 3.32" |
| Subbasin-320th | 10-Year | 3.30" |
| Subbasin-330th | 10-Year | 3.30" |
| Subbasin-340th | 10-Year | 3.30" |
| Subbasin-350th | 10-Year | 3.30" |
| Subbasin-CR 115_West | 10-Year | 3.30" |

Design Rainfall Distribution

The rainfall distribution is based on a site-specific rainfall distribution method as described in the United States Department of Agriculture (USDA) National Engineering Handbook (NEH) Chapter 4: Storm Rainfall Depth and Distribution (Draft) Appendix 4C. An individual rainfall distribution was created for the 5-year, 10-year, and 25-year rainfall events.

Precipitation Losses

The basin models use the SCS Curve Number (CN) as a loss method. The 24-hour scenario CN values were obtained from the RRBWMA project hydrologic analysis previously detailed.

Time of Concentration

The time of concentration (T_c) is the travel time of a particle of water from the most hydraulically distant point in the subwatershed to the outlet. The T_c data in the USACE HEC-HMS model was derived using a Travel Time Routine that had previously been developed by the MnDNR. The tool applies a gridded version of the Manning's equation to calculate flow velocities throughout the contributing watershed drainage area using the 2001 National Landcover Dataset (NLCD) landuse, slope, and stream network as inputs. These flow velocities are converted into travel times and summed along the flow paths that terminate in the watershed outlet. The resulting output grid has an estimate of travel time from any given cell to the watershed outlet. The maximum difference in travel time within a subwatershed to the subwatershed's outlet is set as the T_c .

Hydrograph Shape

The hydrograph transformation used in the RRBWMA is the Clark synthetic unit hydrograph. T_c and the SCS storage coefficient (R) were used as inputs for this method. A summary of the model inputs for each subwatershed are displayed in Table 5.

Table 5. Subwatershed Characteristics

| HEC-HMS Subwatershed | Drainage Area (Square Mile) | Curve Number | Tc (Hours) | R |
|----------------------|-----------------------------|--------------|------------|-------|
| Subbasin-300th | 0.77 | 78 | 6.31 | 16.76 |
| Subbasin-310th | 1.01 | 78 | 7.52 | 19.97 |
| Subbasin-320th | 1.00 | 78 | 11.77 | 31.26 |
| Subbasin-330th | 1.10 | 78 | 6.12 | 16.27 |
| Subbasin-340th | 0.90 | 78 | 7.88 | 20.93 |
| Subbasin-350th | 0.81 | 78 | 8.36 | 22.20 |
| Subbasin-CR 115_West | 0.01 | 78 | 0.27 | 3.83 |

Peak Excess Runoff

Excess precipitation (runoff) hydrographs from each of the subwatersheds was obtained from the HEC-HMS model for each design scenario. The excess runoff is the precipitation that is not infiltrated into the soil and becomes surface flows and the design runoff for the Project. Table 6 provides the peak excess runoff depths and flow rates for each subwatershed during the design scenario.

Table 6. 10-Year 24-Hour Peak Excess Runoff and Flows

| HEC-HMS Subwatershed | Excess Runoff (in) | Peak Flow (cfs) |
|----------------------|--------------------|-----------------|
| Subbasin-300th | 1.38 | 28.3 |
| Subbasin-310th | 1.36 | 31.5 |
| Subbasin-320th | 1.35 | 21.3 |
| Subbasin-330th | 1.35 | 40.0 |
| Subbasin-340th | 1.35 | 26.4 |
| Subbasin-350th | 1.35 | 22.9 |
| Subbasin-CR 115_West | 1.35 | 4.9 |

Hydraulic Analysis

HEC-RAS version 6.0 was utilized to perform all hydraulic computations of the existing conditions as well as the proposed design for this Project. The following methods and data were used for the hydraulic components of the analysis.

General Assumptions

Several assumptions were used in the development of the HEC-RAS models. These assumptions were implemented to simplify certain components of the models that were not required for this analysis. Additional modeling and survey will be required to address these assumptions.

- Where as-built and survey data were not available, elevations were estimated using the available NAVD 1988 LiDAR data
- All features within the WD 4 drainage system are assumed to be in good condition and functioning correctly
- Runoff is applied directly into the ditch channel and does not enter the proposed system through adjacent side water inlet culverts.
- The Roseau River is at the normal summer stage.

Hydraulic Model Development

A field survey of all ditches, hydraulic structures, and overbank areas along CR 115 was completed. This data was used to create an existing ground surface in AutoCAD Civil 3D 2018. LiDAR data was obtained from the Red River Basin Mapping Initiative from the International Water Institute for the Red River of the North watershed. The existing ground surface was mosaicked over the LiDAR data to create a terrain of the Project area.

Existing landuse information was obtained from the NLCD 2011 data. The landuse information used in the model is displayed in Table 7. The NLCD 2019 data was not used in order to be consistent with the data used in the Preliminary Survey Report.

The hydraulic structures were input into the model based on the gathered survey data and using aerial imagery where information was not known.

The excess precipitation hydrograph for each of the design scenarios were obtained from the HEC-HMS runoff analysis as previously discussed. These runoff hydrographs were input as a flow boundary condition directly into the ditch for each of the subwatersheds.

Hydraulic Losses

System losses throughout the hydraulic models were accounted for through defining flow retardation resulting from overland Manning's values as well as loss coefficients and surface roughness for culverts. Manning's n values associated with landuse classifications are summarized in Table 7. Loss coefficients used in the hydraulic structures are summarized in Table 8. Standard Manning's roughness values were used where applicable for the culverts (Table 9).

Table 7. Manning's n Values

| NLCD Name | Manning's n |
|------------------------------|-------------|
| Cultivated crops | 0.035 |
| Deciduous forest | 0.16 |
| Developed, high intensity | 0.15 |
| Developed, low intensity | 0.1 |
| Developed, medium intensity | 0.08 |
| Developed, open space | 0.04 |
| Emergent herbaceous wetlands | 0.07 |
| Evergreen forest | 0.16 |
| Grassland/herbaceous | 0.035 |
| Open water | 0.04 |
| Pasture/hay | 0.03 |
| Shrub/scrub | 0.1 |
| Woody wetlands | 0.12 |

Table 8. Hydraulic Loss Coefficients

| Description | Loss Coefficient |
|-----------------------|------------------|
| Culvert Entrance Loss | 0.5 |
| Culvert Exit Loss | 1.0 |

Table 9. Hydraulic Structure Manning's n Values

| Description | Manning's n |
|--------------------------------------|-------------|
| Precast Reinforced Concrete Pipe/Box | 0.012 |
| Corrugated Steel/Metal Pipe | 0.024 |

Design of Proposed Alternative

Proposed Design

The recommended alternative is one that meets the design goals by keeping the water surface elevation for a 10-year rainfall event below the adjacent landscape or contained by a berm and prevent roadway damage. The design can be modified to incorporate cost savings to lessen the burden on the benefitted landowners by altering the design goals. This could be achieved by eliminating unnecessary field access crossings along CR 115 to reduce culvert costs or reduce crossing top widths. The proposed ditch grade could also be reduced, which would decrease the volume of cut. Some of these changes would raise water surface elevations above the adjacent landscape and require a berm to contain flows. The following sections outline the detailed design of the recommended alternative.

Existing Conditions

Hydraulic analysis was performed to determine the existing channel capacity of the east ditch parallel to CR 115. The existing ditch does not have sufficient capacity to convey runoff from a 2-year 24-hour rainfall event which has an average rainfall depth of 2.23". Water currently passes west into Watershed Ditch #3 (WD 3) through four CR 115 centerline culverts. These four east-west culverts have approximately four times the flow area as the nearest north-south culverts. The proposed project drainage area currently uses WD 3 as the primary outlet. A small amount of water that cannot pass into WD 3 does make its way north to the Roseau River. When the ditch reaches its capacity, water begins to overtop roadways and travel overland until it reaches the nearest ditch system or River.

Figure 9 displays the existing condition result from HEC-RAS for the CR 115 east roadside ditch during a 10-year 24-hour rainfall event. The system was modeled such that water was allowed to travel west through the four centerline culverts into the WD 3 drainage area. Hydrologic data was not input into the HEC-HMS model for the WD 3 drainage area so the flooding that occurs in Sections 5, 8, and 17 of Ross Township and Section 32 of Dieter Township would be greater than displayed.

Improved ditch characteristics such as the side slopes, ditch grade, and bottom width were evaluated using an iterative process in order to meet the design goals and criteria. The following sections summarize the results.

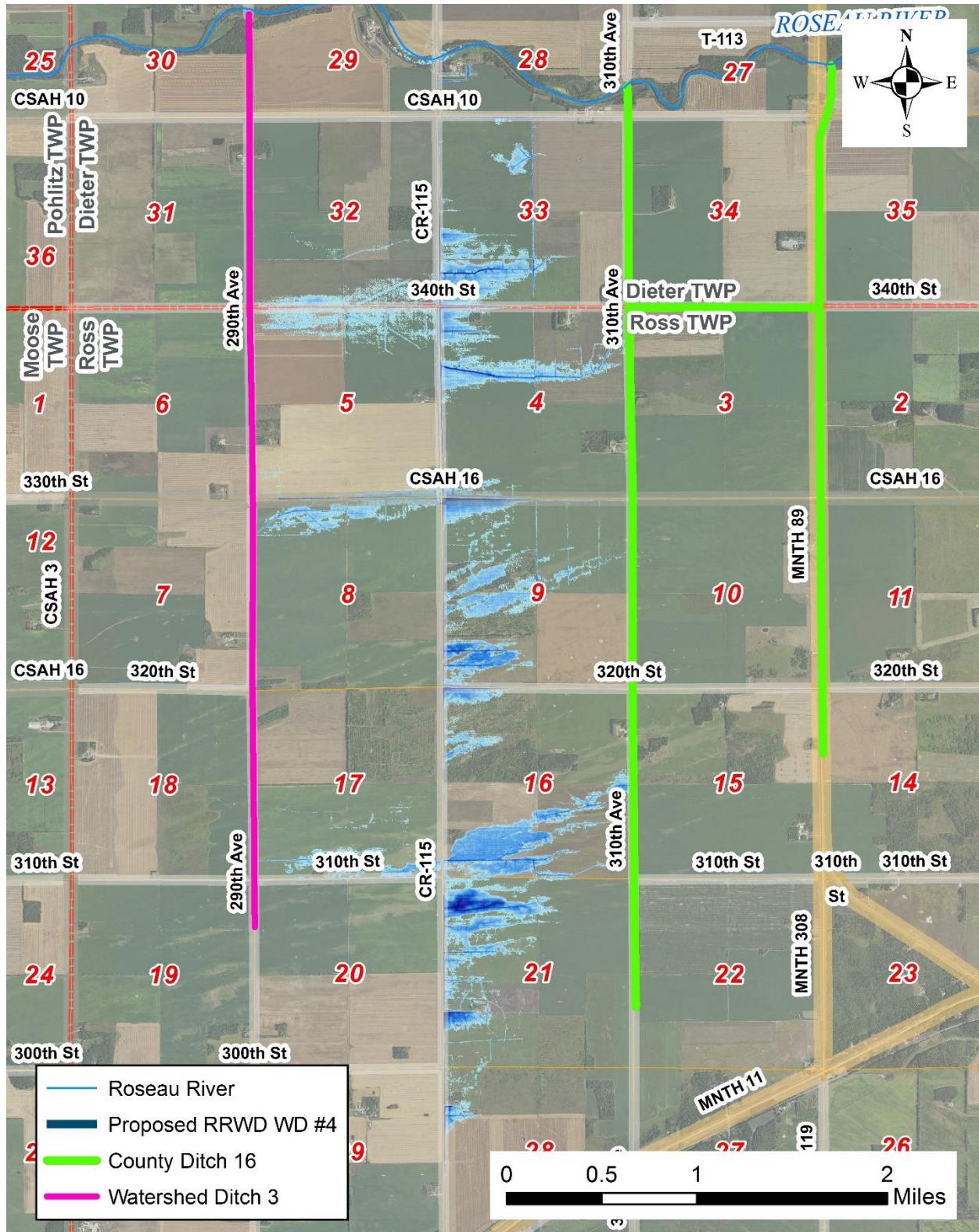


Figure 9: 10-Year 24-Hour Existing Condition HEC-RAS Flood Extents

Ditch Side Slopes

The inslope of the proposed ditch will be a minimum of 4:1 (H:V) along CR 115. Slopes of 4:1 or flatter are considered recoverable slopes for motorists. Backslopes of 4:1 or flatter will be used in all cases to allow mowing or spraying of the slopes.

Ditch Bottom Width

Ditch bottom widths between 8 feet and 15 feet were analyzed for each alternative. Due to areas with a low adjacent ground elevation and relatively flat grade, a ditch bottom width of 10 feet was implemented from the upstream extents of the ditch to Roseau County Road 10. The bottom width from CSAH 10 to the Roseau River will be decreased to 8 feet due to the increase in ditch depth. A bottom width of 10 feet is not required in this area to meet the design goals. The excavated soil from the improved ditch grade will be placed adjacent to the ditch to form a berm. WD 4 will not see continuous flows and as a result, a single-stage ditch geometry is recommended.

Spoil Placement

Spoil from ditch excavation will be placed alongside the ditch, creating a berm within the permanent and/or temporary right-of-way. The berm will have a variable top width, 10:1 (H:V) slope from the ditch daylight point and a 10:1 (H:V) backslope tying into the adjacent land. The berm will be set at a maximum elevation which will contain the 10-year 24-hour runoff within the established ditch. The berm will allow for water to breakout during larger rainfall events near the road crossings. A typical detail for the proposed ditch geometry is displayed in Figure 10.

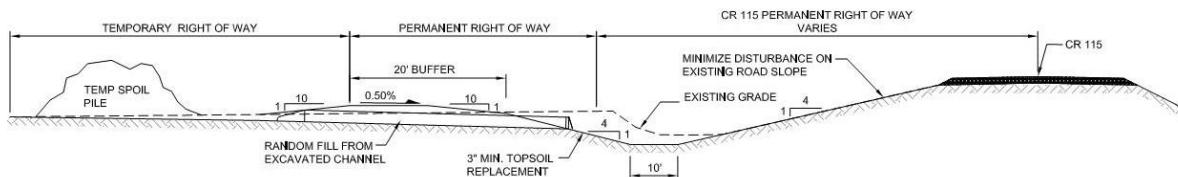


Figure 10. Subwatershed Drainage Areas

Ditch Grade

The goal is to convey water efficiently downstream while maintaining a feasible ditch geometry. Table 10 and Figure 11 summarizes the grade change locations by station range.

Table 10. Proposed Ditch Grade

| Stations | Proposed Grade |
|----------------|----------------|
| 0+00 to 1+00 | 1.70% |
| 1+00 to 2+50 | 0.32% |
| 2+50 to 15+91 | 0.04% |
| 15+91 to 60+00 | 0.03% |

| Stations | Proposed Grade |
|------------------|----------------|
| 60+00 to 95+50 | 0.06% |
| 95+50 to 121+66 | 0.10% |
| 121+66 to 147+08 | 0.14% |
| 147+08 to 174+36 | 0.10% |
| 174+36 to 193+30 | 0.17% |
| 193+30 to 231+77 | 0.15% |
| 231+77 to 247+72 | 0.10% |
| 247+72 to 264+50 | 0.15% |
| 264+50 to 290+80 | 0.18% |

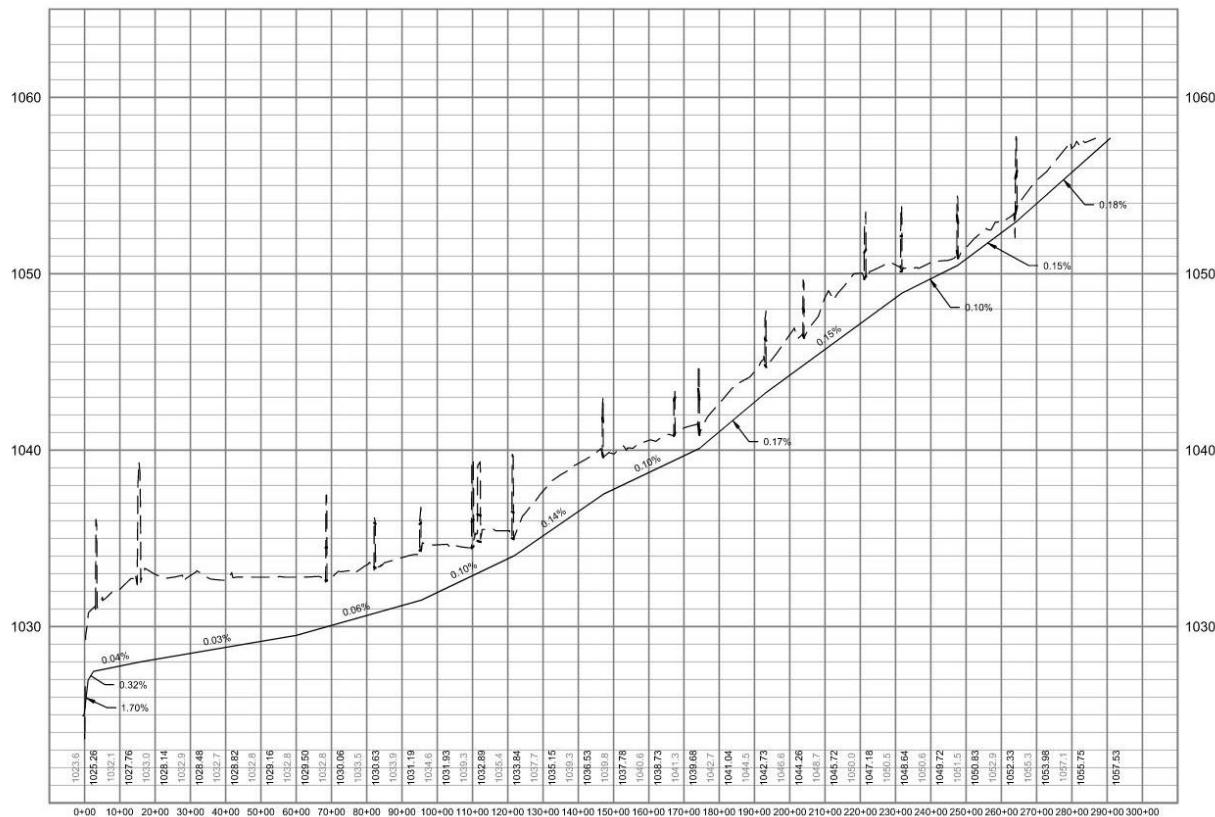


Figure 11: Proposed WD 4 Centerline Profile & Grades

Hydraulic Structure Sizing

Culvert hydraulics were analyzed using an iterative process to adjust the size and slope to meet design criteria. The upstream and downstream WSE, duration of inundation on adjacent land, and not negatively impacting adjacent roadways and infrastructure were the main culvert design considerations. Culvert size, shape, and material will vary depending on location along each alignment and available cover at each crossing. Table 11 summarizes the existing in-place culvert and proposed culvert at each crossing location. Several crossings were either combined on parcel lines or relocated to the nearest east-west roadway. Relocating the crossing to an east-west road when practical reduces the hydraulic size of the culvert required. The proposed lengths may be adjusted when final plans are prepared.

Table 11. Proposed Culvert Crossings and Culvert Sizes

| Description | Station | Existing Culvert | Proposed Shape | Proposed Size | Proposed Length (ft) | Proposed Material |
|-----------------------|---------|--------------------|----------------|----------------|----------------------|---------------------|
| Field Crossing | 3+00 | 18" CSP | Round | 60" CSP | 103 | Corrugated Steel |
| CSAH 10 | 15+50 | 30" RCP | Round | 60" RCP | 148 | Reinforced Concrete |
| Field Crossing | 41+85 | 30" CSP | Round | 60" CSP | 92 | Corrugated Steel |
| 340 th St. | 68+50 | 24" X 35" CSP Arch | Round | 60" CSP | 60 | Corrugated Steel |
| Field Crossing | 82+32 | 30" CSP | - | - | - | - |
| Field Crossing | 95+20 | 18" CSP | Round | 60" CSP | 81 | Corrugated Steel |
| Field Crossing | 110+00 | 18" CSP | - | - | - | - |
| Field Crossing | 111+86 | 18" CSP | Round | 60" CSP | 84 | Corrugated Steel |
| CSAH 16 | 121+50 | 18' CSP | Round | 65" x 40" RCPA | 48 | Reinforced Concrete |
| Field Crossing | 146+92 | 24" CSP | Round | 54" CSP | 82 | Corrugated Steel |
| Field Crossing | 167+28 | 24" CSP | - | - | - | - |
| 320 th St. | 174+20 | 24" CSP | Round | 57" x 38" CSPA | 40 | Corrugated Steel |
| Driveway | 193+09 | 18" CSP | Round | 48" CSP | 40 | Corrugated Steel |
| Field Crossing | 203+86 | 18" CSP | Round | 42" CSP | 74 | Corrugated Steel |

| Description | Station | Existing Culvert | Proposed Shape | Proposed Size | Proposed Length (ft) | Proposed Material |
|----------------|---------|------------------|----------------|----------------|----------------------|-------------------|
| Field Crossing | 221+34 | 18" CSP | Round | 42" CSP | 90 | Corrugated Steel |
| Field Crossing | 231+60 | 24" CSP | Round | - | - | - |
| Field Crossing | 247+55 | 24" CSP | Round | 49" x 33" CSPA | 74 | Corrugated Steel |
| Driveway | 264+21 | 24" CSP | Round | 36" CSP | 44 | Corrugated Steel |
| Driveway | 290+80 | 18" CSP | Round | 36" CSP | 40 | Corrugated Steel |

Roseau County Road 115 Culvert Removals

There are currently four centerline culverts through CR 115 as displayed in Figure 12. Comparing the existing north-south culverts along the proposed alignment with the nearest CR 115 centerline culvert, it was determined that the centerline culverts have approximately four times the flow area as the nearest north-south culvert. The centerline culverts are very similar in invert elevation to the north-south culverts. Water currently passes through the centerline culverts during all runoff events and at a higher efficiency. In addition to the centerline culverts having a greater flow area, the random culvert sizing to the north and various high spots in the ditch force water west into the WD 3 system.

Implementation of WD 4 will alleviate some water from entering the WD 3 system but not entirely. In order to provide the maximum benefits to the landowners along WD 3, the proposed WD 4 ditch should be sized such that it can convey the 10-year 24-hour excess runoff and prevent cross-over water from entering WD 3. This can only be achieved by removing the four CR 115 centerline culverts.

A meeting was held with the Roseau County Highway Department on February 28th, 2022 to present the alternative of removing the culverts. The hydraulic results showed that runoff from up to a 50-year 24-hour would not overtop CR 115 with the proposed WD 4 in-place and the centerline culverts removed. This is assuming that the WD 4 system is functioning as designed and the Roseau River has the capacity to receive the runoff.

Following the meeting, a permit was granted to the Roseau River Watershed District for the removal of the four CR 115 centerline culverts contingent upon construction of the WD 4 system. Figure 13 displays the four culverts to be removed during construction of the Project.

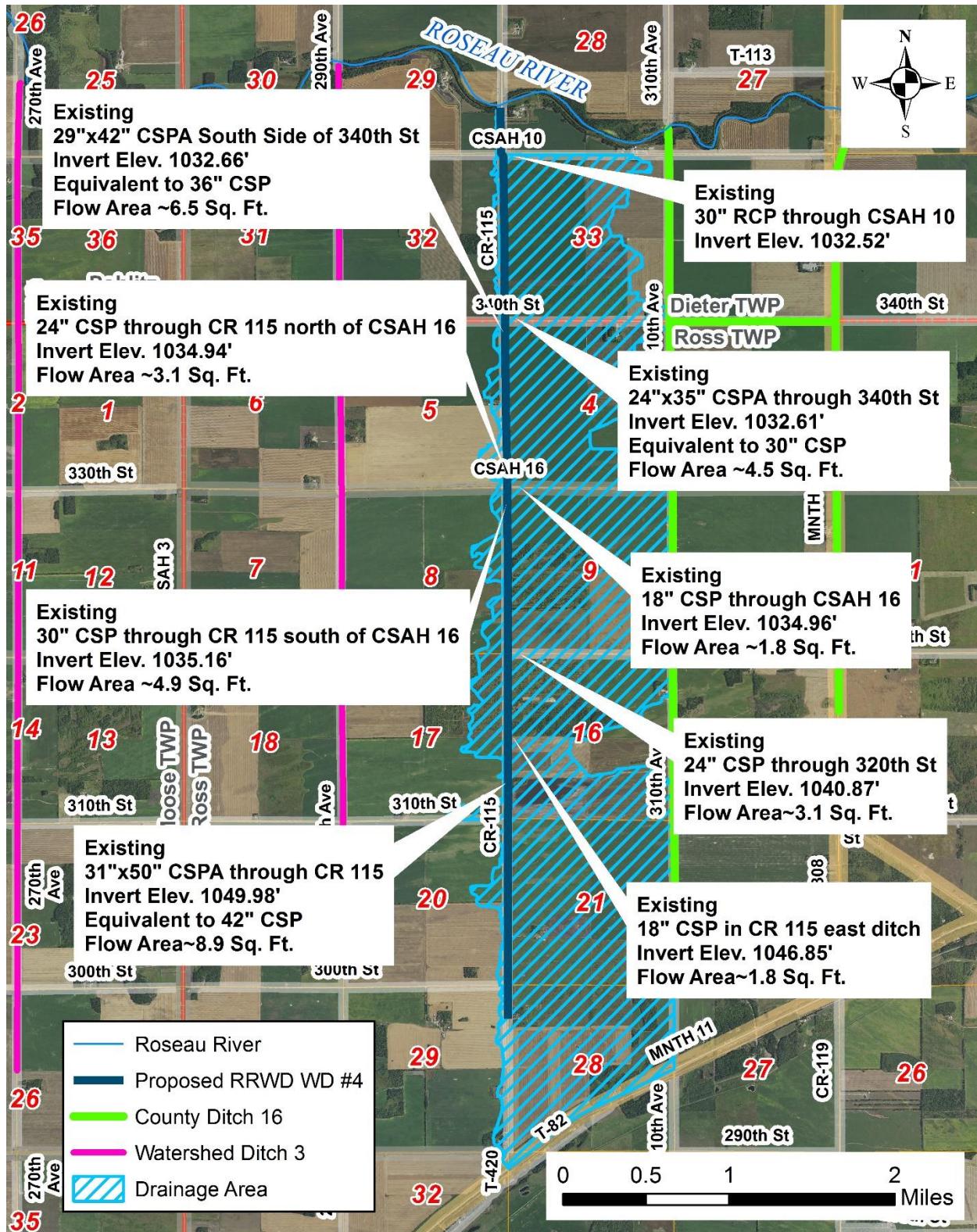


Figure 12: Existing CR 115 Centerline Culverts

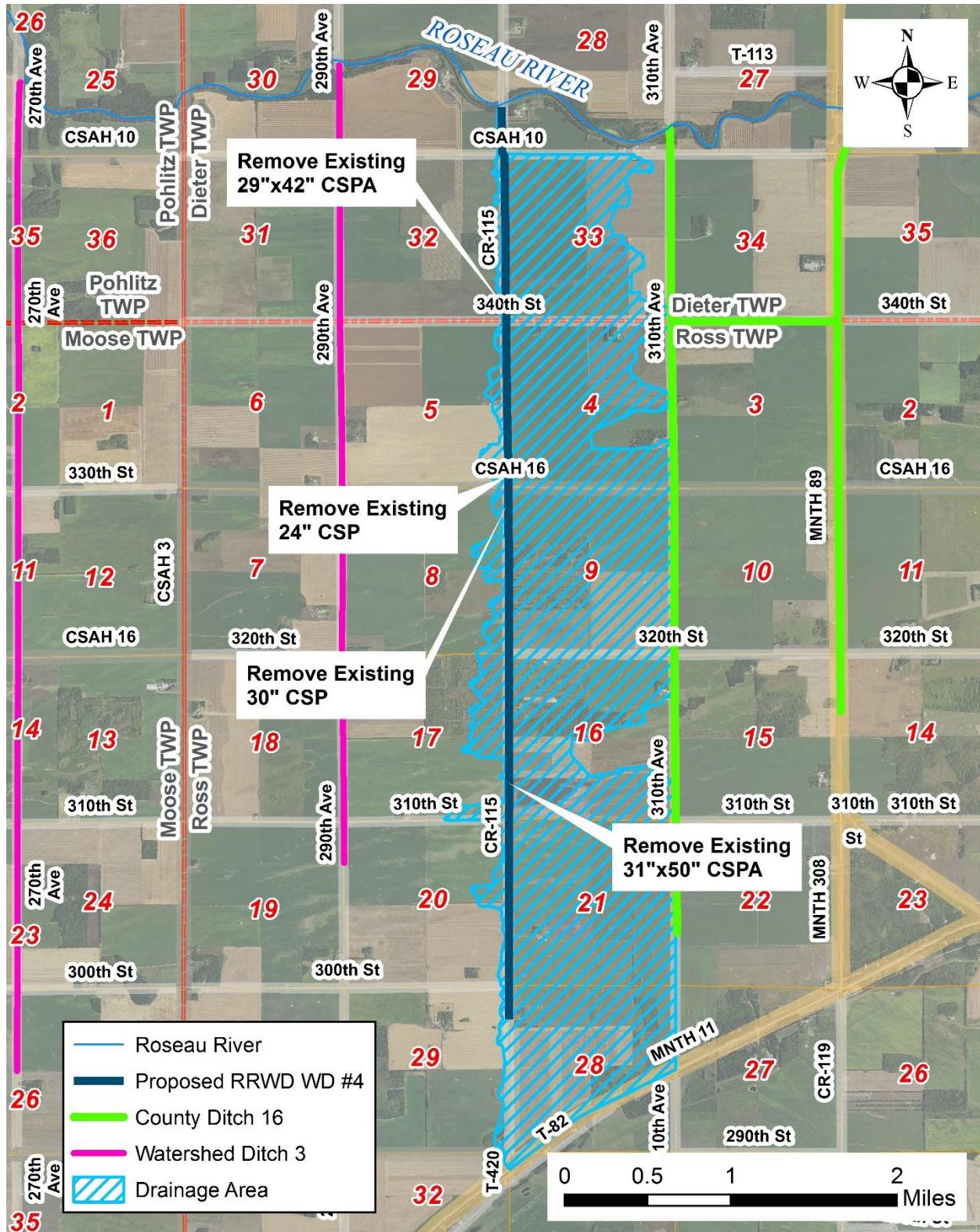


Figure 13: CR 115 Centerline Culverts to be Removed

Outlet Stabilization

WD 4 will discharge on the west side of CR 115 to the Roseau River. This location is currently experiencing head cutting and negative erosive impacts to the adjacent riverbank due to the sudden change in elevation as the ditch transitions to the River as displayed in Figure 14. Measures will be taken to stabilize this transition area and minimize adverse impacts to the riverbank, road slope, and bridge upstream of this location. Two rock drops consisting of Random Riprap Class 3 -Special are proposed to remove the steep grade transition. Any work that takes place below the ordinary high-water elevation of the Roseau River will require a MnDNR Public Waters Permit.



Figure 14: Existing Condition of Proposed WD 4 Outlet Location

Side Inlets/Approaches

Side inlets will be installed where berms are constructed through east-west roadside ditches, and at every major field ditch inlet as appropriate. Each side inlet will have an apron on the inlet end, flap gate on the outlet end, and Random Riprap Class 3 at the outlet to reduce erosion. These pipes are currently estimated to be 18-inch Corrugated Steel Pipe (CSP) for field drains and 24-inch CSP within roadside ditches. Individual landowner discussions will occur to determine where increases in field drain capacity to a 24" CSP are appropriate.

Hydraulic Analysis Results

Figure 15 displays the proposed flood extents for the 10-year 24-hour rainfall event when the Roseau River is at normal summer stage. The proposed design has the capacity to convey the 10-year event with minimal breakouts occurring where the proposed ditch limits tie into the existing roadside ditch at the upstream extent of the Project area. The peak water surface elevation is above the adjacent landscape in several locations along several reaches of the ditch and when that occurs, the spoil berm contains the flows.

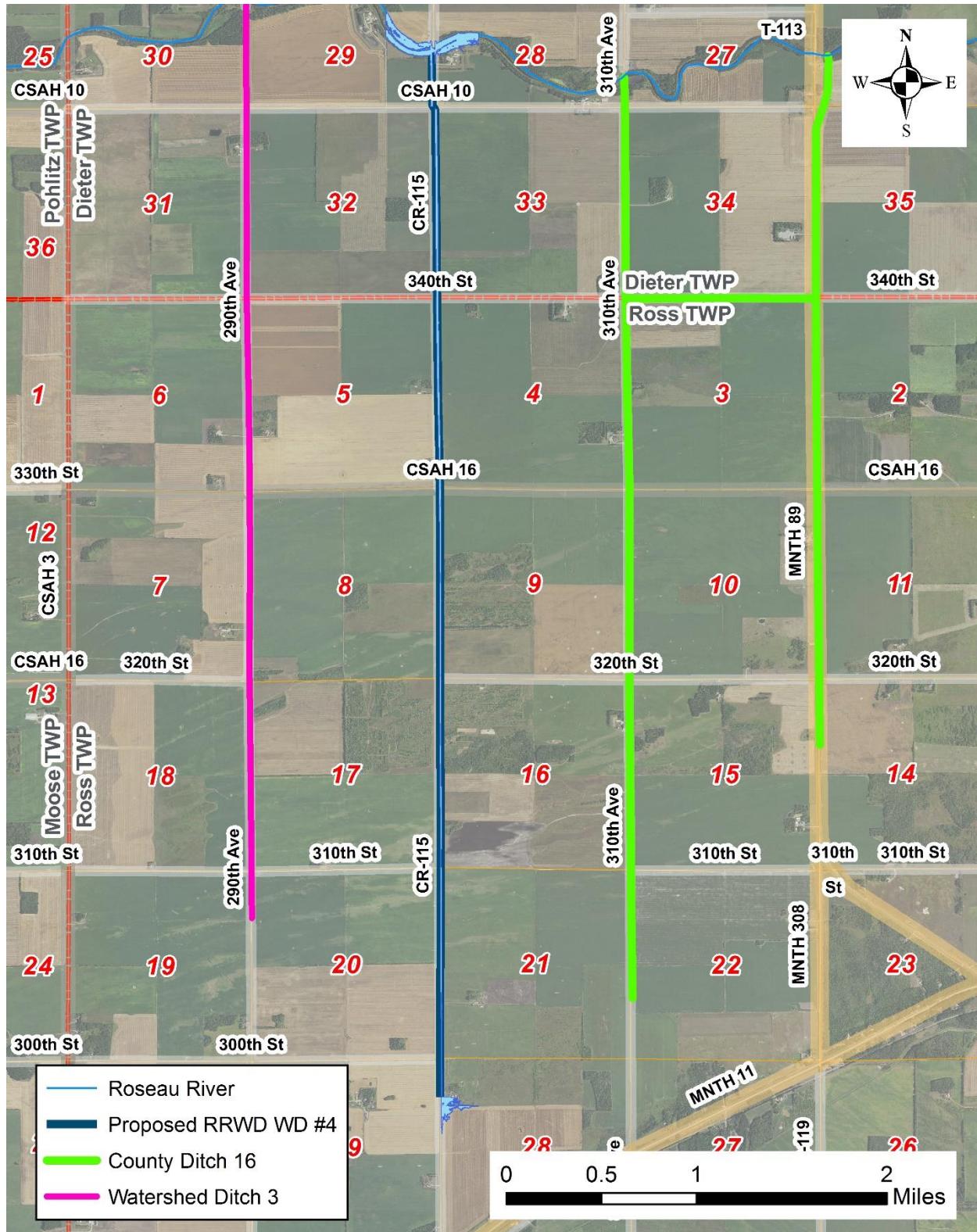


Figure 15: 10-Year 24-Hour Proposed Condition HEC-RAS Flood Extents

Additional Considerations

Erosion Control

A riprap apron consisting of a Random Riprap Class 3 will be designed for the upstream and downstream ends of each culvert crossing. A Stormwater Pollution Prevention Plan (SWPPP) will be developed with the construction plans and implemented during construction.

Utilities

HDR conducted a Gopher State One Call to obtain information on what utilities are located inside the project area. The known utilities within the project area are shown in Figure 16. Exact locations of other utilities such as fiber optic, water lines, and underground electric crossing the ditch will also be determined during development of the construction documents.

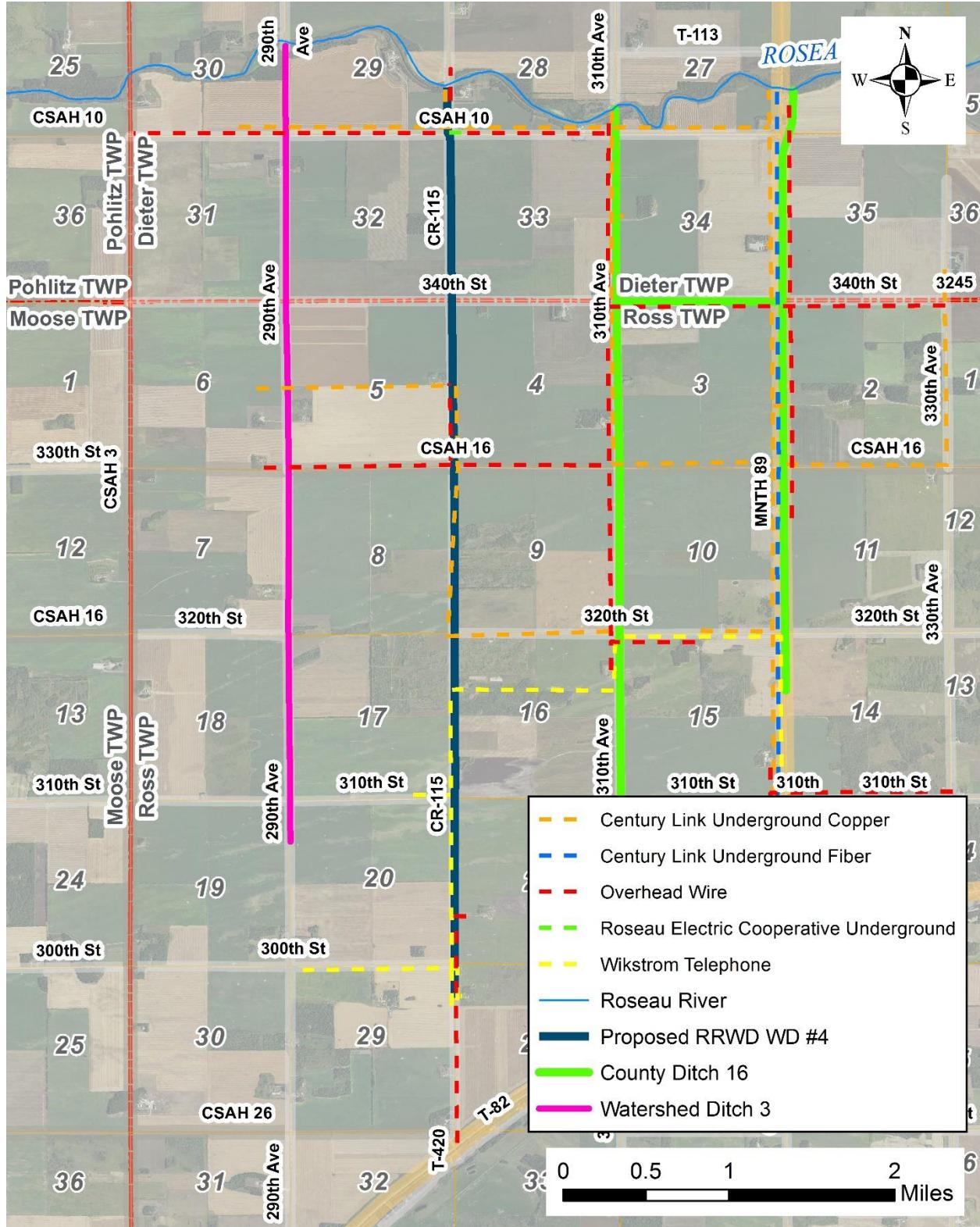


Figure 16. Existing Utilities

Permanent Right-of-Way

Permanent ditch right-of-way will be purchased for the proposed WD 4 establishment. The Minnesota Statutes 103E.021 and 103F.48 require a minimum permanently vegetated buffer zone of 16.5 feet from the top of the excavated slope or to the top of the spoil slope on the ditch side, whichever is greater. Temporary right-of-way will also be purchased beyond the permanent right-of-way to provide for construction access and spoil disposal. Table 12 displays the estimated permanent right-of-way required outside of the existing CR 115 right-of-way. It is estimated that a total of approximately 21 acres of permanent and 40 acres of temporary right-of-way will be required.

Table 12. Estimated Permanent Right-of-Way

| Station | Permanent R.O.W. Required |
|------------------|---------------------------|
| 0+00 to 55+30 | 45' |
| 55+30 to 82+00 | 35' |
| 82+00 to 109+50 | 32' |
| 109+50 to 110+85 | 45' |
| 110+85 to 111+75 | 66' |
| 111+75 to 121+50 | 40' |
| 121+50 to 290+80 | 30' |

Engineer's Opinion of Probable Cost

Table 13 outlines the estimated costs for the recommended alternative based on 2022 rates. These costs are subject to change based on design changes during finalization of the construction documents and inflation rate changes in future years.

Table 13: Engineer's Opinion of Probable Cost

| Construction ¹ | Engineering & Admin | Utility Relocation | Right-of-Way | Temp. Right-of-Way | Total ² |
|---------------------------|---------------------|--------------------|--------------|--------------------|--------------------|
| \$898,377 | \$200,000 | \$15,000 | \$23,100 | \$4,800 | \$1,237,399 |

¹ Summation of estimated quantities and unit costs (see Appendix C).

² Includes 10% contingency of estimated total cost

Benefitted Area

An independent group of viewers were appointed by the Roseau River Watershed District on May 6th, 2021 to analyze the drainage benefits that the proposed WD 4 Project would have on the lands within the drainage area. Through landowner meetings and discussions with RRWD staff, design changes were proposed which were to remove all four centerline culverts through CR 115. The four existing centerline culverts through CR 115 convey water from east to west during all runoff events into the WD 3 system. A landowner meeting was held on February 9th, 2022 to discuss these changes with the landowners within the WD 4 drainage area and those east of WD 3. The landowners in attendance and the Roseau County Highway Department engineering staff were in favor of this change if it would not negatively impact the efficiency of the proposed WD 4 system or the adjacent roadways. The removal of the culverts extends the benefitted area from the WD 4 drainage area to Section 32 of Dieter Township and Sections 5, 8, 17, and 20 of Ross Township immediately adjacent to the west of County Road 115. The proposed benefitted area for WD 4 is displayed in Figure 17. The Detailed Viewer's Report Exhibit 1 can be found in Appendix G. The exhibit provides the proposed benefit values by 40-acre tracts for each of the parcels within the proposed WD 4 benefitted area. It also outlines the damages for each 40-acre tract for the parcels adjacent to the proposed alignment.

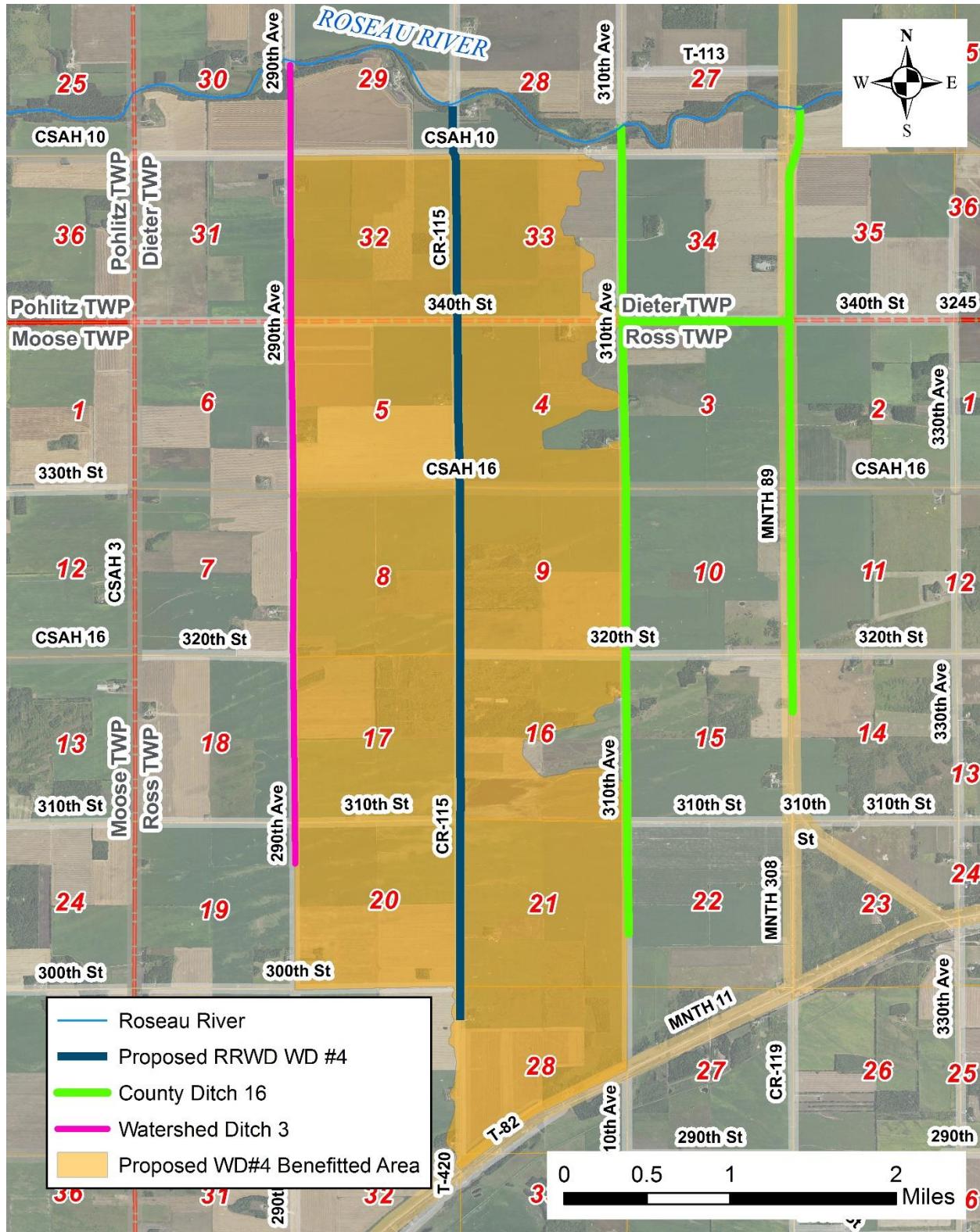


Figure 17: Proposed Watershed Ditch 4 Benefitted Area

Social, Economic, and Environmental Impacts

Adequacy of Outlet

The outlet for the proposed drainage system establishment is the Roseau River. During major flood events, almost all areas of the RRWD contribute flood water to the Roseau River. However, due to location or other characteristics, some areas may consistently contribute more to the peak flow which is the more damaging portion of a flood hydrograph. The selection and design of appropriate Flood Damage Reduction (FDR) measures will depend on the timing of an area's flood water contribution to flooding in other areas of the basin.

The Project is consistent with the Mediation Agreement goals adopted by the RRWMB and Red River Basin Flood Damage Reduction Work Group. The flood water is considered to be "early water" for the Roseau River and is in the middle area for the Red River of the North based on the Flood Damage Reduction Work Group Technical Paper #11. Figure 18 displays the three timing zones for the Red River Basin. FDR measures such as culvert sizing receives a positive "+" rating for a middle area. The drainage system is designed to improve drainage for runoff events up to a 10-year 24-hour storm duration when the Roseau River is at normal summer stage. Larger runoff events will result in water temporarily stored on the landscape. When a 2-year 24-hour event occurs throughout the RRWD, backwater from the River will enter the proposed ditch system as it does today without the Project.

Note that the timing of an area's flood water contribution depends on the location of the downstream damage center being considered. Knowledge of the timing of flows within the RRWD and the Red River Basin continues to be developed based on gage data from actual flood events and by hydrologic modeling.

The Roseau River, into which the WD 4 will discharge, is a significantly larger channel than the proposed geometry of WD 4. When considering the proposed ditch in the larger context of the Roseau River Watershed, the entire system of improvements which include retention, outlet stabilization, and conveyance enhancements work together to reduce flooding problems downstream. As previously stated, this Project is designed to provide drainage when the Roseau River is at normal summer stage. The Roseau River is an adequate outlet for WD 4.

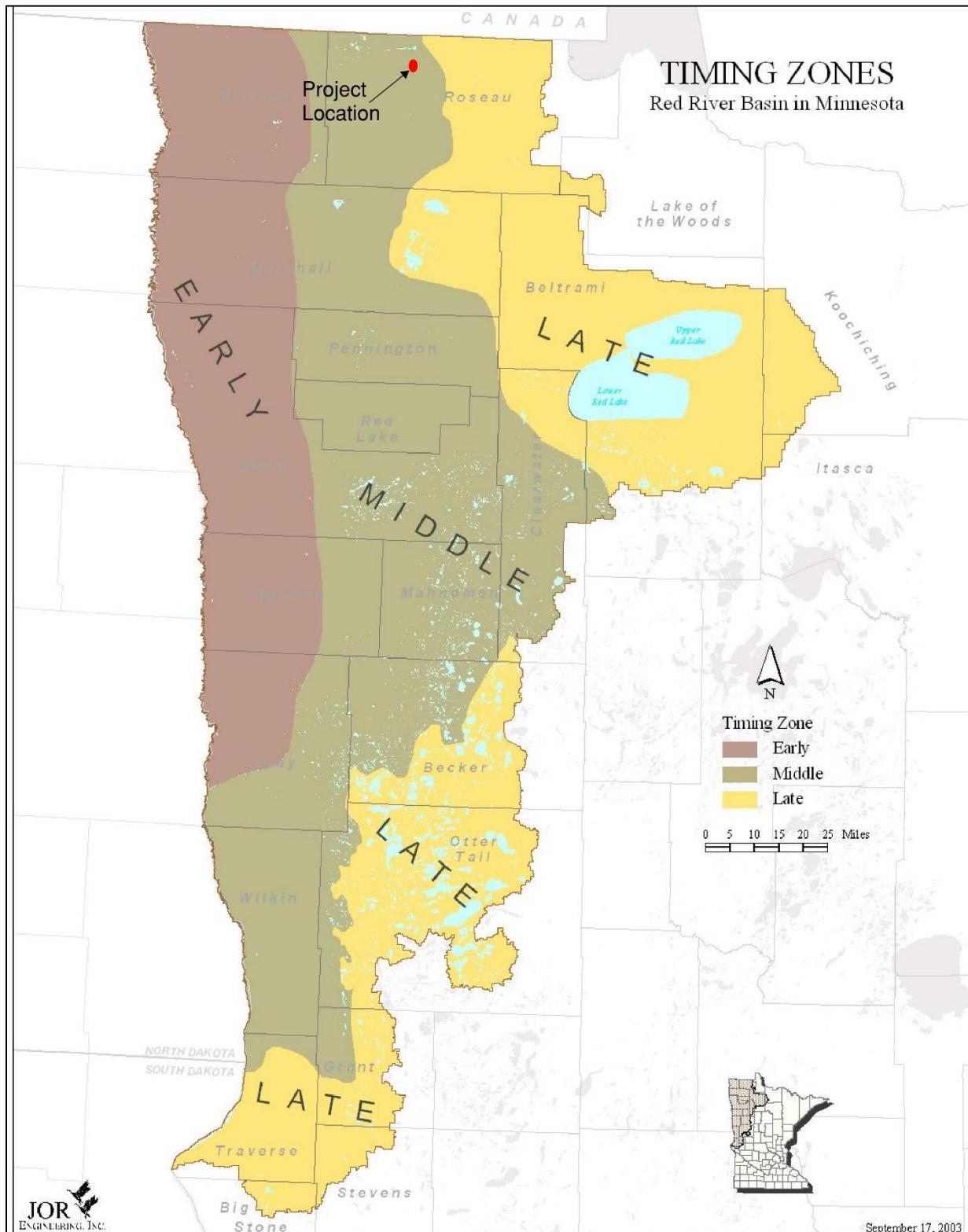


Figure credit: Anderson, Charles and Al Kean, *Red River Basin Flood Damage Reduction Work Group Technical and Scientific Advisory Committee Technical Paper Number 11 (TP-11)*, May 2004.

Figure 18. Runoff Timing Zones

Social and Economic Impacts

The Project will produce a positive economic impact and benefit for the local landowners by reducing property damage and crop loss due to flooding. The Project will also provide increased assurances created by the reduction in flood damages to the infrastructure located within the benefited area.

Permits & Regulatory Requirements

The following permits and compliance actions would be required for construction of the Project:

United States Army Corps of Engineers Section 404 Permit

A Section 404 permit from the United State Army Corps of Engineers (USACE) would be required for impacts on wetlands and other waters of the United States. USACE requires prior authorization of discharges of dredge or fill material, including those for temporary construction purposes, into waters of the United States (33 USC § 1344). Figure 19 shows National Wetland Inventory (NWI) data along the proposed WD 4. A wetland delineation report was prepared by the Roseau River Watershed District in February 2021 and is in Appendix E.

National Flood Insurance Program

The Federal Emergency Management Agency categorized the northern portion of the proposed WD 4 (Sections 28, 33 and the northern portion of 29 of Dieter Township) as a Special Flood Hazard Area Zone AE (areas that have a 1% probability of flooding every year, also known as the "100-year floodplain). A permit is required before construction or development begins within any Special Flood Hazard Area to ensure that proposed development projects meet the requirements of the National Flood Insurance Program and the community's floodplain management ordinance. Figure 20 shows the FEMA floodplain in the location of the proposed WD 4.

National Historic Preservation Act

Should any inadvertent discoveries of cultural resources occur during the construction, work would need to be ceased in the area and the State Historic Preservation Office (SHPO) would be notified.

Minnesota Department of Natural Resources

Prior to construction, a permit/authorization through the MNDNR Permitting and Reporting System to determine the extent of individual and general permits would be required.

Wetland Conservation Act (WCA)

Any wetland disturbed by construction equipment, excavation, or fill material must be permitted in accordance with the Board of Water and Soil Resources (BWSR's) Wetland Conservation Act (WCA) and Section 404 of the Clean Water Act. An individual wetland permit would be required from the local government unit, which would likely include a review of operational parameters, such as wetland inundation, bounce, flood frequency, and water depth, in addition to wetland impacts from the construction footprint. Construction cannot begin until all permits are received.

Section 401 Water Quality Certification

As part of the Section 404 permit, Section 401 established the National Pollutant Discharge Elimination System (NPDES) permit program under the Environmental Protection Agency to regulate point and non-point source discharges into waters of the United States. In Minnesota, the NPDES permit authorizing stormwater discharge associated with construction activities is General Permit No. MN R100001, administered by MPCA for all land, except native land. As a requirement of the NPDES permit, a Storm Water Pollution Prevention Plan would need to be created to meet site-specific requirements and to outline procedures to minimize erosion and to mitigate sediment transport during and after construction activities. After a SWPPP is developed, an online stormwater permit application would need to be submitted as part of authorization for land-disturbing activities.

Minnesota Private Cemeteries Act

If human remains are found during construction activities, construction must stop in that area and procedures set forth by the state must be followed (Minnesota Statutes 307.08).

Minnesota Historic Sites Act

In the case that previously unevaluated cultural resources are discovered during construction, the area of discovery would be avoided and given adequate protection. The Natural Resource Conservation Service (NRCS) and SHPO would be notified. Procedures outlined in the cultural resources NRCS State Level Agreement would be followed.

Roseau County

A permit must be obtained by the Roseau County Environmental Services department to verify a development meets the standards of the Floodplain Management Ordinance No. 29.

An application must be obtained by the Roseau County Highway Department for a Transportation Permit prior to transporting construction materials. This permit is for roads and highways under the jurisdiction of Roseau County only, which includes county roads and county state aid highways.

A permit must be obtained to work within the right-of-way for CR 115 and for the construction of the drainage structures.

Roseau River Watershed District

A permit shall be obtained from the Watershed District prior to any work being commenced per Section 3.2 of the Amended Rules of the Roseau River Watershed District.

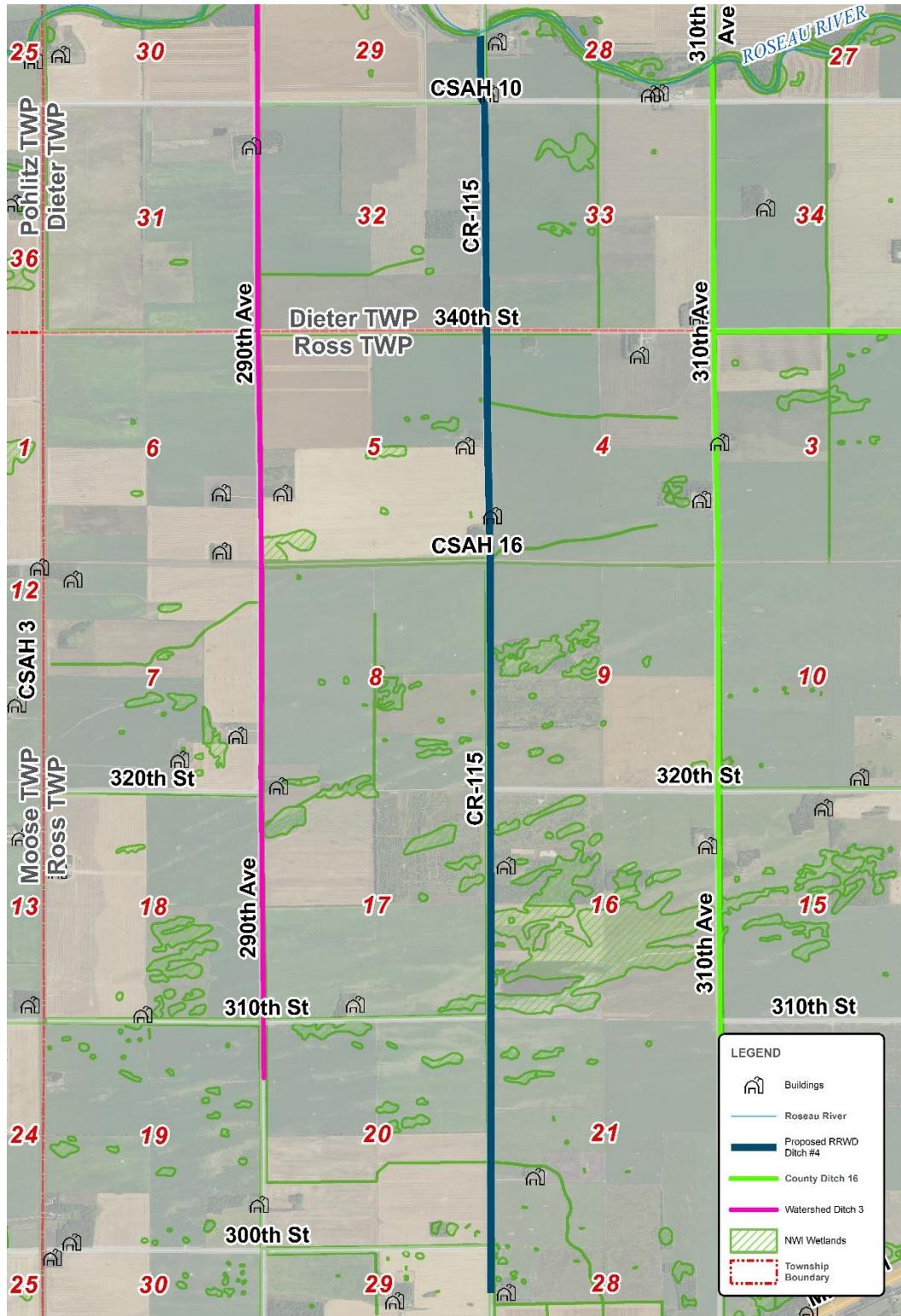


Figure 19. NWI Wetlands

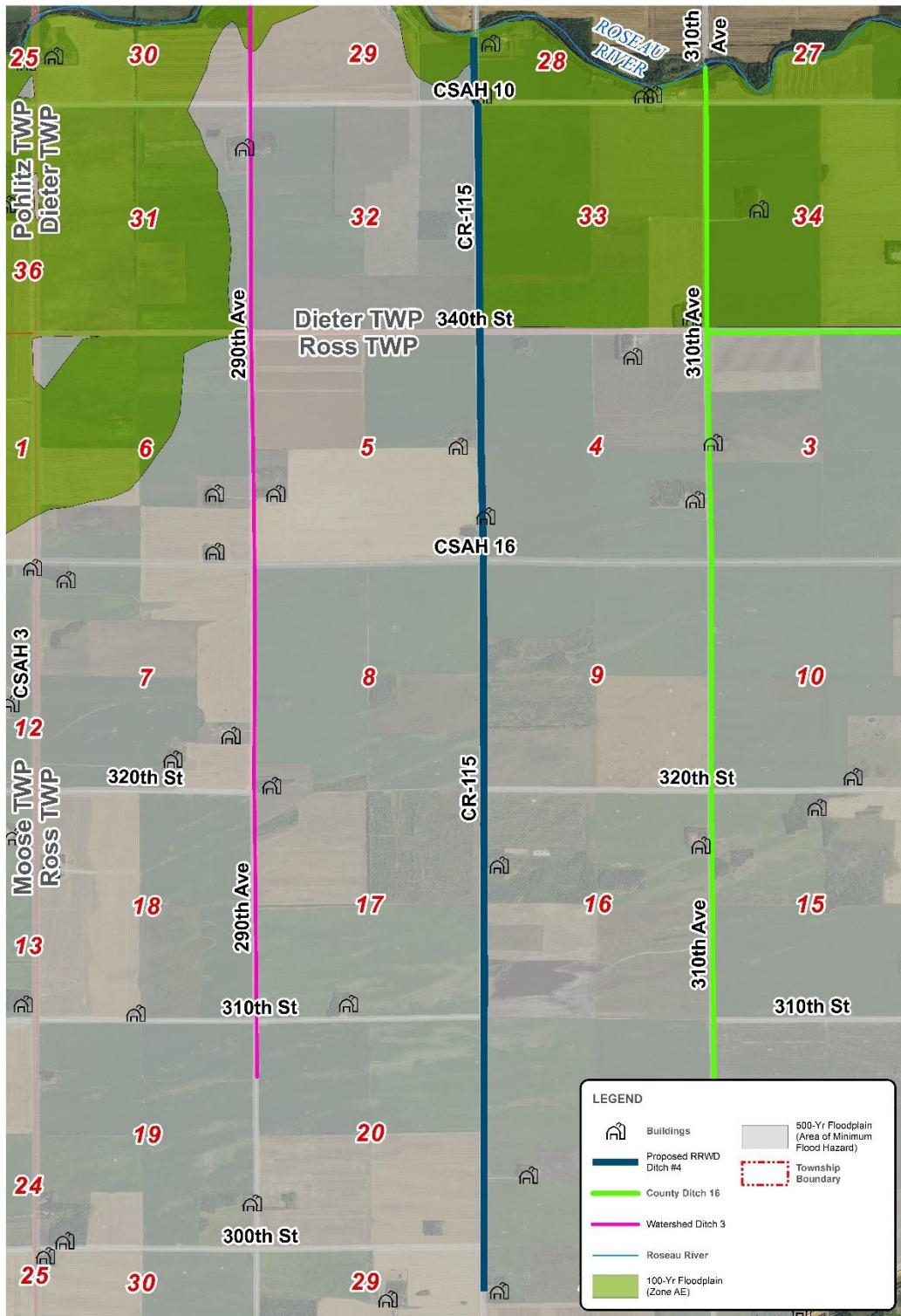


Figure 20. FEMA Floodplain Map

Environmental, Land Use, and Multipurpose Water Management Criteria

This section addresses Minnesota Statutes 103E.015 considerations before drainage work is done.

1. Private and Public benefits and costs of the proposed drainage project:

The project provides private benefits by reducing crop loss due to flooding and improving the productivity of the land. In addition, overland flooding causes significant loss of topsoil. The project reduces overland flooding, incorporates side water inlets and a permanent grass buffer to reduce erosion and preserve topsoil.

2. Alternative measures:

The Whitney Lake Subwatershed Project identified the proposed WD 4 as a preferred alternative along with other ditch improvements and two retention sites. The “do nothing” alternative will allow flooding, erosion, and crop loss to continue.

3. Present and anticipated land use within the drainage project or system, including compatibility of the project with local land use plans.

The overall land use in the proposed WD 4 system is agricultural. There are township and county roads in the project area. It is not anticipated that land use in the watershed will change.

4. Current and potential flooding characteristics of property in the drainage project or system and downstream for 5-, 10-, 25-, and 50-year flood events, including adequacy of the outlet for the drainage project.

As part of the Whitney Lake Subwatershed Project planning effort, all the flooding events have been considered in conjunction with the resources of concern in the watershed. The impacts of the proposed drainage work are minimal. The downstream outlet (River) has a drainage area of 1,086 square miles at the confluence with the proposed WD 4. The outlet is adequate to handle the 5.7 square miles of drainage area from WD 4.

5. Effects of the proposed drainage project on wetlands.

The project does not propose to drain any public waters. A wetland delineation will be outlined in the Detailed Survey Report. Coordination with the Wetland Conservation Act Local Government Unit (LGU) will occur.

6. Effects of the proposed drainage project on water quality.

The project will have a positive impact on water quality. The existing ditch does not incorporate a grassed buffer area or frequent side water inlets. During the survey and site inspection it was observed that significant erosion occurred during runoff events. The proposed design incorporates the use of side water inlets and a minimum 16.5-foot grass buffer area. Flared end sections and riprap will be utilized to reduce velocities and prevent scour.

7. Effects of the proposed drainage project on fish and wildlife resources.

The project area contains minimal wildlife management areas. The land use is primarily agricultural. The project will have a positive benefit on water quality and will reduce sediment

transport to downstream water bodies (Roseau River). It is not anticipated that the project will negatively impact vegetation or aquatic life in the system.

8. Effects of the proposed drainage project on shallow groundwater availability, distribution, and use.

There are no known shallow groundwater reserves in the project area. Shallow groundwater irrigation or sub-surface drainage is not practiced in the watershed.

9. Overall environmental impact of all the above criteria.

The project incorporates modern ditch design principles of flatter side slopes, piped side water inlets, and grassed buffer areas. As a result, the project will likely improve downstream water quality by reducing erosion at the confluence of the Roseau River and within the ditch, as well as prevent field topsoil from entering the system.

References

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APPENDIX A: PETITION FOR ESTABLISHMENT OF ROSEAU RIVER WATERSHED DISTRICT WATERSHED DITCH #4

**ROSEAU RIVER WATERSHED DISTRICT
BOARD OF MANAGERS**

PETITION FOR DITCH

Douglas C. Erickson, of 36838 300th Street, Roseau, MN 56751 the Petitioner, hereby prays the Board of Managers of the Roseau River Watershed District for the construction of a ditch pursuant to Minn. Stat. Chapter 103E.

1. That it is in the public interests that a ditch be established in Ross and Dieter Townships, Roseau County, Minnesota, within this Watershed District.
2. That said ditch should commence in the Southwest corner of the Southwest Quarter (SW $\frac{1}{4}$) of Section Twenty-one (21), Township One Hundred Sixty-two (162), Range Forty-one (41) (Ross Township), and thence pass North along and adjacent to Roseau County Road 115 to the Northwest corner of Section Thirty-three (33), Township One Hundred Sixty-three (163) North, Range Forty-one (41) West (Dieter Township), whereupon it turns Northwest crossing Roseau County Road 115 and enters the Northeast corner of the Northeast Quarter (NE $\frac{1}{4}$) of Section Thirty-two (32), Township One Hundred Sixty-three (163) North, Range Forty-one (41) West (Dieter Township); and thence along and adjacent to Roseau County Road 115 North in the East Half of the East Half of the Southeast Quarter (E $\frac{1}{2}$ E $\frac{1}{2}$ SE $\frac{1}{4}$) of Section Twenty-nine (29) to its terminus at State Ditch 51 (Roseau River). A map is attached hereto as Exhibit B.
3. That the forty-acre tracts or Governmental lots and property where the proposed drainage system passes over are identified on the attached Exhibit A including the names and addresses of the property owners from records in the Roseau County Assessor's Office.
4. That the proposed ditch is necessary to provide adequate drainage for the use of agricultural lands and the protection of structures from flooding.
5. That your Petitioner prays that the proposed ditch be built and designed up to a 10-year event capacity in order to improve agricultural drainage utilizing the design criteria outlined in Red River of the North Basin, Basin Technical and Scientific Advisory Committee BTSAC (Briefing Paper No. 3: Water Management Options for Surface Drainage).

6. That the proposed ditch will benefit and be useful to the public and will promote public health.

7. Your Petitioner will pay all costs of the proceedings if the proceedings are dismissed or the contract for the construction of the proposed drainage system is not awarded.

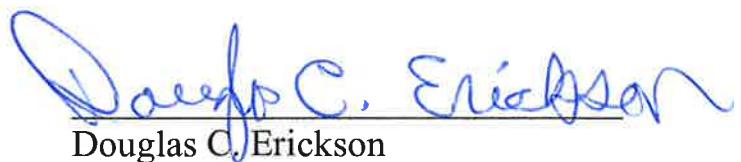
WHEREFORE, your Petitioner prays for relief as follows:

1. That this Board present this Petition to its counsel for confirmation of its legal adequacy;

2. That upon confirmation of legal adequacy by counsel, this Board appoint an engineer to examine the proposed system and return a preliminary survey pursuant to Minnesota Statutes Chapter 103E.

3. That this Board, upon the return of a preliminary survey report, set a hearing where interested parties may appear and be heard, and after which Findings and an Order may issue for additional proceedings as required by law.

Dated: 5-5-2020



The image shows a handwritten signature in blue ink that reads "Douglas C. Erickson". Below the signature, the name "Douglas C. Erickson" is printed in a smaller, black, sans-serif font.

EXHIBIT A
DOUGLAS ERICKSON DITCH PETITION

TABLE OF TRACTS
and
SIGNATURE PAGES

(All owners joining the petition *and their spouses* must sign.
If adequate space is not provided, please sign in the margin.)

1. Sec. 21-Parcel #280045600 SW $\frac{1}{4}$ SW $\frac{1}{4}$

Alice Foss
April Foss, Per. Repr.

Alice

Estate of Bruce L. Foss and
April Foss, Per. Repr.
c/o Moren Law Office
P.O. Box 350
Roseau, MN 56751

2. Sec. 21-Parcel #280045500 NW $\frac{1}{4}$ SW $\frac{1}{4}$

Douglas C. Erickson
Douglas C. Erickson

Rachel T. Erickson
Spouse

Douglas C. Erickson, et ux
36838 300th Street
Roseau, MN 56751

Other Owner

Spouse

Other Owner

Spouse

3. Sec. 21-Parcel #280045200 SW $\frac{1}{4}$ NW $\frac{1}{4}$

Jordan D. Erickson
Jordan D. Erickson

Megan Boen
Spouse

Jordan D. Erickson
816 Duluth Ave. N
Thief River Falls, MN 56701

4. Sec. 21-Parcel #280044900 NW $\frac{1}{4}$ NW $\frac{1}{4}$

Gail Haugen
Gail Haugen
Gen D Haugen
Spouse

Gail Haugen
27066 North Main Street
Badger, MN 56714

5. Sec. 16-Parcel #280035000 SW $\frac{1}{4}$ SW $\frac{1}{4}$

Suzanne J Anderson
Trustee

Suzanne J. Anderson Living Trust
1411 Fifteenth Ave. N
Wahpeton, ND 58075

6. Sec.16-Parcel #280036500 NW $\frac{1}{4}$ SW $\frac{1}{4}$

Ardmore Haugen

Spouse

Other Owner

Other Owner

Ardmore Haugen, et ux
35730 County Road 115
Roseau, MN 56751

Spouse

Spouse

7. Sec. 16-Parcel #280037400 SW $\frac{1}{4}$ NW $\frac{1}{4}$

Josie R. Muirhead

Spouse

next page

~~Josie R. Muirhead~~
~~1102 Center Street East~~
~~Roseau, MN 56751~~

8. Sec. 16-Parcel #280037100 NW $\frac{1}{4}$ NW $\frac{1}{4}$

Justin Wojciechowski
Justin Wojciechowski

Spouse

Justin Wojciechowski
752 Lenmark Lane
Badger, MN 56714

9. Sec. 9-Parcel #280015100 SW $\frac{1}{4}$ SW $\frac{1}{4}$
Carmen M. Przekwas
Carmen M. Przekwas
Robert Przekwas
Spouse
10. Sec. 9-Parcel #280014500 NW $\frac{1}{4}$ SW $\frac{1}{4}$
Patricia Jean Mann
Patricia Jean Mann
Alma Clegg
Spouse
11. Sec. 9-Parcel #280014200 SW $\frac{1}{4}$ NW $\frac{1}{4}$ &
NW $\frac{1}{4}$ NW $\frac{1}{4}$
Selvin M. Erickson
Selvin M. Erickson, Jr.
Debra Erickson
Spouse
12. Sec. 4-Parcel #280006100 SW $\frac{1}{4}$ SW $\frac{1}{4}$ &
NW $\frac{1}{4}$ SW $\frac{1}{4}$
Douglas C. Erickson
Douglas C. Erickson
Rachel F. Erickson
Spouse
-
- Other Owner
-
- Other Owner
- Carmen M. Przekwas
36037 County Road 114
Roseau, MN 56751
- Patricia Jean Mann
4756 North Farm Road 145
Springfield, MO 65803
- Selvin M. Erickson, Jr.
33277 310th Ave.
Badger, MN 56714-9130
- Douglas C. Erickson, et ux
36838 300th Street
Roseau, MN 56751
-
- Spouse
-
- Spouse

13. Sec. 4-Parcel #280005800 SW $\frac{1}{4}$ NW $\frac{1}{4}$ &
Robert Johnson
 Govt. Lt. 4
 Trustee
14. Sec. 33-Parcel #070070300 SW $\frac{1}{4}$ SW $\frac{1}{4}$
Douglas C. Erickson
 Douglas C. Erickson
Rachel Erickson
 Spouse
15. Sec. 33-Parcel #070070000 NW $\frac{1}{4}$ SW $\frac{1}{4}$
Selvin M. Erickson, Jr.
Debra Erickson
 Spouse
16. Sec. 33-Parcel #070069700 SW $\frac{1}{4}$ NW $\frac{1}{4}$ &
 NW $\frac{1}{4}$ NW $\frac{1}{4}$
Garrett Lee
 Garrett D. Lee by Chmn Lee
 Spouse
17. Sec. 32-Parcel #070068500 NE $\frac{1}{4}$ NE $\frac{1}{4}$
Ardmore Haugen
 Spouse
- Robert A. Johnson Trust
 35219 County Road 115
 Badger, MN 56714
- Douglas C. Erickson
 36838 300th Street
 Roseau, MN 56751
- Selvin M. Erickson, Jr.
 33277 310th Ave.
 Badger, MN 56714-9130
- Garrett D. Lee
 30715 350th Str.
 Badger, MN 56714
- Ardmore Haugen, et ux
 35730 County Road 115
 Roseau, MN 56751

Other Owner

Spouse

Other Owner

Spouse

18. Sec. 29-Parcel #070063400 SE $\frac{1}{4}$ SE $\frac{1}{4}$ &

NE $\frac{1}{4}$ SE $\frac{1}{4}$

Robert Johnson
Trustee

Roberta A. Johnson Trust
35219 County Road 115
Badger, MN 56714

7. Sec. 16-Parcel #280037400 SW $\frac{1}{4}$ NW $\frac{1}{4}$
Martina M. Barrett Post
Sean G. Barrett
Sean G. Barrett

Sean G. Barrett
3275 Roosevelt Way, Apt. 1
Rock Springs, WY 82901

Spouse

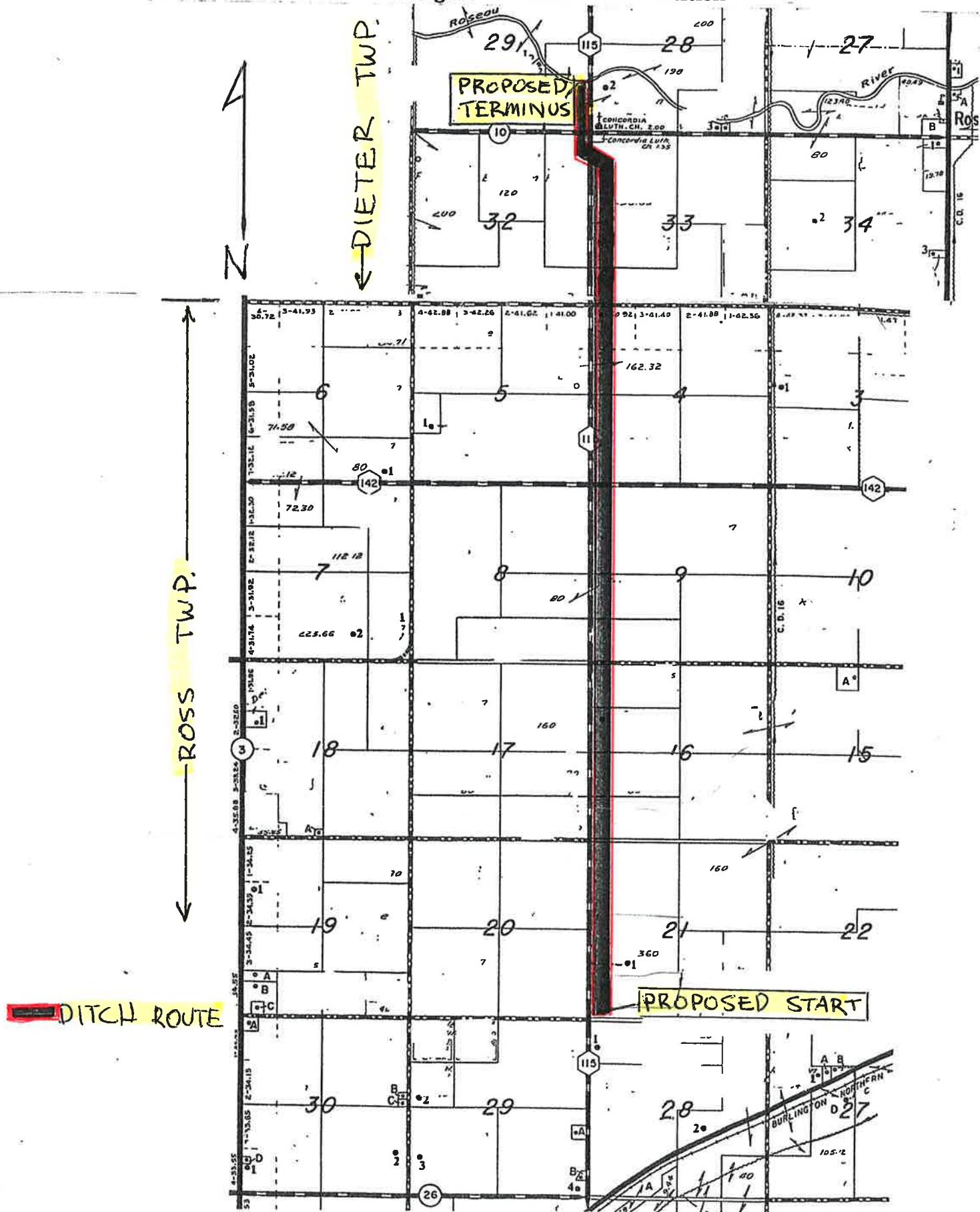
Send contact information to:

Martina Barrett
318 6th ave NE
Roseau, mn 56751

463-1501

EXHIBIT "B"

Douglas Erickson Ditch Petition





CSAH 115



Drawn By: TMM

Date: 3/27/2019

0 0.125 0.25 0.5 Miles



APPENDIX B: WHITENEY LAKE SUBWATERSHED PROJECT FACT SHEET

"With a ridge to the south and inadequate drainage systems flowing north, an inch-and-a-half of rain can turn into a disaster on a Wednesday evening."



Whitney Lake Project

Protecting farmland productivity through comprehensive flood damage reduction solutions

82%

of the Whitney Lake Subwatershed is agricultural land.

THE GOAL

Reduce damage to farmland by providing protection against a ten-year summer storm event, equal to a

3.39"

rainfall in 24 hours.

Critical Timing

Water issues in the Whitney Lake Subwatershed go back more than a century. Farmers facing depressed commodity prices and increased operational cost have expressed a willingness to collaborate in finding long-term solutions to these problems. Landowners are willing to hold water on their land in an effort help protect their neighbors against catastrophic flooding. In this current environment of collaboration, it is important that we seize on this opportunity to create lasting change.

Temporary Flood Storage

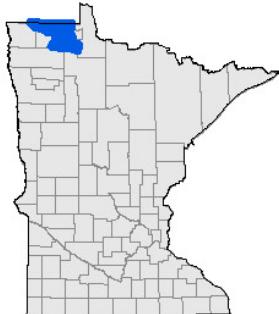
Two retention sites have been identified and will improve wildlife habitat, reduce sediment and nutrients from reaching the beautiful Roseau River, and contribute to reducing peak flows on the Red River of the North.

Increases to Capacity & Protection

The drainage systems can be easily brought up to a ten-year capacity, protecting the lands and providing clean water benefits through improved design.

Putting an end to the flooding hardships

After decades of patiently enduring flood damages, there will be immeasurable social benefits that come from working together to find a solution.



The Whitney Lake subwatershed is located in northwest Minnesota near the Canadian border. It lies south of the Roseau River within the Red River of the North Basin.

The Red River Basin Flood Damage Work Group published the Mediation Agreement of 1998 with a flood damage reduction goal for intensively farmed agricultural land. The goal is to reduce damage to farmland by providing protection against a ten-year summer storm event, equal to a 3.39-inch rainfall in 24 hours.

Total Estimated Costs

\$8 M FDR / Public Funding

\$6 M – Retention Site A

\$2 M – Retention Site C

\$2 M Private Funding

\$1 M – Increased Conveyance

\$1 M – Ditch Improvements

\$10 M Total Costs

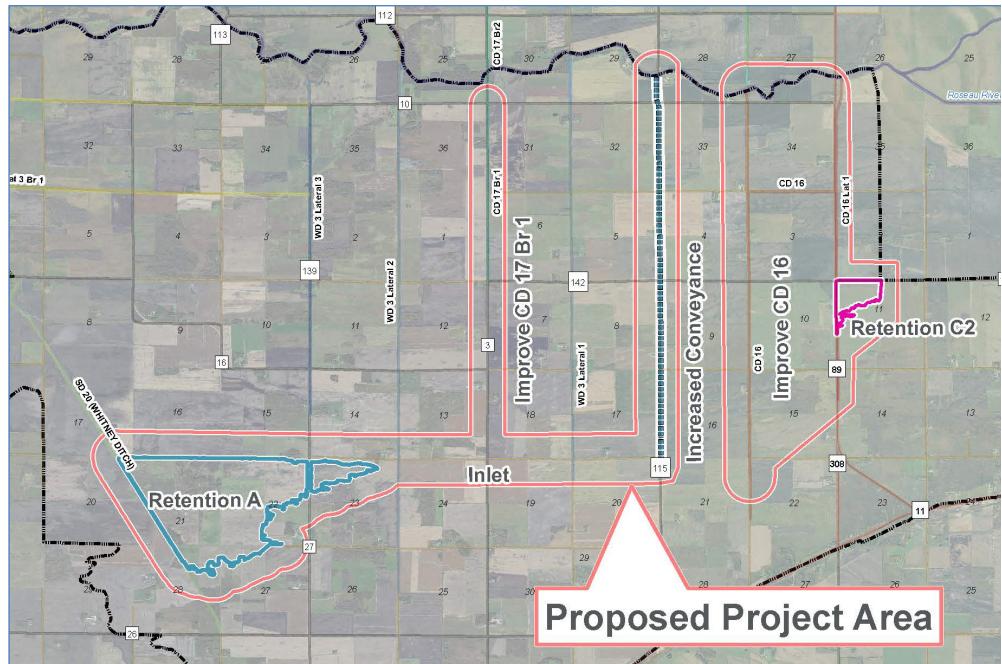
Funding

Federal: RCPP / USDA - \$0.67 M

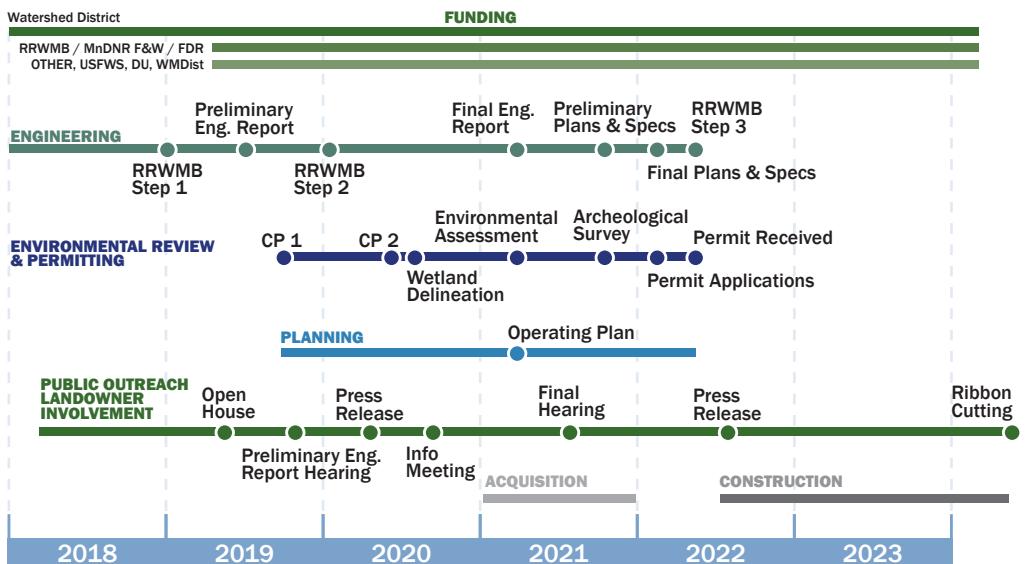
State: FDR - \$4 M, Clean Water - \$90 K

Local: RRWMB - \$2.7 M, RRWD - \$0.63 M

Private: \$2 M



Whitney Lake Project Timeline



How to Stay Informed and Provide Input



You can stay informed about progress online by visiting the Project Page at: www.roseauriverwd.com



Complete a comment form today!

Contact Tracy Halstensgard, Administrator for more information.



218.463.0313



Roseau River Watershed District
714 6th St SW
Roseau, MN 56751

APPENDIX C: ENGINEER'S OPINION OF PROBABLE COST

| ROSEAU RIVER WATERSHED DISTRICT WATERSHED DITCH #4 OPINION OF PROBABLE COST | | | | | |
|-----------------------------------------------------------------------------|-------------------------------------------------|----------|----------------|-------------|----------------|
| ITEM NO. | ITEM DESCRIPTION | UNIT | TOTAL QUANTITY | UNIT COST | TOTAL COST |
| 2021.501 | MOBILIZATION | LUMP SUM | 1 | \$60,000.00 | \$60,000.00 |
| 2051.501 | MAINT AND RESOTRATION OF HAUL ROADS | LUMP SUM | 1 | \$20,000.00 | \$20,000.00 |
| 2101.501 | CLEARING AND GRUBBING | LUMP SUM | 1 | \$5,000.00 | \$5,000.00 |
| 2104.503 | REMOVE 18" CS PIPE CULVERT W/ APRONS | LIN FT | 387 | \$13.00 | \$5,031.00 |
| 2104.503 | REMOVE 24" CS PIPE CULVERT W/ APRONS | LIN FT | 289 | \$13.00 | \$3,757.00 |
| 2104.503 | REMOVE 30" CS PIPE CULVERT W/ APRONS | LIN FT | 164 | \$13.00 | \$2,132.00 |
| 2104.503 | REMOVE 35" SPAN CS PIPE ARCH W/ APRONS | LIN FT | 36 | \$13.00 | \$468.00 |
| 2104.503 | REMOVE 49" SPAN CS PIPE ARCH W/ APRONS | LIN FT | 40 | \$13.00 | \$520.00 |
| 2104.503 | REMOVE 30" RC PIPE W/ APRONS | LIN FT | 60 | \$13.00 | \$780.00 |
| 2104.502 | SALVAGE SIGN TYPE A | EACH | 6 | \$250.00 | \$1,500.00 |
| 2105.507 | COMMON EXCAVATION (P) | CU YD | 125000 | \$1.90 | \$237,500.00 |
| 2106.507 | COMMON EMBANKMENT (P) (CV) | CU YD | 500 | \$2.50 | \$1,250.00 |
| 2118.509 | AGGREGATE SURFACING, CLASS 5 MOD. | TON | 1484 | \$16.00 | \$23,744.00 |
| 2451.507 | GRANULAR BEDDING (CV) (P) | CU YD | 1248 | \$18.00 | \$22,464.00 |
| 2501.502 | 18" CS PIPE APRON | EACH | 20 | \$250.00 | \$5,000.00 |
| 2501.502 | 36" CS PIPE APRON | EACH | 4 | \$600.00 | \$2,400.00 |
| 2501.502 | 42" CS PIPE APRON | EACH | 4 | \$1,000.00 | \$4,000.00 |
| 2501.502 | FLAP GATE FOR 18" CS PIPE | EACH | 20 | \$650.00 | \$13,000.00 |
| 2501.502 | 65" SPAN RC PIPE-ARCH APRON | EACH | 2 | \$4,400.00 | \$8,800.00 |
| 2501.502 | 60" RC PIPE APRON | EACH | 2 | \$4,800.00 | \$9,600.00 |
| 2501.503 | 18" CS PIPE CULVERT | LIN FT | 2160 | \$45.00 | \$97,200.00 |
| 2501.503 | 36" CS PIPE CULVERT | LIN FT | 84 | \$66.62 | \$5,596.08 |
| 2501.503 | 42" CS PIPE CULVERT | LIN FT | 164 | \$105.00 | \$17,220.00 |
| 2501.503 | 48" CS PIPE CULVERT (BEVEL CUT ENDS) | LIN FT | 40 | \$117.55 | \$4,702.00 |
| 2501.503 | 54" CS PIPE CULVERT (BEVEL CUT ENDS) | LIN FT | 82 | \$129.95 | \$10,655.90 |
| 2501.503 | 60" CS PIPE CULVERT (BEVEL CUT ENDS) | LIN FT | 420 | \$150.00 | \$63,000.00 |
| 2501.503 | 49" SPAN CS PIPE-ARCH CULVERT (BEVEL CUT ENDS) | LIN FT | 74 | \$110.00 | \$8,140.00 |
| 2501.503 | 57" SPAN CS PIPE -ARCH CULVERT (BEVEL CUT ENDS) | LIN FT | 40 | \$116.47 | \$4,658.80 |
| 2501.503 | 60" RC PIPE CULVERT CLASS III | LIN FT | 160 | \$280.00 | \$44,800.00 |
| 2503.503 | 65" SPAN RC PIPE-ARCH CULV CLIIA | LIN FT | 48 | \$300.00 | \$14,400.00 |
| 2511.507 | RANDOM RIPRAP (CLASS 3) | CU YD | 1090 | \$105.00 | \$114,450.00 |
| 2511.507 | RANDOM RIPRAP (CLASS 3) - OUTLET CHANNEL | CU YD | 390 | \$105.00 | \$40,950.00 |
| 2563.601 | TRAFFIC CONTROL | LUMP SUM | 1 | \$10,000.00 | \$10,000.00 |
| 2563.601 | DETOUR SIGNING | LUMP SUM | 1 | \$5,000.00 | \$5,000.00 |
| 2573.503 | FLOTATION SILT CURTAIN TYPE MOVING WATER | LIN FT | 100 | \$18.00 | \$1,800.00 |
| 2573.503 | SEDIMENT CONTROL LOG TYPE STRAW | LIN FT | 0 | \$3.50 | \$0.00 |
| 2574.505 | SOIL BED PREPARATION | ACRE | 23 | \$200.00 | \$4,600.00 |
| 2574.508 | FERTILIZER, TYPE 1 | POUND | 4600 | \$0.50 | \$2,300.00 |
| 2575.505 | SEEDING | ACRE | 23 | \$300.00 | \$6,900.00 |
| 2575.505 | DISK ANCHORING | ACRE | 23 | \$30.00 | \$690.00 |
| 2575.508 | SEED MIXTURE, 25-141 | POUND | 1357 | \$4.00 | \$5,428.00 |
| 2575.509 | MULCH MATERIAL TYPE 1 | TON | 46 | \$140.00 | \$6,440.00 |
| 2575.604 | ROLLED EROSION CONTROL PREVENTION CATEGORY 25 | SQ YD | 1000 | \$2.50 | \$2,500.00 |
| | SUBTOTAL | | | | \$898,376.78 |
| | ENGINEERING & ADMIN | | | | \$200,000.00 |
| | UTILITY RELOCATION | | | | \$15,000.00 |
| | RIGHT-OF-WAY ACQUISITION | | | | \$23,100.00 |
| | TEMP. RIGHT-OF-WAY ACQUISITION | | | | \$4,800.00 |
| | TOTAL W/ CONTINGENCY | | | | \$1,237,399.00 |

APPENDIX D: PRELIMINARY HEARING FINDINGS AND ORDER

STATE OF MINNESOTA
Before the
ROSEAU RIVER WATERSHED DISTRICT
SITTING AS THE DRAINAGE AUTHORITY FOR
ROSEAU RIVER WATERSHED DITCH #4

In the Matter of:

**Petition for Establishment of Roseau
River Watershed Ditch #4**

**FINDINGS AND ORDER FOR
DETAILED SURVEY AND DETAILED
SURVEY REPORT**

The Roseau River Watershed District Board of Managers, sitting as the drainage authority for Roseau River Watershed Ditch #4 (WD #4), having received a Petition for Establishment of Roseau River Watershed Ditch #4 pursuant to Minnesota Statutes §103E.215 by Petitioner, Douglas C. Erickson, having noticed and conducted a public hearing on the preliminary survey report, and based on the record and proceedings, Manager _____ moved, seconded by Manager _____ to adopt the following Findings and Order:

Findings:

1. A Petition dated May 5, 2020 was received by the Secretary of the Roseau River Watershed District (RRWD) requesting to Establish Roseau River Watershed Ditch #4 located in Sections 21, 16, 9, and 4, Township 162 N., Range 41 W., in Ross Township, and Section 33, 32, and 29, Township 163 N., Range 41 W., in Dieter Township, all in Roseau County. Minnesota pursuant to Minn. Stat. §103E.215.
2. The drainage authority met on May 6, 2020 and accepted the Petition. Michelle Moren, attorney for the RRWD has reviewed the petition and the petition was deemed adequate. On August 28, 2020 the petitioners submitted a cost bond of \$80,000 which was effective as of August 18, 2020. On November 4, 2020, the drainage authority adopted findings and order accepting the Petition and appointing HDR Engineering as the engineer for the project. The drainage authority directed HDR Engineering to make a preliminary survey pursuant to Minn. Stat. § 103E.245.

3. Engineer Dillon Nelson of HDR filed a preliminary survey report with the drainage authority on January 6, 2021. A copy of the preliminary survey report was sent to the Director of the Division of Ecological and Water Resources in the Department of Natural Resources (DNR) and the Minnesota Board of Water and Soil Resources (BWSR) on December 31, 2020.
4. The drainage authority, by order, set a public hearing for review of the engineer's preliminary survey report on February 3, 2021 and directed the Secretary to provide at least 10 days advance notice, by mail, of the time and location of the hearing to the petitioners, political subdivisions, and owners of property likely to be affected by the proposed project.
5. Notice of the public hearing was properly provided as required by law.
6. At the public hearing, the engineer presented the preliminary survey report detailing the petitioners' request to establish WD #4's capacity in order to carry more frequent rain events up to an approximate 10-year, 24-hour hydrologic event. The preliminary survey report was made part of the record.
7. The MN DNR Director's Advisory Report and the BWSR Advisory Report on the preliminary plan was publicly read by the RRWD Administrator, Tracy Halstensgard and is included in the record of proceedings.
8. During the public comment portion of the proceedings, the following persons appeared and provided testimony. The RRWD board did not provide comment on individual testimony presented at the public hearing.
 - Mitch Magnusson, landowner, asked how the project would be funded. Engineer Nelson stated it would be funded by landowners as well as available grant program. Mr. Magnusson asked what the per acre cost would be. Engineer Nelson stated that would be information developed in the Viewers' Report.
 - Ardmore Haugen, landowner, spoke about a culvert at 340th Street that would potentially allow water to flow west. Engineer Nelson explained how the culverts would be addressed in the Detailed Survey Report. Mr. Haugen then asked about the volume of water coming from the south. Engineer Nelson stated that the volume would not be increase and the ditch would be designed to contain the flow of a 10-year event. The ditch will carry the water north to the river.
 - Douglas Erickson addressed the hearing via phone and discussed the need for improved drainage in the area. The benefit to the community, agricultural incomes and land values will justify the cost to landowners. There has been so much devastation from flooding that something needs to be done.

- Brach Svoboda, landowner, asked that the ditch be extended south and his property in Sect. 28 be included in the project. Engineer Nelson and Attorney Moren will research the options to extend the ditch.
- Brian Haugen, ownership interest in property, stated that drainage improvement is needed to help the area. Mr. Haugen asked if the river (SD51) could handle the events that are being talked about. Engineer Nelson stated that it could handle the water from the proposed ditch up to the 10-year event. Mr. Haugen then asked if that was based on data or assumptions. Engineer Nelson discussed the modeling tools and effort that has gone into developing this system as well as the Whitney Lake and Roseau Lake Projects overall. Mr. Haugen asked the date the petition was filed with the District. Administrator Halstensgard stated that the petition was received by the Board on May 6, 2020 and the required bond was received on August 25, 2020. On November 4, 2020 the Board adopted the Findings and Ordered the Preliminary Survey Report. Mr. Haugen then asked about the next steps in the process. Administrator Halstensgard stated that if the Board affirmed the findings as stated at this hearing, they would order the engineers to complete the Detailed Survey Report and hire viewers as required by statute. After that was completed, a final hearing would be scheduled. It is unknown at this time when that would take place. Mr. Haugen asked who would be paying for the project. Engineer Nelson reiterated that it would be landowners in the benefitted area along with available grant monies.
- Jordan Erickson, landowner, spoke in favor of the project and the need to improve drainage in the area. Mr. Erickson, also stated the need to keep costs down where possible.
- Matt Magnusson, landowner, stated that the water naturally wants to go west and questioned the efficiency of a ditch taking the water north to the river (SD51). Engineer Nelson stated that water naturally want to go overland west and north. Most of the water on the west side of CR 115 will still go west into WD #3 Lat 1. Mr. Magnusson then asked about sending the water west instead of a new ditch system in between two existing systems. He also asked if it was normal to have ditch systems on every mile line. Engineer Nelson replied that it isn't unheard of to have ditched every mile and the issue with ditching into the WD#3 system is the capacity of that system would not be able to handle the additional six square miles of drainage area. By adding this ditch it will ease the burden on all of the ditch systems in bringing the water to the river. Mr. Magnusson then asked how much of the area already drains into WD 3 and commented on the size of the ditches being small near Concordia Church. Engineer Nelson the capacity of the ditches will be increased and transitioned the new ditch to the west side of the road by the church allows for more space for the ditch. Engineer Nelson also commented on the fall and grade of the ditch. Engineer Nelson commented that currently water in this drainage area goes into WD#3, north to the river (SD51) and some goes into CD#16. This system would focus that flow north to the river.

- Mr. Magnusson ask if this would require the redetermination of WD#3. Engineer Nelson and Administrator Halstensgard stated that would be something that would be determined by the Viewers during the viewing process or a request for redetermination. Mr. Magnusson then discussed the cost per acre for the project. It was stated that we didn't have those numbers at this time and the viewing process would be determining the benefits. Mr. Magnusson stated that he has issues with the viewing process and the valuation that was done in the CD #16 Improvement. Mr. Magnusson then asked about the wetland determination and the potential for additional costs beyond the initial estimate. Engineer Nelson stated that would be further investigated in the Detailed Survey Report and the initial estimate included a 15% contingency for unforeseen costs.
- Administrator Halstensgard read for the record comments received at the office from Dennis Kujava, landowner. Mr. Kujava stated he is opposed to the project as it will raise property taxes. He questioned the impact the inlet channel for the Site A impoundment will have on the drainage in the area and requested information on the work MN DOT is proposing on Highway 89. Engineer Nelson stated the inlet channel would begin on the west side of CR 115 and this ditch would be on the east side. In developing the Whitney Lake project area, these projects were viewed as functioning together.

A motion was made by Manager Voll, seconded by Manager Wensloff to close the public hearing. The motion passed unanimously and the hearing ended at 2:17 p.m.

9. There was a change verbally requested in the proposed drainage project by adjacent landowner Brach Svoboda. Brach Svoboda requested that the drainage project be extended to included his real property which is located in Section 28 of Ross Township.
10. The proposed project drainage project outlined in the petition and recommended by the engineer is feasible. The recommended alternative meets all design goals. The final recommendation will be presented in a Detailed Survey Report after receiving comments from regulatory agencies and meeting with landowners.
11. There is necessity for the proposed drainage project. The landowners and land renters in the area feel that establishment of WD #4 will allow for adequate conveyance and will lessen costly crop damages realized on a yearly basis.
12. The engineer has considered the environmental, land use, and multipurpose water management criteria in Minn. Stat. § 103E.015, subd. 1. In the Preliminary Survey

Report, the engineers reported on environmental, land use, and multipurpose water management criteria:

- a. Private and Public benefits and costs of the proposed drainage project:
The project provides private benefits by reducing crop loss due to flooding and improving the productivity of the land. In addition, overland flooding causes significant loss of topsoil. The project reduces overland flooding, incorporates side water inlets and a permanent grass buffer to reduce erosion and preserve topsoil.
- b. Alternative measures:
The Whitney Lake Subwatershed Project identified the proposed WD 4 as a preferred alternative along with other ditch improvements and two retention sites. The “do nothing” alternative will allow flooding, erosion, and crop loss to continue.
- c. Present and anticipated land use within the drainage project or system:
The overall land use in the WD #4 system is agricultural. There are township, county and state roads. It is not anticipated that land use in the watershed will change.
- d. Current and potential flooding characteristics of property in the drainage project: or system and downstream for 5-, 10-, 25-, and 50-year flood events.
As part of the Whitney Lake Subwatershed Project planning effort, all the flooding events have been considered in conjunction with the resources of concern in the watershed. The impacts of the proposed drainage work are minimal. The downstream outlet has a drainage area of 1,086 square miles at the confluence with WD #4. The outlet is adequate to handle the 5.7 square miles of drainage area from WD #4. During events above a 5-year flood, the Roseau River outlet of WD #4 becomes inundated because it is part of the Roseau River floodplain.
- e. Effects of the proposed drainage project on wetlands:
The project does not propose to drain any public waters.
- f. Effects of the proposed drainage project on water quality:
The project will have a positive impact on water quality. During the survey and site inspection it was observed that significant erosion occurred during runoff events. The proposed design incorporates the use of side water inlets and a minimum 16.5-foot grass buffer area. Flared end sections and riprap will be utilized to reduce velocities and prevent scour.

- g. Effects of the proposed drainage project on fish and wildlife resources:
The project area contains minimal wildlife management areas. The land use is primarily agricultural. The project will have a positive benefit on water quality and will reduce sediment transport to downstream water bodies (Roseau River). It is not anticipated that the project will negatively impact vegetation or aquatic life in the system.
 - h. Effects of the proposed drainage project on shallow groundwater availability distribution, and use.
There are no known shallow groundwater reserves in the project area.
 - i. Overall environmental impact of all the above criteria.
The project incorporates modern ditch design principles of flatter side slopes, piped side water inlets, and grassed buffer areas. As a result, the project will likely improve downstream water quality by reducing erosion at the confluence of the Roseau River and within the ditch, as well as prevent field topsoil from entering the system.
13. After consideration of the environmental, land use, and multipurpose water management criteria in Minn. Stat. § 103E.015, subd. 1, the drainage authority finds that the proposed drainage project is of public benefit and promote the public health.
- The goal of this project is to provide hydraulic capacity in WD #4 and reduce the frequency of flooding along the system without increasing downstream flooding. The primary design considerations are project function, cost, and impacts to the environment. Improvements will restore and enhance the proper functioning of the ditch aiding in the reduction of crop loss and increased infrastructure protection.
14. The outlet for the proposed drainage project is adequate.

The outlet for the proposed drainage system establishment is the Roseau River. During major flood events, almost all areas of the RRWD contribute flood water to the Roseau River. However, due to location or other characteristics, some areas may consistently contribute more to the peak flow which is the more damaging portion of a flood hydrograph. The selection and design of appropriate Flood Damage Reduction (FDR) measures will depend on the timing of an area's flood water contribution to flooding in other areas of the basin.

The Project is consistent with the Mediation Agreement goals adopted by the RRWMB and Red River Basin Flood Damage Reduction Work Group. The flood water is considered to be “middle water” for the Roseau River and is in the middle area for the Red River of the North based on the Flood Damage Reduction Work Group Technical Paper #11. **Error! Reference source not found.** displays the three timing zones for the Red River Basin. FDR measures such as culvert sizing receives a positive “+” rating for a middle area. The drainage system is designed to improve drainage for runoff events up to a 10-year 24-hour storm duration. Larger runoff events will result in water temporarily stored on the landscape.

Note that the timing of an area’s flood water contribution depends on the location of the downstream damage center being considered. Knowledge of the timing of flows within the RRWD and the Red River Basin continues to be developed based on gage data from actual flood events and by hydrologic modeling.

The Roseau River, into which the WD 4 will discharge, is a significantly larger channel than the proposed geometry of WD 4. When considering the proposed ditch in the larger context of the Roseau River Watershed, the entire system of improvements which include retention, outlet stabilization, and conveyance enhancements work together to reduce flooding problems downstream. The Roseau River is an adequate outlet for WD 4.

Order:

Based on the foregoing Findings and the entire record of proceedings before the Board, the Board, acting as the drainage authority for Roseau River Watershed Ditch #4 hereby orders as follows:

- A. That the preliminary survey report is approved.
- B. The project engineer shall proceed to make a detailed survey with plans and specifications for the proposed project consistent with the findings herein and submit a detailed survey report to the drainage authority as soon as possible. The project engineer shall also consider the expansion of the project as requested by adjacent landowner, Brach Svoboda.
- C. After the detailed survey report is complete, the engineer shall file the detailed survey report with the secretary and the secretary shall deliver a copy of the detailed survey report to the commissioner of natural resources.

- D. Robert Wagner, Roger Beiswenger, and Michael Baumgartner shall be appointed as viewers to determine the benefits and damages to all property affected by the proposed drainage project and make a viewers' report.
- E. Within five days of this order, the secretary shall, by order, designate the time and location for the first meeting of the viewers and issue a copy to the viewers of the secretary's order and a certified copy of this order appointing the viewers.
- F. At the first meeting and before beginning their duties, the viewers shall subscribe to an oath to faithfully perform their duties. If an appointed viewer does not qualify for any reason, the auditor shall designate another qualified person to take the disqualified viewers' place.

After discussion, the Board Chair called the question. The question was on the adoption of the foregoing findings and order, and there were ____ yeas, ____ nays, ____ absent, and ____ abstentions as follows:

| | Yea | Nay | Absent | Abstain |
|----------|--------------------------|--------------------------|--------------------------|--------------------------|
| Wensloff | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Voll | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Schmalz | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Diesen | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Braaten | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

Upon vote, the Chair declared the motion passed and the Findings and Order adopted.

Dated: _____

Carter Diesen, Chairman

* * * * *

I, Cody Schmalz, Roseau River Watershed District Secretary, do hereby certify that I have compared the above motion; findings and order with the original thereof as the same appears of record and on file with the Roseau River Watershed District and find the same

to be a true and correct transcript thereof. The above order was filed with me, Roseau River Watershed District Secretary, on _____

IN TESTIMONY WHEREOF, I hereunto set my hand this
____ day of _____, ____.

Cody Schmalz



APPENDIX E: WETLAND DELINEATION

**Wetland Delineation Report for:
Watershed Ditch #4 Construction
Dieter and Ross Township**

Roseau County, Minnesota
February, 2021



Prepared by:
Roseau River Watershed District
714 6th St SW
Roseau, MN 56751

Watershed Ditch #4 Wetland Delineation

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Watershed Ditch #4 Wetland Delineation

1.0 Executive Summary

The Roseau River Watershed District received a petition for new ditch construction for Watershed Ditch #4 located in Ross and Dieter Township approximately 8 miles west of Roseau, MN. The ditch construction will require excavation and placement of fill along approximately 5.25 miles which may result in unavoidable wetland impacts.

In September of 2020 a wetland delineation was completed within the proposed ditch alignment. Wetlands boundaries were delineated along the entirety of the ditch corridor, transect points were recorded and photographs were taken. Wetland boundaries and transect locations were collected using a Trimble TSC7, data points collected in the field were corrected in Trimble Business then projected into ArcMap.

2.0 Introduction

The project is located in Ross and Dieter Township in Roseau County, Minnesota. The site lies primarily in the east Right of Way of County State Aid Highway 115, within glacial lake Agassiz, soils are formed of Glaciolacustrine deposits. The City of Roseau is located approximately 8 miles east of the site (See Vicinity Map) and the City of Badger is located approximately 5 miles south of the site, the village of Ross is located 2 miles east of the project. County soils data identifies the soils within the ditch corridor are developed from loamy lodgment till. The National Wetland Inventory identified 4 wetlands within the proposed construction footprint. The wetland delineation was completed in September 2020, to identify jurisdictional wetlands within the project footprint.

The wetland delineation was conducted to identify jurisdictional wetlands within the project footprint, specifically to determine the existence and extent wetlands within the expanded ditch corridor. Review of wetlands in proximity to the ditch improvement was conducted to determine potential indirect impact on wetland communities outside of the construction footprint.

Watershed Ditch #4 Wetland Delineation

3.0 Methods

Prior to on-site delineation of wetland boundaries, aerial review of the site was conducted to determine sites likely supporting wetland communities. National Wetland Inventory Maps, Soil Survey Data and LiDAR data were also reviewed to determine areas that are likely wetland or potentially could have wetland characteristics.

Wetlands were delineated in accordance with *1987 Corps of Engineers Wetland Determination Manual* (1987) and the *Regional Supplement: Northcentral and Northeast Region 2.0* (2011). All areas deemed wetland were determined to meet hydrologic soil requirements, have adequate hydrology and supported hydrophytic dominant plant communities. Transects were taken within and outside of wetland boundaries to record soil, hydrology and vegetative features. Soil profiles were identified using a soil probe, the probe allows for accurate measurement of soil horizons and identification of hydric features while posing the least amount of impact to the transect location.

Wetland boundaries and transect locations were collected using a Trimble TSC7 handheld unit and R10 receiver, data points collected in the field were then projected into ArcMap.

3.1 NWI Map Review

In accordance with the National Wetland Inventory dataset, there are 4 wetland communities within the project limits (See NWI Map on following page). The table below lists NWI identified wetlands within the site:

| Cowardin Id | Number Within Site | Cowardin Description | Circular 39 Description |
|-------------|--------------------|----------------------------------------------------------------------|-----------------------------------------------------|
| PEMB | 1 | Palustrine, Emergent, Temporarily Flooded | Type 2 : Fresh Wet Meadow Type 3 : Shallow Marsh |
| PEMBd | 1 | Palustrine, Emergent, Saturated, Partially Drained | Type 1: Seasonally Flooded Wetland |
| PSS1B | 1 | Palustrine, Scrub-Shrub, Broad-Leaved Deciduous, Saturated | Type 6: Shrub Carr |
| PUBGx | 1 | Palustrine, Unconsolidated Bottom, Intermittently Exposed, Excavated | Type 4: Deep Marsh |

Table 1

Watershed Ditch #4 Wetland Delineation

There are 70 wetlands inventoried within the benefited area of the project, they can be classified as followed; emergent communities (45), scrub shrub communities (9), emergent shrub mix (5), forested communities (4), and excavated wildlife/livestock ponds (7).

3.2 Roseau County Geologic Data

There was no county level geologic data for this region of Roseau county. According to the NRCS web soil survey parent material of the area formed of Glaciolacustrine deposits. According to the Minnesota Statewide Geologic dataset bedrock of the project site is Felsic and Mafic volcaniclastic rock.

3.3 Climatology Data

Average monthly precipitation data was retrieved from weather station located in Ross, MN. Monthly data for 2020 was compared with average monthly rainfall from the 1971-2000 and 1981-2010 periods (see table below). During 2020, the project area encountered above average rainfall during January and March through July, with below average rainfall in February and from August through December. See table below for precipitation data:

| Month | Average 1971- 2000 | Average 1981- 2010 | 2020 | Variation (81-10) to 2020 |
|--------------|--------------------------|--------------------------|--------------|---------------------------------|
| January | 0.67 | 0.68 | 0.82 | +0.14 |
| February | 0.59 | 0.59 | 0.17 | -0.42 |
| March | 0.68 | 0.82 | 0.86 | +0.04 |
| April | 1.22 | 1.3 | 1.9 | +0.6 |
| May | 2.42 | 3.02 | 1.27 | +1.75 |
| June | 3.75 | 4.47 | 7.47 | +3.0 |
| July | 3.59 | 3.86 | 7.56 | +3.7 |
| August | 3.07 | 3.28 | 2.25 | -1.03 |
| September | 2.6 | 2.79 | 0.99 | -1.8 |
| October | 1.78 | 2.17 | 1.06 | -1.11 |
| November | 1.18 | 1.14 | 0.22 | -0.92 |
| December | 0.62 | 0.78 | 0.58 | -0.2 |
| Total | 22.16 | 24.92 | 25.15 | +0.23 |

Table 2

Watershed Ditch #4 Wetland Delineation

3.4 Roseau County Soil Survey Data

Soils within project area have developed from loamy lodgment till deposits on flats and till formed lake plains, in accordance with the Roseau County Soil Survey 1942. Soils data can be found in the Soil Survey Map (See Figure 5),

| MUSYM | Series Name |
|-------|-------------------------|
| 1002 | <i>Fluvaquents</i> |
| 1158 | <i>Skagen Loam</i> |
| 1170 | <i>Skagen Loam</i> |
| 280 | <i>Pelan</i> |
| 379 | <i>Percy Loam</i> |
| 383 | <i>Percy Loam</i> |
| 384 | <i>Percy Mucky Loam</i> |
| 644 | <i>Boash Clay Loam</i> |

Table 3

3.5 Hydrology

Hydrology for the project area is primarily sourced from precipitation events, with some flooding influence from the Roseau River in the northern extent of the project. Due to the low relief and undulating landscape, low lying areas within the project area are prone to inundation following heavy rainfall events. Subsurface hydrology is evident within the site due shallow sand and gravel lenses perched over clay. Shallow sand and gravel layers were encountered in multiple transects throughout the investigation.

4.0 Delineated Wetlands

Twenty wetlands were identified within the construction footprint, 9 wetlands were found in depressions in properties in conservation programs, 10 wetlands were encountered in agricultural fields and 1 wetland was identified in the riparian corridor of the Roseau River. All wetlands identified were degraded due to active farm practices, drainage or a combination. There were 38 sites that were identified as wet ditches, these sites exhibited wetland characteristics but were confined to the ditch dimension and did not extend outside of the ditch bank.

Wetland #1 Transected by T3-2 (T3-1 in upland) this wetland occurs in a partially drained large depression, dominated by Curled Dock and Barnyard Grass, there was a dense stand of Mud Plantain in the center of the wetland. There is 0.48 acres of potential impact through ditch establishment.

Watershed Ditch #4 Wetland Delineation

Wetland #2 Transected by T4-2 and T5-2 (T4-1 & T5-1 in upland) this wetland occurs in a isolated depression adjacent to the ditch corridor, dominated by Reed Canary Grass and Mud Plantain. There is 0.21 acres of potential impact through ditch establishment.

Wetland #3 Transected by T6-2 (T6-1 in upland) this wetland occurs in a swale along a private driveway to a hunting camp, dominated by Hummock Sedge and Reed Canary Grass. There is 0.11 acres of potential impact through ditch establishment.

Wetland #4 Transected by T8-2 (T8-1 in upland) this wetland occurs in a depression currently in a conservation program, dominated by Meadow Willow, Hummock Sedge and Reed Canary Grass. There is 0.13 acres of potential impact through ditch establishment.

Wetland #5 Transected by T9-2 (T9-1 in upland) this wetland occurs in a depression currently in a conservation program, dominated by Fowl Bluegrass and Hummock Sedge. There is 0.13 acres of potential wetland impact through ditch establishment.

Wetland #6 Transected by T10-2 (T10-1 in upland) this wetland occurs in a depression currently in a conservation program, dominated by Common Cocklebur and Hummock Sedge. There is 0.002 acres of potential wetland impact through ditch establishment

Wetland #7 Transected by T11-2 (T11-1 in upland) this wetland occurs in a depression currently in a conservation program, dominated by Hummock Sedge. There is 0.15 acres of potential wetland impact through ditch establishment.

Wetland #8 Transected by T12-2 (T12-1 in upland) this wetland occurs in a drainage ditch, dominated by Blunt Spikerush and Hybrid Cattail. There is 0.05 acres of potential wetland impact through ditch establishment.

Wetland #9 Transected by T13-2 (T13-1 in upland) this wetland occurs in a drainage ditch, dominated by Hybrid Cattail. There is 0.06 acres of potential wetland impact through ditch establishment.

Wetland #10 Transected by T14-2 (T14-1 in upland) this wetland occurs in a depression currently in a conservation program, dominated by Hummock Sedge, Fowl Bluegrass and Meadow Willow. There is 0.2 acres of potential wetland impact through ditch improvement.

Wetland #11 Transected by T15-2 (T15-1 in upland) this wetland occurs in a depression currently in a conservation program, dominated by Hummock Sedge, Fowl Bluegrass and Meadow Willow. There is 0.2 acres of potential wetland impact through ditch establishment.

Wetland #12 Transected by T16-2 (T16-1 in upland) this wetland occurs in a ditched depression currently in a conservation program, dominated by Peachleaf Willow, Meadow Willow and Reed Canary Grass. There is 0.02 acres of potential wetland impact through ditch establishment.

Watershed Ditch #4 Wetland Delineation

Wetland #13 Transected by T17-2 (T17-1 in upland) this wetland occurs in a ditched depression currently in a conservation program, dominated by Meadow Willow, Fowl Bluegrass and Reed Canary Grass. There is 0.03 acres of potential wetland impact through ditch establishment.

Wetland #14 Transected by T18-2 (T18-1 in upland) this wetland occurs in a row cropped depression, dominated by planted Wheat and Reed Canary Grass. There is 0.08 acres of potential wetland impact through ditch establishment

Wetland #15 Transected by T19-2 (T19-1 in upland) this wetland occurs in a row cropped depression, dominated by Waterhemp and Barnyard Grass. There is 0.18 acres of potential wetland impact through ditch establishment.

Wetland #16 Transected by T20-2 (T20-1 in upland) this wetland occurs in a row cropped depression and drainage ditch, dominated by Reed Canary Grass and American Sloughgrass. There is 0.09 acres of potential wetland impact through ditch establishment.

Wetland #17 Transected by T21-2 (T21-1 in upland) this wetland occurs in a farmed depression, dominated by American Sloughgrass. There is 0.21 acres of potential wetland impact through ditch establishment.

Wetland #18 Transected by T22-2 (T22-1 in upland) this wetland occurs in partially drained depression, dominated by Mud Plantain, Barnyard Grass and planted Wheat. There is 0.07 acres of potential wetland impact through ditch establishment.

Wetland #19 Transected by T23-2 (T23-1 in upland) this wetland occurs in a partially drained depression, dominated by Barnyard Grass and Meadow Horsetail. There is 0.06 acres of potential wetland impact through ditch establishment.

Wetland #20 Transected by T24-2 (T24-1 in upland) this wetland occurs in the riparian corridor of the Roseau River, dominated by Diamond Willow, Green Ash, Meadow Willow and Reed Canary Grass. There is 0.06 acres of potential wetland impact through ditch establishment.

Watershed Ditch #4 Wetland Delineation

A complete list of vegetation species inventoried can be found in the table below:

| <i>Common Name</i> | <i>Scientific Name</i> | <i>Indicator</i> | <i>Common Name</i> | <i>Scientific Name</i> | <i>Indicator</i> |
|----------------------|--------------------------------|------------------|--------------------|--------------------------------------|------------------|
| Reed Canary Grass | <i>Phalaris arundinacea</i> | FACW | Lake Sedge | <i>Carex lacustris</i> | OBL |
| Kentucky Bluegrass | <i>Poa pratensis</i> | FACU | Daisy Fleabane | <i>Erigeron strigosus</i> | FACU |
| Water Hemp | <i>Amaranthus tuberculatus</i> | FAC | Sawtooth Sunflower | <i>Helianthus grosseserratus</i> | FACW |
| Mud Plantain | <i>Alisma triviale</i> | OBL | Bog Birch | <i>Betula pumila</i> | OBL |
| Fowl Bluegrass | <i>Poa palustris</i> | FACW | White Oak | <i>Quercus alba</i> | FACU |
| Hummock Sedge | <i>Carex stricta</i> | OBL | Shrubby Ciquefoil | <i>Dasiphora fruticosa</i> | FACW |
| Meadow Willow | <i>Salix petiolaris</i> | OBL | Timothy | <i>Phleum pratense</i> | FACU |
| Lombardi Poplar | <i>Populus nigra</i> | NI | Canada Thistle | <i>Cirsium arvense</i> | FACU |
| White Cedar | <i>Thuja occidentalis</i> | FACW | Showy Dogbane | <i>Apocynum androsaemifolium</i> | UPL |
| Amur Maple | <i>Acer ginnala</i> | NI | Giant Goldenrod | <i>Solidago gigantea</i> | FAC |
| Hybrid Cattail | <i>Typha x glauca</i> | OBL | Torrey's Sedge | <i>Juncus torreyi</i> | FACW |
| Rye (planted) | <i>Secale cereale</i> | NI | Jointed Rush | <i>Juncus articulatus</i> | OBL |
| Wheat (planted) | <i>Triticum aestivum</i> | NI | Yellow coneflower | <i>Ratibida pinnata</i> | UPL |
| Soybeans (planted) | <i>Glycine Willd</i> | NI | Panicum | <i>Panicum virgatum</i> | FAC |
| Curled Dock | <i>Rumex crispus</i> | FAC | Little Bluestem | <i>Schizachyrium scoparium</i> | FACU |
| Foxtail Barley | <i>Hordeum jubatum</i> | FACW | Green Bulrush | <i>Scirpus atrovirens</i> | OBL |
| Greater Ragweed | <i>Ambrosia trifida</i> | FAC | Baltic Rush | <i>Juncus balticus</i> | FACW |
| Common Dandelion | <i>Taraxacum officinale</i> | FACU | Common Cocklebur | <i>Xanthium strumarium</i> | FAC |
| Kochia | <i>Bassia scoparia</i> | FACU | Indian Grass | <i>Sorghastrum nutans</i> | FACU |
| Barnyard Grass | <i>Echinochloa crus-galli</i> | FAC | Softstem Bulrush | <i>choenoplectus tabernaemontani</i> | OBL |
| Common Plantain | <i>Plantago major</i> | FAC | Green Foxtail | <i>Setaria viridis</i> | FACU |
| American Sloughgrass | <i>Beckmannia syzigachne</i> | OBL | Yellow Sweetclover | <i>Melilotus officinalis</i> | FACU |
| Penn. Smartweed | <i>Polygonum pensylvanicum</i> | FACW | Blunt Spikerush | <i>Eleocharis obtusa</i> | OBL |
| Sandbar Willow | <i>Salix interior</i> | FACW | Black-eyed Susan | <i>Rudbeckia hirta</i> | FACU |
| Peachleaf Willow | <i>Salix amygdaloides</i> | FACW | Bottle Gentian | <i>Gentiana andrewsii</i> | FAC |
| Smooth Brome | <i>Bromus inermis</i> | UPL | Common Sowthistle | <i>Sonchus oleraceus</i> | FACU |
| Prairie Cordgrass | <i>Spartina pectinata</i> | FACW | Canada Bluejoint | <i>Calamagrostis canadensis</i> | FACW |
| Big Bluestem | <i>Andropogon gerardii</i> | FACU | Meadow Horsetail | <i>Equisetum pratense</i> | FACW |
| Red Clover | <i>Trifolium pratense</i> | FACU | Green Ash | <i>Fraxinus pennsylvanica</i> | FAC |
| Canada Goldenrod | <i>Solidago altissima</i> | FACU | Box Elder | <i>Acer negundo</i> | FAC |
| Red-osier Dogwood | <i>Cornus sericea</i> | FACW | Virginia Wildrye | <i>Elymus submuticus</i> | FAC |
| American Elm | <i>Ulmus americana</i> | FAC | Ground Apple | <i>Podophyllum peltatum</i> | FACU |
| Diamond Willow | <i>Salix nigra</i> | FACW | | | |

Table 4

Watershed Ditch #4 Wetland Delineation

5.0 Conclusions

Upon completion of wetland delineation approximately 2.51 acres of potential wetland impacts were identified within the proposed construction footprint. Of the 2.51 acres of potential wetland impact, there were 1.48 acres of farmed wetlands, 0.97 acres of wetlands in conservation programs and 0.06 acres of impact along the river corridor. All wetlands identified in this investigation were partially drained due to existing or former agricultural practices, with the exception of the riparian wetland. The altered hydrology coupled with the identified plant communities illustrates these wetlands would be classified as having low ecological function.

Due to the ditch planset not being complete at this time, all wetland impacts are listed as potential. It is likely that there will be permanent and temporary impacts due to construction and placement of fill. The engineer tasked with design of WD#4 will review the wetland boundaries and determine measures to avoid and minimize wetland impacts where feasible, to meet federal and state guidance as well as the petitioners purpose and need.

There were 38 locations within the project footprint that exhibited some wetland features and may have previously been wetland communities prior to drainage. These sites were confined within excavated channels in agricultural fields and road right of ways. These sites were lacking one or more of the features that determine whether a site is indeed a wetland. There were wetlands identified in conjunction with some of the field drains (ex. Wetland #8) where drainage has not been effective enough to modify the surrounding landscape in a manner that removed all 3 criteria.

There are wetlands found throughout the ditch establishment benefited area, outside of the construction footprint, these wetlands can be found in the National Wetland Inventory. With any ditch improvement there can be concerns regarding scope and effect or adverse impacts due to increased drainage and connectivity to private drains. Due to the proposed depth of the ditch establishment, the depth of the restrictive clay layers and the distance of wetlands (outside the construction footprint) to the ditch, it is unlikely the project would have wetland impacts due to scope and effect. As this proposed project does not include cleaning or improvement of private drains or local road ditches, future improvement of these drains/ditches by individuals or road authorities that would result in wetland impact would be the responsibility of those parties.

Watershed Ditch #4 Wetland Delineation

7.0 References

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. *Classification of wetlands and deepwater habitats of the United States*. United States Department of Interior, Fish and Wildlife Service. FWS/OBS-79/31. 103 p.

U.S. Army Corps of Engineers. 1987. Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS, 100 pp. and appendices.

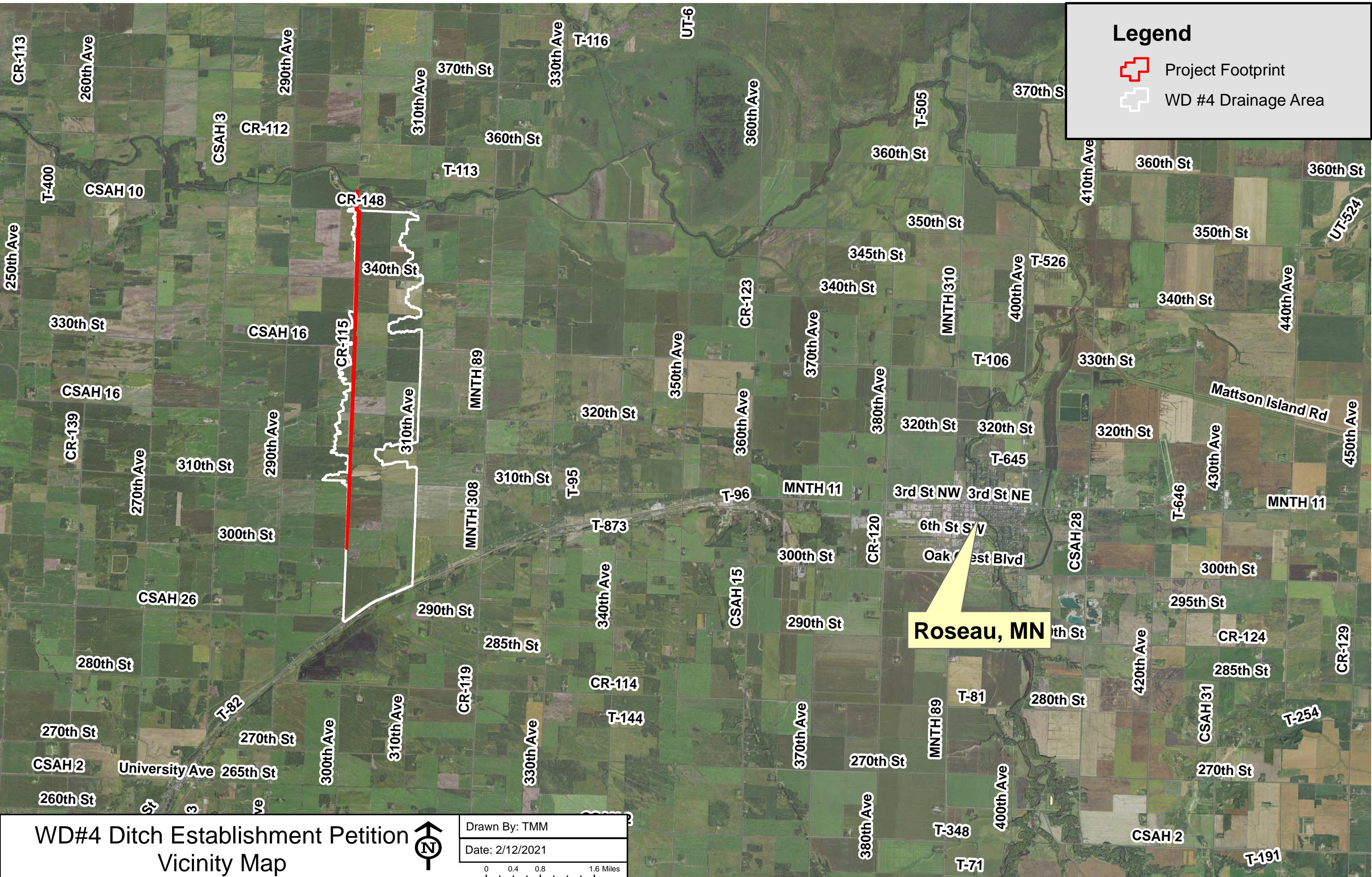
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<http://websoilsurvey.nrcs.usda.gov/app/>

U.S. Fish and Wildlife Service. 1980. *National Wetlands Inventory*, Washington, D.C.

P. R. McMiller, et al. *Soil Survey Roseau County Minnesota*. United States Department of Agriculture Bureau of Plant Industry. Series 1936 No. 11 January 1942.

Figure 1
Vicinity Map



WD#4 Ditch Establishment Petition Vicinity Map

Drawn By: TMM

Date: 2/12/2021



Figure 2
Site Maps (2019 Aerial Photo)

310th St

CR-115

300th St

T5-2

T4-1
T4-2

T3-1
T3-2

T2

T1

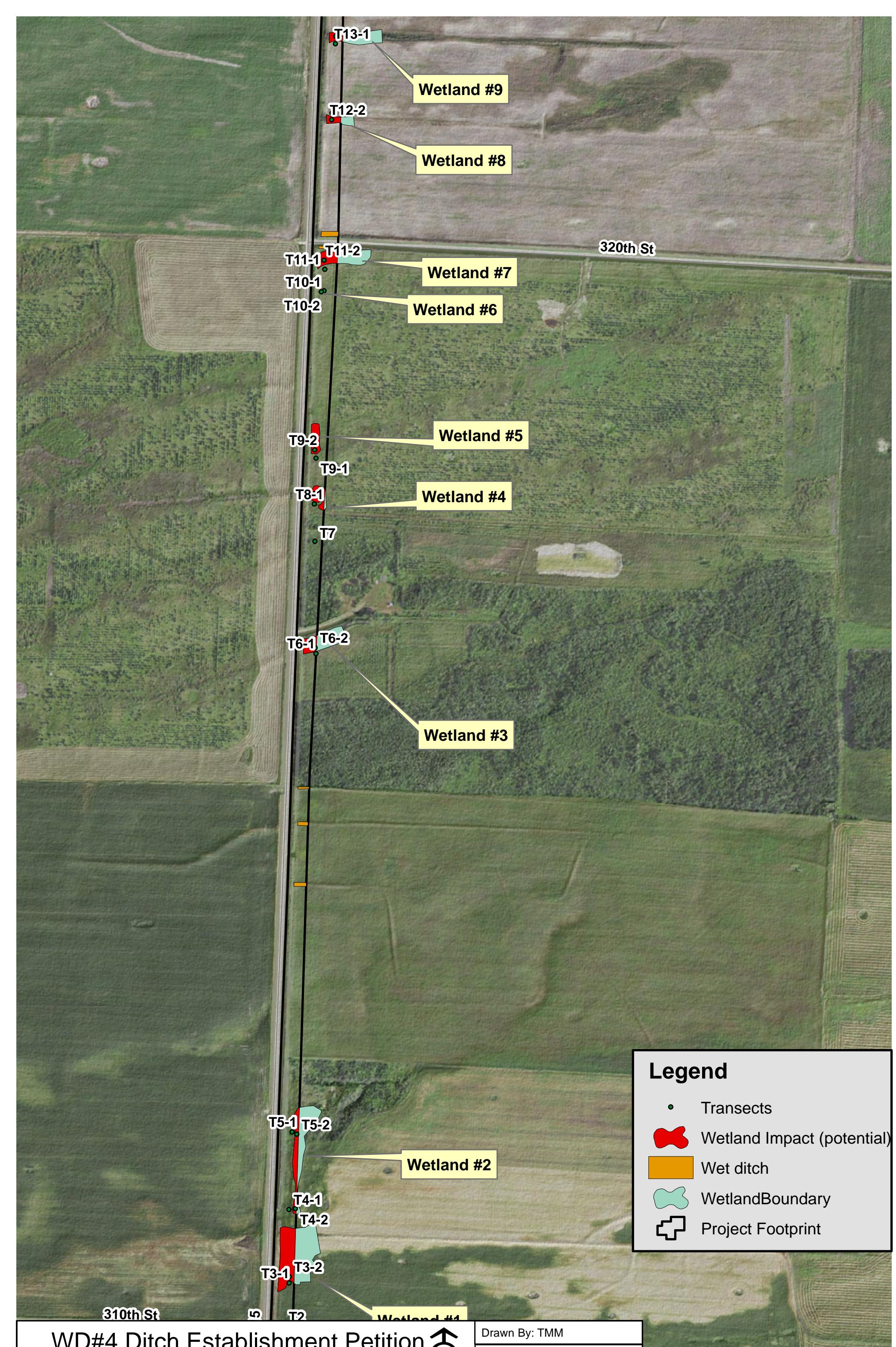
Wetland #2

Wetland #1

Legend

- Transects
- Wetland Impact (potential)
- Wet ditch
- Wetland Boundary
- Project Footprint





WD#4 Ditch Establishment Petition
Site Map (2 of 6)

Drawn By: TMM

Date: 2/12/2021

0 0.025 0.05 0.1 Miles



WD#4 Ditch Establishment Petition
Site Map (3 of 6)

Drawn By: TMM

Date: 2/12/2021

0 0.025 0.05 0.1 Miles

CR-115

T12-2

Wetland #8

Wetland #9

T14-1

T14-2

Wetland #10

T15-1

Wetland #11

T16-1 T16-2

Wetland #12

T17-1 T17-2

Wetland #13

T19-2

Wetland #15

T18-1 T18-2

Wetland #14

CSAH 16

Legend

• Transects

Wetland Impact (potential)

Wet ditch

WetlandBoundary

Project Footprint

340th St

Wetland #16

CR-115

T19-2

Wetland #15

T18-2

Wetland #14

CSAH 1

Drawn By: TMM

Date: 2/12/2021

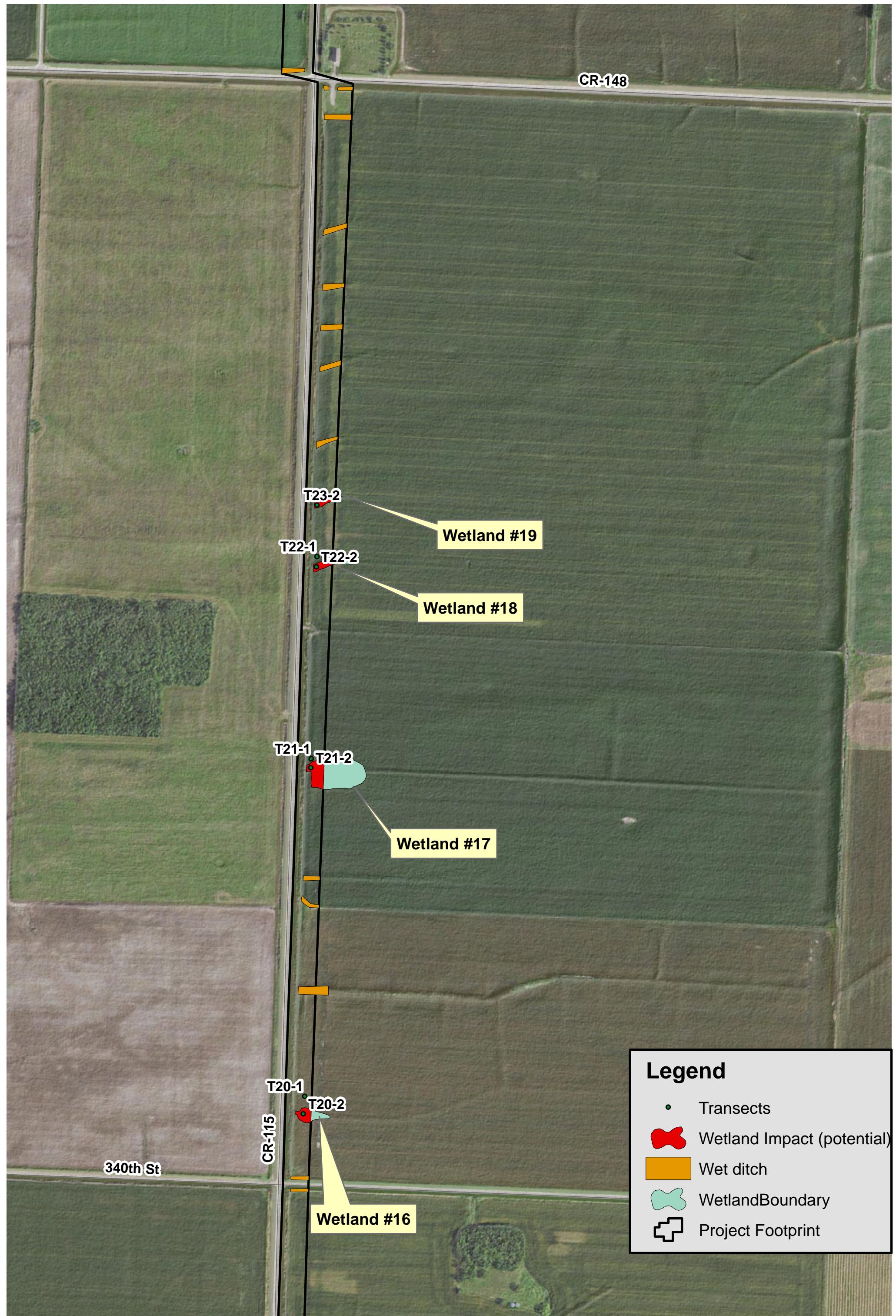
0 0.025 0.05 0.1 Miles



WD#4 Ditch Establishment Petition
Site Map (4 of 6)

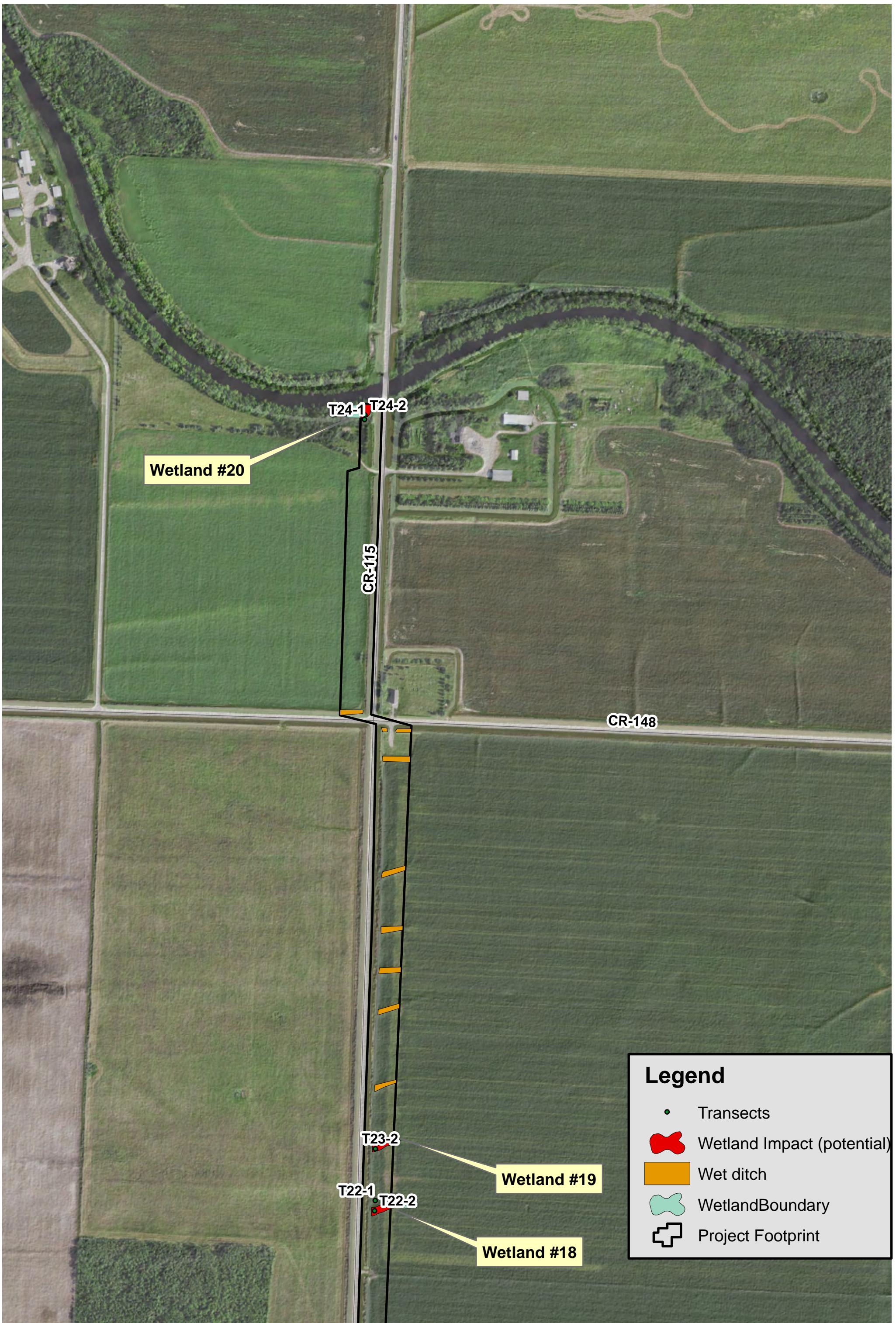
Legend

- Transects
- Wetland Impact (potential)
- Wet ditch
- WetlandBoundary
- ✚ Project Footprint



Legend

- Transects
- Wetland Impact (potential)
- Wet ditch
- WetlandBoundary
- Project Footprint



WD#4 Ditch Establishment Petition
Site Map (6 of 6)

Drawn By: TMM

Date: 2/12/2021

0 0.025 0.05 0.1 Miles



Legend

- Transects
- Wetland Impact (potential)
- Wet ditch
- WetlandBoundary
- Project Footprint

Figure 3
LiDAR and Contour Map

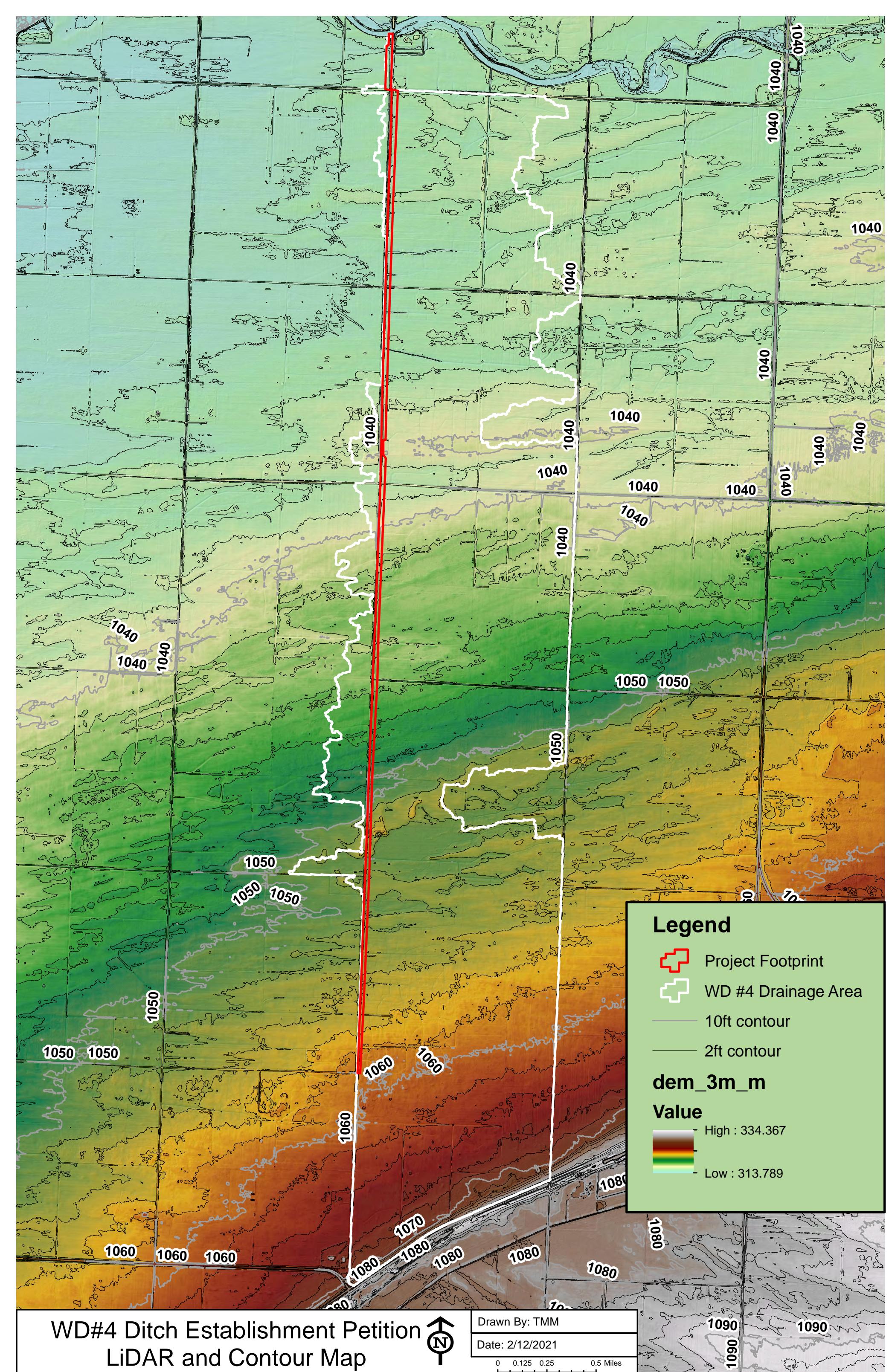
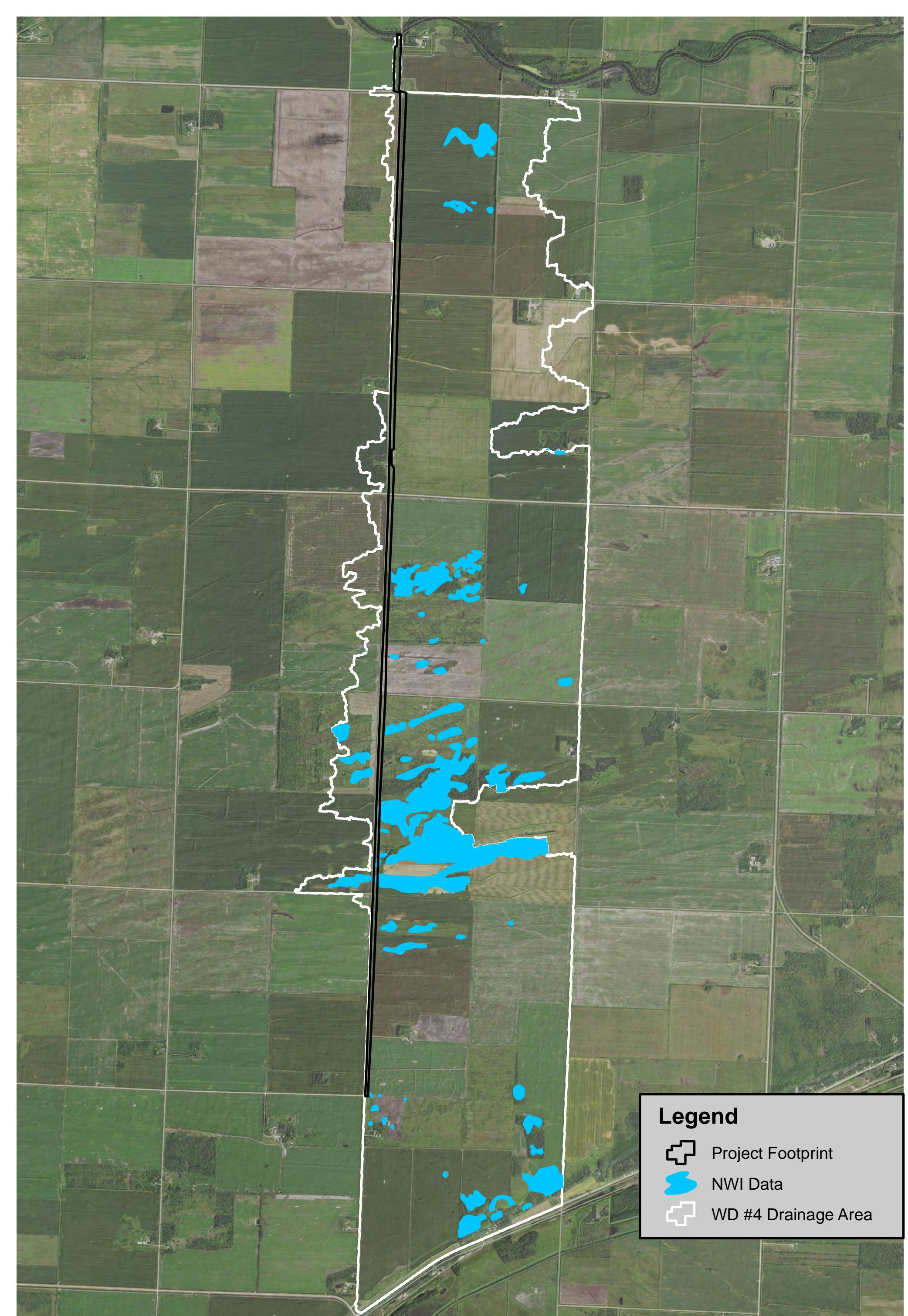


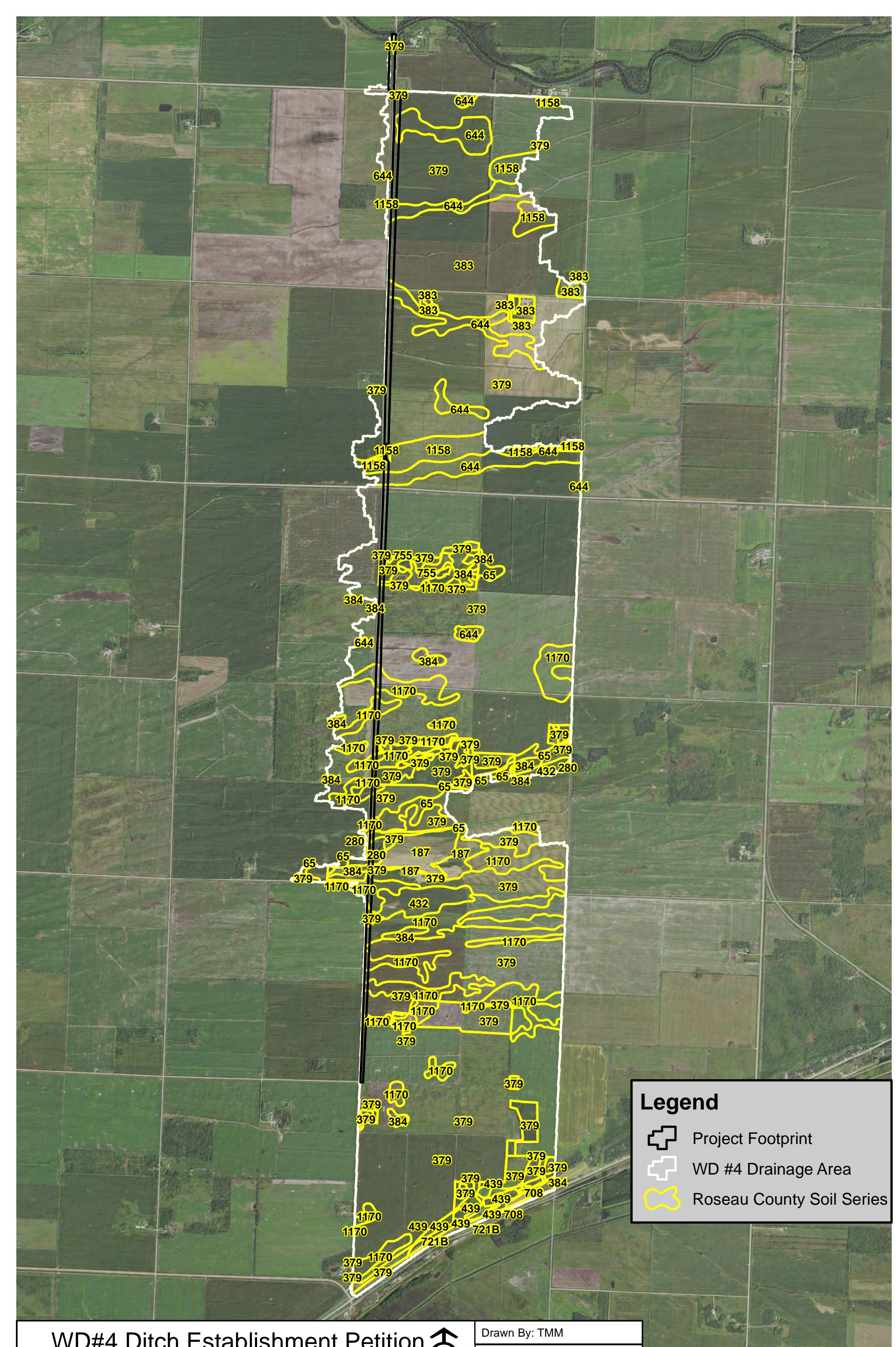
Figure 4
National Wetland Inventory Map



Legend

- Project Footprint
- NWI Data
- WD #4 Drainage Area

Figure 5
Roseau County Soil Survey Map



Legend

- Project Footprint
- WD #4 Drainage Area
- Roseau County Soil Series

WD#4 Ditch Establishment Petition
Roseau County Soils Map

Drawn By: TMM

Date: 2/12/2021

0 0.125 0.25 0.5 Miles

Figure 6

COE Data Forms

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T1
 Investigator(s): T. McCormack Section, Township, Range: 21, T162N-R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8479 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 1170 NWI classification: None

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

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|-------------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| | | | | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species <u>5</u> x 1 = <u>5</u> |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| | | | | UPL species <u>5</u> x 5 = <u>25</u> |
| | | | | Column Totals: <u>10</u> (A) <u>30</u> (B) |
| | | | | Prevalence Index = B/A = <u>3</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. <u>Hybrid Cattail</u> | <u>5%</u> | <u>Yes</u> | <u>OBL</u> | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation |
| 2. <u>Plant Rye</u> | <u>5%</u> | <u>Yes</u> | <u>NI</u> | <input type="checkbox"/> 2 - Dominance Test is >50% |
| 3. _____ | _____ | _____ | _____ | <input checked="" type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ |
| 4. _____ | _____ | _____ | _____ | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. _____ | _____ | _____ | _____ | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| | | | | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Remarks: |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| | | | | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | |
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ | | | | |

SOIL

Sampling Point: T1

HYDROLOGY

| | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Wetland Hydrology Indicators: | |
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T2
 Investigator(s): T. McCormack Section, Township, Range: 21, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8481 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 1170 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>4</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species <u>20</u> x 1 = <u>40</u> |
| 3. _____ | _____ | _____ | _____ | FACW species <u>50</u> x 2 = <u>150</u> |
| 4. _____ | _____ | _____ | _____ | FAC species <u>30</u> x 3 = <u>120</u> |
| 5. _____ | _____ | _____ | _____ | FACU species <u>0</u> x 4 = <u>0</u> |
| = Total Cover | | | | UPL species <u>0</u> x 5 = <u>0</u> |
| = Total Cover | | | | Column Totals: <u>100</u> (A) <u>310</u> (B) |
| | | | | Prevalence Index = B/A = <u>3.1</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. CURLLED DOCK | <u>20%</u> | Yes | FAC | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| 2. FOXTAIL BARLEY | <u>20%</u> | Yes | FACW | <u>X</u> <u>2</u> - Dominance Test is >50% |
| 3. COMMON DANDELION | <u>20%</u> | Yes | FACU | <u>3</u> - Prevalence Index is ≤3.0 ¹ |
| 4. GREATER RAGWEED | <u>20%</u> | Yes | FAC | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. KOCHIA | <u>10%</u> | No | FACU | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. BARNYARD GRASS | <u>10%</u> | No | FAC | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T2

HYDROLOGY

| | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Wetland Hydrology Indicators: | |
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T3-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8487 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation X, Soil X, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|-----------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | | |
|------------------------------------------|------------------|------------------|-------------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|--|--|
| 1. | _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>0</u> (A) | | |
| 2. | _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>1</u> (B) | | |
| 3. | _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0%</u> (A/B) | | |
| 4. | _____ | _____ | _____ | _____ | | | | |
| | | = Total Cover | | | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | | | Prevalence Index worksheet: | | |
| 1. | _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: | | |
| 2. | _____ | _____ | _____ | _____ | OBL species | <u>x 1 =</u> _____ | | |
| 3. | _____ | _____ | _____ | _____ | FACW species | <u>x 2 =</u> _____ | | |
| 4. | _____ | _____ | _____ | _____ | FAC species | <u>45 x 3 =</u> <u>135</u> | | |
| 5. | _____ | _____ | _____ | _____ | FACU species | <u>10 x 4 =</u> <u>40</u> | | |
| | | = Total Cover | UPL species | <u>60 x 5 =</u> <u>300</u> | Column Totals: | <u>115 (A) 475 (B)</u> | | |
| | | | | | Prevalence Index = B/A = | <u>4.13</u> | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | | | Hydrophytic Vegetation Indicators: | | |
| 1. | PLANTED WHEAT | 60% | Yes | NI | <ul style="list-style-type: none"> — 1 - Rapid Test for Hydrophytic Vegetation — 2 - Dominance Test is >50% — 3 - Prevalence Index is ≤3.0¹ — 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) — Problematic Hydrophytic Vegetation¹ (Explain) | | | |
| 2. | CURLED DOCK | 15% | No | FAC | | | | |
| 3. | GIANT RAGWEED | 15% | No | FAC | | | | |
| 4. | COMMON DANDELION | 10% | No | FACU | | | | |
| 5. | WATERHEMP | 10% | No | FAC | | | | |
| 6. | COMMON PLANTAIN | 5% | No | FAC | | | | |
| 7. | _____ | _____ | _____ | _____ | | | | |
| 8. | _____ | _____ | _____ | _____ | | | | |
| 9. | _____ | _____ | _____ | _____ | | | | |
| 10. | _____ | _____ | _____ | _____ | | | | |
| | | = Total Cover | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | Hydrophytic Vegetation Present? | | |
| 1. | _____ | _____ | _____ | _____ | Yes _____ | No <u>X</u> | | |
| 2. | _____ | _____ | _____ | _____ | | | | |
| % Bare Ground in Herb Stratum _____ | | = Total Cover | | | | | | |
| Remarks: | | | | | | | | |

SOIL

Sampling Point: T3-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T3-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8488 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | |
|------------------------------------------|------------------|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>2</u> (A) | |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) | |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>100%</u> (A/B) | |
| 4. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | | Prevalence Index worksheet: | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: | |
| 2. _____ | _____ | _____ | _____ | OBL species | x 1 = _____ | |
| 3. _____ | _____ | _____ | _____ | FACW species | x 2 = _____ | |
| 4. _____ | _____ | _____ | _____ | FAC species | <u>60</u> x 3 = <u>180</u> | |
| 5. _____ | _____ | _____ | _____ | FACU species | <u>5</u> x 4 = <u>20</u> | |
| = Total Cover | | | | UPL species | x 5 = _____ | |
| = Total Cover | | | | Column Totals: | <u>65</u> (A) <u>200</u> (B) | |
| | | | | Prevalence Index = B/A = <u>3.07</u> | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | | Hydrophytic Vegetation Indicators: | |
| 1. CURLED DOCK | 30% | Yes | FAC | 1 - Rapid Test for Hydrophytic Vegetation | | |
| 2. BARNYARD GRASS | 15% | Yes | FAC | <u>X</u> 2 - Dominance Test is >50% | | |
| 3. WATERHEMP | 10% | No | FAC | <u> </u> 3 - Prevalence Index is ≤3.0 ¹ | | |
| 4. COMMON DANDELION | 5% | No | FACU | <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | |
| 5. COMMON PLANTAIN | 5% | No | FAC | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) | | |
| 6. _____ | _____ | _____ | _____ | | | |
| 7. _____ | _____ | _____ | _____ | | | |
| 8. _____ | _____ | _____ | _____ | | | |
| 9. _____ | _____ | _____ | _____ | | | |
| 10. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | |
| 2. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ | |
| Remarks: | | | | | | |

SOIL

Sampling Point: T3-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T4-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8497 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 280 NWI classification: none

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

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

| | | | |
|---------------------------------|-----------|-------------|------------------------------------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | Yes _____ |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | No <u>X</u> |
| Remarks: | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>0</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0 %</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | _____ | _____ | _____ | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species <u>10</u> x 3 = <u>30</u> |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| = Total Cover | | | | UPL species <u>80</u> x 5 = <u>400</u> |
| | | | | Column Totals: <u>90</u> (A) <u>430</u> (B) |
| | | | | Prevalence Index = B/A = <u>4.78</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: |
| 1. PLANTED WHEAT | <u>80 %</u> | Yes | NI | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation |
| 2. BARNYARD GRASS | <u>5 %</u> | No | FAC | <input type="checkbox"/> 2 - Dominance Test is >50% |
| 3. GIANT RAGWEED | <u>5 %</u> | No | FAC | <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ |
| 4. _____ | _____ | _____ | _____ | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. _____ | _____ | _____ | _____ | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | _____ | _____ | _____ | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u> |
| Remarks: | | | | |

SOIL

Sampling Point: T4-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T4-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8497 Long: -95.9639 Datum: NAD 83
 Soil Map Unit Name: 280 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|------------------------------------------|------------------|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: <u>70</u> Multiply by: <u>1</u> = <u>70</u> |
| 2. _____ | _____ | _____ | _____ | OBL species <u>10</u> x 2 = <u>20</u> |
| 3. _____ | _____ | _____ | _____ | FACW species <u>5</u> x 3 = <u>15</u> |
| 4. _____ | _____ | _____ | _____ | FAC species <u></u> x 4 = <u></u> |
| 5. _____ | _____ | _____ | _____ | FACU species <u></u> x 5 = <u></u> |
| = Total Cover | | | | Column Totals: <u>85</u> (A) <u>105</u> (B) |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Prevalence Index = B/A = <u>1.24</u> |
| 1. MUD PLANTAIN | <u>60%</u> | Yes | OBL | |
| 2. AMERICAN SLOUGHGRASS | <u>10%</u> | No | OBL | |
| 3. PENN. SMARTWEED | <u>10%</u> | No | FACW | |
| 4. BARNYARD GRASS | <u>5%</u> | No | FAC | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Indicators: |
| 1. _____ | _____ | _____ | _____ | <u>X</u> 1 - Rapid Test for Hydrophytic Vegetation |
| 2. _____ | _____ | _____ | _____ | <u>X</u> 2 - Dominance Test is >50% |
| % Bare Ground in Herb Stratum _____ | _____ | _____ | _____ | <u> </u> 3 - Prevalence Index is ≤3.0 ¹ |
| | | | | <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| Remarks: | | | | |

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

SOIL

Sampling Point: T4-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | |
| <input checked="" type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T5-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): Hillslope Local relief (concave, convex, none): none Slope (%):
 Subregion (LRR): Northern Great Plains Lat: 48.8507 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 280 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>5</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>60%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| = Total Cover | | | | Total % Cover of: _____ Multiply by: _____ |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | | | OBL species <u>55</u> x 1 = <u>110</u> |
| 1. <u>SANDBAR WILLOW</u> | <u>20%</u> | <u>Yes</u> | <u>FACW</u> | FACW species <u>52</u> x 2 = <u>208</u> |
| 2. <u>PEACHLEAF WILLOW</u> | <u>10%</u> | <u>Yes</u> | <u>FACW</u> | FAC species <u>10</u> x 3 = <u>30</u> |
| 3. _____ | _____ | _____ | _____ | FACU species <u>117</u> x 4 = <u>468</u> |
| 4. _____ | _____ | _____ | _____ | UPL species <u>117</u> x 5 = <u>585</u> |
| 5. _____ | _____ | _____ | _____ | Column Totals: <u>117</u> (A) <u>368</u> (B) |
| = Total Cover | | | | Prevalence Index = B/A = <u>3.15</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. <u>CANADA GOLDENROD</u> | <u>30%</u> | <u>Yes</u> | <u>FACU</u> | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| 2. <u>PRAIRIE CORDGRASS</u> | <u>20%</u> | <u>Yes</u> | <u>FACW</u> | <u>X</u> <u>2</u> - Dominance Test is >50% |
| 3. <u>BIG BLUESTEM</u> | <u>20%</u> | <u>Yes</u> | <u>FACU</u> | <u>3</u> - Prevalence Index is ≤3.0 ¹ |
| 4. <u>SMOOTH BROME</u> | <u>10%</u> | <u>No</u> | <u>UPL</u> | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. <u>REED CANARY GRASS</u> | <u>5%</u> | <u>No</u> | <u>FACW</u> | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. <u>RED CLOVER</u> | <u>2%</u> | <u>No</u> | <u>FACU</u> | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T5-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T5-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8507 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 280 NWI classification: PUBGx

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>5</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>5</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| = Total Cover | | | | Total % Cover of: _____ Multiply by: _____ |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | | | OBL species <u>5</u> x 1 = <u>5</u> |
| 1. <u>SANDBAR WILLOW</u> | <u>30%</u> | <u>Yes</u> | <u>FACW</u> | FACW species <u>150</u> x 2 = <u>300</u> |
| 2. <u>PEACHLEAF WILLOW</u> | <u>30%</u> | <u>Yes</u> | <u>FACW</u> | FAC species _____ x 3 = _____ |
| 3. <u>RED-OSIER DOGWOOD</u> | <u>10%</u> | <u>No</u> | <u>FACW</u> | FACU species _____ x 4 = _____ |
| 4. _____ | _____ | _____ | _____ | UPL species _____ x 5 = _____ |
| 5. _____ | _____ | _____ | _____ | Column Totals: <u>155</u> (A) <u>305</u> (B) |
| | | | | Prevalence Index = B/A = <u>1.97</u> |
| | | | | Hydrophytic Vegetation Indicators: |
| | | | | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| | | | | <u>X</u> 2 - Dominance Test is >50% |
| | | | | <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ |
| | | | | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | Problems with Hydrophytic Vegetation ¹ (Explain) |
| | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T5-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T6-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8571 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 1170 NWI classification: none

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

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

| | | | |
|---------------------------------|-------------------------------|------------------------------------------|-------------------------------|
| Hydrophytic Vegetation Present? | Yes <u> </u> No <u>X</u> | Is the Sampled Area within a Wetland? | Yes <u> </u> No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> No <u> </u> | | |
| Wetland Hydrology Present? | Yes <u> </u> No <u>X</u> | | |
| Remarks: | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | | | Prevalence Index worksheet: |
| 1. MEADOW WILLOW | <u>10%</u> | Yes | FACW | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species <u>20</u> x 1 = <u>20</u> |
| 3. _____ | _____ | _____ | _____ | FACW species <u>20</u> x 2 = <u>40</u> |
| 4. _____ | _____ | _____ | _____ | FAC species <u>94</u> x 3 = <u>282</u> |
| 5. _____ | _____ | _____ | _____ | FACU species <u>94</u> x 4 = <u>376</u> |
| = Total Cover | | | | UPL species <u>114</u> x 5 = <u>570</u> |
| | | | | Column Totals: <u>114</u> (A) <u>416</u> (B) |
| | | | | Prevalence Index = B/A = <u>3.65</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. KENTUCKY BLUEGRASS | <u>60%</u> | Yes | FACU | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation |
| 2. BIG BLUESTEM | <u>30%</u> | Yes | FACU | <input type="checkbox"/> 2 - Dominance Test is >50% |
| 3. SAWTOOTH SUNFLOWER | <u>5%</u> | No | FACW | <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ |
| 4. REED CANARY GRASS | <u>5%</u> | No | FACW | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. DAISY FLEABANE | <u>2%</u> | No | FACU | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. CANADA GOLDENROD | <u>2%</u> | No | FACU | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u> </u> No <u>X</u> |
| Remarks: | | | | |

SOIL

Sampling Point: T6-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T6-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8571 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 1170 NWI classification: none

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

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

| | | | | | |
|---------------------------------|--------------|----------|------------------------------------------|--------------|----------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> | No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|---------------------|--------------------------|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------|-----------------------|
| 1. | _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>3</u> (A) |
| 2. | _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>3</u> (B) |
| 3. | _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>100</u> (A/B) |
| 4. | _____ | _____ | _____ | _____ | Prevalence Index worksheet: | |
| | | | | | Total % Cover of: | Multiply by: |
| | | | | | OBL species <u>50</u> | x 1 = <u>50</u> |
| | | | | | FACW species <u>45</u> | x 2 = <u>90</u> |
| | | | | | FAC species _____ | x 3 = _____ |
| | | | | | FACU species _____ | x 4 = _____ |
| | | | | | UPL species _____ | x 5 = _____ |
| | | | | | Column Totals: <u>95</u> (A) | <u>140</u> (B) |
| | | | | | Prevalence Index = B/A = <u>1.47</u> | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | <u>15%</u> = Total Cover | | | Hydrophytic Vegetation Indicators: | |
| 1. | MEADOW WILLOW | <u>15%</u> | Yes | FACW | <u>X</u> 1 - Rapid Test for Hydrophytic Vegetation | |
| 2. | _____ | _____ | _____ | _____ | <u>X</u> 2 - Dominance Test is >50% | |
| 3. | _____ | _____ | _____ | _____ | <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ | |
| 4. | _____ | _____ | _____ | _____ | <u>—</u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| 5. | _____ | _____ | _____ | _____ | <u>—</u> Problematic Hydrophytic Vegetation ¹ (Explain) | |
| Herb Stratum (Plot size: <u>5 ft</u>) | | <u>15%</u> = Total Cover | | | | |
| 1. | HUMMOCK SEDGE | <u>40%</u> | Yes | OBL | | |
| 2. | REED CANARY GRASS | <u>30%</u> | Yes | FACW | | |
| 3. | NARROW-LEAF CATTAIL | <u>10%</u> | No | OBL | | |
| 4. | _____ | _____ | _____ | _____ | | |
| 5. | _____ | _____ | _____ | _____ | | |
| 6. | _____ | _____ | _____ | _____ | | |
| 7. | _____ | _____ | _____ | _____ | | |
| 8. | _____ | _____ | _____ | _____ | | |
| 9. | _____ | _____ | _____ | _____ | | |
| 10. | _____ | _____ | _____ | _____ | | |
| Woody Vine Stratum (Plot size: _____) | | <u>80%</u> = Total Cover | | | | |
| 1. | _____ | _____ | _____ | _____ | | |
| 2. | _____ | _____ | _____ | _____ | | |
| % Bare Ground in Herb Stratum _____ | | | | | Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ |
| Remarks: | | | | | | |

SOIL

Sampling Point: T6-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T7
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8586 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | |
|---------------------------------|-----------------------|---------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes _____ No <u>X</u> | | |
| Wetland Hydrology Present? | Yes <u>X</u> No _____ | | |
| Remarks: | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|---------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| <u>15 ft</u> = Total Cover | | | | Total % Cover of: _____ Multiply by: _____ |
| 1. BOG BIRCH | 40% | Yes | OBL | OBL species <u>40</u> x 1 = <u>40</u> |
| 2. RED-OSIER DOGWOOD | 10% | No | FACW | FACW species <u>45</u> x 2 = <u>90</u> |
| 3. WHITE OAK | 5% | No | FACU | FAC species <u>60</u> x 3 = <u>240</u> |
| 4. MEADOW WILLOW | 5% | No | FACW | FACU species <u>145</u> x 4 = <u>370</u> (B) |
| 5. SHRUBBY CIQUEFOIL | 30% | Yes | FACW | Column Totals: <u>145</u> (A) <u>370</u> (B) |
| <u>5 ft</u> = Total Cover | | | | Prevalence Index = B/A = <u>2.55</u> |
| 1. KENTUCKY BLUEGRASS | 30% | Yes | FACU | Hydrophytic Vegetation Indicators: |
| 2. BIG BLUESTEM | 20% | Yes | FACU | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| 3. CANADA GOLDENROD | 5% | No | FACU | <u>2</u> - Dominance Test is >50% |
| 4. _____ | _____ | _____ | _____ | <u>3</u> - Prevalence Index is $\leq 3.0^1$ |
| 5. _____ | _____ | _____ | _____ | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 6. _____ | _____ | _____ | _____ | Problems with Hydrophytic Vegetation ¹ (Explain) |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| <u>55%</u> = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| <u> </u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

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

SOIL

Sampling Point: T7

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T8-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.859 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|----------------------------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|-------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>33%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) _____ = Total Cover | | | | Total % Cover of: | Multiply by: |
| 1. <u>MEADOW WILLOW</u> | <u>5%</u> | <u>Yes</u> | <u>FACU</u> | OBL species <u>20</u> | x <u>1</u> = <u>40</u> |
| 2. _____ | _____ | _____ | _____ | FACW species <u>5</u> | x <u>2</u> = <u>15</u> |
| 3. _____ | _____ | _____ | _____ | FAC species <u>75</u> | x <u>3</u> = <u>300</u> |
| 4. _____ | _____ | _____ | _____ | UPL species <u>2</u> | x <u>4</u> = <u>10</u> |
| 5. _____ | <u>5%</u> | _____ | _____ | Column Totals: <u>102</u> (A) | <u>365</u> (B) |
| Herb Stratum (Plot size: <u>5 ft</u>) _____ = Total Cover | | | | Prevalence Index = B/A = <u>3.58</u> | |
| 1. <u>KENTUCKY BLUEGRASS</u> | <u>60%</u> | <u>Yes</u> | <u>FACU</u> | Hydrophytic Vegetation Indicators: | |
| 2. <u>REED CANARY GRASS</u> | <u>20%</u> | <u>Yes</u> | <u>FACW</u> | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation | |
| 3. <u>TIMOTHY</u> | <u>5%</u> | <u>No</u> | <u>FACU</u> | <input type="checkbox"/> 2 - Dominance Test is >50% | |
| 4. <u>CANADA THISTLE</u> | <u>5%</u> | <u>No</u> | <u>FACU</u> | <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ | |
| 5. <u>GIANT GOLDENROD</u> | <u>5%</u> | <u>No</u> | <u>FAC</u> | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| 6. <u>SHOWY DOGBANE</u> | <u>2%</u> | <u>No</u> | <u>UPL</u> | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | |
| 7. _____ | _____ | _____ | _____ | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| Woody Vine Stratum (Plot size: _____) <u>97%</u> = Total Cover | | | | % Bare Ground in Herb Stratum _____ | |
| 1. _____ | _____ | _____ | _____ | Hydrophytic Vegetation Present? | Yes _____ No <u>X</u> |
| 2. _____ | _____ | _____ | _____ | | |
| Remarks: | | | | | |

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

SOIL

Sampling Point: T8-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T8-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8592 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | |
|---------------------------------|-----------------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> No _____ | | |
| Remarks: | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| <u>15 ft</u> = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | 5% | Yes | FACW | Prevalence Index worksheet: |
| 1. MEADOW WILLOW | <u>5%</u> | <u>Yes</u> | <u>FACW</u> | Total % Cover of: <u>5%</u> Multiply by: <u>1</u> = <u>5%</u> |
| 2. _____ | _____ | _____ | _____ | OBL species <u>45</u> x 1 = <u>45</u> |
| 3. _____ | _____ | _____ | _____ | FACW species <u>40</u> x 2 = <u>80</u> |
| 4. _____ | _____ | _____ | _____ | FAC species <u>10</u> x 3 = <u>30</u> |
| 5. _____ | _____ | _____ | _____ | FACU species <u>10</u> x 4 = <u>40</u> |
| <u>5 ft</u> = Total Cover | | | | UPL species <u>95</u> x 5 = <u>475</u> |
| | | | | Column Totals: <u>95</u> (A) <u>165</u> (B) |
| | | | | Prevalence Index = B/A = <u>1.74</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | 5% | Yes | OBL | Hydrophytic Vegetation Indicators: |
| 1. HUMMOCK SEDGE | <u>40%</u> | <u>Yes</u> | <u>OBL</u> | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| 2. REED CANARY GRASS | <u>30%</u> | <u>Yes</u> | <u>FACW</u> | <u>X</u> 2 - Dominance Test is >50% |
| 3. KENTUCKY BLUEGRASS | <u>10%</u> | <u>No</u> | <u>FACU</u> | <u>X</u> 3 - Prevalence Index is ≤3.0 ¹ |
| 4. TORREY'S SEDGE | <u>5%</u> | <u>No</u> | <u>FACW</u> | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. JOINTED RUSH | <u>5%</u> | <u>No</u> | <u>OBL</u> | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| <u>90%</u> = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | 90% | Yes | No | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| <u> </u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

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

SOIL

Sampling Point: T8-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No _____ | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T9-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8597 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------|-----------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>2</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>67%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | _____ | = Total Cover | | Total % Cover of: | Multiply by: |
| 1. MEADOW WILLOW | <u>10%</u> | Yes | FACW | OBL species <u>15</u> | x 1 = <u>15</u> |
| 2. _____ | _____ | _____ | _____ | FACW species <u>15</u> | x 2 = <u>30</u> |
| 3. _____ | _____ | _____ | _____ | FAC species <u>5</u> | x 3 = <u>15</u> |
| 4. _____ | _____ | _____ | _____ | FACU species <u>50</u> | x 4 = <u>200</u> |
| 5. _____ | _____ | _____ | _____ | UPL species <u>5</u> | x 5 = <u>25</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | <u>10%</u> | = Total Cover | | Column Totals: <u>90</u> (A) | <u>285</u> (B) |
| 1. KENTUCKY BLUEGRASS | <u>40%</u> | Yes | FACU | Prevalence Index = B/A = <u>3.17</u> | |
| 2. PATHRUSH | <u>15%</u> | Yes | OBL | | |
| 3. BIG BLUESTEM | <u>5%</u> | No | FACU | | |
| 4. REED CANARY GRASS | <u>5%</u> | No | FACW | | |
| 5. YELLOW CONEFLOWER | <u>5%</u> | No | UPL | | |
| 6. PANICUM | <u>5%</u> | No | FAC | | |
| 7. LITTLE BLUESTEM | <u>5%</u> | No | FACU | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| Woody Vine Stratum (Plot size: _____) | <u>80%</u> | = Total Cover | | Hydrophytic Vegetation Indicators: | |
| 1. _____ | _____ | _____ | _____ | 1 - Rapid Test for Hydrophytic Vegetation | |
| 2. _____ | _____ | _____ | _____ | X 2 - Dominance Test is >50% | |
| % Bare Ground in Herb Stratum _____ | _____ | = Total Cover | | 3 - Prevalence Index is ≤3.0 ¹ | |
| Remarks: | | | | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| | | | | Problems with Hydrophytic Vegetation ¹ (Explain) | |
| | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | |
| | | | | Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ |

SOIL

Sampling Point: T9-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T9-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8598 Long: -95.9642 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--------------------------------------------------|-----------------------|-------------------|------------------|--------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| <u>15 ft</u> = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | 10% | Yes | FACW | Prevalence Index worksheet: |
| 1. MEADOW WILLOW | 10% | Yes | FACW | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| <u>5 ft</u> = Total Cover | | | | UPL species _____ x 5 = _____ |
| Herb Stratum (Plot size: <u>5 ft</u>) | 10% | | | Column Totals: (A) _____ (B) _____ |
| 1. FOWL BLUEGRASS | 30% | Yes | FACW | Prevalence Index = B/A = _____ |
| 2. HUMMOCK SEDGE | 30% | Yes | OBL | |
| 3. BALTIC RUSH | 10% | No | FACW | |
| 4. REED CANARY GRASS | 5% | No | FACW | |
| 5. KENTUCKY BLUEGRASS | 5% | No | FACU | |
| 6. GREEN BULRUSH | 5% | No | OBL | |
| 7. PATHRUSH | 5% | No | OBL | |
| 8. HYBRID CATTAIL | 2% | No | OBL | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| <u>92%</u> = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | 92% | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| <u> </u> = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | |
| Remarks: | | | | |
| Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ | | | |

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

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

SOIL

Sampling Point: T9-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T10-1
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8619 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | |
|------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------|------------------------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) | |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>3</u> (B) | |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>33%</u> (A/B) | | |
| 4. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | = Total Cover | | | | Prevalence Index worksheet: | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ | | |
| 2. _____ | _____ | _____ | _____ | OBL species | <u>5</u> x 1 = <u>10</u> | |
| 3. _____ | _____ | _____ | _____ | FACW species | <u>30</u> x 2 = <u>90</u> | |
| 4. _____ | _____ | _____ | _____ | FAC species | <u>40</u> x 3 = <u>160</u> | |
| 5. _____ | _____ | _____ | _____ | FACU species | <u>20</u> x 4 = <u>100</u> | |
| = Total Cover | | | | Column Totals: | <u>95</u> (A) <u>360</u> (B) | |
| | | | | Prevalence Index = B/A = <u>3.79</u> | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | = Total Cover | | | | Hydrophytic Vegetation Indicators: | |
| 1. KENTUCKY BLUEGRASS | <u>40%</u> | Yes | FACU | 1 - Rapid Test for Hydrophytic Vegetation | | |
| 2. BURDOCK | <u>30%</u> | Yes | FAC | 2 - Dominance Test is >50% | | |
| 3. SMOOTH BROME | <u>20%</u> | Yes | UPL | 3 - Prevalence Index is ≤3.0 ¹ | | |
| 4. REED CANARY GRASS | <u>5%</u> | No | FACW | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | |
| 5. _____ | _____ | _____ | _____ | Problems with Hydrophytic Vegetation ¹ (Explain) | | |
| 6. _____ | _____ | _____ | _____ | | | |
| 7. _____ | _____ | _____ | _____ | | | |
| 8. _____ | _____ | _____ | _____ | | | |
| 9. _____ | _____ | _____ | _____ | | | |
| 10. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Woody Vine Stratum (Plot size: _____) | = Total Cover | | | | Remarks: | |
| 1. _____ | _____ | _____ | _____ | | | |
| 2. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? | Yes _____ No <u>X</u> | |

SOIL

Sampling Point: T10-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T10-2
 Investigator(s): T. McCormack Section, Township, Range: 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8619 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| = Total Cover | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. HUMMOCK SEDGE | <u>40%</u> | Yes | OBL | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| 2. BURDOCK | <u>30%</u> | Yes | FAC | <u>X</u> 2 - Dominance Test is >50% |
| 3. REED CANARY GRASS | <u>10%</u> | No | FACW | <u>3</u> - Prevalence Index is ≤3.0 ¹ |
| 4. PANICUM | <u>5%</u> | No | FACU | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. _____ | _____ | _____ | _____ | Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

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

SOIL

Sampling Point: T10-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T11-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 16, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%):
 Subregion (LRR): Northern Great Plains Lat: 48.8622 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------|-----------------------------|--|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) | |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) | |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B) | | |
| 4. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Sapling/Shrub Stratum (Plot size: _____) | = Total Cover | | | | Prevalence Index worksheet: | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: | |
| 2. _____ | _____ | _____ | _____ | OBL species <u>20</u> | x 1 = <u>20</u> | |
| 3. _____ | _____ | _____ | _____ | FACW species <u>5</u> | x 2 = <u>10</u> | |
| 4. _____ | _____ | _____ | _____ | FAC species <u>5</u> | x 3 = <u>15</u> | |
| 5. _____ | _____ | _____ | _____ | FACU species <u>62</u> | x 4 = <u>248</u> | |
| = Total Cover | | | | UPL species <u>5</u> | x 5 = <u>25</u> | |
| = Total Cover | | | | Column Totals: <u>97</u> (A) | <u>318</u> (B) | |
| Prevalence Index = B/A = <u>3.28</u> | | | | | | |
| Hydrophytic Vegetation Indicators: | | | | | | |
| <ul style="list-style-type: none"> ___ 1 - Rapid Test for Hydrophytic Vegetation ___ 2 - Dominance Test is >50% ___ 3 - Prevalence Index is ≤3.0¹ ___ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) ___ Problematic Hydrophytic Vegetation¹ (Explain) | | | | | | |
| ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Hydrophytic Vegetation Present? | | |
| 1. KENTUCKY BLUEGRASS | <u>40%</u> | Yes | FACU | Yes <u>X</u> | No _____ | |
| 2. PATHRUSH | <u>20%</u> | Yes | OBL | | | |
| 3. BIG BLUESTEM | <u>15%</u> | No | FACU | | | |
| 4. SMOOTH BROME | <u>5%</u> | No | UPL | | | |
| 5. REED CANARY GRASS | <u>5%</u> | No | FACW | | | |
| 6. PANICUM | <u>5%</u> | No | FAC | | | |
| 7. INDIAN GRASS | <u>5%</u> | No | FACU | | | |
| 8. CANADA THISTLE | <u>2%</u> | No | FACU | | | |
| 9. _____ | _____ | _____ | _____ | | | |
| 10. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | Yes <u>X</u> No _____ | | |
| Woody Vine Stratum (Plot size: _____) | = Total Cover | | | | Remarks: | |
| 1. _____ | _____ | _____ | _____ | | | |
| 2. _____ | _____ | _____ | _____ | | | |
| % Bare Ground in Herb Stratum _____ | | | | | | |

SOIL

Sampling Point: T11-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T11-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 16, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8623 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 1170 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|--------------------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | | | Prevalence Index worksheet: |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species <u>85</u> x 1 = <u>85</u> |
| 3. _____ | _____ | _____ | _____ | FACW species <u>7</u> x 2 = <u>14</u> |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| = Total Cover | | | | UPL species <u>5</u> x 5 = <u>25</u> |
| = Total Cover | | | | Column Totals: <u>97</u> (A) <u>124</u> (B) |
| | | | | Prevalence Index = B/A = <u>1.28</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Hydrophytic Vegetation Indicators: |
| 1. HUMMOCK SEDGE | <u>80%</u> | Yes | OBL | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| 2. REED CANARY GRASS | <u>5%</u> | No | FACW | <u>X</u> 2 - Dominance Test is >50% |
| 3. SOFTSTEM BULRUSH | <u>5%</u> | No | OBL | <u>X</u> 3 - Prevalence Index is $\leq 3.0^1$ |
| 4. SHOWY DOGBANE | <u>5%</u> | No | UPL | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. MARSH CIQUEFOIL | <u>2%</u> | No | FACW | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

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

SOIL

Sampling Point: T11-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T12-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Great Northern Plains Lat: 48.8642 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|----------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------|-----------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>0</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) = Total Cover | | | | Prevalence Index worksheet: | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: |
| 2. _____ | _____ | _____ | _____ | OBL species <u>5</u> | x 1 = <u>10</u> |
| 3. _____ | _____ | _____ | _____ | FACW species <u>100</u> | x 2 = <u>400</u> |
| 4. _____ | _____ | _____ | _____ | FAC species <u>10</u> | x 3 = <u>50</u> |
| 5. _____ | _____ | _____ | _____ | UPL species <u>115</u> (A) | x 4 = <u>460</u> (B) |
| | | | | Column Totals: <u>115</u> (A) <u>460</u> (B) | |
| | | | | Prevalence Index = B/A = <u>4.0</u> | |
| Herb Stratum (Plot size: <u>5 ft</u>) = Total Cover | | | | Hydrophytic Vegetation Indicators: | |
| 1. KENTUCKY BLUEGRASS | <u>60%</u> | Yes | FACU | 1 - Rapid Test for Hydrophytic Vegetation | |
| 2. SWEET CLOVER | <u>15%</u> | No | FACU | 2 - Dominance Test is >50% | |
| 3. GREEN FOXTAIL | <u>10%</u> | No | FACU | 3 - Prevalence Index is ≤3.0 ¹ | |
| 4. TIMOTHY | <u>10%</u> | No | FACU | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| 5. SMOOTH BROME | <u>10%</u> | No | UPL | Problems with Hydrophytic Vegetation ¹ (Explain) | |
| 6. REED CANARY GRASS | <u>5%</u> | No | FACW | | |
| 7. CANADA THISTLE | <u>5%</u> | No | FACU | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| <u>115%</u> = Total Cover | | | | | |
| Woody Vine Stratum (Plot size: _____) = Total Cover | | | | | |
| 1. _____ | _____ | _____ | _____ | | |
| 2. _____ | _____ | _____ | _____ | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? | Yes _____ No <u>X</u> |
| Remarks: | | | | | |

SOIL

Sampling Point: T12-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T12-2
Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): Northern Great Plains Lat: 48.8642 Long: -95.9641 Datum: NAD 83
Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | | |
|---------------------------------|-----------|----------|--------------------------------------------------|-----------|----------|
| Hydrophytic Vegetation Present? | Yes _____ | No _____ | Is the Sampled Area within a Wetland? | Yes _____ | No _____ |
| Hydric Soil Present? | Yes _____ | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No _____ | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status |
|--------------------------------------------------------|------------------|-------------------|---------------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| | | | = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15ft</u>) | | | |
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| | | | = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5ft</u>) | | | |
| 1. BLUNT SPIKERUSH | 60% | Yes | OBL |
| 2. HYBRID CATTAIL | 30% | Yes | OBL |
| 3. TORREY'S RUSH | 5% | No | FACW |
| 4. REED CANARY GRASS | 5% | No | FACW |
| 5. CURLED DOCK | 2% | No | FAC |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| | | | = Total Cover <u>102%</u> |
| <u>Woody Vine Stratum</u> (Plot size: _____) | | | |
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| | | | = Total Cover _____ |
| % Bare Ground in Herb Stratum _____ | | | |
| Remarks: | | | |

Dominance Test worksheet:

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

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:

Total % Cover of: _____ Multiply by: _____

OBL species _____ x 1 = _____

FACW species _____ x 2 = _____

FAC species _____ x 3 = _____

FACU species _____ x 4 = _____

UPL species _____ x 5 = _____

Column Totals: _____ (A) _____ (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- 1 - Rapid Test for Hydrophytic Vegetation
- 2 - Dominance Test is >50%
- 3 - Prevalence Index is $\leq 3.0^1$
- 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
- Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes No _____

SOIL

Sampling Point: T12-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T13-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%):
 Subregion (LRR): Northern Great Plains Lat: 48.8652 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|-----------|-------------|------------------------------------------|-----------|-------------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> _____ |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|----------------------------------------------------------------------|------------------|-------------------|------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>0</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0 %</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) _____ = Total Cover | | | | | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: |
| 2. _____ | _____ | _____ | _____ | OBL species | x 1 = |
| 3. _____ | _____ | _____ | _____ | FACW species | x 2 = |
| 4. _____ | _____ | _____ | _____ | FAC species | x 3 = |
| 5. _____ | _____ | _____ | _____ | FACU species | <u>47</u> x 4 = <u>188</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) _____ = Total Cover | | | | UPL species | <u>15</u> x 5 = <u>75</u> |
| 1. KENTUCKY BLUEGRASS | <u>20%</u> | Yes | FACU | Column Totals: | <u>62</u> (A) <u>263</u> (B) |
| 2. SMOOTH BROME | <u>15%</u> | Yes | UPL | | |
| 3. GREEN FOXTAIL | <u>15%</u> | Yes | FACU | | |
| 4. CANADA THISTLE | <u>10%</u> | No | FACU | | |
| 5. BLACK-EYED SUSAN | <u>2%</u> | No | FACU | | |
| 6. _____ | _____ | _____ | _____ | | |
| 7. _____ | _____ | _____ | _____ | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| <u>62 %</u> = Total Cover | | | | Prevalence Index = B/A = <u>4.24</u> | |
| Woody Vine Stratum (Plot size: _____) | | | | Hydrophytic Vegetation Indicators: | |
| 1. _____ | _____ | _____ | _____ | <ul style="list-style-type: none"> ____ 1 - Rapid Test for Hydrophytic Vegetation ____ 2 - Dominance Test is >50% ____ 3 - Prevalence Index is ≤3.0¹ ____ 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet) ____ Problematic Hydrophytic Vegetation¹ (Explain) | |
| 2. _____ | _____ | _____ | _____ | | |
| % Bare Ground in Herb Stratum _____ = Total Cover | | | | | |
| Remarks: | | | | | |

SOIL

Sampling Point: T13-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T13-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): Concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8653 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: _____) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | |
|--------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------|------------------------------------|-----------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | 1 (A) | |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | 1 (B) | |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) | | |
| 4. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | | | | Prevalence Index worksheet: | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: | |
| 2. _____ | _____ | _____ | _____ | OBL species | x 1 = _____ | |
| 3. _____ | _____ | _____ | _____ | FACW species | x 2 = _____ | |
| 4. _____ | _____ | _____ | _____ | FAC species | x 3 = _____ | |
| 5. _____ | _____ | _____ | _____ | FACU species | x 4 = _____ | |
| = Total Cover | | | | UPL species | x 5 = _____ | |
| = Total Cover | | | | Column Totals: (A) _____ (B) _____ | | |
| | | | | Prevalence Index = B/A = _____ | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | | Hydrophytic Vegetation Indicators: | |
| 1. HYBRID CATTAIL | 50% | Yes | OBL | 1 - Rapid Test for Hydrophytic Vegetation | | |
| 2. SOFTSTEM BULRUSH | 20% | No | OBL | X 2 - Dominance Test is >50% | | |
| 3. BLUNT SPIKERUSH | 20% | No | OBL | 3 - Prevalence Index is ≤3.0 ¹ | | |
| 4. MUD PLANTAIN | 5% | No | OBL | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | |
| 5. BALTIC RUSH | 5% | No | FACW | Problems with Hydrophytic Vegetation ¹ (Explain) | | |
| 6. REED CANARY GRASS | 5% | No | FACW | | | |
| 7. TORREY'S RUSH | 2% | No | FACW | | | |
| 8. _____ | _____ | _____ | _____ | | | |
| 9. _____ | _____ | _____ | _____ | | | |
| 10. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | | |
| 1. _____ | _____ | _____ | _____ | | | |
| 2. _____ | _____ | _____ | _____ | | | |
| = Total Cover | | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? | | Yes <u>X</u> No _____ |
| Remarks: | | | | | | |

SOIL

Sampling Point: T13-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T14-1
Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
Landform (hillslope, terrace, etc.): Flat Local relief (concave, convex, none): none Slope (%):
Subregion (LRR): Northern Great Plains Lat: 48.8667 Long: -95.964 Datum: NAD 83
Soil Map Unit Name: 379 NWI classification: none

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

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

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

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

| | | | | | |
|---------------------------------|--------------|-------------|--------------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|-------------------------------------------------|------------------|-------------------|------------------|
| 1. WHITE CEDAR (planted) | 10% | Yes | FACW |
| 2. AMUR MAPLE (planted) | 10% | Yes | NI |
| 3. LOMBARDI POPPLE (planted) | 5% | Yes | NI |
| 4. | | | |
| | <u>25%</u> | = Total Cover | |
| Sapling/Shrub Stratum (Plot size: <u>15ft</u>) | | | |
| 1. MEADOW WILLOW | 10% | Yes | FACW |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | <u>10%</u> | = Total Cover | |
| Herb Stratum (Plot size: <u>5ft</u>) | | | |
| 1. KENTUCKY BLUEGRASS | 80% | Yes | FACU |
| 2. GIANT GOLDENROD | 10% | No | FAC |
| 3. REED CANARY GRASS | 5% | No | FACW |
| 4. DAISY FLEABANE | 2% | No | FACU |
| 5. BIG BLUESTEM | 2% | No | FACU |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | <u>99%</u> | = Total Cover | |
| Woody Vine Stratum (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| % Bare Ground in Herb Stratum _____ | | = Total Cover | |
| Remarks: | | | |

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 40% (A/B)

Prevalence Index worksheet:
Total % Cover of: _____ Multiply by: _____
 OBL species 25 x 1 = 50
 FACW species 10 x 2 = 30
 FAC species 84 x 3 = 336
 UPL species 119 x 5 = 416
 Column Totals: 119 (A) 416 (B)
 Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes No X

SOIL

Sampling Point: T14-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T14-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8668 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|-----------|----------|------------------------------------------|-----------|----------|
| Hydrophytic Vegetation Present? | Yes _____ | No _____ | Is the Sampled Area within a Wetland? | Yes _____ | No _____ |
| Hydric Soil Present? | Yes _____ | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No _____ | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|-------------------------------------------------|--|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. <u>AMUR MAPLE</u> (planted) | | <u>15%</u> | <u>Yes</u> | <u>NI</u> | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>4</u> (A) |
| 2. <u>WHITE CEDAR</u> (planted) | | <u>5%</u> | <u>Yes</u> | <u>FACW</u> | Total Number of Dominant Species Across All Strata: | <u>6</u> (B) |
| 3. <u>LOMBARDI POPPLE</u> (planted) | | <u>5%</u> | <u>Yes</u> | <u>NI</u> | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B) | |
| 4. _____ | | <u>25%</u> | = Total Cover | | | |
| Sapling/Shrub Stratum (Plot size: <u>15ft</u>) | | 10% | Yes | FACW | Prevalence Index worksheet: | |
| 1. <u>MEADOW WILLOW</u> | | | | | Total % Cover of: _____ Multiply by: _____ | |
| 2. _____ | | | | | OBL species _____ x 1 = _____ | |
| 3. _____ | | | | | FACW species _____ x 2 = _____ | |
| 4. _____ | | | | | FAC species _____ x 3 = _____ | |
| 5. _____ | | | | | FACU species _____ x 4 = _____ | |
| Herb Stratum (Plot size: <u>5ft</u>) | | <u>10%</u> | = Total Cover | | | UPL species _____ x 5 = _____ |
| 1. <u>HUMMOCK SEDGE</u> | | <u>40%</u> | <u>Yes</u> | <u>OBL</u> | Column Totals: _____ (A) _____ (B) | |
| 2. <u>FOWL BLUEGRASS</u> | | <u>40%</u> | <u>Yes</u> | <u>FACW</u> | Prevalence Index = B/A = _____ | |
| 3. <u>PATHRUSH</u> | | <u>10%</u> | <u>No</u> | <u>OBL</u> | Hydrophytic Vegetation Indicators: | |
| 4. <u>BALTIC RUSH</u> | | <u>5%</u> | <u>No</u> | <u>FACW</u> | <u>1</u> - Rapid Test for Hydrophytic Vegetation | |
| 5. <u>REED CANARY GRASS</u> | | <u>5%</u> | <u>No</u> | <u>FACW</u> | <u>X</u> <u>2</u> - Dominance Test is >50% | |
| 6. <u>BOTTLE GENTIAN</u> | | <u>2%</u> | <u>No</u> | <u>FAC</u> | <u>3</u> - Prevalence Index is ≤3.0 ¹ | |
| 7. _____ | | | | | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| 8. _____ | | | | | _____ Problematic Hydrophytic Vegetation ¹ (Explain) | |
| 9. _____ | | | | | | |
| 10. _____ | | <u>102%</u> | = Total Cover | | | |
| Woody Vine Stratum (Plot size: <u>_____</u>) | | _____ | _____ | _____ | _____ | |
| 1. _____ | | | | | | |
| 2. _____ | | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | | | |
| Remarks: | | | | | | |

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

SOIL

Sampling Point: T14-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T15-1
Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): Northern Great Plains Lat: 48.8681 Long: -95.964 Datum: NAD 83
Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | | |
|---------------------------------|--------------|-------------|--------------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |

VEGETATION – Use scientific names of plants.

| | | | | | | | |
|-------------------------------------------------|--|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|------------------|
| Tree Stratum (Plot size: <u>30ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | | |
| 1. <u>LOMBARDI POPPLE (planted)</u> | | <u>20%</u> | <u>Yes</u> | <u>NI</u> | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) | | |
| 2. <u>AMUR MAPLE (planted)</u> | | <u>15%</u> | <u>Yes</u> | <u>NI</u> | | | |
| 3. _____ | | _____ | _____ | _____ | | | |
| 4. _____ | | _____ | _____ | _____ | | | |
| | | <u>35%</u> | = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15ft</u>) | | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>25%</u> (A/B) | | |
| 1. <u>MEADOW WILLOW</u> | | <u>5%</u> | <u>Yes</u> | <u>FACW</u> | Prevalence Index worksheet: | | |
| 2. _____ | | _____ | _____ | _____ | Total % Cover of: | Multiply by: | |
| 3. _____ | | _____ | _____ | _____ | OBL species <u>10</u> | x 1 = <u>10</u> | |
| 4. _____ | | _____ | _____ | _____ | FACW species <u>15</u> | x 2 = <u>30</u> | |
| 5. _____ | | _____ | _____ | _____ | FAC species <u>5</u> | x 3 = <u>15</u> | |
| | | <u>5%</u> | = Total Cover | | | FACU species <u>80</u> | x 4 = <u>320</u> |
| Herb Stratum (Plot size: <u>5ft</u>) | | | | | UPL species <u>110</u> | x 5 = _____ | |
| 1. <u>KENTUCKY BLUEGRASS</u> | | <u>70%</u> | <u>Yes</u> | <u>FACU</u> | Column Totals: <u>110</u> (A) <u>375</u> (B) | | |
| 2. <u>REED CANARY GRASS</u> | | <u>10%</u> | <u>No</u> | <u>FACW</u> | Prevalence Index = B/A = <u>3.41</u> | | |
| 3. <u>SOWTHISTLE</u> | | <u>10%</u> | <u>No</u> | <u>FACU</u> | Hydrophytic Vegetation Indicators: | | |
| 4. <u>SOFTSTEM BULLRUSH</u> | | <u>10%</u> | <u>No</u> | <u>OBL</u> | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation | | |
| 5. <u>GIANT GOLDENROD</u> | | <u>5%</u> | <u>No</u> | <u>FAC</u> | <input type="checkbox"/> 2 - Dominance Test is >50% | | |
| 6. _____ | | _____ | _____ | _____ | <input type="checkbox"/> 3 - Prevalence Index is $\leq 3.0^1$ | | |
| 7. _____ | | _____ | _____ | _____ | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | |
| 8. _____ | | _____ | _____ | _____ | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | | |
| 9. _____ | | _____ | _____ | _____ | | | |
| 10. _____ | | _____ | _____ | _____ | | | |
| | | <u>105%</u> | = Total Cover | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | |
| Woody Vine Stratum (Plot size: _____) | | | | | Hydrophytic Vegetation Present? | | |
| 1. _____ | | _____ | _____ | _____ | Yes <u> </u> | No <u>X</u> | |
| 2. _____ | | _____ | _____ | _____ | | | |
| % Bare Ground in Herb Stratum _____ | | _____ | = Total Cover | | | | |
| Remarks: | | | | | | | |

SOIL

Sampling Point: T15-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T15-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8682 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|-----------|----------|------------------------------------------|-----------|----------|
| Hydrophytic Vegetation Present? | Yes _____ | No _____ | Is the Sampled Area within a Wetland? | Yes _____ | No _____ |
| Hydric Soil Present? | Yes _____ | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No _____ | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| | | | | | |
|-------------------------------------------------|--|------------------|-------------------|------------------|--------------------------------------------------------------------------------------|
| Tree Stratum (Plot size: <u>30ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
| 1. <u>LOMBARDI POPPLE (planted)</u> | | <u>20%</u> | <u>Yes</u> | <u>NI</u> | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A) |
| 2. <u>AMUR MAPLE (planted)</u> | | <u>5%</u> | <u>Yes</u> | <u>NI</u> | Total Number of Dominant Species Across All Strata: <u>6</u> (B) |
| 3. _____ | | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B) |
| 4. _____ | | | | | |
| | | <u>25%</u> | = Total Cover | | |
| Sapling/Shrub Stratum (Plot size: <u>15ft</u>) | | | | | |
| 1. <u>MEADOW WILLOW</u> | | <u>20%</u> | <u>Yes</u> | <u>FACW</u> | Prevalence Index worksheet: |
| 2. _____ | | | | | Total % Cover of: _____ Multiply by: _____ |
| 3. _____ | | | | | OBL species _____ x 1 = _____ |
| 4. _____ | | | | | FACW species _____ x 2 = _____ |
| 5. _____ | | | | | FAC species _____ x 3 = _____ |
| | | <u>20%</u> | = Total Cover | | |
| Herb Stratum (Plot size: <u>5ft</u>) | | | | | FACU species _____ x 4 = _____ |
| 1. <u>HUMMOCK SEDGE</u> | | <u>30%</u> | <u>Yes</u> | <u>OBL</u> | UPL species _____ x 5 = _____ |
| 2. <u>FOWL BLUEGRASS</u> | | <u>30%</u> | <u>Yes</u> | <u>FACW</u> | Column Totals: _____ (A) _____ (B) |
| 3. <u>REED CANARY GRASS</u> | | <u>20%</u> | <u>Yes</u> | <u>FACW</u> | Prevalence Index = B/A = _____ |
| 4. <u>KENTUCKY BLUEGRASS</u> | | <u>10%</u> | <u>No</u> | <u>FACU</u> | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| | | <u>90%</u> | = Total Cover | | |
| Woody Vine Stratum (Plot size: _____) | | | | | |
| 1. _____ | | | | | |
| 2. _____ | | | | | |
| | | <u>_____</u> | = Total Cover | | |
| % Bare Ground in Herb Stratum _____ | | | | | |
| | | | | | |
| Remarks: | | | | | |

SOIL

Sampling Point: T15-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T16-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8697 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | | |
|---------------------------------|-----------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|--------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. | | | | | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) |
| 2. | | | | | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) |
| 3. | | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>50%</u> (A/B) |
| 4. | | | | | Prevalence Index worksheet: | |
| | | = Total Cover | | | Total % Cover of: | Multiply by: |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | 15% | Yes | FACW | OBL species | <u>40</u> x 1 = <u>80</u> |
| 1. | MEADOW WILLOW | 15% | Yes | FACW | FACW species | <u>40</u> x 2 = <u>80</u> |
| 2. | | | | | FAC species | <u>80</u> x 3 = <u>240</u> |
| 3. | | | | | FACU species | <u>80</u> x 4 = <u>320</u> |
| 4. | | | | | UPL species | <u>120</u> x 5 = <u>600</u> |
| 5. | | | | | Column Totals: | <u>120</u> (A) <u>400</u> (B) |
| | | = Total Cover | | | Prevalence Index = B/A = | <u>3.33</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | 15% | | | Hydrophytic Vegetation Indicators: | |
| 1. | KENTUCKY BLUEGRASS | 60% | Yes | FACU | 1 - Rapid Test for Hydrophytic Vegetation | |
| 2. | PRAIRIE CORDGRASS | 20% | No | FACW | 2 - Dominance Test is >50% | |
| 3. | RED CLOVER | 10% | No | FACU | 3 - Prevalence Index is ≤3.0 ¹ | |
| 4. | BIG BLUESTEM | 10% | No | FACU | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| 5. | REED CANARY GRASS | 5% | No | FACW | Problems with Hydrophytic Vegetation ¹ (Explain) | |
| 6. | | | | | | |
| 7. | | | | | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| | | = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | 105% | | | | |
| 1. | | | | | | |
| 2. | | | | | | |
| | | = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | | Hydrophytic Vegetation Present? Yes _____ No <u>X</u> | |
| Remarks: | | | | | | |

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

SOIL

Sampling Point: T16-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T16-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8698 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|-----------------------------------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| | | | | Total % Cover of: _____ Multiply by: _____ |
| | | | | OBL species _____ x 1 = _____ |
| | | | | FACW species _____ x 2 = _____ |
| | | | | FAC species _____ x 3 = _____ |
| | | | | FACU species _____ x 4 = _____ |
| | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| | | | | Hydrophytic Vegetation Indicators: |
| | | | | <u>1</u> - Rapid Test for Hydrophytic Vegetation |
| | | | | <u>X</u> 2 - Dominance Test is >50% |
| | | | | <u>3</u> - Prevalence Index is ≤ 3.0 ¹ |
| | | | | <u>4</u> - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | Problematic Hydrophytic Vegetation ¹ (Explain) |
| | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T16-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T17-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8718 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | |
|---------------------------------|-----------|-------------|------------------------------------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | |
| Remarks: | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|--|---------------------------|-------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------------|
| 1. | | | | | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) |
| 2. | | | | | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) |
| 3. | | | | | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>50%</u> (A/B) |
| 4. | | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | = Total Cover | | Prevalence Index worksheet: | | |
| 1. | | | | Total % Cover of: | Multiply by: | |
| 2. | | | | OBL species | x 1 = | |
| 3. | | | | FACW species | x 2 = | <u>80</u> |
| 4. | | | | FAC species | x 3 = | |
| 5. | | | | FACU species | x 4 = | <u>260</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | = Total Cover | | UPL species | x 5 = | |
| 1. BIG BLUESTEM | | 25% | Yes | FACU | Column Totals: | <u>105</u> (A) <u>340</u> (B) |
| 2. PRAIRIE CHORDGRASS | | 25% | Yes | FACW | Prevalence Index = B/A = <u>3.24</u> | |
| 3. KENTUCKY BLUEGRASS | | 20% | No | FACU | | |
| 4. REED CANARY GRASS | | 15% | No | FACW | | |
| 5. CANADA GOLDENROD | | 10% | No | FACU | | |
| 6. TIMOTHY | | 5% | No | FACU | | |
| 7. BLACK-EYED SUSAN | | 5% | No | FACU | | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| | | <u>105%</u> = Total Cover | | Hydrophytic Vegetation Indicators: | | |
| Woody Vine Stratum (Plot size: _____) | | = Total Cover | | 1 - Rapid Test for Hydrophytic Vegetation | | |
| 1. | | | | 2 - Dominance Test is >50% | | |
| 2. | | | | 3 - Prevalence Index is ≤3.0 ¹ | | |
| % Bare Ground in Herb Stratum _____ | | = Total Cover | | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | |
| | | | | Problems with Hydrophytic Vegetation ¹ (Explain) | | |
| Remarks: | | | | | | |

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

SOIL

Sampling Point: T17-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T17-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.872 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|-----------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| | | | | Total % Cover of: _____ Multiply by: _____ |
| | | | | OBL species _____ x 1 = _____ |
| | | | | FACW species _____ x 2 = _____ |
| | | | | FAC species _____ x 3 = _____ |
| | | | | FACU species _____ x 4 = _____ |
| | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| | | | | Hydrophytic Vegetation Indicators: |
| | | | | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation |
| | | | | <input checked="" type="checkbox"/> 2 - Dominance Test is >50% |
| | | | | <input type="checkbox"/> 3 - Prevalence Index is ≤ 3.0 ¹ |
| | | | | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T17-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T18-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8766 Long: -95.964 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes _____ | No <u>X</u> | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|------------------|--------------------------------------------|------------------|--------------------------------------------------------------------------------------------------------|----------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>0</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0 %</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | | |
| <u>= Total Cover</u> | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | _____ | Prevalence Index worksheet: | | | |
| 1. _____ | _____ | Total % Cover of: _____ Multiply by: _____ | | | |
| 2. _____ | _____ | OBL species | _____ | x 1 = | _____ |
| 3. _____ | _____ | FACW species | _____ | x 2 = | _____ |
| 4. _____ | _____ | FAC species | <u>2</u> | x 3 = | <u>6</u> |
| 5. _____ | _____ | FACU species | <u>2</u> | x 4 = | <u>8</u> |
| <u>= Total Cover</u> | | | | UPL species | _____ x 5 = _____ |
| <u>= Total Cover</u> | | | | Column Totals: | <u>4</u> (A) <u>14</u> (B) |
| Prevalence Index = B/A = <u>3.5</u> | | | | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | _____ | Hydrophytic Vegetation Indicators: | | | |
| 1. <u>WHEAT (planted)</u> | <u>10 %</u> | Yes | NI | 1 - Rapid Test for Hydrophytic Vegetation | |
| 2. <u>DANDELION</u> | <u>2 %</u> | No | FACU | 2 - Dominance Test is >50% | |
| 3. <u>CURLED DOCK</u> | <u>2 %</u> | No | FAC | 3 - Prevalence Index is ≤3.0 ¹ | |
| 4. _____ | _____ | _____ | _____ | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| 5. _____ | _____ | _____ | _____ | Problems with Hydrophytic Vegetation ¹ (Explain) | |
| 6. _____ | _____ | _____ | _____ | | |
| 7. _____ | _____ | _____ | _____ | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| <u>= Total Cover</u> | | | | | |
| Woody Vine Stratum (Plot size: _____) | _____ | Hydrophytic Vegetation Present? | | | |
| 1. _____ | _____ | Yes _____ | No <u>X</u> | | |
| 2. _____ | _____ | _____ | _____ | | |
| <u>= Total Cover</u> | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | | |
| Remarks: | | | | | |

SOIL

Sampling Point: T18-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T18-2
Investigator(s): T. McCormack Section, Township, Range: Sec 9, T162N, R41W
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): Northern Great Plains Lat: 48.8767 Long: -95.964 Datum: NAD 83
Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | |
|---------------------------------|-----------------------------------------|----------|--------------------------------------------------|
| Hydrophytic Vegetation Present? | Yes <input checked="" type="checkbox"/> | No _____ | Is the Sampled Area within a Wetland? |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> | No _____ | |
| Wetland Hydrology Present? | Yes <input checked="" type="checkbox"/> | No _____ | |

Remarks:

VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------------------------|------------------|-------------------|------------------|
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| | | | = Total Cover |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u>) | | | |
| 1. | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| | | | = Total Cover |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u>) | | | |
| 1. WHEAT (planted) | 5% | Yes | NI |
| 2. REED CANARY GRASS | 5% | Yes | FACW |
| 3. HYBRID CATTAI | 2% | No | OBL |
| 4. CURLED DOCK | 2% | No | FAC |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| | 14% | | = Total Cover |
| <u>Woody Vine Stratum</u> (Plot size: _____) | | | |
| 1. | | | |
| 2. | | | |
| | | | = Total Cover |
| % Bare Ground in Herb Stratum _____ | | | |
| Remarks: | | | |

Dominance Test worksheet:
Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 1 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:
Total % Cover of: 2 x 1 = 2
OBL species 2 x 2 = 10
FACW species 5 x 3 = 6
FAC species 2 x 4 = _____
FACU species _____ x 5 = _____
UPL species _____ Column Totals: 9 (A) 18 (B)
Prevalence Index = B/A = 2.0

Hydrophytic Vegetation Indicators:
 1 - Rapid Test for Hydrophytic Vegetation
 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes No _____

SOIL

Sampling Point: T18-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T19-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 4, T162N, R41W
 Landform (hillslope, terrace, etc.): flat Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8776 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 644 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------|-------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ | No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|------------------|-------------------|------------------|-------------------------------------------------------------------------|----------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>0</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>0%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | _____ | | | | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: |
| 2. _____ | _____ | _____ | _____ | OBL species | x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species | x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species | <u>5</u> x 3 = <u>15</u> |
| 5. _____ | _____ | _____ | _____ | FACU species | x 4 = _____ |
| = Total Cover | | | | UPL species | x 5 = _____ |
| = Total Cover | | | | Column Totals: | <u>5</u> (A) <u>15</u> (B) |
| Prevalence Index = B/A = <u>3.0</u> | | | | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | | |
| 1. <u>SOYBEANS (planted)</u> | <u>40%</u> | <u>Yes</u> | <u>NI</u> | | |
| 2. <u>COMMON PLANTAIN</u> | <u>5%</u> | <u>No</u> | <u>FAC</u> | | |
| 3. _____ | _____ | _____ | _____ | | |
| 4. _____ | _____ | _____ | _____ | | |
| 5. _____ | _____ | _____ | _____ | | |
| 6. _____ | _____ | _____ | _____ | | |
| 7. _____ | _____ | _____ | _____ | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | | |
| 1. _____ | _____ | _____ | _____ | | |
| 2. _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ |
| Remarks: | | | | | |

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

Hydrophytic Vegetation Present? Yes X No _____

SOIL

Sampling Point: T19-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T19-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 4, T162N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8775 Long: -95.9641 Datum: NAD 83
 Soil Map Unit Name: 644 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|---------------------------------------------------------------------------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>3</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | | | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| = Total Cover | | | | UPL species _____ x 5 = _____ |
| Herb Stratum (Plot size: <u>5 ft</u>) | | | | Column Totals: _____ (A) _____ (B) |
| 1. <u>WATER HEMP</u> | <u>10%</u> | <u>Yes</u> | <u>FAC</u> | Prevalence Index = B/A = _____ |
| 2. <u>BARNYARD GRASS</u> | <u>5%</u> | <u>Yes</u> | <u>FAC</u> | |
| 3. <u>PENN. SMARTWEED</u> | <u>5%</u> | <u>Yes</u> | <u>FACW</u> | |
| 4. <u>SOYBEANS (planted)</u> | <u>2%</u> | <u>No</u> | <u>NI</u> | |
| 5. _____ | _____ | _____ | _____ | |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| Woody Vine Stratum (Plot size: _____) | | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| = Total Cover | | | | |
| % Bare Ground in Herb Stratum _____ | | | | |
| Remarks: | | | | |
| Hydrophytic Vegetation Indicators: | | | | |
| <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation | | | | |
| <input checked="" type="checkbox"/> 2 - Dominance Test is >50% | | | | |
| <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ | | | | |
| <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | | | | |
| <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) | | | | |
| ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | |
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ | | | | |

SOIL

Sampling Point: T19-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T20-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 4, T162N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8926 Long: -95.9643 Datum: NAD 83
 Soil Map Unit Name: 383 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|-----------------------------------------|------------------|-------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>0</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>0 %</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| | | | | Total % Cover of: _____ Multiply by: _____ |
| | | | | OBL species <u>5</u> x 1 = <u>10</u> |
| | | | | FACW species <u>5</u> x 2 = <u>10</u> |
| | | | | FAC species <u>5</u> x 3 = <u>15</u> |
| | | | | FACU species <u>5</u> x 4 = <u>20</u> |
| | | | | UPL species <u>10</u> x 5 = <u>50</u> |
| | | | | Column Totals: <u>10</u> (A) <u>30</u> (B) |
| | | | | Prevalence Index = B/A = <u>3.0</u> |
| | | | | Hydrophytic Vegetation Indicators: |
| | | | | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation |
| | | | | <input type="checkbox"/> 2 - Dominance Test is >50% |
| | | | | <input checked="" type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ |
| | | | | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T20-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T20-2
Investigator(s): T. McCormack Section, Township, Range: Sec 4, T162N, R41W
Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%):
Subregion (LRR): Northern Great Plains Lat: 48.8924 Long: -95.9643 Datum: NAD 83
Soil Map Unit Name: 383 NWI classification: none

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

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

| | | | |
|---------------------------------|--------------------------------------------------|--------------------------------------------------|--------------------------------------------------|
| Hydrophytic Vegetation Present? | Yes <input checked="" type="checkbox"/> No _____ | Is the Sampled Area within a Wetland? | Yes <input checked="" type="checkbox"/> No _____ |
| Hydric Soil Present? | Yes <input checked="" type="checkbox"/> No _____ | | |
| Wetland Hydrology Present? | Yes <input checked="" type="checkbox"/> No _____ | | |

VEGETATION – Use scientific names of plants.

| <u>Tree Stratum</u> (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status |
|---------------------------------------------------------|------------------|-------------------|------------------|
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| = Total Cover | | | |
| <u>Sapling/Shrub Stratum</u> (Plot size: <u>15 ft</u>) | | | |
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| 3. _____ | _____ | _____ | _____ |
| 4. _____ | _____ | _____ | _____ |
| 5. _____ | _____ | _____ | _____ |
| = Total Cover | | | |
| <u>Herb Stratum</u> (Plot size: <u>5 ft</u>) | | | |
| 1. AMERICAN SLOUGHGRASS | 40% | Yes | OBL |
| 2. REED CANARY GRASS | 20% | Yes | FACW |
| 3. CURLED DOCK | 10% | No | FAC |
| 4. MEADOW HORSETAIL | 5% | No | FACW |
| 5. _____ | _____ | _____ | _____ |
| 6. _____ | _____ | _____ | _____ |
| 7. _____ | _____ | _____ | _____ |
| 8. _____ | _____ | _____ | _____ |
| 9. _____ | _____ | _____ | _____ |
| 10. _____ | _____ | _____ | _____ |
| = Total Cover | | | |
| <u>Woody Vine Stratum</u> (Plot size: _____) | | | |
| 1. _____ | _____ | _____ | _____ |
| 2. _____ | _____ | _____ | _____ |
| = Total Cover | | | |
| % Bare Ground in Herb Stratum _____ | | | |
| Remarks: | | | |

Dominance Test worksheet:
 Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): 2 (A)

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

Percent of Dominant Species That Are OBL, FACW, or FAC: 100% (A/B)

Prevalence Index worksheet:
Total % Cover of: _____ Multiply by: _____
 OBL species _____ x 1 = _____
 FACW species _____ x 2 = _____
 FAC species _____ x 3 = _____
 FACU species _____ x 4 = _____
 UPL species _____ x 5 = _____
 Column Totals: _____ (A) _____ (B)
 Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

1 - Rapid Test for Hydrophytic Vegetation

2 - Dominance Test is >50%

3 - Prevalence Index is $\leq 3.0^1$

4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)

Problematic Hydrophytic Vegetation¹ (Explain)

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

Hydrophytic Vegetation Present? Yes No _____

SOIL

Sampling Point: T20-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T21-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 33, T163N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8971 Long: -95.9644 Datum: NAD 83
 Soil Map Unit Name: 644 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| | | | | |
|--------------------------------------------------|--------------------------|-------------------|------------------|-------------------------------------------------------------------------------------------------------------------|
| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 1. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>2</u> (B) |
| 2. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>50%</u> (A/B) |
| 3. _____ | _____ | _____ | _____ | Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ |
| 4. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | = Total Cover | | | FACW species <u>10</u> x 2 = <u>20</u> |
| 1. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 2. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| 3. _____ | _____ | _____ | _____ | UPL species _____ x 5 = _____ |
| 4. _____ | _____ | _____ | _____ | Column Totals: <u>10</u> (A) <u>20</u> (B) |
| Herb Stratum (Plot size: <u>5 ft</u>) | = Total Cover | | | Prevalence Index = B/A = <u>2.0</u> |
| 1. <u>WHEAT (planted)</u> | <u>30%</u> | <u>Yes</u> | <u>NI</u> | Dominance Test indicators: 1 - Rapid Test for Hydrophytic Vegetation |
| 2. <u>FOXTAIL BARLEY</u> | <u>10%</u> | <u>Yes</u> | <u>FACW</u> | 2 - Dominance Test is >50% |
| 3. _____ | _____ | _____ | _____ | 3 - Prevalence Index is $\leq 3.0^1$ |
| 4. _____ | _____ | _____ | _____ | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. _____ | _____ | _____ | _____ | Problems with Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| Woody Vine Stratum (Plot size: _____) | <u>40%</u> = Total Cover | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| % Bare Ground in Herb Stratum _____ | = Total Cover | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

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

SOIL

Sampling Point: T21-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T21-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 33, T163N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8969 Long: -95.9644 Datum: NAD 83
 Soil Map Unit Name: 644 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
|-------------------------------------------------------|------------------|-------------------|------------------|-----------------------------------------------------------------------------------------------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>1</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | |
| <u>= Total Cover</u> | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | _____ | | | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: _____ Multiply by: _____ |
| 2. _____ | _____ | _____ | _____ | OBL species _____ x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species _____ x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species _____ x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species _____ x 4 = _____ |
| <u>= Total Cover</u> | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| Herb Stratum (Plot size: <u>5 ft</u>) | _____ | | | |
| 1. <u>AMERICAN SLOUGHGRASS</u> | <u>15%</u> | <u>Yes</u> | <u>OBL</u> | 1 - Rapid Test for Hydrophytic Vegetation |
| 2. <u>MUD PLANTAIN</u> | <u>5%</u> | <u>No</u> | <u>OBL</u> | <u>X</u> 2 - Dominance Test is >50% |
| 3. <u>FOXTAIL BARLEY</u> | <u>5%</u> | <u>No</u> | <u>FACW</u> | <u>_</u> 3 - Prevalence Index is ≤3.0 ¹ |
| 4. <u>CURLED DOCK</u> | <u>5%</u> | <u>No</u> | <u>FAC</u> | <u>_</u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| 5. <u>WHEAT (planted)</u> | <u>5%</u> | <u>No</u> | <u>NI</u> | <u>_</u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| 6. _____ | _____ | _____ | _____ | |
| 7. _____ | _____ | _____ | _____ | |
| 8. _____ | _____ | _____ | _____ | |
| 9. _____ | _____ | _____ | _____ | |
| 10. _____ | _____ | _____ | _____ | |
| <u>= Total Cover</u> | | | | <u>35%</u> = Total Cover |
| Woody Vine Stratum (Plot size: _____) | _____ | | | |
| 1. _____ | _____ | _____ | _____ | |
| 2. _____ | _____ | _____ | _____ | |
| <u>= Total Cover</u> | | | | |
| % Bare Ground in Herb Stratum _____ | | | | |
| Remarks: | | | | |
| Hydrophytic Vegetation Present? Yes <u>X</u> No _____ | | | | |

SOIL

Sampling Point: T21-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input checked="" type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T22-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 33, T163N, R41W
 Landform (hillslope, terrace, etc.): Depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8997 Long: -95.9645 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes _____ | No <u>X</u> | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|-----------------------------------------|-----------------|------------------|-------------------|------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------|
| 1. | _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) |
| 2. | _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) |
| 3. | _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>50%</u> (A/B) |
| 4. | _____ | _____ | _____ | _____ | Prevalence Index worksheet: | |
| = Total Cover | | | | | Total % Cover of: | Multiply by: |
| | | | | | OBL species | x 1 = |
| | | | | | FACW species | x 2 = |
| | | | | | FAC species | x 3 = |
| | | | | | FACU species | x 4 = |
| | | | | | UPL species | x 5 = |
| | | | | | Column Totals: | <u>15</u> (A) <u>35</u> (B) |
| | | | | | Prevalence Index = B/A = | <u>2.33</u> |
| Herb Stratum (Plot size: <u>5 ft</u>) | | _____ | _____ | _____ | Hydrophytic Vegetation Indicators: | |
| 1. | WHEAT (planted) | 30% | Yes | NI | 1 - Rapid Test for Hydrophytic Vegetation | _____ |
| 2. | FOXTAIL BARLEY | 10% | Yes | FACW | 2 - Dominance Test is >50% | _____ |
| 3. | BARNYARD GRASS | 5% | No | FAC | X 3 - Prevalence Index is ≤3.0 ¹ | _____ |
| 4. | _____ | _____ | _____ | _____ | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | _____ |
| 5. | _____ | _____ | _____ | _____ | Problems with Hydrophytic Vegetation ¹ (Explain) | _____ |
| 6. | _____ | _____ | _____ | _____ | | |
| 7. | _____ | _____ | _____ | _____ | | |
| 8. | _____ | _____ | _____ | _____ | | |
| 9. | _____ | _____ | _____ | _____ | | |
| 10. | _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | |
| Woody Vine Stratum (Plot size: _____) | | 45% | _____ | _____ | | |
| 1. | _____ | _____ | _____ | _____ | | |
| 2. | _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | | Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ |
| Remarks: | | | | | | |

SOIL

Sampling Point: T22-1

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

²Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if present):

Type: _____

Hydric Soil Present? Yes No X

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes No Depth (inches):

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

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

Wetland Hydrology Present? Yes _____ No X

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T22-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 33, T163N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.8996 Long: -95.9645 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| | | | | |
|-----------------------------------------|------------------|-------------------|------------------|------------------------------------------------------------------------------------------------------------------|
| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: |
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>2</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: <u>3</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>67%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: |
| | | | | Total % Cover of: _____ Multiply by: _____ |
| | | | | OBL species _____ x 1 = _____ |
| | | | | FACW species _____ x 2 = _____ |
| | | | | FAC species _____ x 3 = _____ |
| | | | | FACU species _____ x 4 = _____ |
| | | | | UPL species _____ x 5 = _____ |
| | | | | Column Totals: _____ (A) _____ (B) |
| | | | | Prevalence Index = B/A = _____ |
| | | | | Hydrophytic Vegetation Indicators: |
| | | | | <u> </u> 1 - Rapid Test for Hydrophytic Vegetation |
| | | | | <u> X</u> 2 - Dominance Test is >50% |
| | | | | <u> </u> 3 - Prevalence Index is ≤3.0 ¹ |
| | | | | <u> </u> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | <u> </u> Problematic Hydrophytic Vegetation ¹ (Explain) |
| | | | | ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. |
| | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ |
| Remarks: | | | | |

SOIL

Sampling Point: T22-2

| Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.) | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------|---------------|-----|----------------|-----|-------------------|---------|---------|--|
| Depth (inches) | Matrix | | Redox Features | | | Texture | Remarks | |
| | Color (moist) | % | Color (moist) | % | Type ¹ | | | |
| 0-8 | 10YR3/1 | 100 | | | | SICL | | |
| 8-14 | 10YR5/1 | 90 | 10YR5/6 | 10 | C | PL | SIL | |
| 14-21 | 10YR6/1,5/2 | 95 | 10YR5/6 | 2-5 | C | PL | SIL | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

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

²Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if present):

Type: _____

Depth (inches): _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

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

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

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

Wetland Hydrology Present? Yes No

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T23-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 33, T163N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.9005 Long: -95.9645 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|----------------------------------------------------------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------|----------------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>1</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>50%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | Prevalence Index worksheet: | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) = Total Cover | | | | Total % Cover of: _____ | Multiply by: _____ |
| 1. _____ | _____ | _____ | _____ | OBL species | x 1 = _____ |
| 2. _____ | _____ | _____ | _____ | FACW species | <u>5</u> x 2 = <u>10</u> |
| 3. _____ | _____ | _____ | _____ | FAC species | _____ x 3 = _____ |
| 4. _____ | _____ | _____ | _____ | FACU species | _____ x 4 = _____ |
| 5. _____ | _____ | _____ | _____ | UPL species | _____ x 5 = _____ |
| Herb Stratum (Plot size: <u>5 ft</u>) = Total Cover | | | | Column Totals: | <u>5</u> (A) <u>10</u> (B) |
| 1. SOYBEANS (planted) | <u>20%</u> | Yes | NI | Prevalence Index = B/A = <u>2.0</u> | |
| 2. REED CANARY GRASS | <u>5%</u> | Yes | FACW | Hydrophytic Vegetation Indicators: | |
| 3. _____ | _____ | _____ | _____ | 1 - Rapid Test for Hydrophytic Vegetation | _____ |
| 4. _____ | _____ | _____ | _____ | 2 - Dominance Test is >50% | _____ |
| 5. _____ | _____ | _____ | _____ | X 3 - Prevalence Index is $\leq 3.0^1$ | _____ |
| 6. _____ | _____ | _____ | _____ | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | _____ |
| 7. _____ | _____ | _____ | _____ | Problems with Hydrophytic Vegetation ¹ (Explain) | |
| 8. _____ | _____ | _____ | _____ | 1 Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | <u>25%</u> | _____ | _____ | | |
| Woody Vine Stratum (Plot size: _____) = Total Cover | | | | Hydrophytic Vegetation Present? Yes <u>X</u> No _____ | |
| 1. _____ | _____ | _____ | _____ | Remarks: | |
| 2. _____ | _____ | _____ | _____ | | |
| % Bare Ground in Herb Stratum _____ | | | | | |

SOIL

Sampling Point: T23-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T23-2
 Investigator(s): T. McCormack Section, Township, Range: Sec 33, T163N, R41W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.9004 Long: -95.9645 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

Are Vegetation _____, Soil _____, or Hydrology _____ significantly disturbed? Are "Normal Circumstances" present? Yes X No _____

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

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

| | | | | | |
|---------------------------------|--------------|----------|------------------------------------------|--------------|----------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> | No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | | |
| Remarks: | | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|------------------|-------------------|------------------|-------------------------------------------------------------------------|-----------------------|
| 1. _____ | _____ | _____ | _____ | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>2</u> (A) |
| 2. _____ | _____ | _____ | _____ | Total Number of Dominant Species Across All Strata: | <u>2</u> (B) |
| 3. _____ | _____ | _____ | _____ | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>100%</u> (A/B) |
| 4. _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | _____ | | | | |
| 1. _____ | _____ | _____ | _____ | Total % Cover of: | Multiply by: |
| 2. _____ | _____ | _____ | _____ | OBL species | x 1 = _____ |
| 3. _____ | _____ | _____ | _____ | FACW species | x 2 = _____ |
| 4. _____ | _____ | _____ | _____ | FAC species | x 3 = _____ |
| 5. _____ | _____ | _____ | _____ | FACU species | x 4 = _____ |
| = Total Cover | | | | UPL species | x 5 = _____ |
| | | | | Column Totals: | (A) (B) |
| Prevalence Index = B/A = _____ | | | | | |
| Herb Stratum (Plot size: <u>5 ft</u>) | _____ | | | | |
| 1. <u>BARNYARD GRASS</u> | <u>20%</u> | <u>Yes</u> | <u>FAC</u> | | |
| 2. <u>MEADOW HORSETAIL</u> | <u>15%</u> | <u>Yes</u> | <u>FACW</u> | | |
| 3. <u>SOYBEANS (planted)</u> | <u>5%</u> | <u>No</u> | _____ | | |
| 4. _____ | _____ | _____ | _____ | | |
| 5. _____ | _____ | _____ | _____ | | |
| 6. _____ | _____ | _____ | _____ | | |
| 7. _____ | _____ | _____ | _____ | | |
| 8. _____ | _____ | _____ | _____ | | |
| 9. _____ | _____ | _____ | _____ | | |
| 10. _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | |
| Woody Vine Stratum (Plot size: _____) | _____ | | | | |
| 1. _____ | _____ | _____ | _____ | | |
| 2. _____ | _____ | _____ | _____ | | |
| = Total Cover | | | | | |
| % Bare Ground in Herb Stratum _____ | | | | Hydrophytic Vegetation Present? | Yes <u>X</u> No _____ |
| Remarks: | | | | | |

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

Hydrophytic Vegetation Indicators:
1 - Rapid Test for Hydrophytic Vegetation
X 2 - Dominance Test is >50%
 3 - Prevalence Index is ≤3.0¹
 4 - Morphological Adaptations¹ (Provide supporting data in Remarks or on a separate sheet)
 Problematic Hydrophytic Vegetation¹ (Explain)

SOIL

Sampling Point: T23-2

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

²Location: PL=Pore Lining, M=Matrix.

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

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

Indicators for Problematic Hydric Soils³:

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

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

Restrictive Layer (if present):

Type: _____

Hydric Soil Present? Yes No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

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

Secondary Indicators (minimum of two required)

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

Field Observations:

Surface Water Present? Yes No Depth (inches):

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

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

Wetland Hydrology Present? Yes X No _____

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

Remarks:

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
 Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T24-1
 Investigator(s): T. McCormack Section, Township, Range: Sec 29, T16 3N, R41W
 Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): _____
 Subregion (LRR): Northern Great Plains Lat: 48.9099 Long: -95.9653 Datum: NAD 83
 Soil Map Unit Name: 379 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|-------------|------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes _____ No <u>X</u> |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes _____ | No <u>X</u> | | |
| Remarks: | | | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|--------------------------------------------------|------------|------------------|-------------------|------------------|--------------------------------------------------------------------------------------------------------|----------------------------|
| 1. <u>BOX ELDER</u> | | <u>30%</u> | <u>Yes</u> | <u>FAC</u> | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): | <u>2</u> (A) |
| 2. <u>LOMBARDI POPPLE</u> | | <u>20%</u> | <u>Yes</u> | <u>NI</u> | Total Number of Dominant Species Across All Strata: | <u>4</u> (B) |
| 3. <u>AMERICAN ELM</u> | | <u>10%</u> | <u>No</u> | <u>FAC</u> | Percent of Dominant Species That Are OBL, FACW, or FAC: | <u>50%</u> (A/B) |
| 4. <u>GREEN ASH</u> | | <u>10%</u> | <u>No</u> | <u>FAC</u> | | |
| | | <u>70%</u> | = Total Cover | | | |
| Sapling/Shrub Stratum (Plot size: <u>15 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Prevalence Index worksheet: | |
| 1. _____ | | | | | Total % Cover of: _____ | Multiply by: _____ |
| 2. _____ | | | | | OBL species | x 1 = _____ |
| 3. _____ | | | | | FACW species | x 2 = _____ |
| 4. _____ | | | | | FAC species | <u>65</u> x 3 = <u>195</u> |
| 5. _____ | | | | | FACU species | <u>20</u> x 4 = <u>80</u> |
| | | <u>70%</u> | = Total Cover | | UPL species | x 5 = _____ |
| Herb Stratum (Plot size: <u>5 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Column Totals: <u>85</u> (A) <u>175</u> (B) | |
| 1. <u>MAY APPLE</u> | <u>20%</u> | <u>Yes</u> | <u>FACU</u> | | Prevalence Index = B/A = <u>2.05</u> | |
| 2. <u>VIRGINIA WILD RYE</u> | <u>15%</u> | <u>Yes</u> | <u>FAC</u> | | | |
| 3. _____ | | | | | | |
| 4. _____ | | | | | | |
| 5. _____ | | | | | | |
| 6. _____ | | | | | | |
| 7. _____ | | | | | | |
| 8. _____ | | | | | | |
| 9. _____ | | | | | | |
| 10. _____ | | | | | | |
| | | <u>35%</u> | = Total Cover | | | |
| Woody Vine Stratum (Plot size: _____) | | Absolute % Cover | Dominant Species? | Indicator Status | Hydrophytic Vegetation Indicators: | |
| 1. _____ | | | | | 1 - Rapid Test for Hydrophytic Vegetation | |
| 2. _____ | | | | | 2 - Dominance Test is >50% | |
| | | <u>35%</u> | = Total Cover | | 3 - Prevalence Index is <u>≤ 3.0</u> ¹ | |
| % Bare Ground in Herb Stratum _____ | | Absolute % Cover | Dominant Species? | Indicator Status | 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) | |
| | | <u>35%</u> | = Total Cover | | Problems with Hydrophytic Vegetation ¹ (Explain) | |
| Remarks: | | | | | | |

SOIL

Sampling Point: T24-1

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input checked="" type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

WETLAND DETERMINATION DATA FORM – Great Plains Region

Project/Site: WD 4 City/County: Roseau County Sampling Date: 9-11-20
Applicant/Owner: Ditch Petition 103E State: MN Sampling Point: T24-2
Investigator(s): T. McCormack Section, Township, Range: Sec 29, T163N, R41W
Landform (hillslope, terrace, etc.): terrace Local relief (concave, convex, none): none Slope (%):
Subregion (LRR): Northern Great Plains Lat: 48.91 Long: -95.9653 Datum: NAD 83
Soil Map Unit Name: 1002 NWI classification: none

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

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

| | | | | |
|---------------------------------|--------------|----------|--------------------------------------------------|-----------------------|
| Hydrophytic Vegetation Present? | Yes <u>X</u> | No _____ | Is the Sampled Area within a Wetland? | Yes <u>X</u> No _____ |
| Hydric Soil Present? | Yes <u>X</u> | No _____ | | |
| Wetland Hydrology Present? | Yes <u>X</u> | No _____ | | |

VEGETATION – Use scientific names of plants.

| Tree Stratum (Plot size: <u>30 ft</u>) | | Absolute % Cover | Dominant Species? | Indicator Status | Dominance Test worksheet: | |
|----------------------------------------------------------------------------------------------------------------|--|---------------------|-------------------|------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| 1. DIAMOND WILLOW | | <u>15%</u> | Yes | FACW | Number of Dominant Species That Are OBL, FACW, or FAC (excluding FAC-): <u>4</u> (A) | |
| 2. GREEN ASH | | <u>10%</u> | Yes | FAC | Total Number of Dominant Species Across All Strata: <u>4</u> (B) | |
| 3. | | | | | | |
| 4. | | | | | | |
| <u>Sapling/Shrub Stratum (Plot size: <u>15 ft</u>)</u> | | <u>25%</u> | = Total Cover | | | |
| 1. MEADOW WILLOW | | <u>15%</u> | Yes | FACW | Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100%</u> (A/B) | |
| 2. | | | | | | |
| 3. | | | | | | |
| 4. | | | | | | |
| 5. | | | | | | |
| <u>Herb Stratum (Plot size: <u>5 ft</u>)</u> | | <u>15%</u> | = Total Cover | | | |
| 1. REED CANARY GRASS | | <u>80%</u> | Yes | FACW | OBL species <u> </u> x 1 = <u> </u> | |
| 2. VIRGINIA WILD RYE | | <u>10%</u> | No | FAC | FACW species <u> </u> x 2 = <u> </u> | |
| 3. | | | | | FAC species <u> </u> x 3 = <u> </u> | |
| 4. | | | | | FACU species <u> </u> x 4 = <u> </u> | |
| 5. | | | | | UPL species <u> </u> x 5 = <u> </u> | |
| 6. | | | | | Column Totals: <u> </u> (A) <u> </u> (B) | |
| 7. | | | | | Prevalence Index = B/A = <u> </u> | |
| 8. | | | | | | |
| 9. | | | | | | |
| 10. | | | | | | |
| <u>Woody Vine Stratum (Plot size: <u> </u>)</u> | | <u>90%</u> | = Total Cover | | | |
| 1. | | | | | Hydrophytic Vegetation Indicators: | |
| 2. | | | | | <input type="checkbox"/> 1 - Rapid Test for Hydrophytic Vegetation | |
| % Bare Ground in Herb Stratum <u> </u> | | <u> </u> | = Total Cover | | | |
| Remarks: | | | | | | <input checked="" type="checkbox"/> 2 - Dominance Test is >50% |
| | | | | | | <input type="checkbox"/> 3 - Prevalence Index is ≤3.0 ¹ |
| | | | | | | <input type="checkbox"/> 4 - Morphological Adaptations ¹ (Provide supporting data in Remarks or on a separate sheet) |
| | | | | | | <input type="checkbox"/> Problematic Hydrophytic Vegetation ¹ (Explain) |
| ¹ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. | | | | | | |
| Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <u> </u> | | | | | | |

SOIL

Sampling Point: T24-2

HYDROLOGY

| Wetland Hydrology Indicators: | |
|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Primary Indicators (minimum of one required; check all that apply) | |
| <input type="checkbox"/> Surface Water (A1) | <input type="checkbox"/> Salt Crust (B11) |
| <input type="checkbox"/> High Water Table (A2) | <input type="checkbox"/> Aquatic Invertebrates (B13) |
| <input type="checkbox"/> Saturation (A3) | <input type="checkbox"/> Hydrogen Sulfide Odor (C1) |
| <input type="checkbox"/> Water Marks (B1) | <input type="checkbox"/> Dry-Season Water Table (C2) |
| <input type="checkbox"/> Sediment Deposits (B2) | <input checked="" type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where not tilled) |
| <input type="checkbox"/> Drift Deposits (B3) | <input type="checkbox"/> Presence of Reduced Iron (C4) |
| <input type="checkbox"/> Algal Mat or Crust (B4) | <input type="checkbox"/> Thin Muck Surface (C7) |
| <input type="checkbox"/> Iron Deposits (B5) | <input type="checkbox"/> Other (Explain in Remarks) |
| <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) | |
| <input type="checkbox"/> Water-Stained Leaves (B9) | |
| Secondary Indicators (minimum of two required) | |
| <input type="checkbox"/> Surface Soil Cracks (B6) | |
| <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) | |
| <input type="checkbox"/> Drainage Patterns (B10) | |
| <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) (where tilled) | |
| <input type="checkbox"/> Crayfish Burrows (C8) | |
| <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) | |
| <input type="checkbox"/> Geomorphic Position (D2) | |
| <input type="checkbox"/> FAC-Neutral Test (D5) | |
| <input type="checkbox"/> Frost-Heave Hummocks (D7) (LRR F) | |
| Field Observations: | |
| Surface Water Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Water Table Present? | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Saturation Present? (includes capillary fringe) | Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): _____ |
| Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> | |
| Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available: | |
| Remarks: | |

APPENDIX F: MNDNR & BWSR PRELIMINARY SURVEY REPORT COMMENT LETTERS



January 28, 2021

Tracy Halstensgard
District Administrator
Roseau River Watershed District
714 6th St. SW
Roseau, MN 56751

RE: Director's Advisory Report: Establishment of Roseau River Watershed District (RRWD) Watershed Ditch #4, Roseau County

Dear Ms. Halstensgard;

On behalf of the Commissioner of the Department of Natural Resources (MDNR), I offer the following comments on the Preliminary Engineering Report for the above cited project, in accordance with Minnesota Statute 103E.255.

1. The Preliminary Survey Report appears to be adequate provided the comments provided below are addressed in the final report.
2. A soil survey is not needed.

Minnesota Environmental Policy Act

This project is the fourth component of the Whitney Lake project (CD 16, Impoundments A and C, and WD 4) that MDNR has reviewed. Components such as the impoundments described in Whitney Lake impoundments sites C and A frequently trigger mandatory environmental review under the Minnesota Environmental Policy Act (MN Rule 4410.4300, subparts 24 and 27). While the proposed ditch improvements for CD 16 and WD 4 may not meet any mandatory environmental review thresholds by themselves, they may be interpreted as phased actions of the proposed impoundment and part of the overall Whitney Lake project. MN Rule 4410.3100, Subpart 1 prohibits final governmental actions (permit issuance by any government) for any projects exceeding mandatory EAW thresholds until the environmental review process has been completed.

MDNR requests a meeting to discuss environmental review and potential responsible governmental units (RGU) for the Whitney Lake project and how it pertains to related ditch improvements. Potential RGU's could be Roseau County, MDNR, or the watershed district. Please contact Environmental Assessment Ecologist Jaime Thibodeaux at jaimie.thibodeaux@state.mn.us or 218-308-2672 to coordinate further discussion.

MDNR Permits and Regulatory Requirements

- Item number 5 on page 33 indicates that the project does not propose to drain public waters. Please clarify whether any work is proposed below the bank of the Roseau River. If so, a MDNR Public Water Work Permit may be needed.
- Figure 13 depicts potential wetland impacts. Further review of the wetland delineation report and an assessment of potential lateral drainage effects to wetlands should occur in cooperation with the Wetland Conservation Act Local Government Unit (LGU). The final engineer's report should describe the results of this additional review.
- We recommend consulting with the [State Historic Preservation Office](#) for a review of the location before the project begins. Being this close to historic Roseau Lake, unanticipated cultural resources could occur.
- A portion of the project lies within the Roseau River floodplain. MDNR recommends ensuring that the proposed berm will not cause a rise in the stage of the Roseau River. A no-rise certificate may be required for this project. The berm will also entrench the water in the ditch creating faster and deeper flows. Describe the ditch be designed so that there is no head cutting or erosion caused by the enhanced flows.

Hydrology and Water Quality

- Constructing a new ditch will increase early water runoff into the Roseau River. This is also the plan for the Roseau Lake Bottom project as well as CD 16 and WD 3. MDNR recommends the final engineer's report describe how all the proposed projects (Roseau Lake Bottom, Whitney Lake, Pool 3, CD 16, WD 4, and WD 3) will operate in tandem. The final engineer's report should discuss and consider potential interactions and cumulative effects of these projects.
- MDNR is concerned about the potential cumulative impact of improved drainage on timing and flows in the Roseau River. Alteration of flow and run-off has the potential to change instream aquatic environments, as well as downstream MDNR wildlife management areas within the Big Swamp. Cumulative impacts to the Roseau River and downstream environments from the updated ditch systems and proposed impoundments should be figured into outlet capacity and potential downstream effects in the final engineers report.
- In the final engineer's report please describe the outlet capacity of the Roseau River and its effect on drainage in the WD 4 system during 5-, 10-, 25-, and 50-year flood events. Please include current and proposed drainage coefficients for WD 4. Also clarify if enhanced drainage in WD4 will be offset by operation of Whitney Lake impoundments.
- Please clarify how side-water inlets will these be installed to ensure improved water quality. MDNR recommends describing the process by which the district determines where side-inlets are placed and if their installation will be voluntary or mandatory.

Fish and Wildlife

- MDNR is unable to determine potential impacts to fish and wildlife based on information provided within the preliminary report. There are concerns regarding potential downstream impacts to wildlife habitat within the Big Swamp, and hydrological changes within the Roseau River. Providing this information in the final engineer's report will provide more clarity on potential impacts to fish and wildlife resources.
- To aid in wildlife and pollinator habitat as well as improve water quality, MDNR recommends planting of BWSR Seed mix 32-241, native construction for the ditch, berm, and buffer areas.
- Due to entanglement issues with small animals, use of erosion control blankets should be limited to 'bio-netting' or 'natural netting' types, and specifically not products containing plastic mesh netting or other plastic components. These are Category 3N or 4N in the 2016 & 2018 MnDOT Standards Specifications for Construction. Also be aware that hydro-mulch products may contain small plastic fibers to aid in its matrix strength. These loose fibers could potentially re-suspend and make their way into Public Waters. As such, please review mulch products and not allow any materials with synthetic fiber additives in areas that drain to Public Waters.
- Black sandshells (*Ligumia recta*) (mussels), a species of special concern, have been documented downstream of the project in the Roseau River. This species is usually found in the riffle and run areas of medium to large rivers in areas dominated by sand or gravel. Care should be taken to avoid siltation into downstream water to avoid further degradation of mussel habitat.

Thank you for your consideration of these comments. We look forward to continuing to work with the Roseau River Watershed District on this and other projects. For any questions or further details on our concerns, please contact MDNR Area Hydrologist, Stephanie Klamm (218-219-8585).

Sincerely,



Nathan Kestner
Eco-Waters Regional Manager

CC. Nate Dalager, HDR Engineering
Kerrie Berg, HDR Engineering
Theresa Ebbenga, MDNR Regional Director
Jaimé Thibodeaux, MDNR Env. Assessment Ecologist
Stephanie Klamm, MDNR Area Hydrologist
Randy Prachar, MDNR Area Wildlife Manager



February 3, 2021

Board of Managers
Roseau River Watershed District
714 6th Street SW
Roseau, MN 56751

Re: BWSR Advisory Report – Watershed Ditch #4, Preliminary Survey Report

Dear Managers,

On behalf of the Minnesota Board of Soil and Water Resources, I offer this advisory report in accordance with Minnesota Statues, Section 103D.605, Subdivision 2 and 103D.711, Subdivision 5. The comments in this advisory report are based on review of the *Preliminary Survey Report, Roseau River Watershed District Watershed Ditch #4*, dated January 1, 2021.

General Comments

I agree that this project will reduce flooding potential of the agricultural lands near the proposed project during the 10-year storm event. The report I reviewed was somewhat limited in information due to hydrology and hydraulic modeling results presented only for the design event (24-hour, 10-year storm event) and limited design information presented at this stage of project development. I offer specific comments below for areas where I suggest additional consideration or evaluation as the final recommendations are developed for this project.

Specific Comments

Please consider these additional comments as designs are finalized:

- Sound modeling methodology was provided in the preliminary report. However, I suggest further evaluation be completed and those results reported so the watershed district has a thorough understanding of the potential effects of this project. These evaluations include:
 - An existing to proposed conditions comparison of hydrograph peak timing in WD4 to help evaluate how changes in peak will affect the Roseau River. Report states that this project is in the “middle water” area for the Roseau River and Figure 10 shows the project location towards the upstream side of the “middle water” area. I am concerned the increase in ditch capacity will shift the hydrograph peak earlier (and possibly higher). While the project area may remain in “middle water”, the move could negatively impact downstream peaks.

Bemidji Brainerd Detroit Lakes Duluth Mankato Marshall Rochester St. Cloud St. Paul

St. Paul HQ 520 Lafayette Road North St. Paul, MN 55155 Phone: (651) 296-3767

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- The preliminary report states that larger events will result in water temporarily stored, however it is likely that water is already being temporarily stored. I suggest an evaluation on the overall changes in the storage along WD4 for the 10-year event and the 100-year event.
- The preliminary report shows the changes in water surface elevation during the design storm (24-hour, 10-year event), but there is no evaluation of how WSE will change during larger events (i.e. – 100-year event).
- There is no discussion on how flow rates will change at the WD4 outlet for any storm event. I suggest that this information be included in the report. I feel that this is an important component of determining the adequacy of an outlet.
- Figure 10 does not state which elevations were used for the WSE profiles. I assume these are for the 10-year event since it is the design event, but I suggest that this be included on the figure.
- The watershed district may benefit from a map showing the flood extent under existing and proposed conditions for the design storm.
- I suggest consideration of alternative side inlets or controlled drainage at the side inlet locations if it is feasible for this project.
- Because of the close proximity of the ditch to the road, I suggest ditch velocities be reviewed during larger storm events so that adequate armoring is used at the downstream end of the side inlets.
- As with any project like this, a maintenance plan should be in place to catch areas that are beginning to erode or scour before they become a bigger problem.

Please feel free to contact me at 651-769-5292 (email rita.weaver@state.mn.us) if you have questions regarding this advisory report.

Sincerely,



Rita Weaver, PE, CFM
Chief Engineer

CC: John Jaschke, Director
 Ryan Hughes, Northern Region Supervisor
 Matt Fischer, Board Conservationist
 Henry Van Offelen, Clean Water Specialist
 Matt Johnson, Wetland Specialist
 Stephanie Klamm, DNR Area Hydrologist
 Tracy Halstensgard, RRWD Administrator
 Dillon Nelson, HDR Engineering

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APPENDIX G: DETAILED VIEWER'S REPORT – EXHIBIT 1

Showing Names and Owners of Land, Total Number of Acres Benefited or Damaged and

Amounts of Benefits of Damages to each Tract of Land Affected by Redetermination

| Parcel Number | Names of Owners | Township Range Section | Description | Acres in Tract | Benefited Acres in Tract | Benefited (AG 1 Cropland) | Benefit Value \$400 Per Acre | Area 2 or 3 Acres Benefited (AG 1 Cropland) | Area 2 or 3 Benefit Value \$100/200 Per Acre | Area 4 Acres Benefited | Area 4 Benefit Value \$100 Per Acre | Class "B" Acres Benefited (Converted Wetlands) | Benefit Value \$600 Per Acre | Class "C" Acres Benefited (Residential) | Benefit Value \$400 Per Acre Area 1 \$100 / acre Area 2 | Class "D" Acres Benefited; AG 2 - CRP, Pasture, Hay | Benefit Value \$100 Per Acre | Class "E" Acres Benefited (Woodland/C conservation) | Benefit Value \$100 Per Acre | Existing R/W Acres | NEW Perm Ag R/W Acres | Perm Ag R/W \$1100 per Acre | Total Perm Ag R/W \$ | Total Ag Damages R/W | Temp R/W Acres | Temp R/W \$120 per Acres | Total Damages Temp R/W \$ | Benefits Per Parcel \$ | NonConverted Wetland Acres |
|---------------|---------------------------------------------------------------------|------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------|----------------------------------------------------|----------------------------------|------------------------------|----------------------------------------------------|----------------------------------------------|------------------------------|-------------------------------------|------------------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|-----------------------------------------------------|------------------------------|--------------------|-----------------------|-----------------------------|----------------------|----------------------------------------------------------|------------------------------------------------|--------------------------------------------------|--------------------------------------------------|------------------------|----------------------------|
| Dieter | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7.00634 | Roberta A Johnson Trust 35219 Co Rd 115 Badger, MN 56714 | 29-163-041 | NE 1/4 SE 1/4 SE 1/4 SE 1/4 | 40 | 0.04 40 1.99 | 1.99 | 400 | | | | | | | | | | | | | | | | | | | | 176.00 | 4.00 | |
| 7.00667 | Ardmore Haugen ETUX 35730 Co Rd 115 Roseau, MN 56751 | 32-163-041 | NW 1/4 NE 1/4 E 1/2 NW 1/4 NW 1/4 E 1/2 SW 1/4 NW 1/4 SW 1/4 NE 1/4 | 40 20 20 40 | 36.39 18.36 20.29 39.98 | | | 36.39 18.36 20.29 39.98 | 100 100 100 100 | | | | | | | | | | | | | | | | | 3,639.00 1,836.00 2,029.00 3,998.00 | | | |
| 7.00673.00 | Stacy J Lee ETUX 34777 290th Ave Badger, MN 56714 | 32-163-041 | W 1/2 NE 1/4 NW 1/4 NW 1/4 NW 1/4 SW 1/4 NW 1/4 W1/2 SW 1/4 NW 1/4 NW 1/4 SW 1/4 NE 1/4 SW 1/4 | 20 40 40 20 40 40 | 18.23 34.68 38.07 19.62 38.56 39.96 | | | 18.23 34.68 38.07 19.62 38.56 39.96 | 100 100 100 100 100 100 | | | | | | | | | | | | | | | 1,100.00 1,100.00 | 1,298.00 1.94 120.00 232.80 796.00 | | | | |
| 7.00685 | Ardmore Haugen 35730 Co Rd 115 Roseau, MN 56751 | 32-163-041 | NE1/4 NE1/4 SE 1/4 NE 1/4 NE 1/4 SE 1/4 | 40 40 40 | 34.43 37.84 37.63 | | | 34.43 37.84 37.63 | 100 100 100 | | | | | | | | | | | | | | | | | 3,443.00 3,784.00 3,763.00 | | | |
| 7.00682 | Ardmore Haugen ETUX 35730 Co Rd 115 Roseau, MN 56751 | 32-163-041 | SW 1/4 SW 1/4 SE 1/4 SW 1/4 NW 1/4 SE 1/4 SW 1/4 SE 1/4 SE 1/4 SE 1/4 | 40 40 40 40 40 | 38.48 39.24 40.03 39.43 36.92 | | | 38.48 39.24 40.03 39.43 36.92 | 100 100 100 100 100 | | | | | | | | | | | | | | | 3,848.00 3,924.00 4,003.00 3,943.00 3,692.00 | | | | | |
| 7.00707 | Garrett D Lee 30715 350th St Badger, MN 56714 | 33-163-041 | NE1/4 NE1/4 SW1/4 NE 1/4 | 40 40 | 6.76 28.08 | 6.76 10.02 | 400 | 18.06 | 200 | | | | | | | | | | | | | | | | | 2,704.00 7,620.00 | | | |
| 7.00706 | Garrett D Lee 30715 350th St Badger, MN 56714 | 33-163-041 | NW1/4 NE1/4 | 40 | 35.77 | 9.25 | 400 | 26.52 | 200 | | | | | | | | | | | | | | | | | 9,004.00 | | | |
| 7.00697 | Garrett D Lee 30715 350th St Badger, MN 56714 | 33-163-041 | NE1/4 NW1/4 NW1/4 NW1/4 less tr SW1/4 NW1/4 SE 1/4 NW1/4 | 40 38.65 40 40 | 37.00 33.35 37.49 40.00 | 13.94 30.8 36.55 24.19 | 400 | 14.95 2.32 0.81 12.72 | 200 200 200 200 | 8.11 0.23 0.13 3.09 | 600 600 600 600 | | | | | | | | | | | | | 1,100.00 1,089.00 1,100.00 1,342.00 | 2.09 2.28 120.00 273.60 | 13,432.00 12,922.00 14,860.00 14,074.00 | | | |
| 7.30067 | Concordia Lutheran Church 35380 State Hwy 89 Roseau, MN 56751 | 33-163-041 | NW1/4 NW1/4 less tr | 1.35 | 0.58 | 0.58 | 400 | | | | | | | | | | | | | | | | | | | 110.00 0.22 120.00 26.40 | 232.00 | | |
| 7.007 | Selvin M Erickson Jr 33277 310th Ave Badger, MN 56714 | 33-163-041 | NE1/4 SW1/4 NW1/4 SW1/4 | 40 40 | 40.00 37.58 | 37.48 37.58 | 400 | | | 2.52 | 600 | | | | | | | | | | | | | | 1,100.00 1,353.00 | 2.03 120.00 | 16,504.00 15,032.00 | | |
| 7.00703 | Isaac B Erickson 30680 340th St Badger, MN 56714 | 33-163-041 | SW1/4 SW1/4 SE1/4 SW1/4 | 40 40 | 37.67 39.27 | 37.67 39.27 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,177.00 | 2.06 120.00 | 247.20 15,068.00 | | |
| 7.00712 | Jason & Ruth Braaten 30957 340th St Badger, MN 56714 | 33-163-041 | NE1/4 SE1/4 SE1/4 SE1/4 | 40 40 | 6.36 15.73 | 6.36 14.75 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,056.00 | 1.71 1.51 | 2,544.00 5,998.00 | | |
| 7.00709 | Jordan D Erickson 816 Duluth Ave N | 33-163-041 | NW1/4 SE1/4 SW1/4 SE1/4 | 40 40 | 39.17 39.47 | 39.17 39.47 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,419.00 | 1.51 120.00 | 15,668.00 15,788.00 | | |
| Ross | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 28.00049 | Douglas C Erickson etux 36838 300th St Roseau MN 56751 | 04-162-041 | LOT 1 LOT 2 SW1/4 NE1/4 SE1/4 NE1/4 | 42.12 42.12 40 40 | 16.15 40.48 39.64 17.85 | 16.15 37.04 39.64 17.85 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,089.00 1,100.00 1,342.00 | 2.09 2.28 120.00 273.60 | 6,460.00 15,160.00 15,856.00 7,140.00 | | |
| 28.00058 | Roberta A Johnson Trust 35219 Co Rd 115 Badger, MN 56714 | 04-162-041 | LOT 3 LOT 4 SW1/4 NW1/4 SE1/4 NW1/4 | 41.16 41.16 40 40 | 39.91 37.15 37.89 39.78 | 39.91 35.49 37.89 39.78 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,144.00 1,100.00 1,067.00 | 2.07 2.07 120.00 248.40 | 15,964.00 14,362.00 15,156.00 15,912.00 | | |
| 28.00061 | Isaac B Erickson 30680 340th St Badger, MN 56714 | 04-162-041 | NE1/4 SW1/4 NW1/4 SW1/4 SW1/4 SW1/4 SE1/4 SW1/4 | 40 40 40 40 | 39.81 37.74 36.02 39.08 | 39.81 37.74 36.02 39.08 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,056.00 1,100.00 1,419.00 | 1.71 1.71 120.00 181.20 | 15,924.00 15,096.00 14,408.00 15,632.00 | | |
| 28.00055 | Selvin M Erickson Jr. 33277 310th Ave Badger, MN 56714 | 04-162-041 | NE1/4 SE1/4 NW1/4 SE1/4 SW1/4 SE1/4 SE1/4 SE1/4 | 40 40 40 40 | 6.62 16.57 36.10 36.61 | 6.43 16.57 36.1 36.21 | 400 | | | | | | | | | | | | | | | | | | 1,100.00 1,056.00 1,419.00 14,440.00 | 1.51 1.51 120.00 14,524.00 | 2,591.00 6,628.00 14,440.00 14,524.00 | | |
| 28.00064 | Roberta A Johnson Trust 35219 Co Rd 115 Badger, MN 56714 | 5-162-041 | NE 1/4 NE 1/4 NW 1/4 NE 1/4 SW 1/4 NE 1/4 | 40 40 40 | 36.32 40.03 39.74 | | 100 100 100 | 36.32 40.03 39.74 | 100 100 100 | | | | | | | | | | | | | | | 3,632.00 4,003.00 3,974.00 | 1.94 1.94 120.00 | | | | |

| Parcel Number | Names of Owners | Township Range Section | Description | Acres in Tract | Benefited Acres in Tract | Benefited (AG 1 Cropland) | Benefit Value \$400 Per Acre | Area 2 or 3 Acres Benefited (AG 1 Cropland) | Area 2 or 3 Benefit Value \$100/200 Per Acre | Area 4 Acres Benefited | Area 4 Benefit Value \$100 Per Acre | Class "B" Acres Benefited (Converted Wetlands) | Benefit Value \$600 Per Acre | Class "C" Acres Benefited (Residential) | Benefit Value \$400 Per Acre Area 1 \$100 / acre Area 2 | Class "D" Acres Benefited; AG 2 - CRP, Pasture, Hay | Benefit Value \$100 Per Acre | Class "E" Acres Benefited (Woodland/Conservation) | Benefit Value \$100 Per Acre | Existing R/W Acres | NEW Perm Ag R/W Acres | Perm Ag R/W \$1100 per Acre | Total Perm Ag R/W \$ | Total Ag Damages R/W | Temp R/W Acres | Temp R/W \$120 per Acres | Total Damages Temp R/W \$ | Benefits Per Parcel \$ | NonConverted Wetland Acres |
|---------------|-------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|----------------|--------------------------|---------------------------|------------------------------|---------------------------------------------|----------------------------------------------|------------------------|-------------------------------------|------------------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|---------------------------------------------------|------------------------------|--------------------|-----------------------|-----------------------------|----------------------|----------------------|----------------|--------------------------|---------------------------|------------------------|----------------------------|
| | | | SE 1/4 NE 1/4 | 40 | 36.85 | | | | | 36.85 | 100 | | | | | | | | | | | | | | | 3,685.00 | | | |
| | | | SE1/4 NE1/4 | 40 | 17.85 | 17.85 | 400 | | | | | | | | | | | | | | | | | | | 7,140.00 | | | |
| 28.00067 | Adam M Stoe 35563 Co Rd 3 Badger, MN 56714 | 5-162-041 | NE 1/4 NW 1/4 NW 1/4 NW 1/4 SW 1/4 NW 1/4 SE 1/4 NW 1/4 | 40 | 40.83 | | | | 40.83 | 100 | | | | | | | | | | | | | | | | 4,083.00 | | | |
| | | | | 40 | 40.09 | | | | 40.09 | 100 | | | | | | | | | | | | | | | | 4,009.00 | | | |
| | | | | 40 | 37.76 | | | | 37.76 | 100 | | | | | | | | | | | | | | | | 3,776.00 | | | |
| | | | | 40 | 39.78 | | | | 39.78 | 100 | | | | | | | | | | | | | | | | 3,978.00 | | | |
| 28.00073 | Sara A Norstebon 33278 290th Ave Badger, MN 56714 | 5-162-041 | NW 1/4 SW 1/4 less tr | 20.32 | 19.28 | | | | | 19.28 | 100 | | | | | | | | | | | | | | | 1,928.00 | | | |
| 28.00076 | Selvin M Erickson Jr. 33277 310th Ave Badger, MN 56714 | 5-162-041 | NE 1/4 SE 1/4 NW 1/4 SW 1/4 less tr SW 1/4 SW 1/4 SE 1/4 SW 1/4 NE 1/4 SE 1/4 NW 1/4 SE 1/4 SW 1/4 SE 1/4 SE 1/4 SE 1/4 | 40 | 36.73 | | | | 36.73 | 100 | | | | | | | | | | | | | | | | 3,673.00 | | | |
| | | | | 19.68 | 18.97 | | | | 18.97 | 100 | | | | | | | | | | | | | | | | 1,897.00 | | | |
| | | | | 40 | 35.92 | | | | 35.92 | 100 | | | | | | | | | | | | | | | | 3,592.00 | | | |
| | | | | 40 | 37.75 | | | | 37.75 | 100 | | | | | | | | | | | | | | | | 3,775.00 | | | |
| | | | | 40 | 39.80 | | | | 39.8 | 100 | | | | | | | | | | | | | | | | 3,980.00 | | | |
| | | | | 40 | 39.75 | | | | 39.75 | 100 | | | | | | | | | | | | | | | | 3,975.00 | | | |
| | | | | 40 | 37.93 | | | | 37.93 | 100 | | | | | | | | | | | | | | | | 3,793.00 | | | |
| | | | | 40 | 35.66 | | | | 35.66 | 100 | | | | | | | | | | | | | | | | 3,566.00 | | | |
| 28.00124.00 | FROSAKER FAMILY TRUST 3658 BELL BLVD E WEST FARGO, ND 58078 | 8-162-041 | NE 1/4 NE 1/4 NW 1/4 NE 1/4 SW 1/4 NE 1/4 SE 1/4 NE 1/4 | 40 | 35.40 | | | | 35.4 | 100 | | | | | | | | | | | | | | | | 3,540.00 | | | |
| | | | | 40 | 37.68 | | | | 37.68 | 100 | | | | | | | | | | | | | | | | 3,768.00 | | | |
| | | | | 40 | 39.82 | | | | 39.82 | 100 | | | | | | | | | | | | | | | | 3,982.00 | | | |
| | | | | 40 | 37.75 | | | | 37.75 | 100 | | | | | | | | | | | | | | | | 3,775.00 | | | |
| 28.0013 | VJ Johnson Trust 29162 Co Rd 3 Badger, MN 56714 | 8-162-041 | NE 1/4 NW 1/4 NW 1/4 NW 1/4 SW 1/4 NW 1/4 SE 1/4 NW 1/4 NE 1/4 SW 1/4 NW 1/4 SW 1/4 SW 1/4 SW 1/4 SE 1/4 SW 1/4 less tr | 40 | 37.85 | | | | 37.85 | 100 | | | | | | | | | | | | | | | | 3,785.00 | | | |
| | | | | 40 | 36.49 | | | | 36.49 | 100 | | | | | | | | | | | | | | | | 3,649.00 | | | |
| | | | | 40 | 38.02 | | | | 38.02 | 100 | | | | | | | | | | | | | | | | 3,802.00 | | | |
| | | | | 40 | 39.76 | | | | 39.76 | 100 | | | | | | | | | | | | | | | | 3,976.00 | | | |
| | | | | 40 | 39.79 | | | | 39.79 | 100 | | | | | | | | | | | | | | | | 3,979.00 | | | |
| | | | | 40 | 38.32 | | | | 38.32 | 100 | | | | | | | | | | | | | | | | 3,832.00 | | | |
| | | | | 35.01 | 34.00 | | | | 34 | 100 | | | | | | | | | | | | | | | | 3,400.00 | | | |
| 28.0012101 | Joshua E Flaten 39948 State Hwy 89 Roseau, MN 56751 | 8-162-041 | SW 1/4 SW 1/4 less tr | 4.99 | 4.18 | | | | | 4.18 | 100 | | | | | | | | | | | | | | | | 418.00 | | |
| 28.00139 | Selvin M Erickson Jr. 33277 310th Ave Badger, MN 56714 | 8-162-041 | SE 1/4 SW 1/4 SW 1/4 SE 1/4 SE 1/4 SE 1/4 | 40 | 39.80 | | | | 39.8 | 100 | | | | | | | | | | | | | | | | 3,980.00 | | | |
| | | | | 40 | 39.87 | | | | 39.87 | 100 | | | | | | | | | | | | | | | | 3,987.00 | | | |
| | | | | 40 | 37.74 | | | | 37.74 | 100 | | | | | | | | | | | | | | | | 3,774.00 | | | |
| 28.00136 | Karolyn J. Eastman Trust 607 5th Ave NE Roseau, MN 56751 | 8-162-041 | NE 1/4 SE 1/4 NW 1/4 SE 1/4 | 40 | 37.79 | | | | 37.79 | 100 | | | | | | | | | | | | | | | | 3,779.00 | | | |
| | | | | 40 | 39.85 | | | | 39.85 | 100 | | | | | | | | | | | | | | | | 3,985.00 | | | |
| 28.00148 | Selvin M Erickson Jr. 33277 310th Ave Badger, MN 56714 | 09-162-041 | NE1/4 NE1/4 NW1/4 NE1/4 SW1/4 NE1/4 SE1/4 NE1/4 | 40 | 35.54 | 35.54 | 400 | | | | | | | | | | | | | | | | | | | 14,216.00 | | | |
| | | | | 40 | 36.60 | 36.6 | 400 | | | | | | | | | | | | | | | | | | | 14,640.00 | | | |
| | | | | 40 | 40.00 | 40 | 400 | | | | | | | | | | | | | | | | | | | 16,000.00 | | | |
| | | | | 40 | 38.66 | 38.66 | 400 | | | | | | | | | | | | | | | | | | | 15,464.00 | | | |
| 28.00142 | Selvin M Erickson Jr. 33277 310th Ave Badger, MN 56714 | 09-162-041 | NE1/4 NW1/4 NW1/4 NW1/4 SW1/4 NW1/4 SE1/4 NW1/4 | 40 | 36.70 | 36.7 | 400 | | | | | | | | | | 0.91 | 100 | 13.51 | 100 | 1,100.00 | 2.23 | 120.00 | 267.60 | 14,680.00 | | | | |

| Parcel Number | Names of Owners | Township Range Section | Description | Acres in Tract | Benefited Acres in Tract | Benefited (AG 1 Cropland) | Benefit Value \$400 Per Acre | Area 2 or 3 Acres Benefited (AG 1 Cropland) | Area 2 or 3 Benefit Value \$100/200 Per Acre | Area 4 Acres Benefited | Area 4 Benefit Value \$100 Per Acre | Class "B" Acres Benefited (Converted Wetlands) | Benefit Value \$600 Per Acre | Class "C" Acres Benefited (Residential) | Benefit Value \$400 Per Acre Area 1 \$100 / acre Area 2 | Class "D" Acres Benefited; AG 2 - CRP, Pasture, Hay | Benefit Value \$100 Per Acre | Class "E" Acres Benefited (Woodland/Conservation) | Benefit Value \$100 Per Acre | Existing R/W Acres | NEW Perm Ag R/W Acres | Perm Ag R/W \$1100 per Acre | Total Perm Ag R/W \$ | Total Ag Damages R/W | Temp R/W Acres | Temp R/W \$120 per Acres | Total Damages Temp R/W \$ | Benefits Per Parcel \$ | NonConverted Wetland Acres |
|---------------|--------------------------------------------------------------------------------------|------------------------|----------------------------------------------------------------------------------------|----------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------|---------------------------------------------|----------------------------------------------|--------------------------|-------------------------------------|------------------------------------------------|------------------------------|-----------------------------------------|---------------------------------------------------------|-----------------------------------------------------|------------------------------|---------------------------------------------------|------------------------------|--------------------|-----------------------|-----------------------------|----------------------|--------------------------------------------------------------------------|----------------------------------------------|--------------------------------------------------|---------------------------|------------------------|----------------------------|
| 28.0035 | Suzanne J Anderson Living Trust 1411 15th Ave N Wahpeton, ND 58075 | 16-162-041 | SW1/4SW1/4 SE1/4SW1/4 NE1/4 SE 1/4 NW1/4 SE1/4 SW 1/4 SE1/4 SE1/4 SE1/4 | 40 40 40 40 40 40 | 36.40 40.00 5.05 6.01 40.00 38.84 | 11.39 13.25 5.05 6.01 38.25 38.84 | 400 400 400 400 400 400 | | | | | 21.02 26.75 1.75 | 600 600 600 | | 3.99 | 100 | 2.17 0.9 0.79 | 0.9 | 1,100.00 | 990.00 | 1.63 | 120.00 | 195.60 | 17,567.00 21,350.00 2,020.00 2,404.00 16,350.00 15,536.00 | 0.52 | | | | |
| 28.00377 | Selvin M Erickson Jr. 33277 310th Ave Badger, MN 56714 | 17-162-041 | NE 1/4 NE 1/4 NW 1/4 NE 1/4 SW 1/4 NE 1/4 SE 1/4 NE 1/4 | 40 40 40 40 | 37.55 39.64 39.56 37.57 | | | | 37.55 39.64 39.56 37.57 | 100 100 100 100 | | | | | | | | | | | | | | | 3,755.00 3,964.00 3,956.00 3,757.00 | | | | |
| 28.00386 | VJ Johnson Trust 29162 Co Rd 3 Badger, MN 56714 | 17-162-041 | NE 1/4 NW 1/4 NW 1/4 NW 1/4 SW 1/4 NW 1/4 SE 1/4 NW 1/4 | 40 40 40 40 | 39.44 36.57 37.97 39.53 0.00 | | | | 39.44 36.57 37.97 39.53 | 100 100 100 100 | | | | | | | | | | | | | | | 3,944.00 3,657.00 3,797.00 3,953.00 | | | | |
| 28.0038 | Lawrence C Foss & Kathy M Howdahl 2118 Co Rd 138 International Falls, MN 56649 | 17-162-041 | NE 1/4 SW 1/4 NW 1/4 SW 1/4 | 40 40 | 39.46 37.93 | | | | 39.46 37.93 | 100 100 | | | | | | | | | | | | | | | | 3,946.00 3,793.00 | | | |
| 28.00381 | Richard A Foss 31816 County Rd 3 Badger, MN 56714 | 17-162-041 | SW 1/4 SW 1/4 SE 1/4 SW 1/4 | 40 40 | 37.69 39.28 | | | | 37.69 39.28 | 100 100 | | | | | | | | | | | | | | | | 3,769.00 3,928.00 | | | |
| 28.00382 | Richard A Foss 31816 County Rd 3 Badger, MN 56714 | 17-162-041 | NE 1/4 SE 1/4 NW 1/4 SE 1/4 | 40 40 | 37.62 39.47 | | | | 37.62 39.47 | 100 100 | | | | | | | | | | | | | | | | 3,762.00 3,947.00 | | | |
| 28.00383 | Jordan Foss 29391 310th St Badger, MN 56714 | 17-162-041 | SW1/4 SE1/4 SE1/4 SE1/4 | 40 40 | 39.12 37.23 | | | | 39.12 37.23 | 100 100 | | | | | | | | | | | | | | | | 3,912.00 3,723.00 | | | |
| 28.00434 | Richard A Foss 31816 County Rd 3 Badger, MN 56714 | 20-162-041 | NE 1/4 NE 1/4 NW 1/4 NE 1/4 SW 1/4 NE 1/4 SE 1/4 NE 1/4 | 40 40 40 40 | 36.42 38.06 39.77 37.89 | | | | 36.42 38.06 39.77 37.89 | 100 100 100 100 | | | | | | | | | | | | | | | 3,642.00 3,806.00 3,977.00 3,789.00 | | | | |
| 28.00437 | Gary A Peckman 19435 W 351 Street Paola, KS 66071 | 20-162-041 | NE 1/4 NW 1/4 NW 1/4 NW 1/4 SW 1/4 NW 1/4 SE 1/4 NW 1/4 | 40 40 40 40 | 37.87 36.04 37.95 39.77 | | | | 37.87 36.04 37.95 39.77 | 100 100 100 100 | | | | | | | | | | | | | | | 3,787.00 3,604.00 3,795.00 3,977.00 | | | | |
| 28.0044 | VJ Johnson Trust 29162 Co Rd 3 Badger, MN 56714 | 20-162-041 | NE 1/4 SW 1/4 NW 1/4 SW 1/4 SW 1/4 SW 1/4 SE 1/4 SW 1/4 | 40 40 40 40 | 39.80 38.00 37.67 37.67 | | | | 39.8 38 37.67 37.67 | 100 100 100 100 | | | | | | | | | | | | | | | 3,980.00 3,800.00 3,767.00 3,946.00 | | | | |
| 28.00443 | Brent D Haugen 29229 290 Ave Badger, MN 56714 | 20-162-041 | NE 1/4 SE 1/4 NW 1/4 SE 1/4 SW 1/4 SE 1/4 SE 1/4 SE 1/4 | 40 40 40 40 | 37.80 39.80 39.58 37.38 | | | | 37.8 39.8 39.58 37.38 | 100 100 100 100 | | | | | | | | | | | | | | | 3,780.00 3,980.00 3,958.00 3,738.00 | | | | |
| 28.00446 | Burl & Shemene Peckman Living Trust 17524 W 351st Street Paola, KS 66071 | 21-162-041 | NE1/4 NE1/4 NW1/4 NE1/4 SW1/4 NE1/4 SE1/4 NE1/4 | 40 40 40 40 | 39.19 40.00 39.29 39.35 | 39.04 40 400 39.35 | 400 400 400 400 | | 0.15 0.71 | 600 600 | | | | | | | | | | | | | | | | 15,706.00 16,000.00 16,142.00 15,740.00 | | | |
| 28.00449 | Gail Haugen 27066 N Main St Badger, MN 56714 | 21-162-041 | NE1/4 NW1/4 NW1/4 NW1/4 | 40 40 | 40.00 37.20 | 37.99 25.9 | 400 400 | | 2.01 11.3 | 600 600 | | | | | | | | | | | | | | | | 16,402.00 17,140.00 | | | |
| 28.00452 | Jordan D Erickson 816 Duluth Ave N Thief River Falls, MN 56701 | 21-162-041 | SW1/4 NW1/4 SE1/4 NW1/4 | 40 40 | 37.20 40.00 | 27.92 40 | 400 400 | | 8.55 | 600 | | | | | | | | | | | | | | | | 1,012.00 120.00 249.60 | | | |
| 28.00455 | Douglas C Erickson etux 36838 300th St Roseau MN 56751 | 21-162-041 | NE1/4 SW1/4 NW1/4 SW1/4 | 40 40 | 40.00 37.27 | 39.49 35.78 | 400 400 | | 0.51 | 600 | | | | | | | | | | | | | | | | 1,001.00 120.00 206.40 | | | |
| 28.004601 | Jordan D Erickson 816 Duluth Ave N Thief River Falls, MN 56701 | 21-162-041 | N1/2 SW1/4 SW1/4 N1/2 SE1/4 SW1/4 | 20 20 | 18.65 20.00 | 18.65 20 | 400 400 | | | | | | | | | | | | | | | | | | | 489.50 8,000.00 | | | |
| 28.00456 | Isaac B Erickson 30680 340th St Badger, MN 56714 | 21-162-041 | S1/2 SW1/4 SW 1/4 S1/2 SE1/4 SW1/4 | 20 20 | 18.65 20.00 | 18.65 20 | 400 400 | | | | | | | | | | | | | | | | | | | 489.50 8,000.00 | | | |
| 28.00461 | Daniel M Anderson 31309 St Hwy 11 Badger, MN 56714 | 21-162-041 | NE1/4 SE1/4 SE1/4 SE1/4 | 40 40 | 39.25 39.14 | 38.71 36.53 | 400 100 | | 0.54 | 600 | | | | | | | | | | | | | | | | 15,808.00 3,914.00 | | | |
| 28.00458 | Burl & Shemene Peckman Living Trust 17524 W 351st Street Paola, KS 66071 | 21-162-041 | NW1/4 SE1/4 SW1/4 SE1/4 | 40 40 | 39.94 39.88 | 39.48 39.88 | 400 100 | | 0.46 | 600 | | | | | | | | | | | | | | | | 16,068.00 3,988.00 | | | |

Petition for Establishment of Roseau River Watershed District drainage systems Watershed Ditch #4 (WD4)

EXHIBIT 1 OF VIEWERS REPORT IN DITCH PROCEEDINGS, 10 YEAR BENEFITS

Showing Names and Owners of Land, Total Number of Acres Benefited or Damaged and

Amounts of Benefits of Damages to each Tract of Land Affected by Redetermination

| Parcel Number | Names of Owners | Township Range Section | Description | Acres in Tract | Benefited Acres in Tract | Benefited (AG 1 Cropland) | Benefit Value \$400 Per Acre | Area 2 or 3 Acres Benefited (AG 1 Cropland) | Area 2 or 3 Benefit Value \$100/200 Per Acre | Area 4 Acres Benefited | Area 4 Benefit Value \$100 Per Acre | Class "B" Acres Benefited (Converted Wetlands) | Benefit Value \$600 Per Acre | Class "C" Acres Benefited (Residential) | Benefit Value \$400 Per Acre Area 1 \$100 /acre Area 2 | Class "D" Acres Benefited; AG 2 - CRP, Pasture, Hay | Benefit Value \$100 Per Acre | Class "E" Acres Benefited (Woodland/Conservation) | Benefit Value \$100 Per Acre | Existing R/W Acres | NEW Perm Ag R/W Acres | Perm Ag R/W \$1100 per Acre | Total Perm Ag R/W \$ | Total Ag Damages R/W | Temp R/W Acres | Temp R/W \$120 per Acres | Total Damages Temp R/W \$ | Benefits Per Parcel \$ | NonConverted Wetland Acres |
|---------------|--------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------------|----------------------------|-------------------------------------------|---------------------------|-------------------------------------------|---------------------------------------------|----------------------------------------------|------------------------|-------------------------------------|------------------------------------------------|------------------------------|-----------------------------------------|--------------------------------------------------------|-----------------------------------------------------|------------------------------|---------------------------------------------------|------------------------------|--------------------|-----------------------|-----------------------------|----------------------|----------------------------------------------------------|--------------------------------|--------------------------|---------------------------|------------------------|----------------------------|
| 28.00743 | Daniel M Anderson 31309 St Hwy 11 Badger, MN 56714 | 28-162-041 | NE1/4 NE1/4 N1/2 SE1/4 NE1/4 less tr | 40 14 | 38.16 16.14 | | 25.92 11.16 | 100 100 | | 0.66 0.21 | 600 600 | | | | 11.58 4.77 | 100 100 | 0.69 0.31 | | | | | | | | 4,146.00 1,719.00 | 0.73 | | | |
| 28.0074401 | Daniel M Anderson 31309 St Hwy 11 Badger, MN 56714 | 28-162-041 | SE1/4 NE1/4 less tr | 3.7 | 4.36 | | 3.7 | 100 | | | | | | | 0.66 | 100 | | | | | | | | | | 436.00 | | | |
| 28.00742 | Burl & Shemene Peckman Living Trust 17524 W 351st Street Paola, KS 66071 | 28-162-041 | NW1/4 NE1/4 NE1/4 NW1/4 NW1/4 NW1/4 less tr | 40 40 9.09 | 40.00 40.00 9.08 | | 40 40 9.08 | 100 100 100 | | | | | | | | | | | | | | | | | 4,000.00 4,000.00 908.00 | | | | |
| 28.00744 | Ethel K Anderson 29529 310th Ave Badger, MN 56714 | 28-162-041 | SE1/4 NE1/4 less tr | 22.3 | 12.66 | | 1.22 | 100 | | | | | | | | 11.44 | 100 | 0.53 | | | | | | | | 1,266.00 | 7.09 | | |
| 28.00741 | Sarah Foss PO Box 32 Badger, MN 56714 | 28-162-041 | NW1/4 NW1/4 less tr | 30.91 | 29.16 | | 18.77 | 100 | | 0.23 | 600 | | | | 10.16 | 100 | 1.92 | | | | | | | | | 3,031.00 | | | |
| 28.00737 | Brach Svoboda & David Transgrud PO Box 39 Badger, MN 56714 | 28-162-041 | SW1/4 NE1/4 SW1/4 NW1/4 SE1/4 NW1/4 NE1/4 SW1/4 NW1/4 SW1/4 | 40 40 40 40 40 | 39.08 38.09 39.74 39.78 37.96 | | 37.06 38.09 39.74 37.62 37.96 | 100 100 100 100 100 | | | | | | 2.02 | 100 | 1.91 | | | | | | | | 3,908.00 3,809.00 3,974.00 3,978.00 3,796.00 | 0.92 | | | | |
| 28.00746 | Brach Svoboda & David Transgrud PO Box 39 Badger, MN 56714 | 28-162-041 | S1/2 SW1/4 less tr | 47.75 | 36.61 | | 29.37 | 100 | | | | | | | 5.25 | 100 | 1.99 | 100 | 5.64 | | | | | | | 3,661.00 | | | |
| 28.00752 | Ethel K Anderson 29529 310th Ave Badger, MN 56714 | 28-162-041 | NE1/4 SE1/4 less tr | 20.59 | 19.18 | | 14.2 | 100 | | 0.21 | 600 | | | | 4.77 | 100 | 0.31 | | | | | | | | | 2,023.00 | | | |
| 28.007501 | Austen R Madison 30711 State Hwy 11 Badger, MN 56714 | 28-162-041 | NW1/4 SE1/4 less tr | 8.07 | 4.36 | | 2.11 | 100 | | | 600 | | | | 0.56 | 100 | 1.69 | 100 | 1.8 | | | | | | | 436.00 | 1.91 | | |
| 28.00753 | Austen R Madison 30711 State Hwy 11 Badger, MN 56714 | 28-162-041 | NW1/4 SE1/4 less tr | 17.93 | 12.56 | | | | | | | | | | 0.69 | 100 | 11.87 | 100 | 0.59 | | | | | | | 1,256.00 | 4.78 | | |
| 28.3005000 | Roseau County 606 5th Ave SW Roseau, MN 56751 | 33-162-041 | RANGE 41 16.61 less tr | 0.37 | 400 | 2.56 | | | | | | | | | 1.59 | 100 | 0.6 | 100 | 1.33 | | | | | | | 367.00 0.00 0.00 | | | |
| TOTALS | | | | 6237.10 | 2170.13 | 537.79 | 3064.33 | 109.87 | 0 | 9.74 | 345.24 | 107.89 | 21.02 | 0 | \$21,175.00 | 40.34 | | \$4,840.80 | \$1,337.222.00 | 40.88 | | | | | | | | | |