Wetland Delineation Report

Upper Maple River Watershed– Site 2A

Prepared for
Moore Engineering, Inc.

December 2017

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1.0 Introduction

Barr Engineering Co. (Barr) was retained by Moore Engineering, Inc. to complete a wetland delineation in preparation for evaluation of potential impacts associated with features of a temporary floodwater storage impoundment for flood risk reduction in the Upper Maple River Watershed. The proposed project is located east of County Road 32 in Barnes County near the town of Pilsbury. The evaluation area is within Sections 4, 8, 9, 16, 17, 20, and 21 of Township 142 North, Range 56 West. See **Figure 1** for a project location map.

On September 18 and 19, 2017, Barr conducted a wetland delineation within the evaluation area to assist with the planning activities. This Wetland Delineation Report has been prepared in accordance with the U.S. Army Corps of Engineers 1987 Wetland Delineation Manual ("1987 Manual", USACE, 1987), the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE, 2010).

This report includes general environmental information (Section 2.0), descriptions of the delineated wetland area (Section 3.0), and a discussion of regulations and the administering authorities (Section 4.0). The **Tables** section includes the precipitation data. The **Figures** section includes the Site Location Map, Site Topography Map, Water Resources Map (NWI and NHD) Maps, Soil Survey Map, Wetland Delineation Maps, and Hydrologic Connections Map. **Appendix A** includes Wetland Data Forms, site photographs are included in **Appendix B,** and an aerial imagery review is provided in **Appendix C**.

2.0 General Environmental Setting

2.1 Site Description

The wetland evaluation area includes the area below the 1251 foot contour line. The project area is located along a tributary to the Maple River and its adjacent floodplain. A majority of the evaluation area consists of active agriculture land and grasslands (**Figure 1**).

2.2 Site Topography

The topography within the evaluation area and the surrounding area is relatively flat. The evaluation area slopes toward the tributary and drains to the south. Elevations within the evaluation area ranges from 1220 to 1251 feet (**Figure 2**).

2.3 Precipitation

Recent precipitation data were compared to historic data for evaluating annual and monthly deviations from normal conditions. Precipitation data were obtained from the Natural Resources Conservation Service, Agricultural Applied Climate Information Service (http://agacis.rcc-acis.org/?fips=38093) for wetlands in Barnes County, Township 142 North, Range 56 West, Section 16.

Antecedent (preceding) moisture conditions were within the normal range based on precipitation during the three months prior to the September 18 and 19, 2017 site visit (**Table 1**). The annual precipitation for 2015 and 2016 were wetter than normal range. (**Table 2)**.

2.4 National Wetland Inventory and Water Resources

The NWI Map identifies numerous wetlands within the evaluation area (**Figure 3**). Wetland communities mapped within the evaluation area include freshwater pond, freshwater emergent, freshwater shrub, freshwater forested, and riverine. These communities had varying water regimes from temporarily flooded to semi permanently flooded. In addition, some wetlands are listed with the Cowardin "x" modifier suggesting these wetlands have been formed by excavation and some wetlands mapped with a Cowardin "d" modifier suggesting these wetlands have been ditched or drained. The USGS maps two tributaries to the Maple River as intermittent streams.

2.5 Soil Resources

Soil information for the project site was obtained from the Natural Resources Conservation Service SSURGO Database. The soil map unit ID is labeled on **Figure 4**. The following table summarizes the associated map unit name, hydric classification presence, and hydric classification rating.

Map Unit ID	Map Unit Name	Hydric Classification Presence (%)	Hydric Classification Rating
G100A	Hamerly-Tonka complex, 0 to 3 percent slopes	40	partially hydric
G101A	Hamerly-Wyard loams, 0 to 3 percent slopes	12	predominantly non hydric
G118A	Vallers loam, saline, 0 to 1 percent slopes	79	predominantly hydric
G12A	Vallers, saline-Parnell complex, 0 to 1 percent slopes	86	predominantly hydric
G143B	Barnes-Svea loams, 3 to 6 percent slopes	6	predominantly non hydric
G143C	Barnes-Buse-Langhei loams, 6 to 9 percent slopes	6	predominantly non hydric
G143F	Buse-Barnes loams, 15 to 35 percent slopes	6	predominantly non hydric
G144B	Barnes-Buse loams, 3 to 6 percent slopes	8	predominantly non hydric
G167B	Balaton-Wyard loams, 0 to 6 percent slopes	14	predominantly non hydric
G250A	Divide loam, 0 to 2 percent slopes	14	predominantly non hydric
G25A	Marysland loam, 0 to 1 percent slopes	86	predominantly hydric
G272E	Sioux-Arvilla-Renshaw complex, 9 to 25 percent slopes	0	not hydric
G275A	Renshaw loam, 0 to 2 percent slopes	0	not hydric
G276B	Renshaw-Sioux complex, 2 to 6 percent slopes	3	predominantly non hydric
G521A	Lowe loam, 0 to 1 percent slopes, occasionally flooded	94	predominantly hydric
G523A	Lowe-Fluvaquents, channeled complex, 0 to 2 percent slopes, frequently flooded	93	predominantly hydric
G651E	Udarents loamy, abandoned gravel pits, 0 to 25 percent slopes	0	not hydric

3.0 Wetland Delineation

3.1 Wetland Delineation and Classification Methods

Wetlands within the evaluation area were delineated and classified during a site visit on September 18 and 19, 2017. The wetland delineation was established according to the Routine On-Site Determination Method specified in the U.S. Army Corps of Engineers Wetlands Delineation Manual (1987 Edition) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains Region (USACE, 2010).

The delineated wetland boundaries and sample points were surveyed using a Global Positioning System (GPS) with sub-meter accuracy (**Figures 5.1, 5.2, and 5.3 provide the location of each wetland in relation to the evaluation area**).

Wetlands were classified using the U.S. Fish and Wildlife Service (USFWS) Cowardin System (Cowardin et al., 1979), the USFWS Circular 39 system (Shaw and Fredine, 1956), and the Eggers and Reed Wetland Classification System (Eggers and Reed, 1977).

Soil borings were conducted in and around wetland areas, to a depth of at least 24 inches below the ground surface where possible. Representative soil samples from each boring were examined for the presence of hydric soil indicators using the Natural Resources Conservation Service (NRCS) hydric soil indicators (Version 8.1). Soil colors (e.g., 7.5YR 4/2, etc.) were determined using a Munsell® soil color chart and noted on the Wetland Data Forms **Appendix A**.

Hydrologic conditions were evaluated at each soil boring, and this information was also noted on the Wetland Data Forms. The dominant plant species were identified, and the corresponding wetland indicator status of each plant species was determined and noted on the Wetland Data Forms (**Appendix A**). Photographs taken at the time of the site visit are provided in **Appendix B**.

3.2 Wetland Descriptions

Fifty-three wetlands were delineated within the wetland evaluation area. These wetlands consisted of four different community types: shallow marsh, fresh (wet) meadow, seasonally flooded basin, and shrub-carr. A description of each wetland community is provided below, with representative photographs in **Appendix B**. A Wetland Summary Table is provided in **Table 3**. Wetland IDs are labeled on the wetland delineation maps (**Figures 5.1, 5.2, and 5.3)**.

3.2.1 Shallow Marsh

The shallow marsh communities within the study area are mainly located along the tributaries to the Maple River and the associated floodplain. Additional shallow marsh communities are located in the ditches along roads and in small enclosed depressions throughout the study area (**Figures 5.1, 5.2, and 5.3**). Dominant vegetation in the shallow marsh communities consists of narrow leaf cattail (*Typha angustifolia*), broad leaf cattail (*Typha latifolia*), reed canary grass (*Phalaris arudinacea*), smartweed (*Persicaria pensylvanica*), softstem bulrush (*Schoenoplectus tabernaemontani)*, and common reed (*Phragmites australis*). Soils in the shallow marsh communities typically consisted of a layer of organic material at varying depths over a mucky modified layer. Soils either met the A1 hydric soil criteria for a histosol, A11 depleted below dark surface, or F1 hydric soil criteria for loamy mucky mineral. The hydrology source for the shallow marsh wetlands varied depending on location within the study area. The isolated wetlands receive hydrology from precipitation and overland flow. Other wetlands receive hydrology from the tributaries that run through the study area. Hydrology in the shallow marsh communities varied from saturation at ground surface to inundation of up to 12 inches during the September 18 and 19, 2017 site visit. Sampling points KSW-SP-1, MJS2-SP-1 and MJS2-SP-3 document wetland criteria for Wetlands 14 and 52. These sampling points are characteristic of the other shallow marsh wetlands within the study area including wetlands 8, 9, 18, 29, 57, 58, 61, 64, and 66. Wetland 14 is connected by culverts below roadways and is considered one wetland. Wetland 14 is the only wetland on the site that is hydrologically connected to the Maple River tributary and therefore is likely the only jurisdictional wetland (**Figure 6**). The remaining wetlands on the site are isolated from the Maple River tributary.

In some wetlands, the shallow marsh community transitions to a fresh (wet) meadow community, which is characterized by a change in vegetation from cattail into wetland grasses. The transition to upland is characterized by upward sloping topography with an absence of hydrology indicators and a dominance of smooth brome (*Bromus inermis*), Canadian thistle (*Cirsium arvense*), Canadian goldenrod (*Solidago canadensis*), wild licorice (*Glycyrrhiza lepidota*), and wolfberry (*Symphoricarpos occidentalis*) or the presence of row crops when located in an agricultural field. Sampling point MJS2-SP-2 documents the upland area for an upland grassland adjacent to Wetland 50. The wetland summary table (**Table 3**) shows all of the wetlands and community types.

3.2.2 Fresh (Wet) Meadow

The fresh (wet) meadow communities within the study area are located outside of the shallow marsh community in Wetlands 14 and 9 and in two small depressions (Wetlands 17 and 60) in the southeast corner of the study area (**Figures 5.1, 5.2, and 5.3**). Dominant vegetation in the fresh (wet) meadow community consists of reed canary grass, common reed, an unidentified grass, smartweed, and prairie cordgrass (*Spartina pectinata*). Typical soils consist of a mucky modified cap and met the F1 hydric soil indicator for loamy mucky mineral. The fresh (wet) meadow community in Wetland 14 receives hydrology from the tributary to the Maple River. Wetlands 9, 17 and 60 receive hydrology from precipitation and overland flow. At the time of the site visit on September 18 and 19, 2017, hydrology was observed as saturation within the upper 12 inches of the ground surface or secondary hydrology indicators for geomorphic position (D2) and a positive FAC-neutral test (D5).

The transition to upland is characterized by upward sloping topography with an absence of hydrology indicators and a dominance of smooth brome, Canadian thistle, Canadian goldenrod, wild licorice, sweet clover (*Melilotus officianalis*), common milkweed (*Asclepias syracia*), dogbane (*Apocynum sp.*), prairie clover (*Dalea leporina*), Indian grass (*Sorghastrum nutans*), big bluestem (*Andropogon gerardii)*, little bluestem (*Schizachyrium scoparium*), leafy spurge (*Euphorbia esula*), and wolfberry or the presence of row crops when located in an agricultural field. Sampling point MJS2-SP-2 documents the upland area for an upland grassland adjacent to Wetland 14. The wetland summary table (**Table 3**) shows all of the wetlands and community types.

3.2.3 Seasonally Flooded Basin

The seasonally flooded basin communities within the study area are located in the agricultural fields (**Figures 5.1, 5.2, and 5.3**). Vegetation in the seasonally flooded basin communities consists of stunted corn or soy beans, smartweed, or an absence of vegetation. Typical soils consist of a mucky modified cap at varying depth and met the F1 hydric soil criteria for loamy mucky mineral. The hydrology source for the seasonally flooded basin wetlands is precipitation and overland flow. The seasonally flooded basins usually met the wetland hydrology indicators for inundation visible on aerial imagery (B7), sparsely vegetated concave surface (B8), saturation visible on aerial imagery (C9), and geomorphic position (D2). Areas of the site that were not accessible due to corn crop relied on an aerial imagery review for wetland determination (**Appendix C**). In situations where the aerial imagery review results require field verification, which was not completed within inaccessible corn crop, the wetland was kept in the map. These questionable wetlands are all isolated and would not be jurisdictional (**Figure 6**).

The transition to upland within the seasonally flooded basin wetlands is characterized by upward sloping topography with an absence of hydrology indicators and healthy agriculture crops. The wetland summary table (**Table 3**) shows all of the wetlands and community types.

3.2.4 Shrub-carr

The shrub-carr community within the study area is located in the northern part of the study area (**Figure 5.1**). Dominant vegetation in the shrub-carr community consists of sandbar willow (*Salix interior*) and an unidentified grass. Soils consist of a mucky modified cap and met the F1 hydric soil indicator for loamy mucky mineral. Hydrology for the shrub-carr communities is precipitation and overland flow. At the time of the site visit on September 20, 2017, hydrology was observed as the secondary hydrology indicators for geomorphic position (D2) and a positive FAC-neutral test (D5).

The transition to upland is characterized by upward sloping topography with an absence of hydrology indicators and a dominance of smooth brome (*Bromus inermis*). The wetland summary table (**Table 3**) shows all of the wetlands and community types.

4.0 Regulatory Overview

The USACE regulates the placement of dredge or fill materials into wetlands that are located adjacent to or are hydrologically connected to interstate or navigable waters under the authority of Section 404 of the Clean Water Act. If the USACE has jurisdiction over any portion of a project, they may also review impacts to wetlands under the authority of the National Environmental Policy Act. The USACE should be contacted before altering any wetlands.

This report requests wetland boundary and type concurrence from the USACE. This submittal also is requesting a jurisdictional determination from the USACE with respect to administration of Section 404 of the Clean Water Act.

5.0 References

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Tables

Table 1

Antecedent Moisture Conditions Prior to September 18, 2017

Precipitation Worksheet Using NRCS

Precipitation data for target wetland location:

county: **Barnes**

nearest community: **Pilsbury**

township number: **142N**

range number: **56W**

section number: **16**

Aerial photograph or site visit date:

18-Sep-17

Score using 1971-2000 normal period

values are in inches	first prior month: **Aug-17**	second prior month: **Jul-17**	third prior month: **Jun-17**
estimated precipitation total for this location:	**2.66**	**1.2**	**2.63**
there is a 30% chance this location will have less than:	1.59	1.73	2.14
there is a 30% chance this location will have more than:	3.00	3.76	4.03
type of month: dry normal wet	**normal**	**dry**	**normal**
monthly score	**3 * 2 = 6**	**2 * 1 = 2**	**1 * 2 = 2**
multi-month score: 6 to 9 (dry) 10 to 14 (normal) 15 to 18 (wet)	**10 (Normal)**		

Table 2

Precipitation in Comparison to WETS Data

1971-2000 Summary Statistics													
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
30%	0.3	0.22	0.45	0.54	1.49	2.14	1.73	1.59	0.93	0.59	0.32	0.24	16.61
70%	0.72	0.52	0.95	1.5	2.82	4.03	3.67	3	2.29	1.77	0.84	0.48	20.89
Average	0.61	0.44	0.78	1.29	2.34	3.35	3.01	2.49	1.87	1.54	0.72	0.4	18.84

Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
1995	0.3	0.2	1.49	1.01	2.68	1.05	6.74	3.16	0.78	1.74	0.61	M	19.76
1996	0.93	0.42	0.25	T	2.29	1.79	6.84	2.3	1.71	1.47	0.81	M	18.81
1997	2.13	T	M	1.93	0.45	2.54	3.89	0.45	3.53	1.52	0.11	T	16.55
1998	T	0.95	0.31	1.36	3.35	2.37	1.09	3.27	0.88	4.31	1.51	0.1	19.5
1999	0.83	0.34	0.12	1.45	5	4.18	2.07	3.73	2.9	0.23	0	T	20.85
2001	T	0.36	0.2	1.21	2.13	2.54	5.32	M	0.8	2.07	0.05	0.08	14.76
2002	0.14	0.07	0.19	1.29	1.17	1.58	5.7	0.67	1.73	0.98	T	0.42	13.94
2003	T	0.43	0.42	0.7	5.74	5.12	1.86	0.67	0.75	0.45	0.25	0.63	17.02
2004	0.47	0.15	3.36	0.39	6.6	2.83	3.09	2.65	3.99	1.73	T	0.52	25.78
2005	0.3	0.25	T	0.8	2.12	5.66	3.27	1.67	0.82	1.53	0.94	0.59	17.95
2006	0.34	0.25	0.55	2.4	1.95	3.33	0.86	4.05	2.6	1.78	T	0.89	19
2007	T	0.81	2.62	0.7	3.24	3.82	2.93	0.53	3.04	0.65	T	0.28	18.62
2008	M	0.57	0.35	0.22	0.5	5.13	2.43	2.13	2.86	2.5	1.78	1.41	19.88
2009	1.07	1.18	2.14	1	1.83	1.08	1.93	2.49	3.22	3.58	T	0.75	20.27
2010	0.92	1.02	M	0.29	5.35	1.76	4	2.14	5.9	1.91	0.46	1.51	25.26
2011	M	M	M	M	M	M	M	M	M	M	M	M	M
2012	M	M	0.42	M	1.92	2.34	1.15	0.83	0.25	1.4	0.64	0.25	9.2
2013	M	0.47	M	0.95	M	1.11	M	M	M	4.18	M	0.61	7.32
2014	0.4	0.15	0.1	M	M	6.68	1.03	2.98	1.17	0.48	0.41	T	13.4
2015	0.43	0.21	M	0.56	8.15	3.21	3.07	2.16	0.78	1	0.82	0.72	21.11
2016	0	0.54	0.4	2.93	3.45	1.88	5.71	2.86	3.33	1.09	1.06	2.12	25.37
2017	0.78	0.3	0.15	1.88	1.46	3.09	1.29	2.94	2.3	T	M	M	14.19
Mean	**0.36**	**0.5**	**0.8**	**1.18**	**3.14**	**3.35**	**2.96**	**2.07**	**2.18**	**1.65**	**0.55**	**0.7**	**20.19**

Precipitation data from the Courtenay 1 NW station located west of the project area.

"M" values refer to missing precipitation data. "T" values indicate trace precipitation amounts.

Above normal

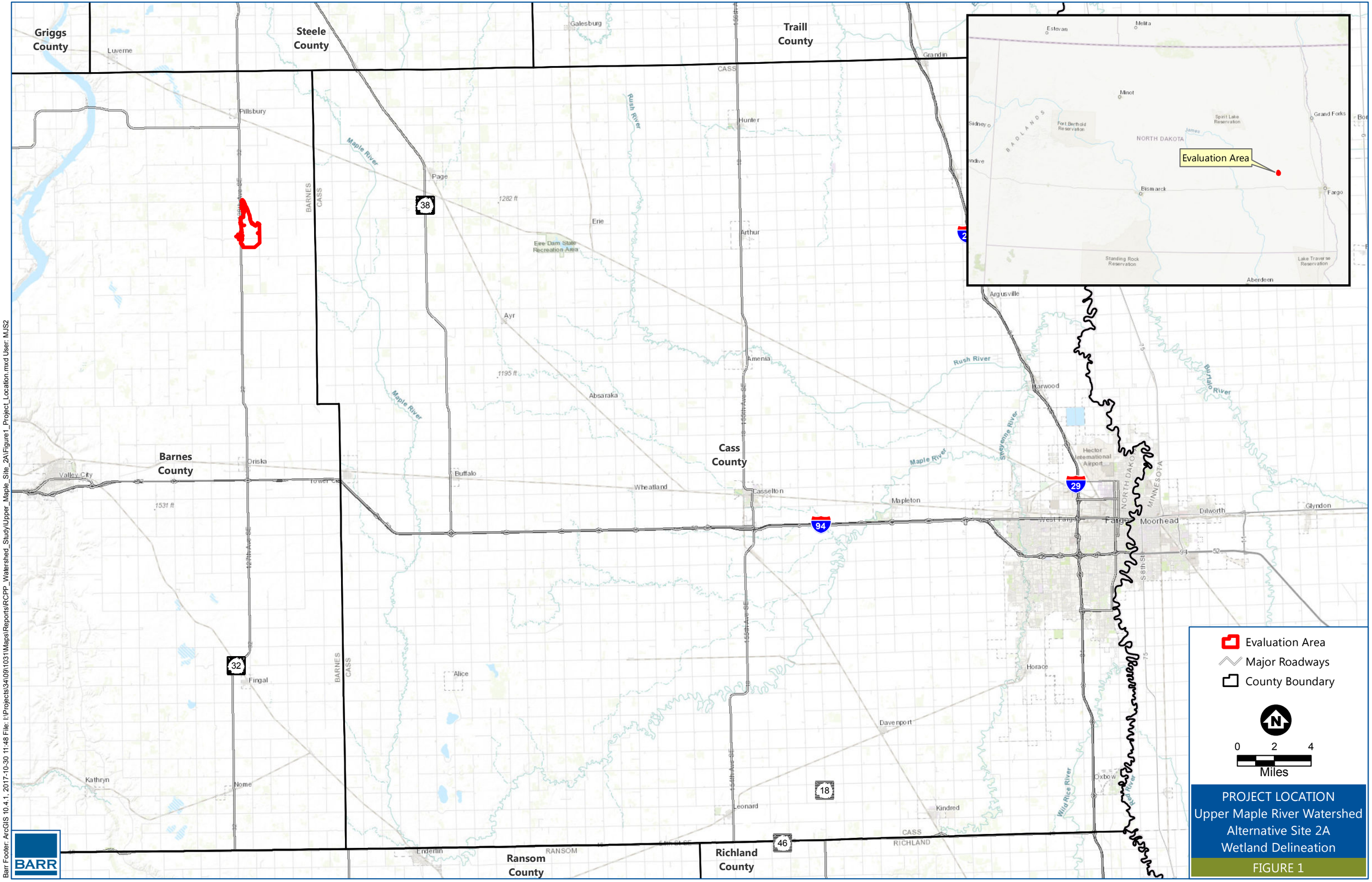
Below normal

Normal

Table 3
Wetland Summary Table

Wetland ID	Cowardin	Circular 39	Eggers and Reed	Acres
0	PEMA	Type 1	Seasonally Flooded Basin	0.06
5	PEMA	Type 1	Seasonally Flooded Basin	0.32
6	PEMA	Type 1	Seasonally Flooded Basin	0.22
7	PEMA	Type 1	Seasonally Flooded Basin	0.92
8	PEM1C/A	Type 3/1	Shallow Marsh/ Fresh (Wet) Meadow	1.76
9	PEM1C/A	Type 3/1	Shallow Marsh/ Fresh (Wet) Meadow	0.41
10	PEMA	Type 1	Seasonally Flooded Basin	4.49
11	PEMA	Type 1	Seasonally Flooded Basin	0.21
12	PEMA	Type 1	Seasonally Flooded Basin	0.33
13	PEMA	Type 1	Seasonally Flooded Basin	0.08
14	PEM1C/A	Type 3/1	Shallow Marsh/ Fresh (Wet) Meadow	195.63
17	PEM1A	Type 2	Fresh (Wet) Meadow	0.29
18	PEM1C	Type 3	Shallow Marsh	0.43
19	PEMA	Type 1	Seasonally Flooded Basin	1.21
20	PEMA	Type 1	Seasonally Flooded Basin	0.93
21	PEMA	Type 1	Seasonally Flooded Basin	0.72
22	PEMA	Type 1	Seasonally Flooded Basin	5.10
23	PEMA	Type 1	Seasonally Flooded Basin	0.32
24	PEMA	Type 1	Seasonally Flooded Basin	1.08
25	PEMA	Type 1	Seasonally Flooded Basin	0.24
27	PEMA	Type 1	Seasonally Flooded Basin	0.25
28	PEMA	Type 1	Seasonally Flooded Basin	0.17
29	PEM1C	Type 3	Shallow Marsh	7.34
30	PEMA	Type 1	Seasonally Flooded Basin	0.32
31	PEMA	Type 1	Seasonally Flooded Basin	0.86
32	PEMA	Type 1	Seasonally Flooded Basin	0.53
33	PEMA	Type 1	Seasonally Flooded Basin	0.57
34	PEMA	Type 1	Seasonally Flooded Basin	0.08
35	PEMA	Type 1	Seasonally Flooded Basin	0.11
36	PEMA	Type 1	Seasonally Flooded Basin	0.21
37	PEMA	Type 1	Seasonally Flooded Basin	0.02
38	PEMA	Type 1	Seasonally Flooded Basin	0.28
39	PEMA	Type 1	Seasonally Flooded Basin	0.16
40	PEMA	Type 1	Seasonally Flooded Basin	0.24
41	PEMA	Type 1	Seasonally Flooded Basin	0.38
43	PEMA	Type 1	Seasonally Flooded Basin	0.47
44	PEMA	Type 1	Seasonally Flooded Basin	0.46
46	PEMA	Type 1	Seasonally Flooded Basin	0.36
47	PEMA	Type 1	Seasonally Flooded Basin	0.17
49	PEMA	Type 1	Seasonally Flooded Basin	0.64
51	PEMA	Type 1	Seasonally Flooded Basin	1.05
52	PEM1Cx/FO1B	Type 3/7	Shallow Marsh/ Hardwood Swamp	1.14
53	PSS1B	Type 6	Shrub-carr	0.73
56	PEMA	Type 1	Seasonally Flooded Basin	0.85
57	PEM1C	Type 3	Shallow Marsh	0.10
58	PEM1Cx	Type 3	Shallow Marsh	0.01
59	PEMA	Type 1	Seasonally Flooded Basin	3.37
60	PEM1A	Type 2	Fresh (Wet) Meadow	0.15
61	PEM1C	Type 3	Shallow Marsh	0.23
62	PEMA	Type 1	Seasonally Flooded Basin	0.79
64	PEM1C	Type 3	Shallow Marsh	0.54
65	PEM1A	Type 2	Seasonally Flooded Basin	0.04
66	PEM1C	Type 3	Shallow Marsh	0.22
			Total	237.59

Figures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Arthur
Ayr
Amenia
Absaraka
Wheatland
Casselton
Mapleton
Buffalo
Driska
Valley City
Fingal
Alice
Nome
Kathryn
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Dilworth
Glyndon
Hector International Airport
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Rush River
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Buffalo River
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1531 ft
BARNES
CASS
RANSOM
RICHLAND
NORTH DAKOTA
MINNESOTA
Estevan
Melita
Minot
Sidney
Fort Berthold Reservation
Spirit Lake Reservation
Grand Forks
Bismarck
Fargo
Standing Rock Reservation
Lake Traverse Reservation
Aberdeen
Evaluation Area
Evaluation Area
Major Roadways
County Boundary
N
0 2 4
Miles
PROJECT LOCATION
Upper Maple River Watershed
Alternative Site 2A
Wetland Delineation
FIGURE 1
BARR
Barr Footer: ArcGIS 10.4.1, 2017-10-30 11:48 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Figure1_Project_Location.mxd User: MJS2

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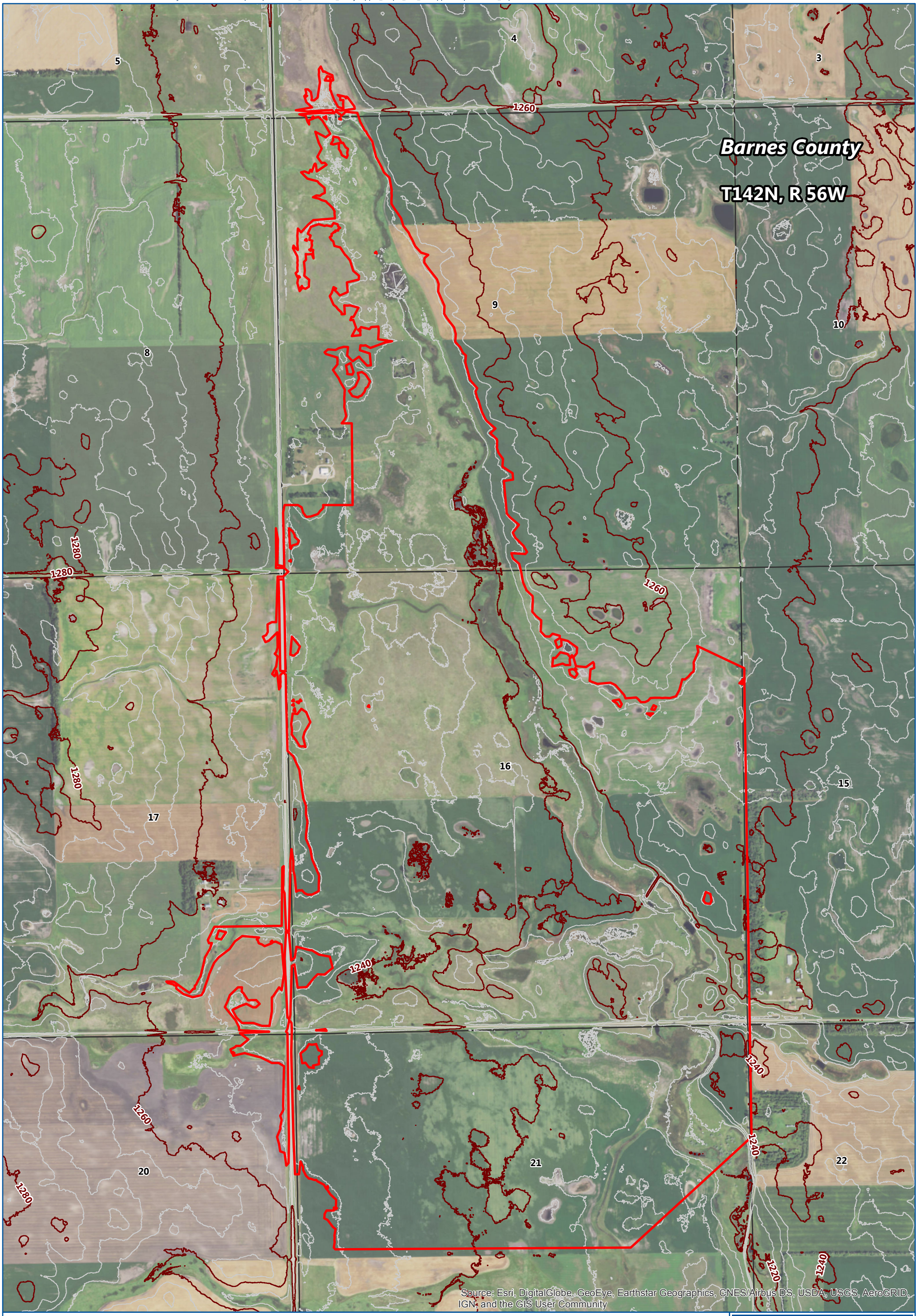


Evaluation Area

20-foot Contour

5-foot Contour

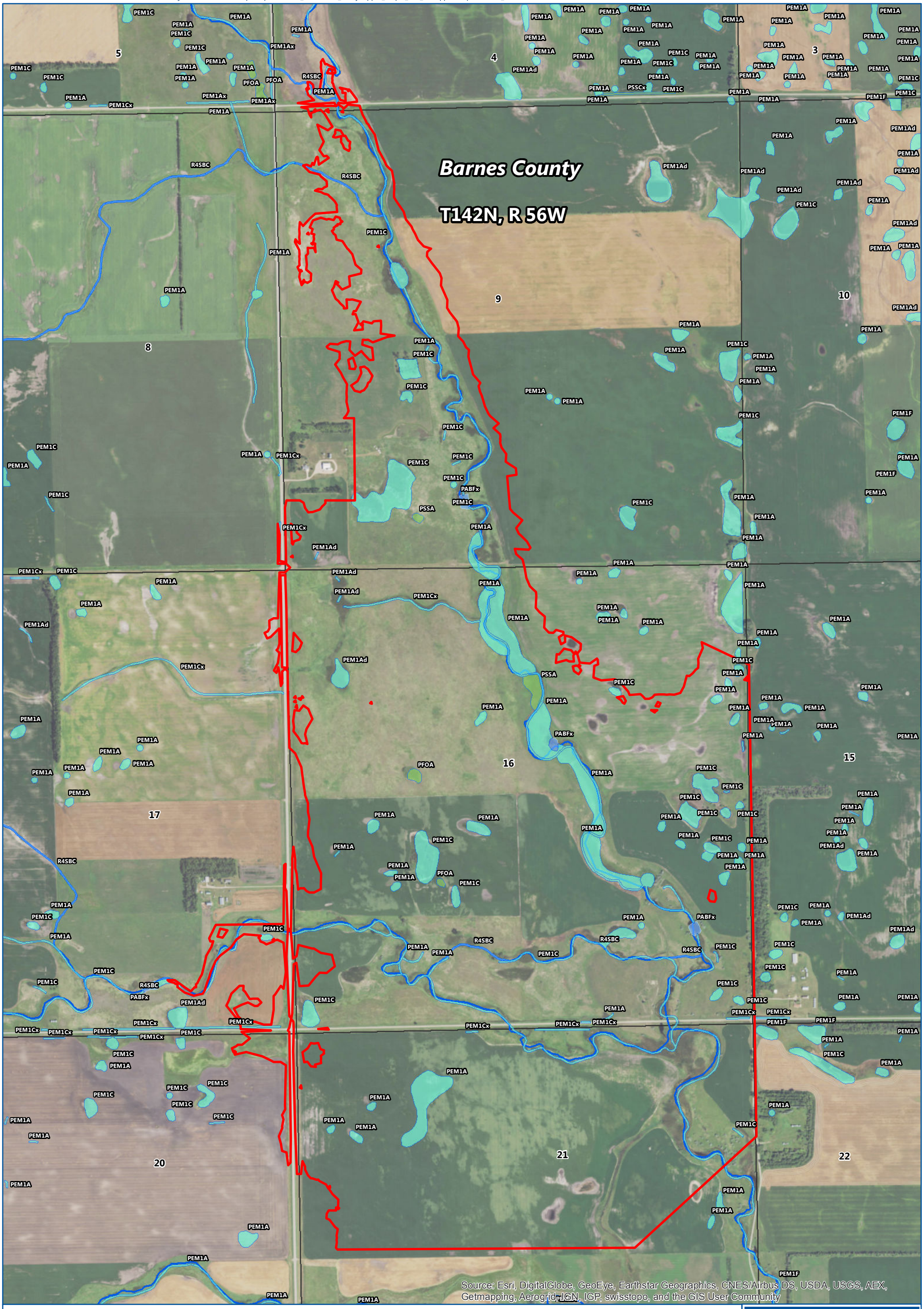
0 500 1,000 1,500 2,000

Feet

BARR

TOPOGRAPHY MAP
Upper Maple River Watershed
Alternative Site 2A
Wetland Delineation

FIGURE 2



Evaluation Area

NHDFlowline

Wetland (National Wetlands Inventory)

- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Riverine

0 500 1,000 1,500 2,000

Feet

BARR

WATER RESOURCES
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE 3

Barr Footer: ArcGIS 10.4.1, 2017-10-30 13:16 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Upper Maple Site 2A_Soils.mxd User: MJS2

Barnes County

T142N, R 56W

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Evaluation Area

Hydric Rating

- Not Hydric (0%)
- Predominantly Non-Hydric (1 to 32%)
- Partially Hydric (33 to 65%)
- Predominantly Hydric (66 to 99%)

0 500 1,000 1,500 2,000

Feet

BARR

SOIL SURVEY MAP
Upper Maple River Watershed
Alternative Site 2A
Wetland Delineation

FIGURE 4

Barr Footer: ArcGIS 10.4.1, 2017-10-30 13:06 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Upper Maple Site 2A_Wetland.mxd User: MJS2

14
Culvert
57
19TH ST SE
Culvert
Barnes County
T142N, R 56W
32
52
MJS2-SP-3
58
53
14
51
20TH ST SE
Culvert
14
37
36

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Evaluation Area
Data Plots
Culverts

Delineated Wetlands
Fresh (Wet) Meadow
Seasonally Flooded Basin
Shallow Marsh
Shrub-carr

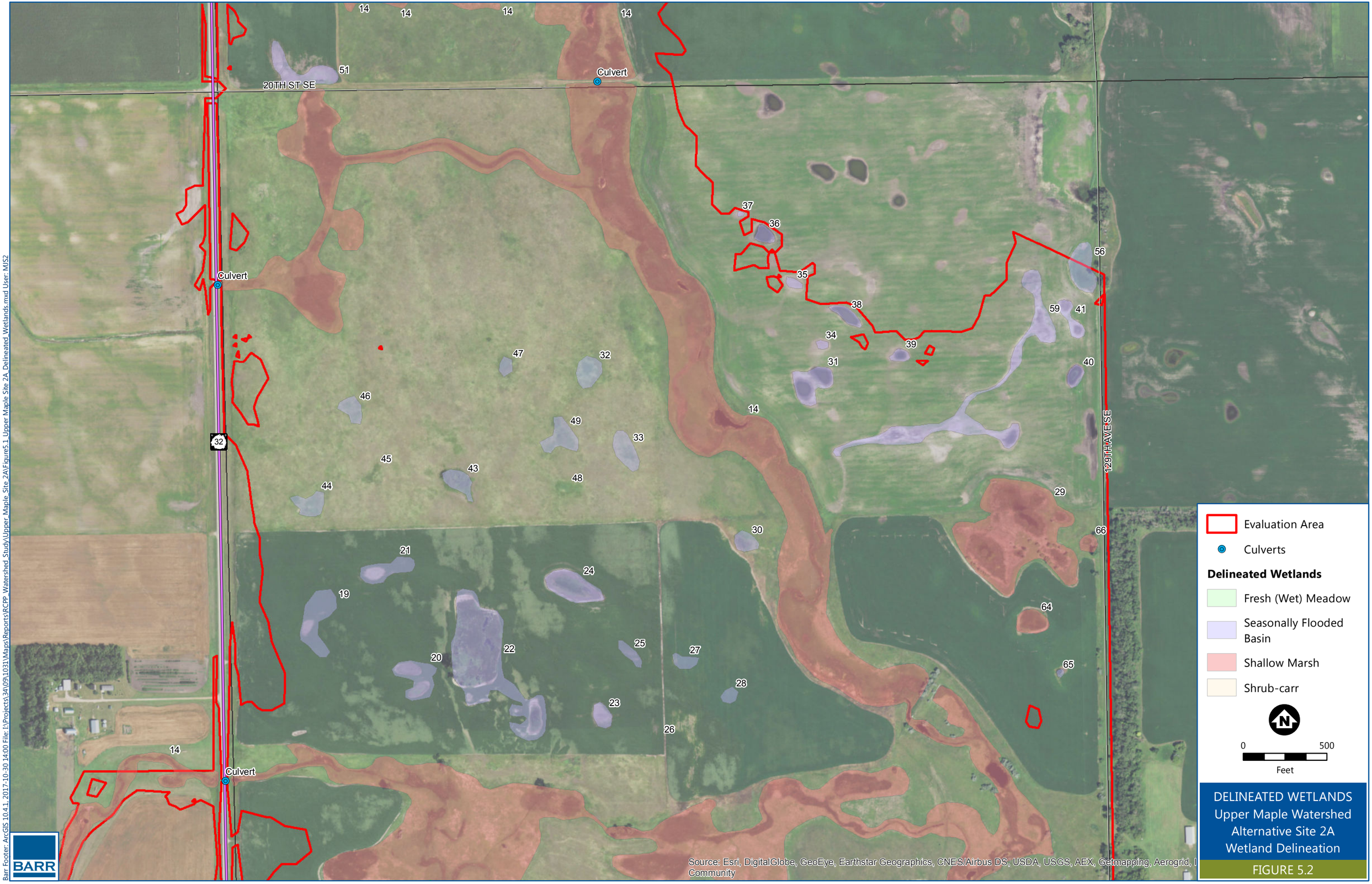
N

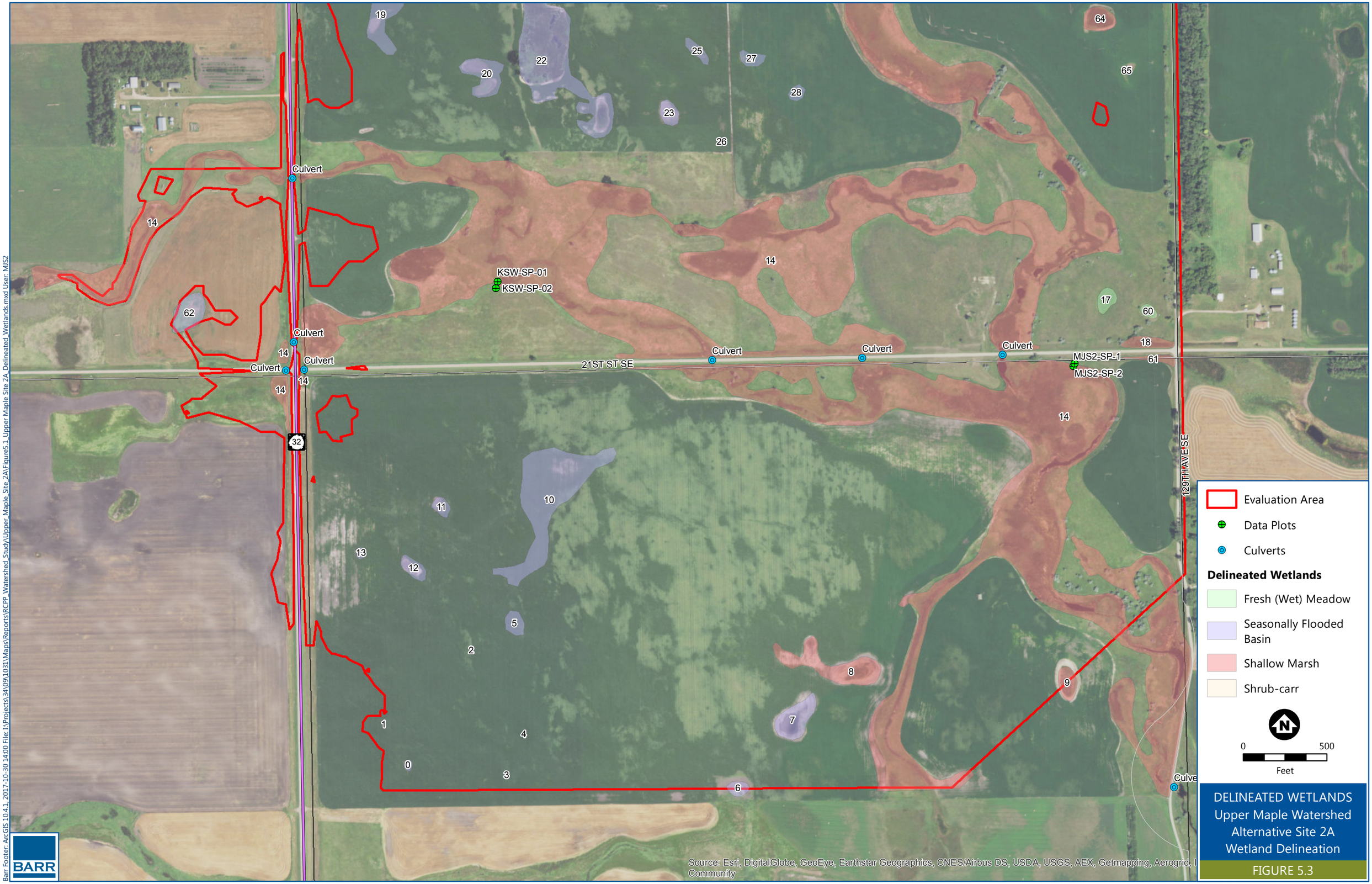
0 500 1,000
Feet

BARR

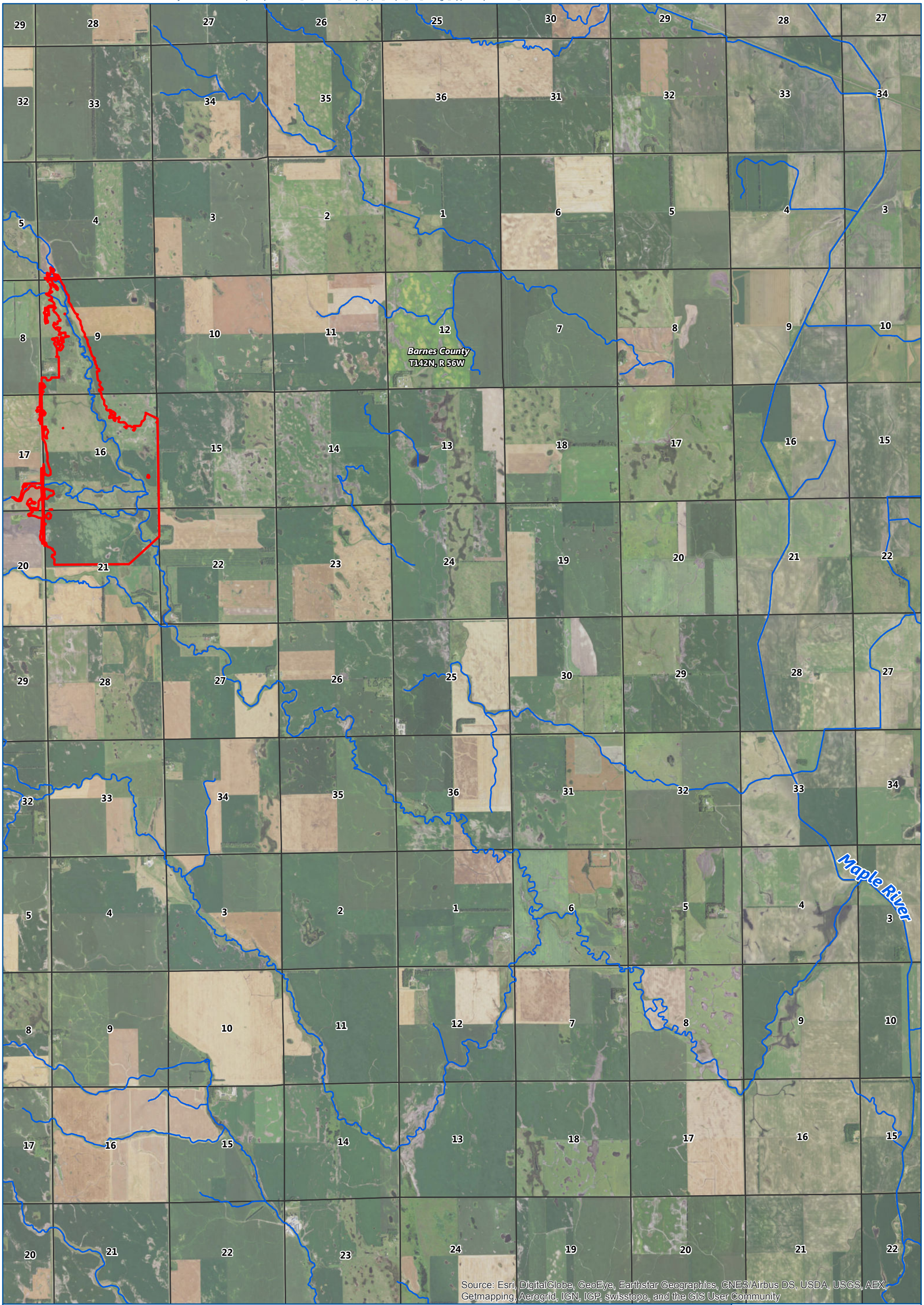
DELINEATED WETLANDS
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE 5.1


20TH ST SE
Culvert
Culvert
Culvert
Culvert
129TH AVE SE
14
51
37
36
35
56
38
59
41
34
39
31
40
47
32
46
14
49
33
45
43
48
44
29
30
66
21
24
19
64
25
27
20
22
65
28
23
26
14
32
Evaluation Area
Culverts
Delineated Wetlands
Fresh (Wet) Meadow
Seasonally Flooded Basin
Shallow Marsh
Shrub-carr
N
0
500
Feet
DELINEATED WETLANDS
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation
FIGURE 5.2
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, I
Community
BARR
Barr Footer: ArcGIS 10.4.1, 2017-10-30 14:00 File: I:\Projects\3410\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Figure5.1_U
Figure5.1_Upper Maple Site 2A_Delineated_Wetlands.mxd User: MJS2



Barr Footer: ArcGIS 10.4.1, 2017-12-15 14:07 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Fig6_Upper Maple Site 2A_WetlandConnections.mxd User: MJS2



Evaluation Area

NHDFlowline

N

0 0.5 1

Miles

BARR

HYDROLOGIC CONNECTIONS
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE 6

Appendices

Appendix A

Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Upper Maple Site 2A | Applicant/Owner: Moore Engineering | City/County: Pilsbury/ Barnes | State: ND | Sampling Date: 09/19/17

Investigator(s): KSW | Section: 16 | Township: 142N | Range: 56W | Sampling Point: KSW-SP-01

Land Form: Footslope | Local Relief: Concave | Slope %: 2-5 | Soil Map Unit Name: G523A, Lowe-Fluvaquents

Subregion (LRR): F | Latitude: 5218170 mN | Longitude: 592128 mE | Datum: UTM, NAD83, meters

Cowardin Classification: PEMB/C | Circular 39 Classification: 2/3 | Mapped NWI Classification: Upland

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

Eggers & Reed (primary): Shallow Marsh

Eggers & Reed (secondary): Fresh (Wet) Meadow

Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

Are vegetation Yes Soil No Hydrology No significantly disturbed? Are "normal circumstances" present? Yes

Are vegetation No Soil No Hydrology No naturally problematic?

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

Hydrophytic vegetation present? Yes

Hydric soil present? Yes

Indicators of wetland hydrology present? Yes

Is the sampled area within a wetland? Yes

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: KSW-A = MJS2-A = W14

VEGETATION

Tree Stratum (Plot Size: 30 ft)

		Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)

1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

1.	Typha angustifolia	40	Yes	OBL
2.	Persicaria pensylvanica	10	No	FACW
3.	Phalaris arundinacea	20	Yes	FACW
4.	Spartina pectinata	20	Yes	FACW
5.	Schoenoplectus tabernaemontani	10	No	OBL
6.		0		
7.		0		
8.		0		
	Total Cover:	100		

Woody Vine Stratum (Plot Size: 30 ft)

1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: | % Sphagnum Moss Cover:

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	20	50
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW or FAC: 100.00% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	50	X 1	50	
FACW Species	50	X 2	100	
FAC Species	0	X 3	0	
FACU Species	0	X 4	0	
UPL Species	0	X 5	0	
Column Totals:	100	(A)	150	(B)

Prevalence Index = B/A = 1.50

Hydrophytic Vegetation Indicators:

- Yes — Rapid Test for Hydrophytic Vegetation
- Yes — Dominance Test is >50%
- Yes — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

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

Hydrophytic vegetation present? Yes

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WETLAND DETERMINATION DATA FORM - Great Plains Region

SOIL

Sampling Point: KSW-SP-01

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 6	10YR 2/1	100					mucky peat	
2.	6 - 24	10YR 4/1	87	10YR 6/1	10	D		clay loam	
3.	6 - 24			10YR 5/6	3	C			
4.	-								
5.	-								
6.	-								

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

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

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

Indicators for Problematic Hydric Soils [3]:

- ☐ 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 MLRA 72 & 73)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): *Type:* _____ *Depth (inches):* _____ **Hydric soil present?** Yes

Soil 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 (where not tilled) (C3)
- ☐ 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 (where tilled) (C3)
- ☐ 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? ☐ **Surface Water Depth (inches):** _____

Water table present? ☐ **Water Table Depth (inches):** _____

Saturation present? (includes capillary fringe) ☐ **Saturation Depth (inches):** _____

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

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WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Upper Maple Site 2A | Applicant/Owner: Moore Engineering | City/County: Pilsbury/ Barnes | State: ND | Sampling Date: 09/19/17

Investigator(s): KSW | Section: 16 | Township: 142N | Range: 56W | Sampling Point: KSW-SP-02

Land Form: Backslope | Local Relief: Convex | Slope %: 2-5 | Soil Map Unit Name: G523A, Lowe-Fluvaquents

Subregion (LRR): F | Latitude: 5218158 mN | Longitude: 592125 mE | Datum: UTM, NAD83, meters

Cowardin Classification: Upland | Circular 39 Classification: Upland | Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Upland

Are vegetation Yes Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary):

Are vegetation No Soil No Hydrology No naturally problematic? | Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

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

Hydrophytic vegetation present? No

Hydric soil present? No

Indicators of wetland hydrology present? No

Is the sampled area within a wetland? No

General Remarks (explain any answers if needed): upland point for KSW-A= MJS2-A = W14

If yes, optional Wetland Site ID:

VEGETATION

Tree Stratum (Plot Size: 30 ft)

		Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)

1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

1.	Bromus inermis	100	Yes	UPL
2.	Symphoricarpos occidentalis	1	No	UPL
3.	Glycyrrhiza lepidota	1	No	FACU
4.	Cirsium arvense	1	No	FACU
5.	Asclepias syriaca	1	No	UPL
6.		0		
7.		0		
8.		0		
	Total Cover:	104		

Woody Vine Stratum (Plot Size: 30 ft)

1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 0 | % Sphagnum Moss Cover:

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	20.8	52
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 0 (A)

Total Number of Dominant Species Across All Strata: 1 (B)

Percent of Dominant Species That Are OBL, FACW or FAC: 0.00% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	0	X 1	0	
FACW Species	0	X 2	0	
FAC Species	0	X 3	0	
FACU Species	2	X 4	8	
UPL Species	102	X 5	510	
Column Totals:	104	(A)	518	(B)

Prevalence Index = B/A = 4.98

Hydrophytic Vegetation Indicators:

- No — Rapid Test for Hydrophytic Vegetation
- No — Dominance Test is >50%
- No — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

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

Hydrophytic vegetation present? No

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WETLAND DETERMINATION DATA FORM - Great Plains Region

SOIL

Sampling Point: KSW-SP-02

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 8	10YR 3/1	100					loam	
2.	8 - 25	10YR 5/3	90					loam	
3.	8 - 25	10YR 3/2	10						
4.	-								
5.	-								
6.	-								

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

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

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

Indicators for Problematic Hydric Soils [3]:

- ☐ 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 MLRA 72 & 73)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): Type: _____ Depth (inches): _____ **Hydric soil present?** No

Soil 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 (where not tilled) (C3)
- ☐ 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 (where tilled) (C3)
- ☐ 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? ☐ **Surface Water Depth (inches):** _____

Water table present? ☐ **Water Table Depth (inches):** _____

Saturation present? (includes capillary fringe) ☐ **Saturation Depth (inches):** _____

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Upper Maple Site 2A | Applicant/Owner: | City/County: Pilsbury/ Barnes | State: ND | Sampling Date: 09/18/17

Investigator(s): KSW, MJS2 | Section: 21 | Township: 142N | Range: 56W | Sampling Point: MJS2-SP-01

Land Form: Floodplain | Local Relief: Concave | Slope %: 0-1 | Soil Map Unit Name: G523A, Lowe-Fluvaquents

Subregion (LRR): F | Latitude: 5218016 mN | Longitude: 593178 mE | Datum: UTM, NAD83, meters

Cowardin Classification: PEM1C | Circular 39 Classification: Type 3 | Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Shallow Marsh

Are vegetation No Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary):

Are vegetation No Soil No Hydrology No naturally problematic? | Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

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

Hydrophytic vegetation present? Yes

Hydric soil present? Yes

Indicators of wetland hydrology present? Yes

Is the sampled area within a wetland? Yes

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: MJS2-A = W14

VEGETATION

	Tree Stratum (Plot Size: 30 ft)	Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		
	Sapling/Shrub Stratum (Plot Size: 15 ft)			
1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		
	Herb Stratum (Plot Size: 5 ft)			
1.	Typha angustifolia	100	Yes	OBL
2.	Phalaris arundinacea	10	No	FACW
3.	Mentha arvensis	2	No	FACW
4.	Lycopus americanus	2	No	OBL
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	114		
	Woody Vine Stratum (Plot Size: 30 ft)			
1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 0 **% Sphagnum Moss Cover:** 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	22.8	57
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC:	1	(A)
Total Number of Dominant Species Across All Strata:	1	(B)
Percent of Dominant Species That Are OBL, FACW or FAC:	100.00%	(A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:	
OBL Species	102	X 1	102
FACW Species	12	X 2	24
FAC Species	0	X 3	0
FACU Species	0	X 4	0
UPL Species	0	X 5	0
Column Totals:	114 (A)		126 (B)

Prevalence Index = B/A = 1.11

Hydrophytic Vegetation Indicators:

- Yes — Rapid Test for Hydrophytic Vegetation
- Yes — Dominance Test is >50%
- Yes — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

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

Hydrophytic vegetation present? Yes

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WETLAND DETERMINATION DATA FORM - Great Plains Region

SOIL

Sampling Point: MJS2-SP-01

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 6	10YR 3/1	100					Peat	Saturated; no redox
2.	6 - 22	2.5Y 6/1	90					Mucky peat with sand	Saturated
3.	6 - 22	10YR 3/1	10						
4.	-								
5.	-								
6.	-								

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

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

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

Indicators for Problematic Hydric Soils [3]:

- [ ] 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 MLRA 72 & 73)
- [ ] Reduced Vertic (F18)
- [ ] Red Parent Material (F21)
- [ ] Very Shallow Dark Surface (TF12)
- [ ] Other (explain in soil remarks)

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

Restrictive Layer (if present): *Type:* None observed *Depth (inches):* - **Hydric soil present?** Yes

Soil Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

- [ ] Surface Water (A1)
- [x] High Water Table (A2)
- [x] 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 (where not tilled) (C3)
- [ ] 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 (where tilled) (C3)
- [ ] Crayfish Burrows (C8)
- [ ] Saturation Visible on Aerial Imagery (C9)
- [x] Geomorphic Position (D2)
- [x] FAC-Neutral Test (D5)
- [ ] Frost-Heave Hummocks (D7) (LRR F)

Field Observations:

- Surface water present? [ ] Surface Water Depth (inches):
- Water table present? [x] Water Table Depth (inches): 9
- Saturation present? (includes capillary fringe) [x] Saturation Depth (inches): 0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: [ ] Aerial Photo [ ] Monitoring Well [ ] Stream Gauge [ ] Previous Inspections

Hydrology Remarks:

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WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Upper Maple Site 2A | Applicant/Owner: | City/County: Pilsbury/ Barnes | State: ND | Sampling Date: 09/18/17

Investigator(s): KSW, MJS2 | Section: 21 | Township: 142N | Range: 56W | Sampling Point: MJS2-SP-02

Land Form: Slope | Local Relief: Convex | Slope %: 2-5 | Soil Map Unit Name: G523A, Lowe-Fluvaquents

Subregion (LRR): F | Latitude: 5218021 mN | Longitude: 593180 mE | Datum: UTM, NAD83, meters

Cowardin Classification: Upland | Circular 39 Classification: Upland | Mapped NWI Classification: Upland

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Upland

Are vegetation Yes Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary):

Are vegetation No Soil No Hydrology No naturally problematic? | Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

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

Hydrophytic vegetation present? No

Hydric soil present? No

Indicators of wetland hydrology present? No

Is the sampled area within a wetland? No

General Remarks (explain any answers if needed): upland point for MJS2-A = W14

If yes, optional Wetland Site ID:

VEGETATION

Tree Stratum (Plot Size: 30 ft)

		Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)

1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

1.	Bromus arvensis	60	Yes	FACU
2.	Solidago canadensis	30	Yes	FACU
3.	Bromus inermis	10	No	UPL
4.	Cirsium arvense	10	No	FACU
5.	Glycyrrhiza lepidota	10	No	FACU
6.	Symphoricarpos occidentalis	10	No	UPL
7.	Spartina pectinata	5	No	FACW
8.	Sonchus arvensis	2	No	FAC
	Total Cover:	137		

Woody Vine Stratum (Plot Size: 30 ft)

1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 0 | % Sphagnum Moss Cover: 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	27.4	68.5
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 0 (A)

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

Percent of Dominant Species That Are OBL, FACW or FAC: 0.00% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	0	X 1	0	
FACW Species	5	X 2	10	
FAC Species	2	X 3	6	
FACU Species	110	X 4	440	
UPL Species	20	X 5	100	
Column Totals:	137	(A)	556	(B)

Prevalence Index = B/A = 4.06

Hydrophytic Vegetation Indicators:

- No — Rapid Test for Hydrophytic Vegetation
- No — Dominance Test is >50%
- No — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

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

Hydrophytic vegetation present? No

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WETLAND DETERMINATION DATA FORM - Great Plains Region

SOIL

Sampling Point: MJS2-SP-02

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	0 - 10	10YR 3/2	100					Loam	Dry; no redox
2.	10 - 14	10YR 3/2	98	10YR 4/2	2	D	M	Loam	Dry
3.	14 - 20	10YR 4/2	100					Loam	Dry; no redox
4.	20 - 24	2.5Y 6/3	100					Loam	Dry; no redox
5.	-								
6.	-								

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

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

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

Indicators for Problematic Hydric Soils [3]:

- ☐ 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 MLRA 72 & 73)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (explain in soil remarks)

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

Restrictive Layer (if present): *Type:* None observed *Depth (inches):* - **Hydric soil present?** No

Soil 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 (where not tilled) (C3)
- ☐ 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 (where tilled) (C3)
- ☐ 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?	☐	Surface Water Depth (inches):	
Water table present?	☐	Water Table Depth (inches):	>24
Saturation present? (includes capillary fringe)	☐	Saturation Depth (inches):	>24

Indicators of wetland hydrology present? No

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

WETLAND DETERMINATION DATA FORM - Great Plains Region

Project/Site: Upper Maple Site 2A | Applicant/Owner: | City/County: Pilsbury/ Barnes | State: ND | Sampling Date: 09/19/17

Investigator(s): MJS2 | Section: 9 | Township: 142N | Range: 56W | Sampling Point: MJS2-SP-03

Land Form: Depression | Local Relief: Concave | Slope %: 1-2 | Soil Map Unit Name: G651E,Udarents loamy,abonded gravel pits

Subregion (LRR): F | Latitude: 5220307 mN | Longitude: 592194 mE | Datum: UTM, NAD83, meters

Cowardin Classification: PEM1C | Circular 39 Classification: Type 3 | Mapped NWI Classification: PEM1C

Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in remarks) | Eggers & Reed (primary): Shallow Marsh

Are vegetation Yes Soil No Hydrology No significantly disturbed? | Are "normal circumstances" present? Yes | Eggers & Reed (secondary):

Are vegetation No Soil No Hydrology No naturally problematic? | Eggers & Reed (tertiary):

Eggers & Reed (quaternary):

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

Hydrophytic vegetation present? Yes

Hydric soil present? Yes

Indicators of wetland hydrology present? Yes

Is the sampled area within a wetland? Yes

General Remarks (explain any answers if needed):

If yes, optional Wetland Site ID: MJS2-O = W52

VEGETATION

Tree Stratum (Plot Size: 30 ft)

		Absolute % Cover	Dominant Species?	Indicator Status
1.		0		
2.		0		
3.		0		
4.		0		
	Total Cover:	0		

Sapling/Shrub Stratum (Plot Size: 15 ft)

1.		0		
2.		0		
3.		0		
4.		0		
5.		0		
	Total Cover:	0		

Herb Stratum (Plot Size: 5 ft)

1.	Typha latifolia	50	Yes	OBL
2.	Typha angustifolia	20	Yes	OBL
3.	Sparganium emersum	20	Yes	OBL
4.		0		
5.		0		
6.		0		
7.		0		
8.		0		
	Total Cover:	90		

Woody Vine Stratum (Plot Size: 30 ft)

1.		0		
2.		0		
	Total Cover:	0		

% Bare Ground in Herb Stratum: 10 **% Sphagnum Moss Cover:** 0

Vegetation Remarks: (include photo numbers here or on a separate sheet)

Salix tree - 30%.

50/20 Thresholds:	20%	50%
Tree Stratum	0	0
Sapling/Shrub Stratum	0	0
Herb Stratum	18	45
Woody Vine Stratum	0	0

Dominance Test Worksheet:

Number of Dominant Species That Are OBL, FACW or FAC: 3 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW or FAC: 100.00% (A/B)

Prevalence Index Worksheet:

Total % Cover of:		Multiply by:		
OBL Species	90	X 1	90	
FACW Species	0	X 2	0	
FAC Species	0	X 3	0	
FACU Species	0	X 4	0	
UPL Species	0	X 5	0	
Column Totals:	90	(A)	90	(B)

Prevalence Index = B/A = 1.00

Hydrophytic Vegetation Indicators:

- Yes — Rapid Test for Hydrophytic Vegetation
- Yes — Dominance Test is >50%
- Yes — Prevalence Index ≤ 3.0 [1]
- No — Morphological Adaptations [1] (provide supporting data in vegetation remarks or on a separate sheet)
- No — Problematic Hydrophytic Vegetation [1] (Explain)

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

Hydrophytic vegetation present? Yes

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WETLAND DETERMINATION DATA FORM - Great Plains Region

SOIL

Sampling Point: MJS2-SP-03

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

	Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox Features %	Redox Features Type [1]	Redox Features Loc [2]	Texture	Remarks
1.	-								
2.	-								
3.	-								
4.	-								
5.	-								
6.	-								

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

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

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

Indicators for Problematic Hydric Soils [3]:

- ☐ 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 MLRA 72 & 73)
- ☐ Reduced Vertic (F18)
- ☐ Red Parent Material (F21)
- ☐ Very Shallow Dark Surface (TF12)
- ☑ Other (explain in soil remarks)

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

Restrictive Layer (if present): *Type:* _____ *Depth (inches):* _____ **Hydric soil present?** Yes

Soil Remarks: Hydric soils assumed due to dominance of OBL vegetation and primary hydrology indicators.

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 (where not tilled) (C3)
- ☐ 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 (where tilled) (C3)
- ☐ 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?	☐	**Surface Water Depth (inches):**	
Water table present?	☑	**Water Table Depth (inches):**	6
Saturation present? (includes capillary fringe)	☑	**Saturation Depth (inches):**	0

Indicators of wetland hydrology present? Yes

Describe Recorded Data:

Recorded Data: ☐ Aerial Photo ☐ Monitoring Well ☐ Stream Gauge ☐ Previous Inspections

Hydrology Remarks:

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Appendix B

Site Photographs

Appendix B: Photo Log Of Wetland Delineation

Photo 1: Photo of shallow marsh community near sampling point MJS2-SP-1. Taken on September 18, 2017.

Photo 2: Photo of the shallow marsh community in Wetland XX along the Maple River tributary . Taken on September 19, 2017.

Appendix B: Photo Log Of Wetland Delineation

Photo 3: Photo of shallow marsh community located in a roadside ditch. Taken on September 18, 2017.

Photo 4: Photo of shallow marsh community located in enclosed depression in an agriculture field. Taken on September 18, 2017.

Appendix B: Photo Log Of Wetland Delineation

Photo 5: Photo of fresh (wet) community outside of shallow marsh community located along the tributary to the Maple River. Taken on September 18, 2017.

Photo 6: Photo of an enclosed fresh (wet) meadow community in wetland XX. Taken on September 19, 2017.

Appendix B: Photo Log Of Wetland Delineation

Photo 7: Photo of shrub-carr community in wetland XX. Taken on September 19, 2017.

Photo 8: Photo of seasonally flooded basin in a soy bean field. Taken on September 19, 2017.

Appendix B: Photo Log Of Wetland Delineation

Photo 9: Photo of typical upland grassland community adjacent to Wetland XX. Taken on September 18, 2017.

Photo 10: Photo of typical upland agriculture field adjacent in the study area. Taken on September 18, 2017.

Appendix C

Aerial Image Review

Appendix C - Review of Historical Imagery
Wetland Delineation

Upper Maple Site 2A		Image Interpretation														
Imagery Date	**Image Source**	**Climate Condition (wet, dry, normal)**	0	1	2	3	4	5	6 (MJS2-G)	7 (MJS2-F)	8 (MJS2-E)	9 (MJS2-D)	10	11	12	13	14 (MJS2-A)
8/5/2016	**NDGISHUB_WMS**	**normal**	**DO**	**NV**	**NV**	**NV**	**NV**	**NV**	**DO**	**DO, SS, SW**	**DO, SS**	**DO, SS, AP**	**DO**	**DO**	**DO**	**NV**	**WS, NC, SS, SW, A**
9/26/2015	**NDGISHUB_WMS**	**normal**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**SS**	**AP, CS**	**WS, AP, CS**	**AP, WS**	**SS**	**AP**	**NV**	**NV**	**WS, NC, SS, SW, A**
8/12/2014	**NDGISHUB_WMS**	**normal**	**WS, AP**	**WS**	**NV**	**NV**	**WS**	**DO**	**NC, AP**	**DO, AP**	**SS, DO, AP**	**WS, AP**	**WS, DO, SS**	**DO**	**DO**	**CS**	**WS, NC, SS, SW, A**
7/27/2012	NDGISHUB_WMS	dry	NV	NV	NV	AP	NV	NV	NC, AP	NC, AP, WS, SS	SS, WS, AP, NC	SS, AP, NC	WS, SS, NC	NC, SS	NC, SS	NV	WS, NC, SS, SW, A
7/8/2010	NDGISHUB_WMS	dry	NV	NV	NV	SS	NV	DO	CS	DO, SS, SW	DO, SS	DO, SS, AP	WS, DO, SS	DO	SS	DO	WS, SS, SW
8/18/2009	**NDGISHUB_WMS**	**normal**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**SS**	**SS**	**SS, AP, NC**	**WS**	**NV**	**WS**	**NV**	**WS, SS, SW**
7/8/2006	**NDGISHUB_WMS**	**normal**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**WS**	**NV**	**SS**	**SS, AP, NC**	**WS**	**NV**	**SS**	**NV**	**WS, SS, SW**
6/20/2005	**NDGISHUB_WMS**	**normal**	**NV**	**NV**	**NV**	**NV**	**NV**	**SS**	**SS**	**NV**	**SS**	**SS**	**SS**	**SS**	**SS**	**NV**	**WS, SS, SW**
8/19/2004	**NDGISHUB_WMS**	**normal**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**NV**	**WS, SS**
6/29/2003	**NDGISHUB_WMS**	**normal**	**SS**	**SS**	**NV**	**WS**	**NV**	**SS**	**WS, SS**	**WS**	**WS, SS**	**WS**	**WS**	**WS**	**WS**	**WS**	**WS, SS, SW**
9/17/1997	NDGISHUB_WMS	dry	NV	NV	NV	NV	NV	NV	WS	WS	WS	WS	WS	NV	NV	NV	WS, SS, SW
number of images regardless of climate conditions			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
number of wet signatures - all imagery regardless of climate conditions			3	2	0	3	1	4	9	8	10	10	10	7	8	3	11
percent of wet signatures - all imagery regardless of climate conditions			27%	18%	0%	27%	9%	36%	82%	73%	91%	91%	91%	64%	73%	27%	100%
number of imagers with normal climate conditions			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
number of wet signatures under normal climate condition			3	2	0	1	1	3	6	5	7	7	7	5	6	2	8
percent of wet signatures under normal climate condition			38%	25%	0%	13%	13%	38%	75%	63%	88%	88%	88%	63%	75%	25%	100%
NWI			no	no	no	no	no	no	no	no	no	no	PEM1A	PEM1A	PEM1A	PEM1A	PEM1C/Cx
hydric soil			predominantly non hydric	not hydric	not hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	not hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	not hydric	predominantly hydric	predominantly hydric	predominantly hydric
field verified			no *	no *	no *	no *	no *	no *	yes	yes	yes	yes	field visit in 2017 indicted not wetland at northeast corner	no *	no *	no *	yes
wetland ?			need field verification	no	no	no	no	need field verification	yes	yes	yes	yes	yes	yes	yes	need field verification	yes

* not accessible through corn field

KEY		
WS - wetland signature	SS - soil wetness signature	CS - crop stress
NC - not cropped	AP - altered pattern	NV - normal vegetative cover **
DO - drowned out	SW - standing water	NSS – no soil wetness signature **

** Not a wet signature

Appendix C - Review of Historical Imagery
Wetland Delineation

Upper Maple Site 2A		Image Interpretation														
Imagery Date	**Image Source**	**Climate Condition (wet, dry, normal)**	61 (MJS2-B)	62	46	47	32	44	45	43	49	33	48	19	21	20	22
8/5/2016	**NDGISHUB_WMS**	**normal**	**WS, NC**	**WS**	**NV**	**SS**	**NV**	**NV**	**NV**	**WS**	**NV**	**SS**	**NV**	**DO**	**DO**	**DO, SS**	**WS, SW**
9/26/2015	**NDGISHUB_WMS**	**normal**	**WS, NC**	**WS, NC, AP**	**NV**	**SS**	**WS**	**NV**	**NV**	**WS**	**SS**	**NV**	**NV**	**NV**	**NV**	**NV**	**WS, SW**
8/12/2014	**NDGISHUB_WMS**	**normal**	**WS, NC**	**WS, DO**	**WS**	**WS**	**WS**	**WS**	**WS**	**WS**	**WS**	**WS**	**WS**	**WS, DO, SS**	**DO**	**WS**	**WS, SW**
7/27/2012	NDGISHUB_WMS	dry	WS, NC	WS, NC, AP	WS	WS	WS	WS	WS	WS	WS	WS	WS	NV	SS	WS, DO	WS
7/8/2010	NDGISHUB_WMS	dry	WS	WS, NC	WS	WS	WS	WS	WS	WS	WS	WS	WS	DO	SS	SS	WS
8/18/2009	**NDGISHUB_WMS**	**normal**	**WS, SS**	**WS, NC**	**SS**	**SS**	**WS**	**SS**	**NV**	**WS**	**WS**	**SS**	**WS**	**CS**	**SS**	**CS**	**WS, SW**
7/8/2006	**NDGISHUB_WMS**	**normal**	**WS, SS**	**WS, NC**	**WS**	**WS**	**WS**	**NV**	**NV**	**WS**	**NV**	**NV**	**NV**	**SS**	**SS**	**SS**	**WS, SW, SS**
6/20/2005	**NDGISHUB_WMS**	**normal**	**WS**	**WS, AP**	**NV**	**NV**	**SS**	**SS**	**NV**	**WS**	**NV**	**WS**	**NV**	**SS**	**SS**	**SS**	**WS**
8/19/2004	**NDGISHUB_WMS**	**normal**	**WS**	**WS**	**NV**	**NV**	**NV**	**NV**	**NV**	**WS**	**NV**	**NV**	**NV**	**NV**	**SS**	**NV**	**WS**
6/29/2003	**NDGISHUB_WMS**	**normal**	**WS**	**WS, AP**	**NV**	**NV**	**NV**	**NV**	**NV**	**WS**	**NV**	**NV**	**NV**	**NV**	**WS**	**WS**	**WS**
9/17/1997	NDGISHUB_WMS	dry	WS	WS, AP	SS	NV	WS	SS	NV	WS	NV	NV	WS	SS	SS	SS	WS
number of images regardless of climate conditions			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
number of wet signatures - all imagery regardless of climate conditions			11	11	6	7	8	6	3	11	5	6	5	7	10	9	11
percent of wet signatures - all imagery regardless of climate conditions			100%	100%	55%	64%	73%	55%	27%	100%	45%	55%	45%	64%	91%	82%	100%
number of imagers with normal climate conditions			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
number of wet signatures under normal climate condition			8	8	3	5	5	3	1	8	3	4	2	5	7	6	8
percent of wet signatures under normal climate condition			100%	100%	38%	63%	63%	38%	13%	100%	38%	50%	25%	63%	88%	75%	100%
NWI			no	no	no	no	PEM1A	no	no	PFOA	no	no	no	PEM1A	PEM1A	PEM1A	PEM1C/FOA
hydric soil			predominantly non hydric		not hydric	not hydric	not hydric	not hydric	predominantly non hydric	not hydric	not hydric	not hydric	not hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	not hydric
field verified			yes	no *	no *	no *	no *	no *	no *	no *	no *	no *	no *	no *	no *	no *	yes
wetland ?			yes	yes	need field verification	yes	yes	need field verification	no	yes	need field verification	need field verification	no	yes	yes	yes	yes

* not accessible through corn field

KEY		
WS - wetland signature	SS - soil wetness signature	CS - crop stress
NC - not cropped	AP - altered pattern	NV - normal vegetative cover **
DO - drowned out	SW - standing water	NSS – no soil wetness signature **

** Not a wet signature

Appendix C - Review of Historical Imagery
Wetland Delineation

Upper Maple Site 2A		Image Interpretation															
Imagery Date	**Image Source**	**Climate Condition (wet, dry, normal)**	24	25	23	26	27	28	30	17 (MJS2-H)	60 (MJS2-I)	18 (MJS2-C)	37	36	35	38	34
8/5/2016	**NDGISHUB_WMS**	**normal**	**WS, SS**	**DO**	**DO**	**NV**	**DO**	**NV**	**SS, NC**	**WS**	**WS**	**SS**	**DO**	**SW**	**DO**	**SW**	**DO**
9/26/2015	**NDGISHUB_WMS**	**normal**	**WS**	**NV**	**NV**	**NV**	**NV**	**NV**	**NC**	**WS**	**SS**	**WS**	**NV**	**NV**	**NV**	**NV**	**NV**
8/12/2014	**NDGISHUB_WMS**	**normal**	**WS, SW, DO**	**DO**	**DO**	**DO**	**DO**	**DO**	**SS, NC**	**WS**	**SS**	**SS**	**DO**	**DO**	**DO**	**DO**	**DO**
7/27/2012	NDGISHUB_WMS	dry	WS	NV	SS	NV	NV	NV	NC	WS	WS	WS	NV	NV	NV	NV	NV
7/8/2010	NDGISHUB_WMS	dry	DO	NV	NV	NV	DO	DO	NC	SS	SS	WS, SW	NV	WS, DO	DO	DO	DO
8/18/2009	**NDGISHUB_WMS**	**normal**	**WS**	**CS**	**CS**	**CS**	**DO**	**NV**	**SS, NC**	**WS, SS**	**WS**	**WS, SW**	**NV**	**NV**	**NV**	**NV**	**NV**
7/8/2006	**NDGISHUB_WMS**	**normal**	**SS**	**CS**	**CS**	**NV**	**CS**	**SS**	**SS, NC**	**WS**	**WS**	**SS**	**NV**	**SS**	**SS**	**SS**	**SS**
6/20/2005	**NDGISHUB_WMS**	**normal**	**SS**	**CS**	**CS**	**NV**	**NV**	**NV**	**WS, NC**	**SS**	**SS**	**WS**	**SS**	**SW**	**SW**	**SW**	**SS**
8/19/2004	**NDGISHUB_WMS**	**normal**	**SS**	**NV**	**NV**	**NV**	**NV**	**NV**	**SS, NC**	**NV**	**NV**	**SS**	**NV**	**SS**	**NV**	**SS**	**NV**
6/29/2003	**NDGISHUB_WMS**	**normal**	**WS**	**DO**	**NV**	**NV**	**DO**	**DO**	**NC**	**SS**	**NV**	**SS, SW**	**NV**	**SS**	**SS**	**SS**	**SS**
9/17/1997	NDGISHUB_WMS	dry	WS	DO	SS	SS	SS	NV	NC, AP	WS	WS	WS	NV	SS	NV	NV	NV
number of images regardless of climate conditions			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
number of wet signatures - all imagery regardless of climate conditions			11	7	7	3	7	4	11	10	9	11	3	8	6	7	6
percent of wet signatures - all imagery regardless of climate conditions			100%	64%	64%	27%	64%	36%	100%	91%	82%	100%	27%	73%	55%	64%	55%
number of imagers with normal climate conditions			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
number of wet signatures under normal climate condition			8	6	5	2	5	3	8	7	6	8	3	6	5	6	5
percent of wet signatures under normal climate condition			100%	75%	63%	25%	63%	38%	100%	88%	75%	100%	38%	75%	63%	75%	63%
NWI			PEM1A	no	no	no	no	no	no	PEM1C	PEM1C	PEM1Cx	no	no	no	PEM1C	no
hydric soil			predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	not hydric	not hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric
field verified			no *	no *	no *	no *	no *	no	no	yes	yes	yes	no	no	no	no	no
wetland ?			yes	yes	yes	no	yes	need field verification	yes	yes	yes	yes	need field verification	yes	yes	yes	yes

* not accessible through corn field

KEY		
WS - wetland signature	SS - soil wetness signature	CS - crop stress
NC - not cropped	AP - altered pattern	NV - normal vegetative cover **
DO - drowned out	SW - standing water	NSS – no soil wetness signature **

** Not a wet signature

Appendix C - Review of Historical Imagery
Wetland Delineation

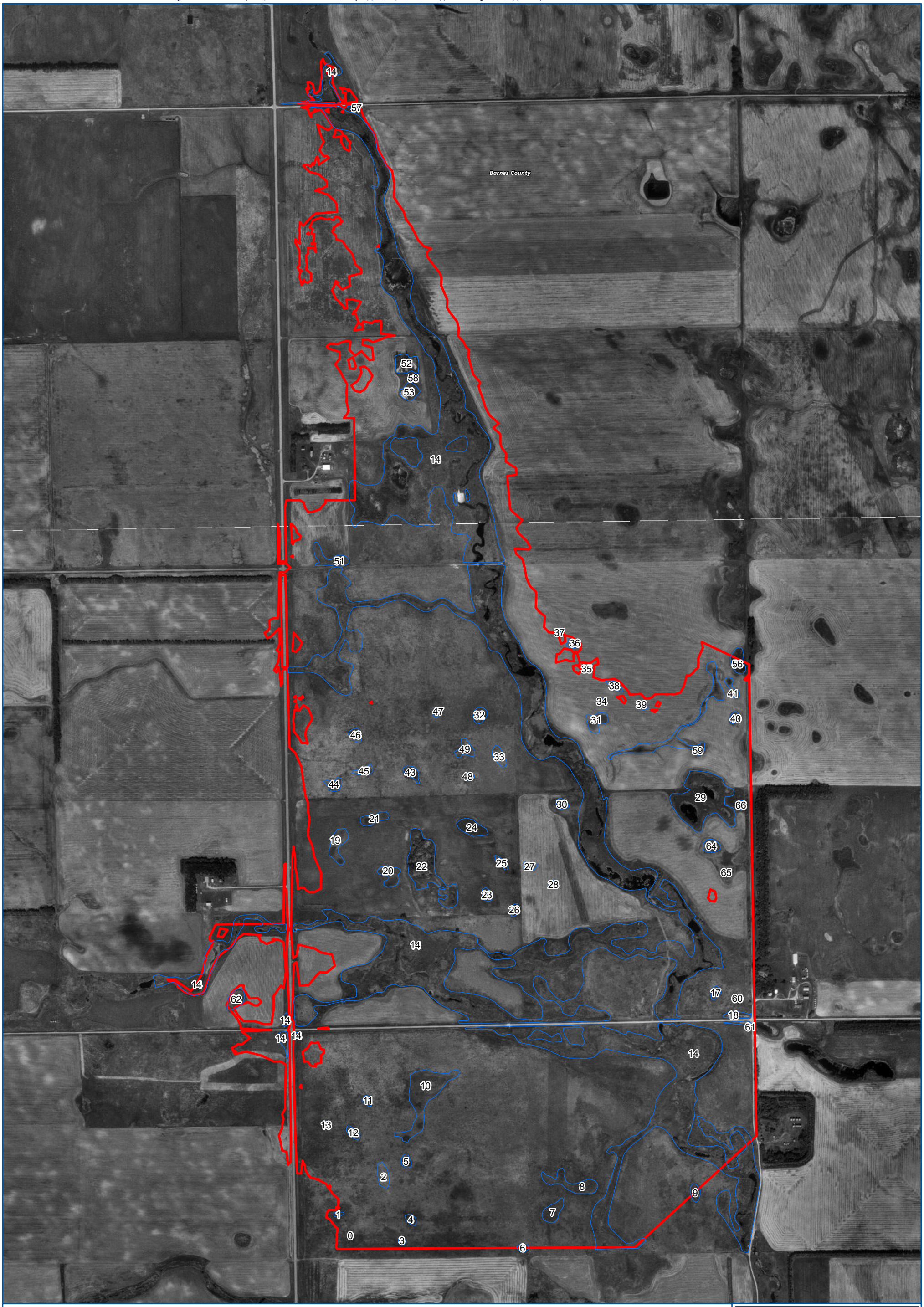
Upper Maple Site 2A		Image Interpretation															
Imagery Date	**Image Source**	**Climate Condition (wet, dry, normal)**	39	31	56	41	40	59	29	66	64	65	51 (KSW-B)	52 (MJS2-O)	53 (MJS2-Q)	58 (MJS2-P)	57 (MJS2-N)
8/5/2016	**NDGISHUB_WMS**	**normal**	**SW**	**SW**	**WS, AP, NC, SS**	**SS, DO**	**SW**	**DO, SS**	**WS, NC, SW, AP**	**SS**	**SS**	**SS**	**DO**	**WS**	**SS, WS**	**DO**	**SS**
9/26/2015	**NDGISHUB_WMS**	**normal**	**NV**	**NV**	**WS, AP, NC**	**NV**	**NV**	**NV**	**WS, AP, NC**	**WS, NC**	**WS, SS, AP**	**DO, AP**	**DO**	**WS**	**WS**	**SS**	**WS**
8/12/2014	**NDGISHUB_WMS**	**normal**	**DO**	**DO**	**WS, AP, NC, SW**	**DO**	**DO**	**DO**	**WS, AP, NC, SW**	**WS, NC**	**WS, NC, AP**	**NC, AP, SS**	**DO**	**WS, SS**	**WS, SS**	**WS**	**SS**
7/27/2012	NDGISHUB_WMS	dry	NV	NV	WS, NC	NV	NV	NV	WS, NC, AP, SW	WS, NC	WS, NC, AP	NC, AP	DO	WS	SS	WS	SS
7/8/2010	NDGISHUB_WMS	dry	DO	DO	WS	DO	WS, AP	DO	WS, SW, NC, AP	WS, NC	WS, SS, AP	SS, AP	DO	WS, SS	SS	WS, SS	SS
8/18/2009	**NDGISHUB_WMS**	**normal**	**NV**	**DO**	**WS**	**DO**	**DO**	**DO**	**WS, SW, NC, AP**	**WS, NC**	**WS, NC**	**WS, NC**	**DO**	**WS, SW**	**WS, SS**	**SS**	**WS**
7/8/2006	**NDGISHUB_WMS**	**normal**	**SS**	**DO**	**WS**	**SS**	**SS**	**SS, DO**	**WS, SS**	**SS**	**SS**	**SS**	**WS**	**WS**	**SS**	**DO**	**SS**
6/20/2005	**NDGISHUB_WMS**	**normal**	**SS**	**SS**	**WS, NC, AP**	**SS**	**SS**	**SS, AP**	**WS, AP, SS**	**SS**	**SS, AP**	**SS**	**SS, AP**	**WS, NC**	**SS, NC**	**SS, NC**	**SS**
8/19/2004	**NDGISHUB_WMS**	**normal**	**SS**	**SS**	**NC, AP**	**SS**	**SS**	**SS**	**WS, AP, SS**	**NC, SS**	**NC, AP, SS**	**NC, AP**	**DO, AP**	**WS**	**SS**	**DO**	**NV**
6/29/2003	**NDGISHUB_WMS**	**normal**	**SS**	**SS**	**WS, NC**	**SS**	**SS**	**SS**	**WS, AP, NC, SS**	**NC**	**SS, AP**	**AP**	**SS**	**WS, SS, NC, AP**	**WS, SS, NC, AP**	**NC, AP**	**NV**
9/17/1997	NDGISHUB_WMS	dry	NV	SS	SS, AP, NC	SS	SS	SS, AP	WS, AP, NC, SW	NC	SS, AP	AP	SS	WS, AP	WS, AP	NC, SS	SS
number of images regardless of climate conditions			11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
number of wet signatures - all imagery regardless of climate conditions			7	9	11	9	9	9	11	11	11	11	11	11	11	11	9
percent of wet signatures - all imagery regardless of climate conditions			64%	82%	100%	82%	82%	82%	100%	100%	100%	100%	100%	100%	100%	100%	82%
number of imagers with normal climate conditions			8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
number of wet signatures under normal climate condition			6	7	8	7	7	7	8	8	8	8	8	8	8	8	6
percent of wet signatures under normal climate condition			75%	88%	100%	88%	88%	88%	100%	100%	100%	100%	100%	100%	100%	100%	75%
NWI			no	no	PEM1A/C	PEM1A	PEM1A	PEM1A	PEM1C	PEM1C	PEM1C	PEM1A	PEM1Ad	PEM1C	PEM1C	no	no
hydric soil			predominantly non hydric	predominantly non hydric	predominantly hydric	predominantly non hydric	predominantly non hydric	predominantly non hydric	partially hydric	partially hydric	partially hydric	partially hydric	predominantly hydric	not hydric	not hydric	not hydric	predominantly hydric
field verified			no	no	no	no	no	no	yes	yes	yes	yes	yes	yes	yes	yes	yes
wetland ?			yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

* not accessible through corn field

KEY		
WS - wetland signature	SS - soil wetness signature	CS - crop stress
NC - not cropped	AP - altered pattern	NV - normal vegetative cover **
DO - drowned out	SW - standing water	NSS – no soil wetness signature **

** Not a wet signature

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:08 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.1_Upper Maple Site 2A_1997.mxd User: MJS2



Evaluation Area

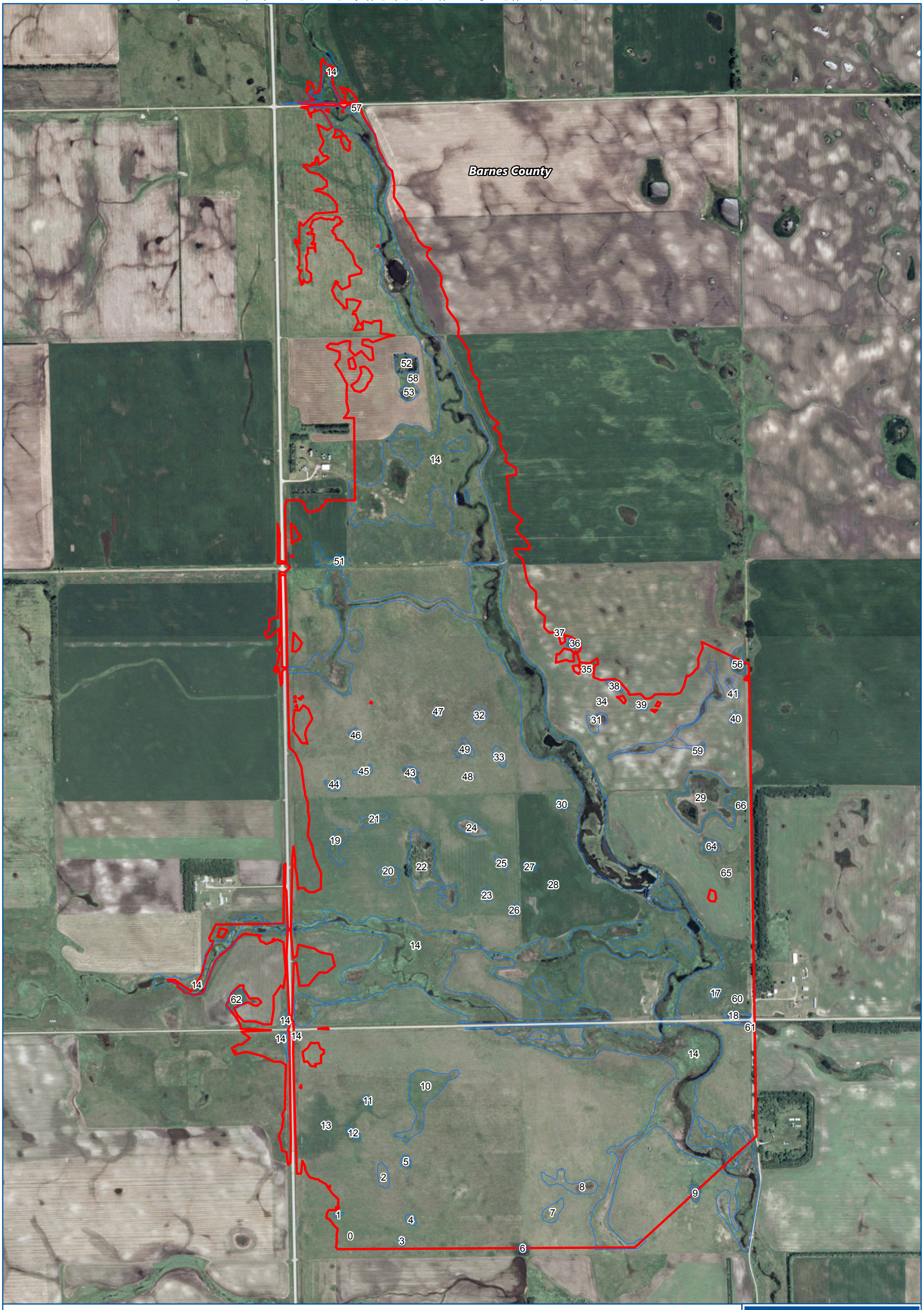
Potential Wetlands

0 500 1,000 1,500 2,000

Feet

SEPTEMBER 17, 1997 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.1



Evaluation Area

Potential Wetlands

BARR

N

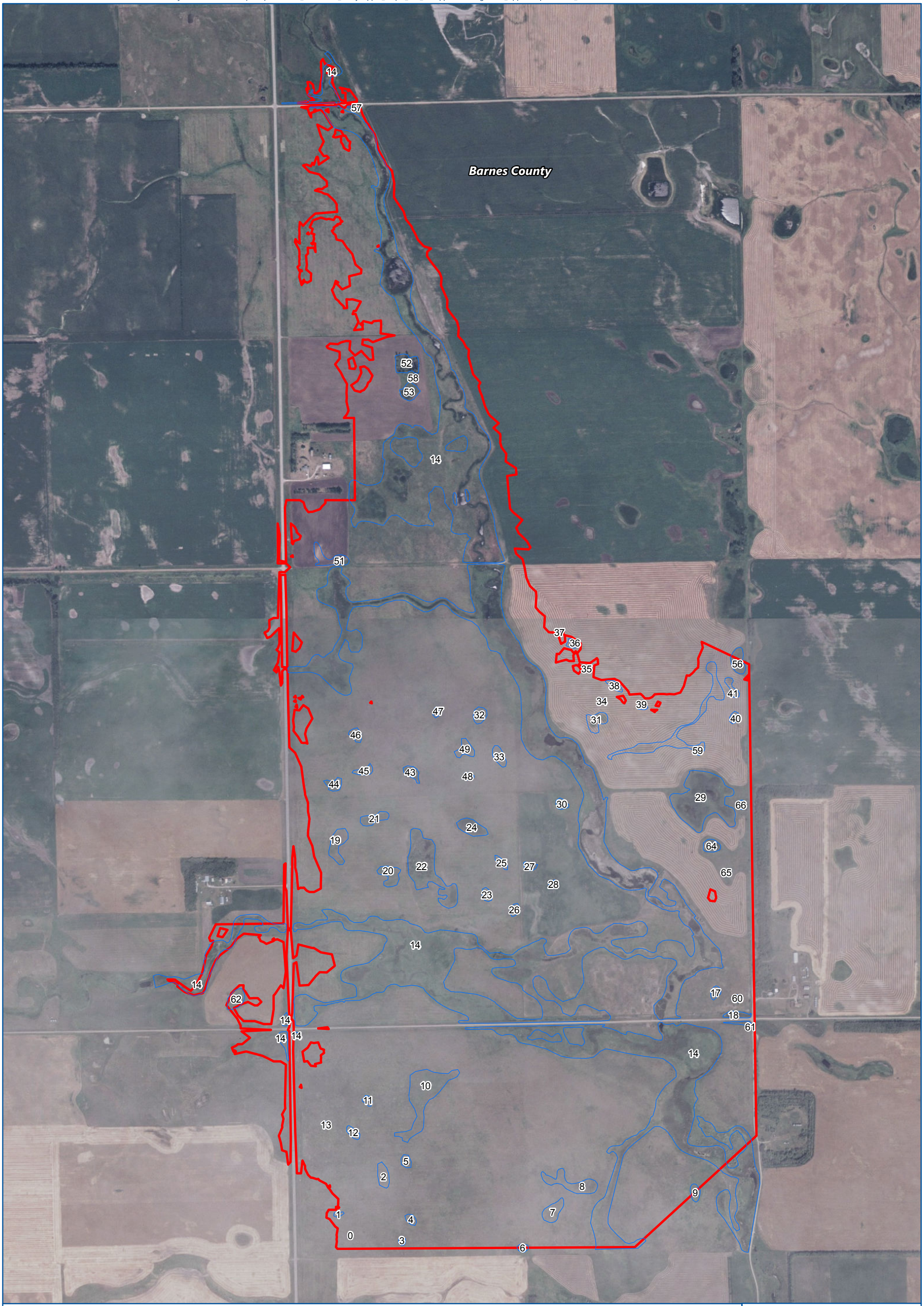
0 500 1,000 1,500 2,000

Feet

JUNE 29, 2003 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.2

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:15 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.3_Upper Maple Site 2A_2004.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

N

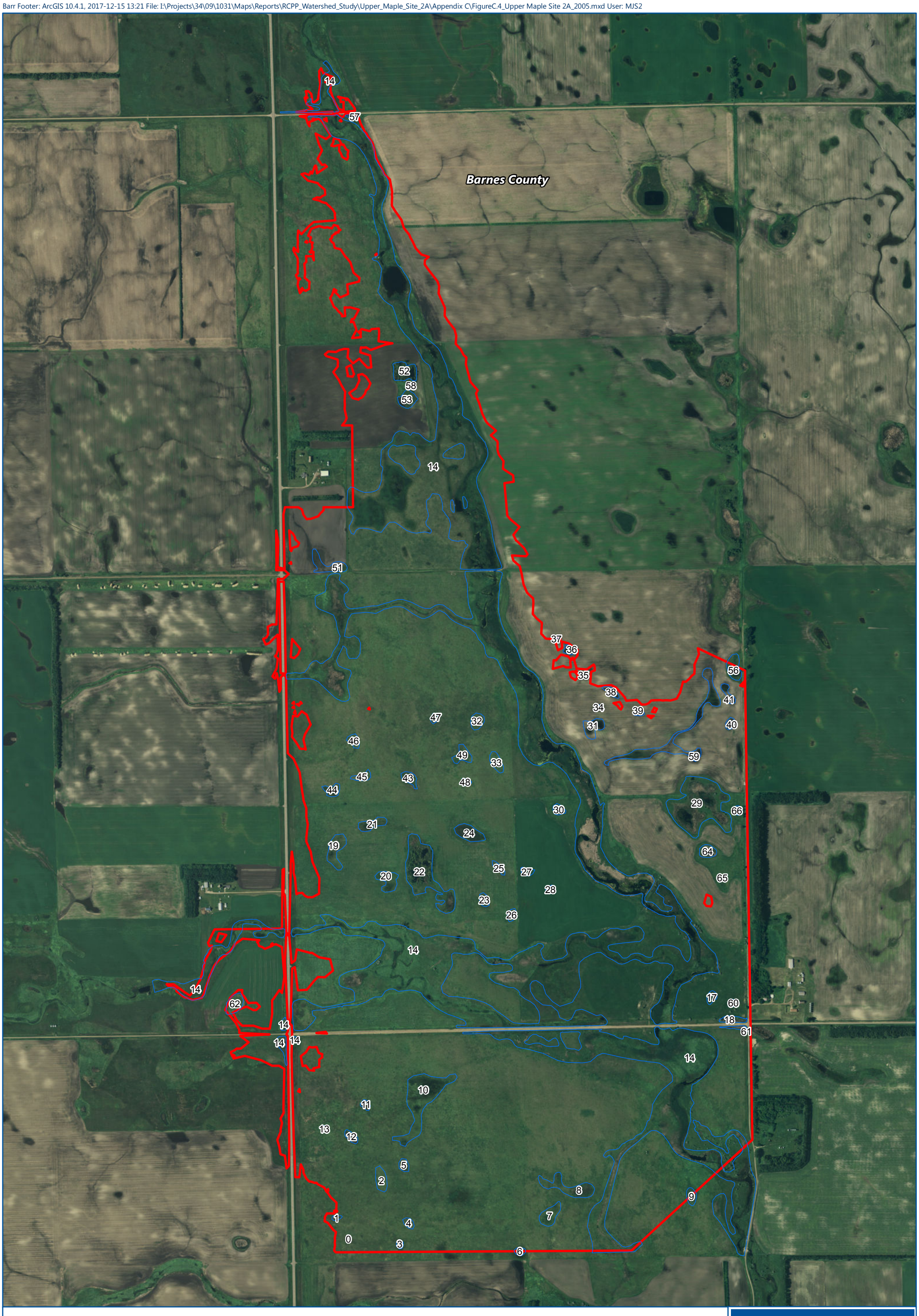
0 500 1,000 1,500 2,000

Feet

AUGUST 19, 2004 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.3

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:21 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.4_Upper Maple Site 2A_2005.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

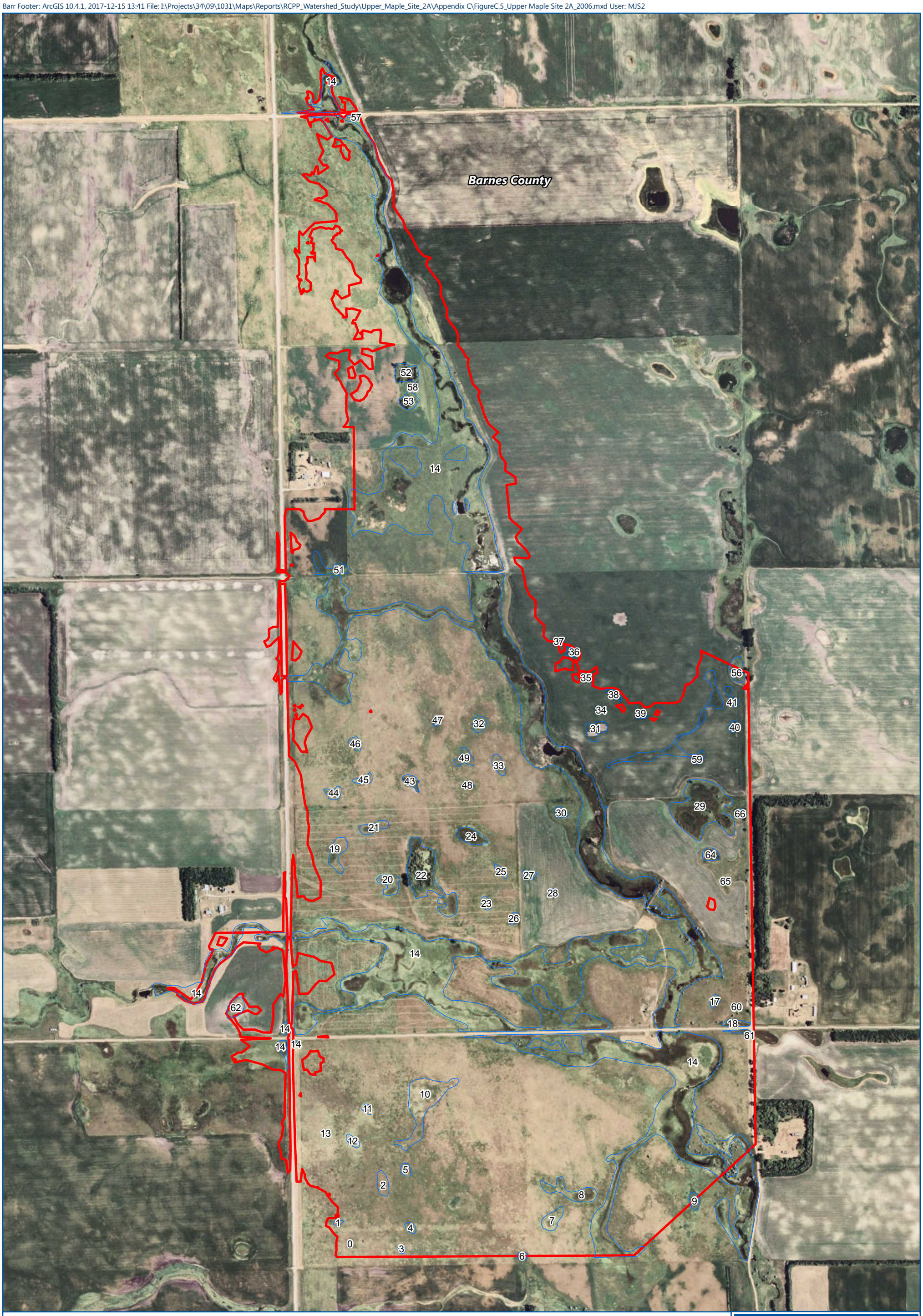
0 500 1,000 1,500 2,000

Feet

JUNE 20, 2005 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.4

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:41 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.5_Upper Maple Site 2A_2006.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

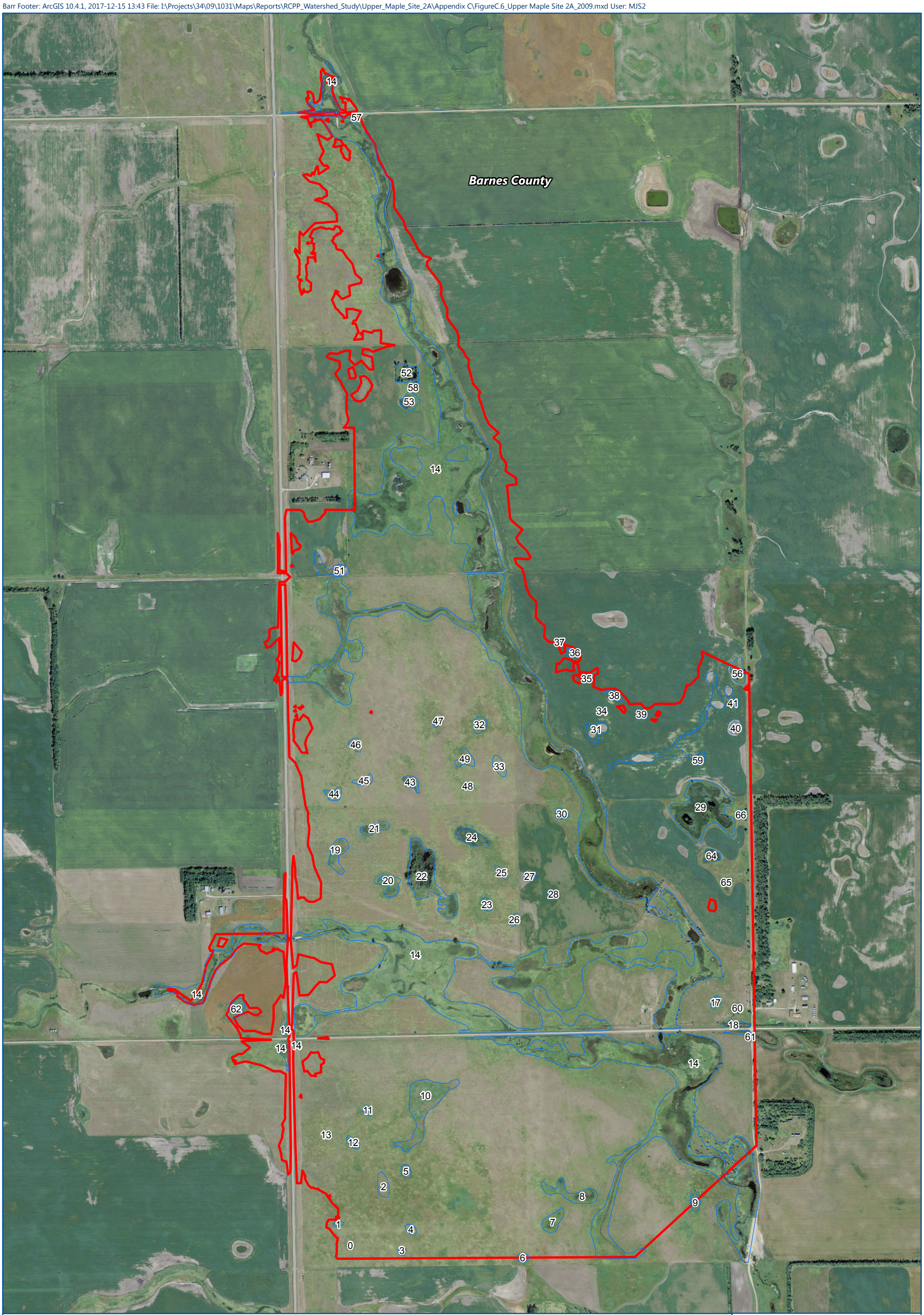
0 500 1,000 1,500 2,000

Feet

JULY 8, 2006 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.5

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:43 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.6_Upper Maple Site 2A_2009.mxd User: MJS2



Evaluation Area

Potential Wetlands

0 500 1,000 1,500 2,000

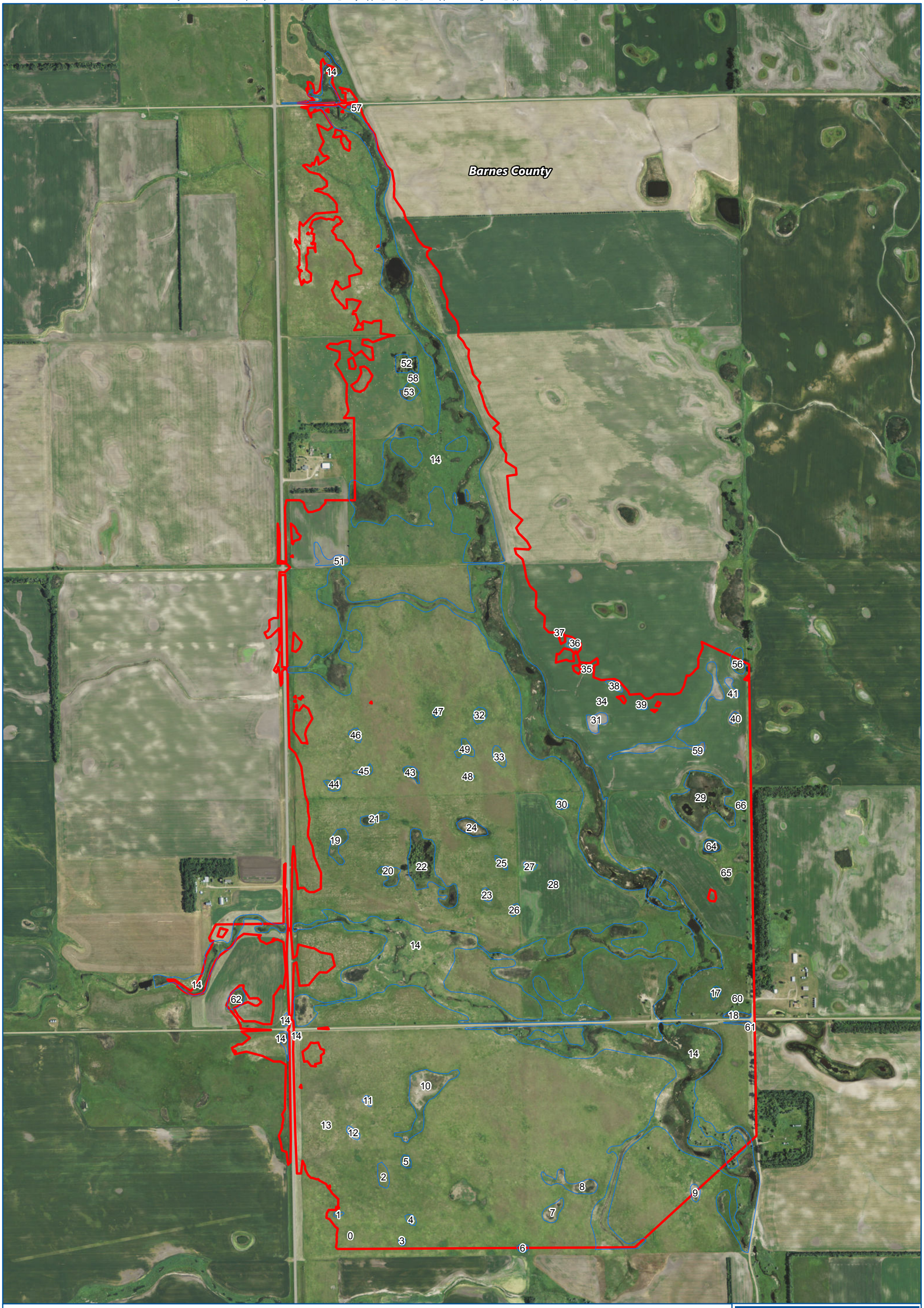
Feet

BARR

AUGUST 18, 2009 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.6

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:52 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.7_Upper Maple Site 2A_2010.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

N

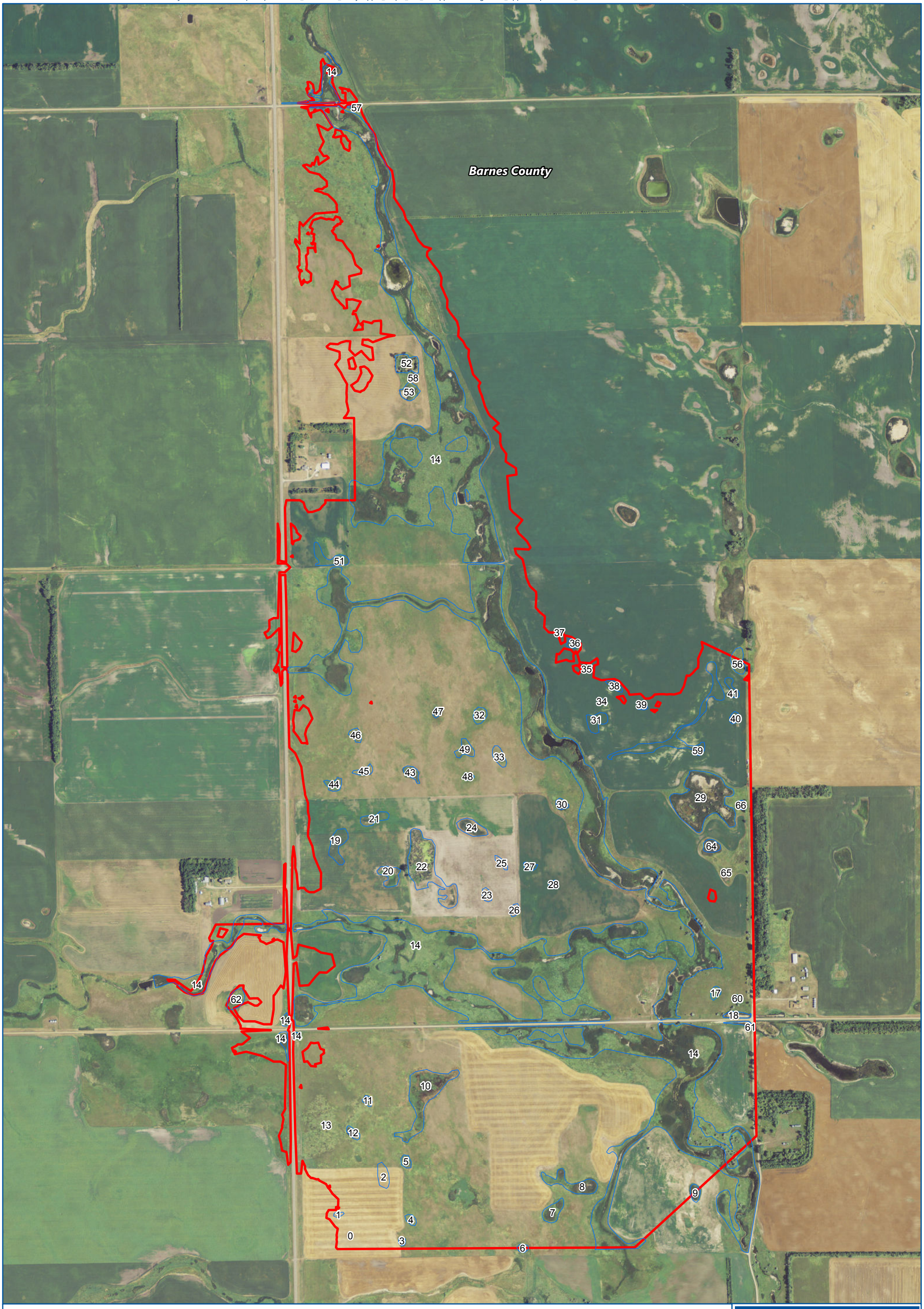
0 500 1,000 1,500 2,000

Feet

JULY 8, 2010 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.7

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:56 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.8_Upper Maple Site 2A_2012.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

N

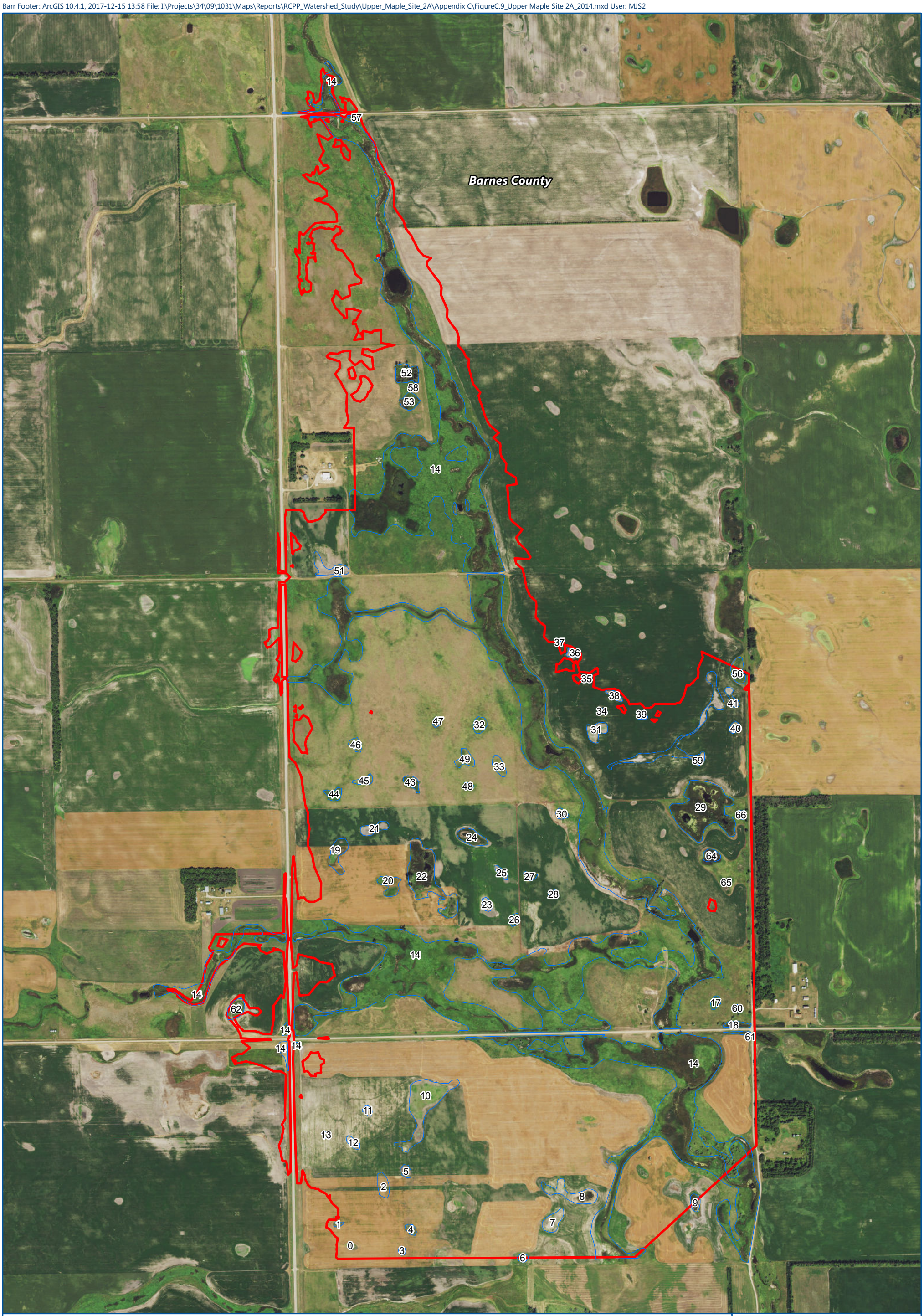
0 500 1,000 1,500 2,000

Feet

JULY 27, 2012 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.8

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:58 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.9_Upper Maple Site 2A_2014.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

N

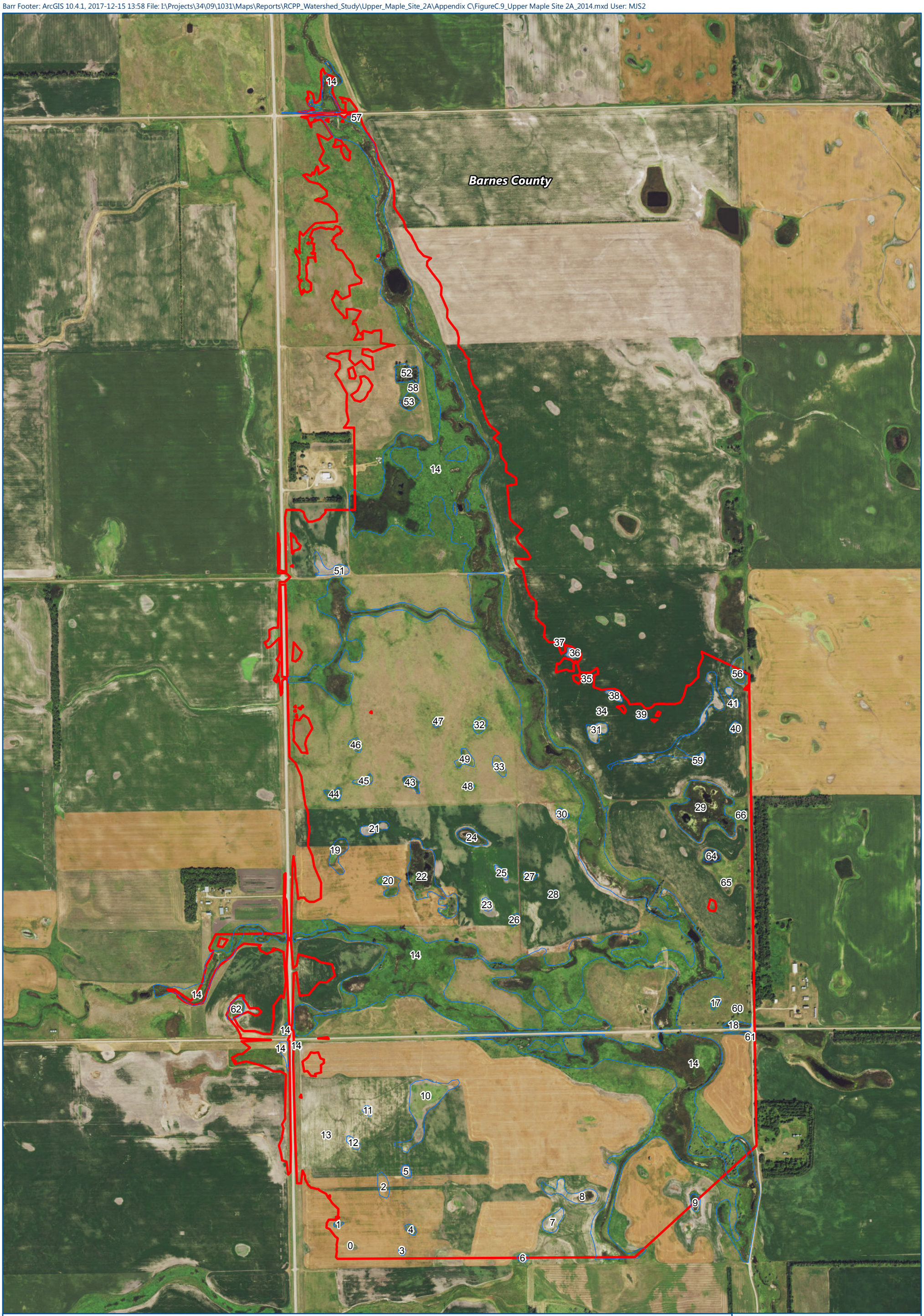
0 500 1,000 1,500 2,000

Feet

AUGUST 12, 2014 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.9

Barr Footer: ArcGIS 10.4.1, 2017-12-15 13:58 File: I:\Projects\34\09\1031\Maps\Reports\RCPP_Watershed_Study\Upper_Maple_Site_2A\Appendix C\FigureC.9_Upper Maple Site 2A_2014.mxd User: MJS2



Evaluation Area

Potential Wetlands

BARR

N

0 500 1,000 1,500 2,000

Feet

SEPTEMBER 26, 2015 IMAGERY
Upper Maple Watershed
Alternative Site 2A
Wetland Delineation

FIGURE C.10

NRCS Addendum

Addendum to Wetland Delineation Report

Upper Maple River Watershed – Site 2A

Prepared by NRCS

January 4, 2024

1.0 *Rationale for Addendum*

While reviewing the Draft Plan EIS in January of 2024, it was observed that a design change had extended the project footprint into an area unevaluated for wetlands.

2.0 *Methods*

A field delineation was not feasible at this time of year due to frozen soils and winter precipitation. Offsite procedures were used to determine a wetland boundary. The same Normal-year precipitation aerial photography was used as that for all other wetlands in the original determination: was used (2003 – 2006, 2014 – 2016) to observe wet signatures. Soil Maps, LiDAR imagery and USFWS National Wetlands Inventory maps were also utilized.

Wetland ID	**Acres**			
67	6.7			
SOILS	**Map Unit**	**Name**	**Hydric Classification Presence (%)**	**Hydric Classification Rating**
	G12A	Vallers-saline-Parnell complex, 0-1 % Slope	86	predominantly hydric
	G25A	Marysland loam, 0-1% slope	86	predominantly hydric
	G250A	Divide loam, 0-2% slope	14	predominantly non-hydric
USFWS National Wetlands Inventory				
NWI (2005)	**Definition**			
NA	Non-Wetland			
NWI (2023)				
PEM1C	Palustrine Emergent, Seasonally Flooded			

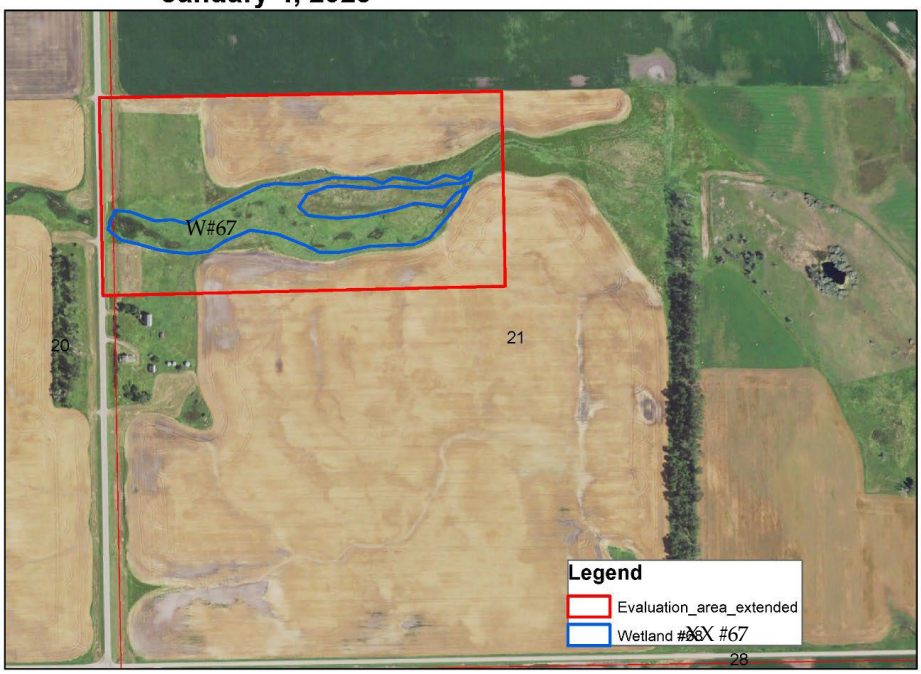
Imagery Date	Imagery Source	Climate conditions	Wetland 67
8/6/2016	NDGISHUB_WMS	Normal	WS
9/26/2015	NDGISHUB_WMS	Normal	WS
8/12/2014	NDGISHUB_WMS	Normal	WS
7/8/2006	NDGISHUB_WMS	Normal	WS
6/20/2005	NDGISHUB_WMS	Normal	WS
8/19/2004	NDGISHUB_WMS	Normal	WS
6/29/2003	NDGISHUB_WMS	Normal	WS

WS = Wetland Signature
NSS = No wetness signature

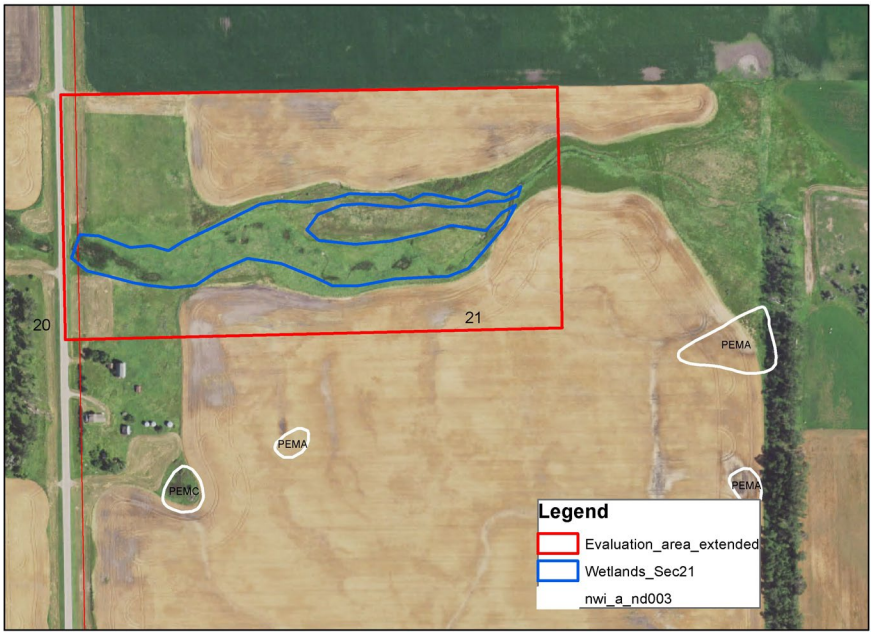
3.0 *Results*

The plan design includes an embankment to be constructed through and perpendicular to Wetland 67, which is a new wetland with continued numbering from Appendix D-4 (Wetland Delineation Report, 2017). A culvert will be installed through the embankment to maintain major hydrologic inputs to the wetland; flood flows beyond the culvert capacity will be diverted to the impoundment. The only impacts to the wetland will be the narrow construction footprint of the embankment which will impact 0.08 acres. The acres impacted were determined to be insufficient to warrant changes to the economics and summary of the project. The project as designed, has net wetland gains that more than offset the loss of 0.08 acres of Wetland #68; Appendix D-5 (Environmental Quality Report) calculates 236.2 acres of wetland gain, which was rounded to 230 acres of wetland gain in OMB summary.

Wetland Map, SW1/4 21-142-56
Addendum to Appendix D-4 Wetland Delineation
January 4, 2023



NWI 2005
Wetland Map, SW1/4 21-142-56



U.S. Fish and Wildlife Service
National Wetlands Inventory

umr 2023 NWI

January 5, 2024

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

National Wetlands Inventory (NWI)
This page was produced by the NWI mapper