

Wetland Delineation Report

William & Mary Keefer Site, PID # 03.030.20.14.0003

Stillwater Township, Minnesota

Prepared for: Lynskey & Clark



October 23, 2018

 Bopray
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Wetland Delineation Report

William & Mary Keefer, PID# 03.030.20.14.0003

Stillwater Township, Minnesota

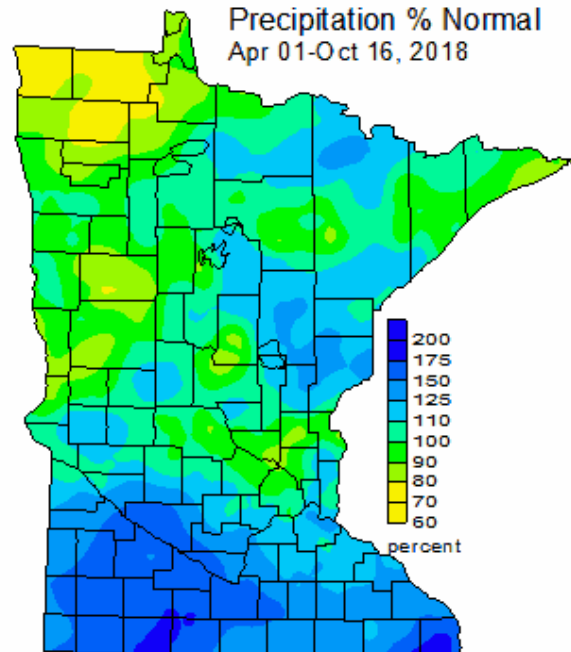
October 23, 2018

Background

Bopray Environmental Services LLC (BES) has completed a wetland delineation on an approximately 40-acre site located in the S ½, NE ¼, Section 3, T30N, R20W, Stillwater Township, and Washington County, Minnesota (**Figure 1**). Most of the site consists of agricultural crop field with a semi-wooded valley along the north side of the site. The topography of the site is gently rolling with steep slopes along the north part of the site according to the U.S.G.S. quadrangle topographic map (**Figure 2**). The approximate sample location area is shown on an aerial photo in **Figure 3**. Cornerstone Surveying will be locating the sample points and incorporating them into the site plans. The purpose of this delineation was to identify wetlands on the site for planning purposes and for regulatory purposes.

Methodologies

The site was evaluated for wetlands based on the methods contained in the “Level 2 Routine Wetland Delineation” section of the U.S. Army Corps of Engineers “Wetland Delineation Manual” (Technical Report Y87-1, 1987) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region. This is the methodology currently used to determine wetlands by both the U.S. Army Corps of Engineers for implementation of Section 404 of the Clean Water Act and by the Minnesota Wetland Conservation Act. According to the Climatology Working Groups’ webpage, the area was at 100-125% of normal year to date precipitation at the time of the site visit. Using the WETS Table method for the proceeding three months the antecedent precipitation was Wetter Than Normal at the time of the site visit.



Results

Resource Maps Review

The National Wetlands Inventory (NWI) (**Figure 4**) does identify a Little Carnelian Lake outlet channel that crosses the middle of the site, but it doesn't exist in the field or on aerial photos. The DNR Protected Waters Inventory map (**Figure 5**) does identify the same outlet channel but does not list it as a public waters water course. The Washington County Soils Survey (**Figure 6**) shows the site is mapped as Antigo silt loam (49, 49B), Bill silt loam (120) and Chetek sandy loam (155C) soil map units. The Brill map unit is listed as having 5% inclusions of hydric soils. The other map units are all listed as having 0% inclusions of hydric soils.

Wetland A

Wetland A is small linear wetland along an old field road in the northeast corner of the site. The characteristics suggest the wetland might be an incidental or artificial wetland. The wetland is a Palustrine, Emergent, Temporarily Flooded (PEMA) seasonally flooded basin. The vegetation in the wetland (SA-W) is dominated by witch grass (*Panicum capillare*) and yellow foxtail grass (*Setaria pumila*). The plant community did meet the dominance test and had a prevalence index of 2.99. Soils in the wetland consisted of nine inches of 10YR 2/1 dense sandy loam with 5% 10YR 3/4 iron concentrations and 3% 10YR 4/2 iron depletions, over 10YR 4/3 dense sandy loam with 5% 10YR 4/2 iron depletions (F6). Surface water (A1) up to four inches deep was observed in the basin. The water table (A2) and soil saturation (A3) was at zero inches in the wetland soil pit at the time of the site visit. The other wetland hydrology indicators observed in the wetland include; geomorphic position (D2) and a positive FAC-neutral test (D5). The adjacent upland (SA-U) is dominated by common buckthorn (*Rhamnus cathartica*), Kentucky bluegrass (*Poa pratensis*) and yellow foxtail grass. The plant community did meet the dominance test but had a prevalence index of 3.54. The upland soils consisted of ten inches of 10YR 2/2 loam, over eight inches of 10YR 3/3 sandy loam, over 10YR 3/4 sandy loam. The water table and soil saturation were not observed within a depth of 25 inches in the upland soil pit. There were no other wetland hydrology indicators observed at the upland sampling point. The wetland boundary was generally staked along a break in the topography and a change in the plant community.

Sample point SP-1

Sample point SP-1 is at the east end of the glacial valley train that runs along the north side of the site. This area was evaluated because the resource maps indicate the soils could have inclusions of hydric soils and there is a drainage easement over the area. The dominant vegetation in the sample area was American elm (*Ulmus americana*), common buckthorn and hazelnut (*Corylus americana*). The plant community did meet the dominance test and had a prevalence index of 2.50. The soil at SP-1 consisted of 16 inches of 10YR 2/2 silt loam, over seven inches of 10YR 2/1 silt loam, over 10YR 2/1 silt loam. There were no redox features observed in the soil profile and the surface was not dark enough to meet the A12 hydric soils

criteria. Surface water was not observed at SP-1, and there were no indicators of previous flooding or ponding. The watertable and saturated soil were not observed within a depth of 27 inches at the time of the site visit, during a wetter than normal time of the year. Although the area is in a concave landscape, the geomorphic position hydrology indicator is not applicable because the area is not wet enough to form a hydric soil. Although the vegetation meets the hydrophytic vegetation criteria it does not meet the FAC-Neutral hydrology criteria. This area was determined to be non-wetlands because it did not meet the hydric soils or wetland hydrology criteria.

Sample point SP-2

Sample point SP-2 is in a small, farmed, depression near the southwest corner of the site. This area was evaluated because of its landscape position. The dominant vegetation in the sample area was soybeans (*Glycine max*), with no weed species due to herbicide applications. The plant community did not meet the dominance test and had a prevalence index of 5.00. The plant community is disturbed and atypical. The soil at SP-2 consisted of eight inches of 10YR 3/2 silt loam, over 10YR 3/3 silt loam. There were no redox features observed in the soil profile and the surface was not dark enough to meet the A12 hydric soils criteria. Surface water was not observed at SP-2, and there were no indicators of previous flooding or ponding. The watertable and soil saturation were deeper than 25 inches at the time of the site visit during a wetter than normal time of the year. Although the area is in a concave landscape, the geomorphic position hydrology indicator is not applicable because the area is not wet enough to form a hydric soil. A preliminary review of historical aerial photos indicated wet signature were very rare in the basin (**Appendix A**). A full offsite hydrology/wetland determination (Farmed Wetland Review) was not conducted because of the rarity of wet signatures in the preliminary review and because the soils in the field were not hydric. This area was determined to be non-wetlands because it did not meet the hydric soils or wetland hydrology criteria.

Sample point SP-3

Sample point SP-3 is in a farmed, depression near the center of the site. This area was evaluated because of its landscape position. The dominant vegetation in the sample area was soybeans (*Glycine max*), with no weed species due to herbicide applications. The plant community did not meet the dominance test and had a prevalence index of 5.00. The plant community is disturbed and atypical. The soil at SP-3 consisted of nine inches of 10YR 2/2 silt loam, over seven inches of 10YR 3/2 silt loam, over 10YR 2/2 silt loam. There were no redox features observed in the soil profile and the surface was not dark enough to meet the A12 hydric soils criteria. Surface water was not observed at SP-3, and there were no indicators of previous flooding or ponding. The watertable and soil saturation was deeper than 24 inches at the time of the site visit during a wetter than normal time of the year. Although the area is in a concave landscape, the geomorphic position hydrology indicator is not applicable because the area is not wet enough to form a hydric soil. A preliminary review of historical aerial photos indicated wet signature were very rare in the basin (**Appendix A**). A full offsite hydrology/wetland

determination (Farmed Wetland Review) was not conducted because of the rarity of wet signatures in the preliminary review and because the soils in the field were not hydric. This area was determined to be non-wetlands because it did not meet the hydric soils or wetland hydrology criteria.

Wetland Classification

BES' classification of the wetlands is based on observations of the site and is include in Table 1 below.

Table 1. Summary of Wetland Characteristics

Basin	Class	Circ. 39 Type	Isolated Y/N	Comments
Wetland A	Seasonally Flooded Basin PEMA	1	Y	This wetland is a small, linear depression along an old field road. It has a very limited watershed and may be a remnant of vehicle tire traffic.
SP-1	Non-wetland	N/A	N/A	This area was evaluated because it is at the low end of a glacial valley train, is mapped as a soil unit with 5% hydric soils inclusions and had a potential wetland plant community.
SP-2	Non-wetland	N/A	N/A	This area was evaluated because of its landscape position but failed to meet any of the wetland criteria.
SP3	Non-wetland	N/A	N/A	This area was evaluated because of its landscape position but failed to meet any of the wetland criteria.

Jurisdiction

Table 1 indicates whether the wetlands are isolated or not for purposes of U.S. Army Corps of Engineers (COE) jurisdiction under Section 404 of the Clean Water Act. This determination is made by BES in the field at the time of the delineation and is essentially our best professional opinion based on the portion of the particular wetland we observed. In some cases, only a small portion of the wetland edge that is present on the property being delineated is evaluated. If no inlets or outlets are observed in the evaluated area, and none are evident on topographic maps or aerial photos, we are inclined to determine the wetland is isolated. However, since the entire wetland is sometimes not assessed, it is possible that inlets and/or outlets do exist and

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that the wetland has a surface connection to a federal “navigable” water and, thus, falls within the jurisdiction of Section 404. Therefore, a determination by BES of whether a particular wetland is isolated or not should not be considered a final determination with regard to COE jurisdiction until the COE concurs with the determination. The wetland on the site appear to be an isolated basin with no outlets or overland connections to other wetlands or waters of the US. Therefore, the COE should only take jurisdiction over Wetland A.

There are no wetlands or waterways identified on the protected waters inventory map so the Minnesota Department of Natural Resources (DNR) will not have jurisdiction over this site. Wetland A is regulated under the Minnesota Wetland Conservation Act (WCA) which is administered by the Washington Conservation District as the Local Government Units (LGU).

A copy of this report should be submitted to the Corps of Engineers and the LGU responsible for administering the WCA. Supplying these agencies with reports will serve the dual purpose of determining which agencies have jurisdiction and beginning the process of obtaining concurrence with the non-wetland determination.

Additional information regarding the sites’ vegetation, soils and hydrology is included in **Appendix B**. Ground level photos of the wetlands are included in **Figures 7, 8, 9 and 10**.

The information contained herein represents the findings of BES during wetland evaluation activities conducted October 17, 2018 at the referenced site.

Respectfully,
Bopray Environmental Services LLC

Kelly J. Bopray
Professional Soil Scientist
Certified Wetland Delineator

Date

Enclosures

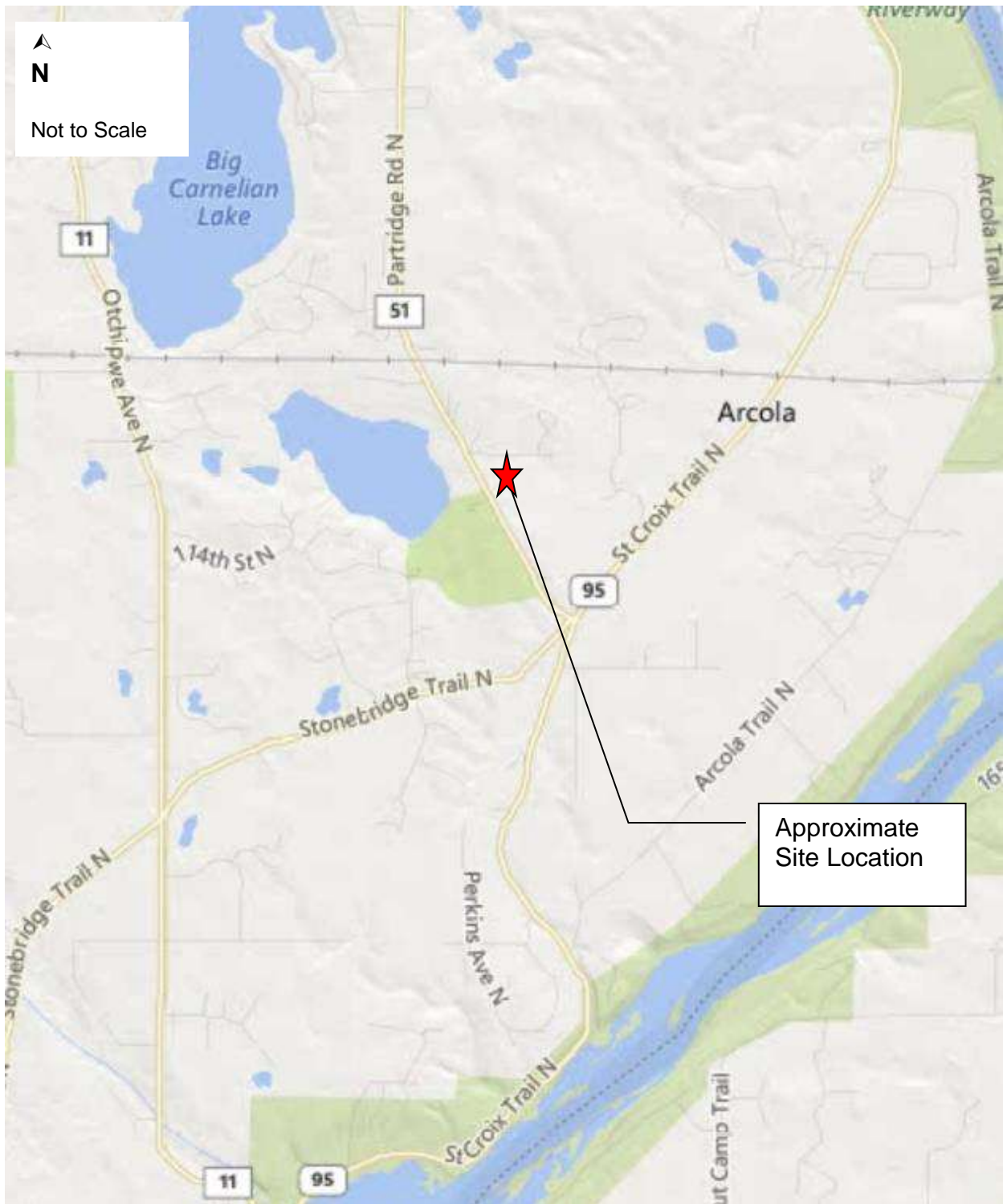


Figure 1. Location Map
Keffer Site, PID 03.030.20.14.0003
Stillwater Township, Minnesota

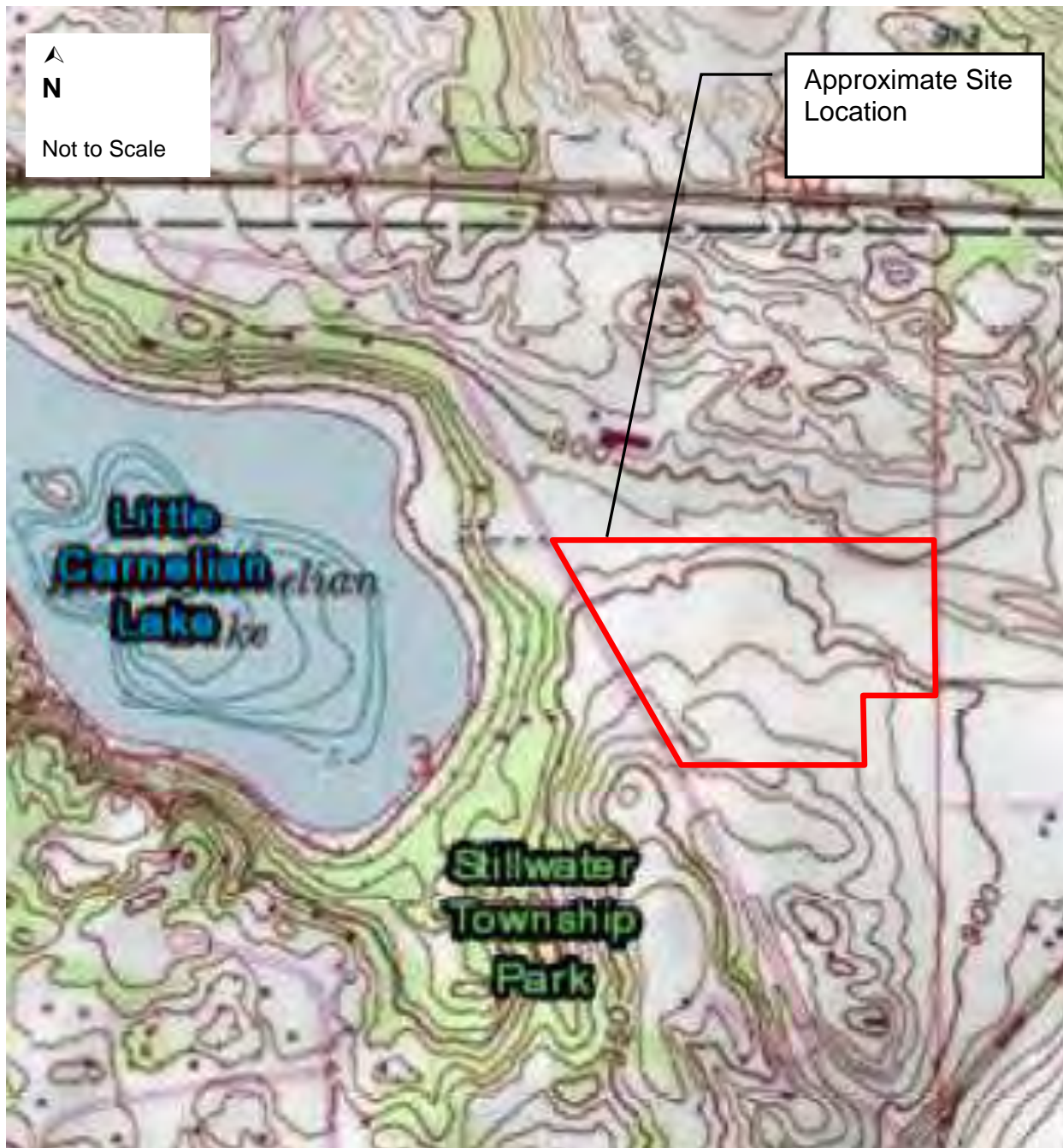


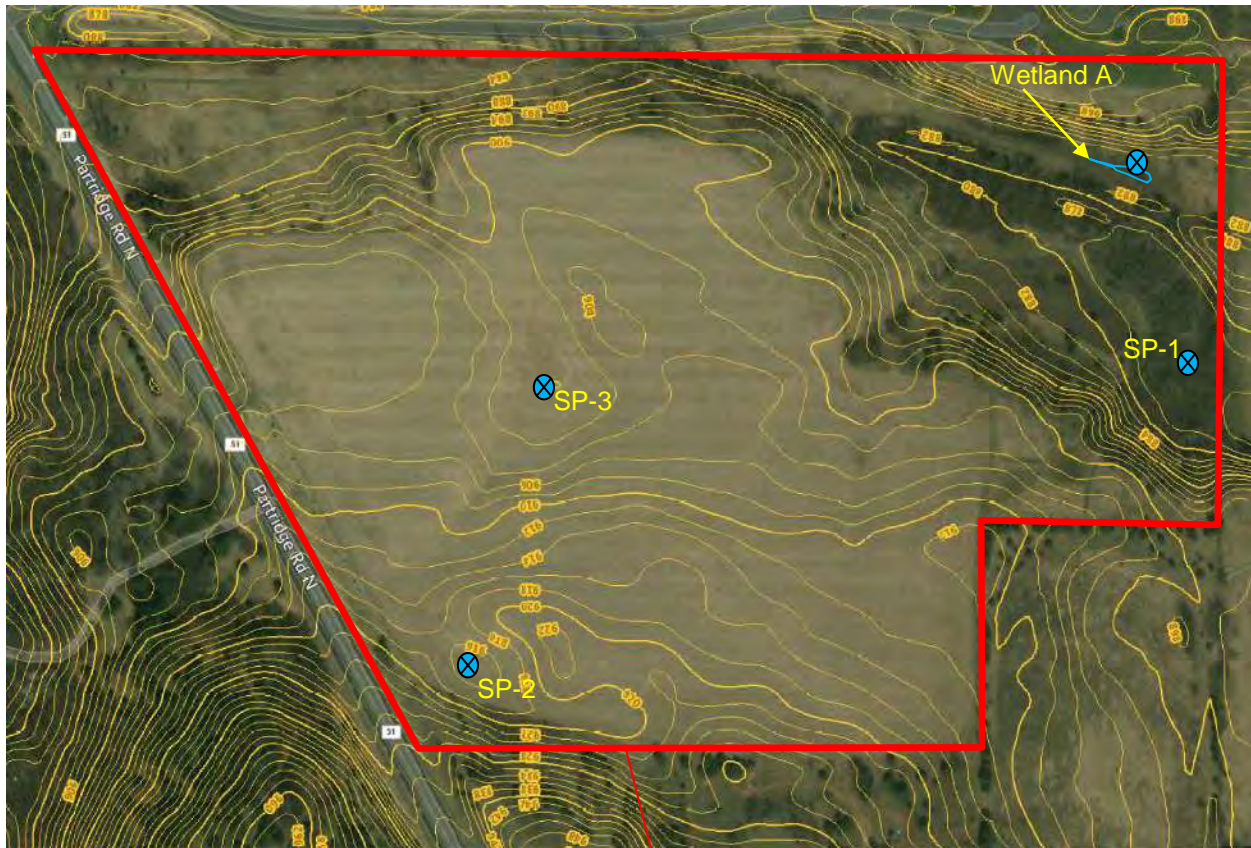
Figure 2. USGS Quadrangle Map

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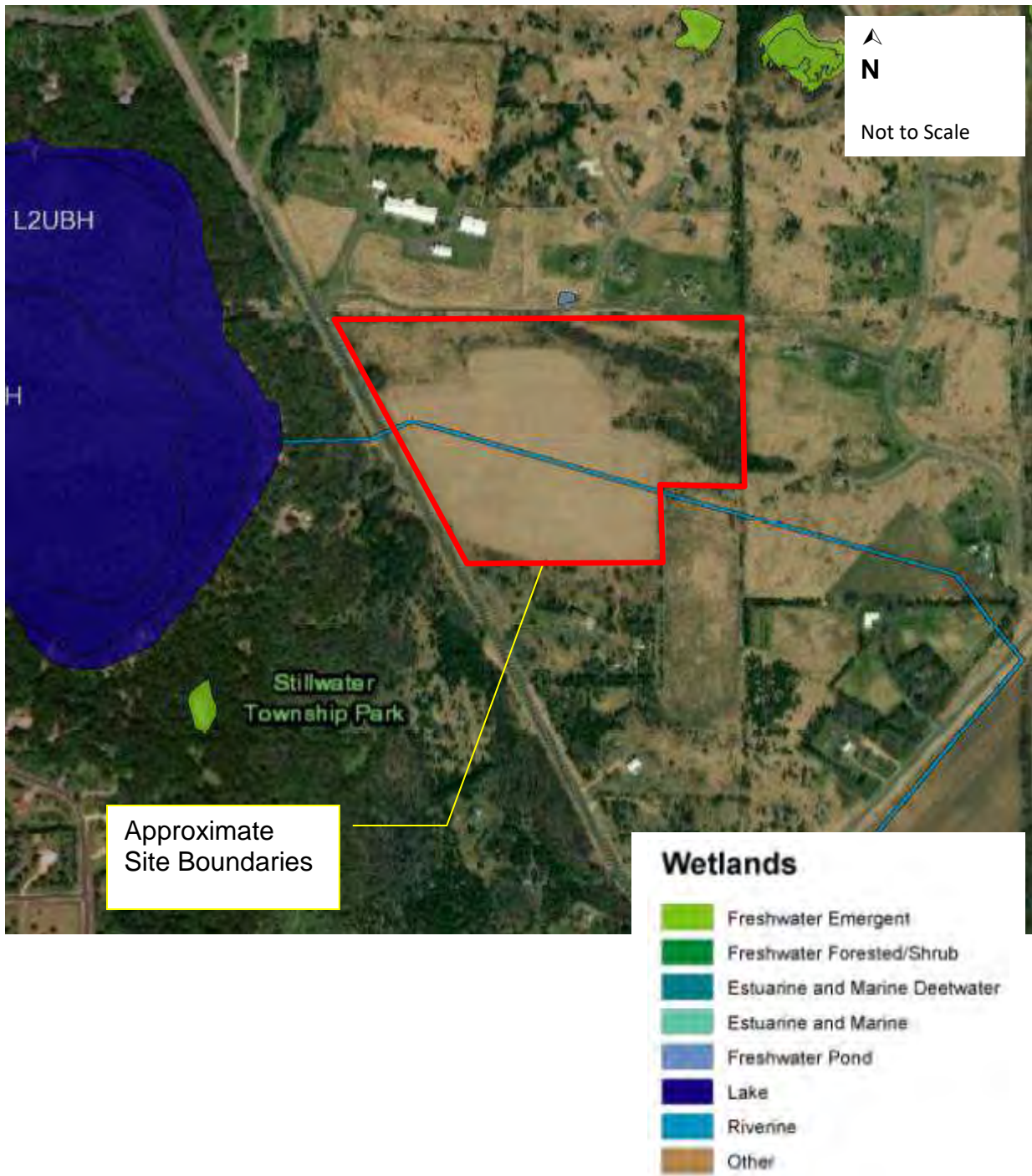


Not to Scale

Approximate Site Boundaries



**Figure 3. Aerial Photo With
Approximate Wetland Boundaries**
Keeper Site, PID# 03.030.20.14.0003
Stillwater Township, Minnesota



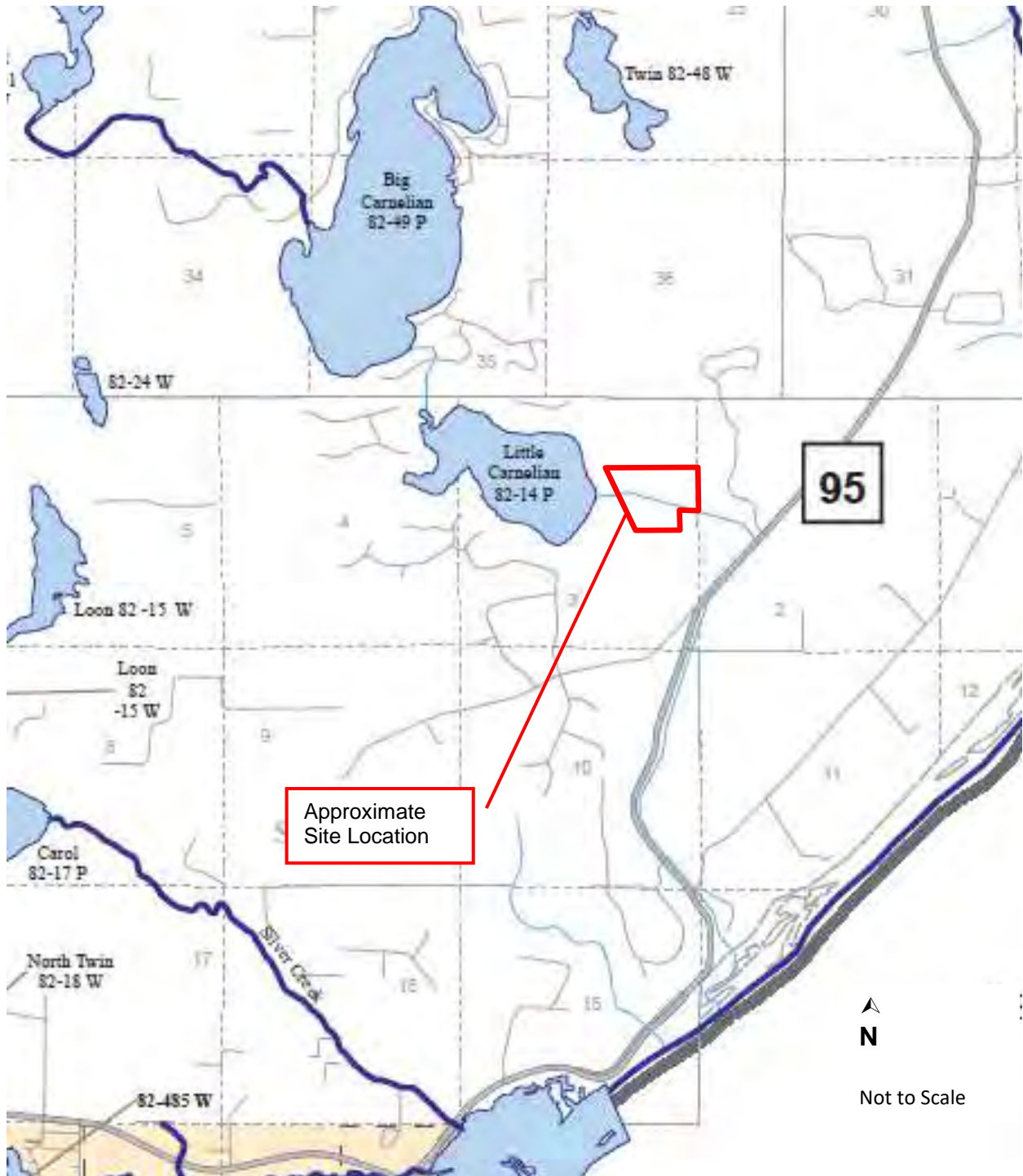
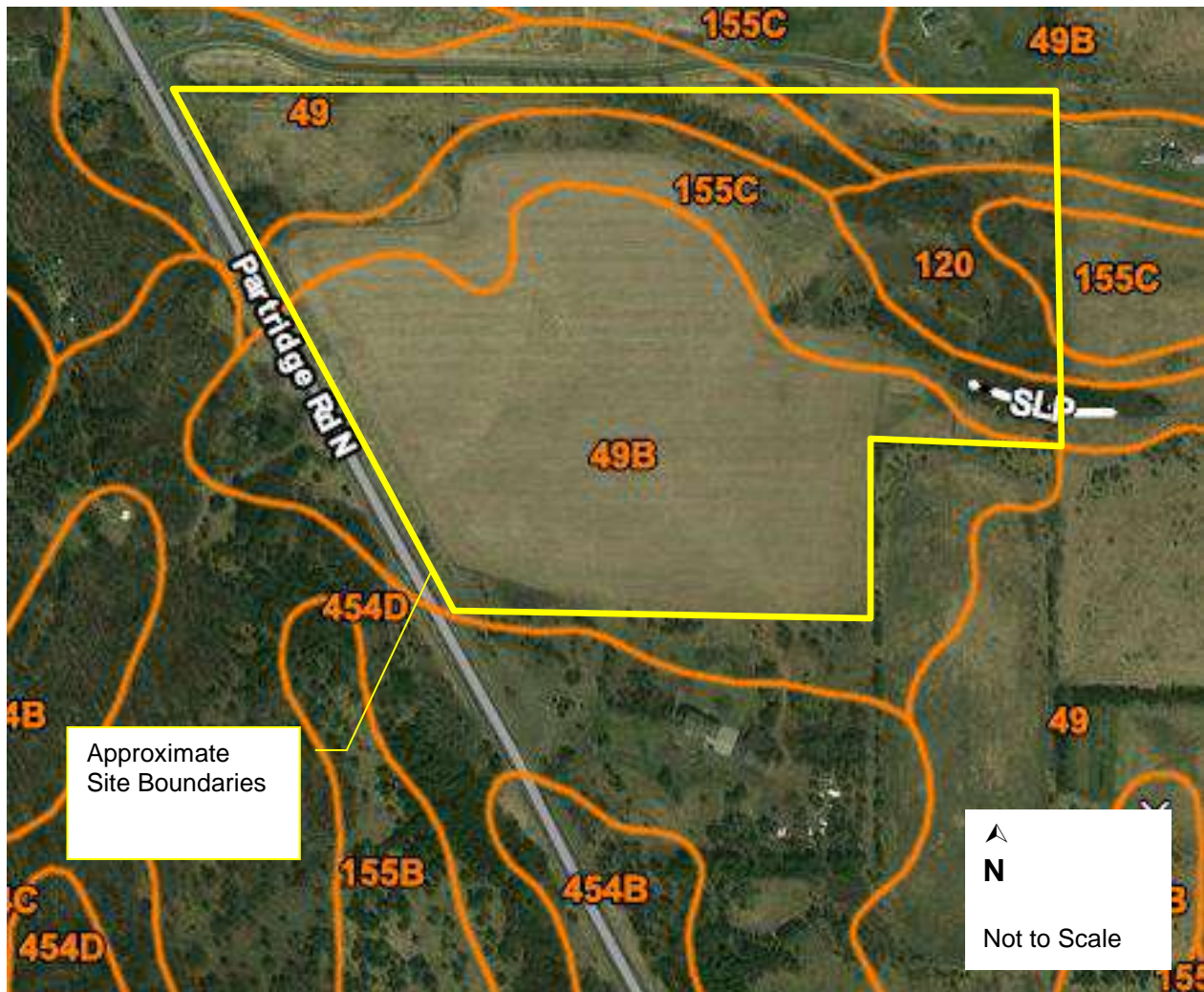


Figure 5. DNR Protected Waters Inventory Map

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Soil Map Unit Legend

- 49 Antigo silt loam, 0-2%, 0% Hydric soils.
- 49B Antigo silt loam, 2-6%, 0% Hydric soils.
- 120 Brill silt loam, 5% Hydric soils.
- 155C Chetek sandy loam, 0-6% slopes, 0% Hydric soils.



**Figure 6. Washington County
Soil Survey Map**
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Wetland A looking west. This basin is a linear feature that may be a remnant of a rut along an old field road. The basin is dominated by witch grass and yellow foxtail grass.



Wetland A soil profiles, SA-W is on top. SA-W has a redox dark surface over a high chroma subsoil. There were no redox features observed in the SA-U soil profile.



Sample point SP-1 is on the east side of the property in a glacial valley train. Topographically any drainage from the west cannot leave the site because the property to the east is higher.



The SP-1 soil profile is a mollisol, but lacks redox features and the surface is not dark enough to meet the a12 criteria.



Sample point SP-2 is a closed depression in the southwest corner of the site. The area is farmed but rarely shows evidence of wetness on historical aerial photos.



The SP-2 soil profile is a mollisol, but lacks redox features and the surface is not dark enough to meet the A12 criteria.



Sample Point SP-3 is a depression near the center of the site.



SP-3 looking east. What appears to be a darker signature in the photo above, is a result of the soybeans lodging and not a sign of wetness. The soil was similar to SP-2 and was not hydric.

Appendix A



Appendix A. Historical Aerial Photos

Keffer Site, PID 03.030.20.14.0003
Stillwater Township, Minnesota

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Appendix A. Historical Aerial Photos
Keffer Site, PID 03.030.20.14.0003
Stillwater Township, Minnesota

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2005, May



2006, June

Appendix A. Historical Aerial Photos
Keffer Site, PID 03.030.20.14.0003
Stillwater Township, Minnesota



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Appendix A. Historical Aerial Photos
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Appendix B

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bill Keefer Site City/County: Stillwater Twp/Was Sampling Date: 10/17/2018
 Applicant/Owner: Mick Lynskey/Bill Keefer State: MN Sampling Point: SA-W
 Investigator(s): Kelly Bopray PSS, CWD Section, Township, Range: Sec. 3, T30N, R20W
 Landform (hillslope, terrace, etc.): footslope, glacial valley train Local relief (concave, convex, none): concave
 Slope (%): 0-2% Lat.: _____ Long.: _____ Datum: _____
 Soil Map Unit Name: 120 Brill silt loam NWI Classification: not id'ed
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil _____, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u> Hydric soil present? <u>Y</u> Indicators of wetland hydrology present? <u>Y</u>	Is the sampled area within a wetland? <u>Y</u> If yes, optional wetland site ID: <u>Wetland A, PEMA</u>
Remarks: (Explain alternative procedures here or in a separate report.) YTD precip was 100-125% of average at the time of the site visit. Per the WETS Table method, antecedent precip was wetter than normal.	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input checked="" type="checkbox"/> Surface Water (A1) _____ Water-Stained Leaves (B9) <input checked="" type="checkbox"/> High Water Table (A2) _____ Aquatic Fauna (B13) <input checked="" type="checkbox"/> Saturation (A3) _____ Marl Deposits (B15) _____ Water Marks (B1) _____ Hydrogen Sulfide Odor (C1) _____ Sediment Deposits (B2) _____ Oxidized Rhizospheres on Living _____ Drift Deposits (B3) _____ Roots (C3) _____ Algal Mat or Crust (B4) _____ Presence of Reduced Iron (C4) _____ Iron Deposits (B5) _____ Recent Iron Reduction in Tilled _____ Inundation Visible on Aerial _____ Soils (C6) _____ Imagery (B7) _____ Thin Muck Surface (C7) _____ Sparsely Vegetated Concave _____ Other (Explain in Remarks) _____ Surface (B8)	Secondary Indicators (minimum of two required) _____ Surface Soil Cracks (B6) _____ Drainage Patterns (B10) _____ Moss Trim Lines (B16) _____ Dry-Season Water Table (C2) _____ Crayfish Burrows (C8) _____ Saturation Visible on Aerial Imagery _____ (C9) _____ Stunted or Stressed Plants (D1) <input checked="" type="checkbox"/> Geomorphic Position (D2) _____ Shallow Aquitard (D3) <input checked="" type="checkbox"/> FAC-Neutral Test (D5) _____ Microtopographic Relief (D4)	Field Observations: Surface water present? Yes <u>X</u> No _____ Depth (inches): <u>0-4</u> Water table present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> Saturation present? Yes <u>X</u> No _____ Depth (inches): <u>0</u> (includes capillary fringe)
Indicators of wetland hydrology present? <u>Y</u>		
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks:		

VEGETATION - Use scientific names of plants

Sampling Point: SA-W

Tree Stratum	Plot Size (30 ft)	Absolute % Cover	Dominant Species	Indicator Status	50/20 Thresholds		
1					Tree Stratum	20%	50%
2					Sapling/Shrub Stratum	0	0
3					Herb Stratum	21	52
4					Woody Vine Stratum	0	0
5					Dominance Test Worksheet		
6					Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)		
7					Total Number of Dominant Species Across all Strata: <u>2</u> (B)		
8					Percent of Dominant Species that are OBL, FACW, or FAC: <u>100.00%</u> (A/B)		
9					Prevalence Index Worksheet		
10		<u>0</u>	= Total Cover		Total % Cover of:		
					OBL species	<u>0</u> x 1 =	<u>0</u>
					FACW species	<u>1</u> x 2 =	<u>2</u>
					FAC species	<u>102</u> x 3 =	<u>306</u>
					FACU species	<u>0</u> x 4 =	<u>0</u>
					UPL species	<u>0</u> x 5 =	<u>0</u>
					Column totals	<u>103</u> (A)	<u>308</u> (B)
					Prevalence Index = B/A = <u>2.99</u>		
					Hydrophytic Vegetation Indicators:		
					<input type="checkbox"/> Rapid test for hydrophytic vegetation		
					<input checked="" type="checkbox"/> Dominance test is >50%		
					<input checked="" type="checkbox"/> Prevalence index is ≤3.0*		
					Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)		
					<input type="checkbox"/> Problematic hydrophytic vegetation* (explain)		
					*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic		
					Definitions of Vegetation Strata:		
					Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.		
					Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
					Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.		
					Woody vines - All woody vines greater than 3.28 ft in height.		
					Hydrophytic vegetation present? <u>Y</u>		
					Herb Stratum Plot Size (5 ft) Absolute % Cover Dominant Species Indicator Status		
1					1 <i>Panicum capillare</i> 70 Y FAC		
2					2 <i>Setaria pumila</i> 30 Y FAC		
3					3 <i>Echinochloa crus-galli</i> 2 N FAC		
4					4 <i>Bidens frondosa</i> 1 N FACW		
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
		<u>103</u>	= Total Cover				
					Woody Vine Stratum Plot Size (30 ft) Absolute % Cover Dominant Species Indicator Status		
1							
2							
3							
4							
5							
		<u>0</u>	= Total Cover				
Remarks: (Include photo numbers here or on a separate sheet)							

SOIL

Sampling Point: SA-W

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*	Loc**		
0-9	10YR 2/1		10YR 3/4	5	C	M	sandy loam	dense
0-9			10YR 4/2	3	D	M		
9-18+	10YR 4/3		10YR 4/2	5	D	M	sandy loam	dense

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

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils:

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> <input type="checkbox"/> Histisol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Stratified Layers (A5) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4) <input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) | <ul style="list-style-type: none"> <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input checked="" type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8) | <ul style="list-style-type: none"> <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) <input type="checkbox"/> Dark Surface (S7) (LRR K, L) <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) <input type="checkbox"/> Red Parent Material (F21) <input type="checkbox"/> Very Shallow Dark Surface (TF12) <input type="checkbox"/> Other (Explain in Remarks) |
|---|--|---|

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric soil present? Y

Remarks:
 basin may be an old rut along a field road.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bill Keefer Site City/County: Stillwater Twp/Was Sampling Date: 10/17/2018
 Applicant/Owner: Mick Lynskey/Bill Keefer State: MN Sampling Point: SA-U
 Investigator(s): Kelly Bopray PSS, CWD Section, Township, Range: Sec. 3, T30N, R20W
 Landform (hillslope, terrace, etc.): footslope, glacial valley train Local relief (concave, convex, none): concave
 Slope (%): 2-6% Lat.: _____ Long.: _____ Datum: _____
 Soil Map Unit Name: 120 Brill silt loam NWI Classification: Not id'ed
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil X, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u> Hydric soil present? <u>N</u> Indicators of wetland hydrology present? <u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>upland adj. to Wetland A</u>
Remarks: (Explain alternative procedures here or in a separate report.) YTD precip was 100-125% of average at the time of the site visit. Per the WETS Table method, antecedent precip was wetter than normal. Soil is a mollisol.	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)	Field Observations: Surface water present? Yes _____ No <u>X</u> Depth (inches): _____ Water table present? Yes _____ No <u>X</u> Depth (inches): <u>>25</u> Saturation present? Yes _____ No <u>X</u> Depth (inches): <u>>25</u> (includes capillary fringe)
Indicators of wetland hydrology present? <u>N</u>		Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available: _____ _____
Remarks: no hydrology indicators observed.		

VEGETATION - Use scientific names of plants

Sampling Point: SA-U

<p>Tree Stratum Plot Size (30 ft)</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th></th> <th>Absolute % Cover</th> <th>Dominant Species</th> <th>Indicator Status</th> </tr> </thead> <tbody> <tr><td>1</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>2</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>3</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>4</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>5</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>6</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>7</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>8</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>9</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr><td>10</td><td>_____</td><td>_____</td><td>_____</td></tr> <tr> <td></td> <td style="text-align: right;"><u>0</u></td> <td colspan="2">= Total Cover</td> </tr> </tbody> </table> <p>Sapling/Shrub Stratum Plot Size (15 ft)</p> <table border="1" style="width:100%; 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(7.6 cm) or more in diameter at breast height (DBH), regardless of height.</p> <p>Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.</p> <p>Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.</p> <p>Woody vines - All woody vines greater than 3.28 ft in height.</p> <p>Hydrophytic vegetation present? <u>Y</u></p>		20%	50%	Tree Stratum	0	0	Sapling/Shrub Stratum	7	18	Herb Stratum	20	50	Woody Vine Stratum	0	0	OBL species	0	x 1 =	0	FACW species	0	x 2 =	0	FAC species	65	x 3 =	195	FACU species	67	x 4 =	268	UPL species	3	x 5 =	15	Column totals	<u>135</u> (A)		<u>478</u> (B)	Prevalence Index = B/A =			<u>3.54</u>
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SOIL

Sampling Point: SA-U

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*	Loc**		
0-10	10YR 2/2						loam	
10-18	10YR 3/3						sandy loam	
18-25+	10YR 3/4						sandy loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric soil present? N

Remarks:
 no redox features observed.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bill Keefer Site City/County: Stillwater Twp/Was Sampling Date: 10/17/2018
 Applicant/Owner: Mick Lynskey/Bill Keefer State: MN Sampling Point: SP-1
 Investigator(s): Kelly Bopray PSS, CWD Section, Township, Range: Sec. 3, T30N, R20W
 Landform (hillslope, terrace, etc.): footslope, glacial valley train Local relief (concave, convex, none): concave
 Slope (%): 0-2% Lat.: _____ Long.: _____ Datum: _____
 Soil Map Unit Name: 120 Brill silt loam NWI Classification: Not id'ed
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation _____, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil X, or hydrology _____ naturally problematic? circumstances" present? Yes
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u>Y</u> Hydric soil present? <u>N</u> Indicators of wetland hydrology present? <u>N</u>	Is the sampled area within a wetland? <u>N</u> If yes, optional wetland site ID: <u>Non-wetland</u>
Remarks: (Explain alternative procedures here or in a separate report.) YTD precip was 125-150% of average at the time of the site visit. Per the WETS Table method, antecedent precip was wetter than normal. Soil is a mollisol.	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Oxidized Rhizospheres on Living <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Roots (C3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Recent Iron Reduction in Tilled <input type="checkbox"/> Inundation Visible on Aerial <input type="checkbox"/> Soils (C6) <input type="checkbox"/> Imagery (B7) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Sparsely Vegetated Concave <input type="checkbox"/> Other (Explain in Remarks) <input type="checkbox"/> Surface (B8)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery <input type="checkbox"/> (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)	Field Observations: Surface water present? Yes _____ No <u>X</u> Depth (inches): _____ Water table present? Yes _____ No <u>X</u> Depth (inches): <u>>27</u> Saturation present? Yes _____ No <u>X</u> Depth (inches): <u>>27</u> (includes capillary fringe)
Indicators of wetland hydrology present? <u>N</u>		
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: geomorphic position is not applicable because the soil is not hydric. Does not meet D5.		

VEGETATION - Use scientific names of plants

Sampling Point: SP-1

Tree Stratum					50/20 Thresholds		
Plot Size (30 ft)		Absolute % Cover	Dominant Species	Indicator Status		20%	50%
1	<i>Ulmus americana</i>	35	Y	FACW	Tree Stratum	7	18
2					Sapling/Shrub Stratum	5	13
3					Herb Stratum	0	0
4					Woody Vine Stratum	0	0
5							
6							
7							
8							
9							
10							
		35	= Total Cover				
Sapling/Shrub Stratum					Dominance Test Worksheet		
Plot Size (15 ft)		Absolute % Cover	Dominant Species	Indicator Status	Number of Dominant Species that are OBL, FACW, or FAC: <u>2</u> (A)		
1	<i>Rhamnus cathartica</i>	20	Y	FAC	Total Number of Dominant Species Across all Strata: <u>3</u> (B)		
2	<i>Corylus americana</i>	5	Y	FACU	Percent of Dominant Species that are OBL, FACW, or FAC: <u>66.67%</u> (A/B)		
3							
4							
5							
6							
7							
8							
9							
10							
		25	= Total Cover				
Herb Stratum					Prevalence Index Worksheet		
Plot Size (5 ft)		Absolute % Cover	Dominant Species	Indicator Status	Total % Cover of:		
1					OBL species	<u>0</u> x 1 =	<u>0</u>
2					FACW species	<u>35</u> x 2 =	<u>70</u>
3					FAC species	<u>20</u> x 3 =	<u>60</u>
4					FACU species	<u>5</u> x 4 =	<u>20</u>
5					UPL species	<u>0</u> x 5 =	<u>0</u>
6					Column totals	<u>60</u> (A)	<u>150</u> (B)
7					Prevalence Index = B/A =		<u>2.50</u>
8							
9							
10							
11							
12							
13							
14							
15							
		0	= Total Cover				
Woody Vine Stratum					Hydrophytic Vegetation Indicators:		
Plot Size (30 ft)		Absolute % Cover	Dominant Species	Indicator Status	<input type="checkbox"/> Rapid test for hydrophytic vegetation <input checked="" type="checkbox"/> Dominance test is >50% <input checked="" type="checkbox"/> Prevalence index is ≤3.0* Morphological adaptations* (provide supporting data in Remarks or on a separate sheet) Problematic hydrophytic vegetation* (explain) *Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic		
1					Definitions of Vegetation Strata: Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height. Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall. Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall. Woody vines - All woody vines greater than 3.28 ft in height.		
2							
3							
4							
5							
		0	= Total Cover		Hydrophytic vegetation present? <u>Y</u>		

Remarks: (Include photo numbers here or on a separate sheet)
 No understory vegetation

SOIL

Sampling Point: SP-1

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*	Loc**		
0-4	10YR 2/2						silt loam	
4-16	10YR 2/2						silt loam	
16-23	10YR 2/1						silt loam	
23-27+	10YR 2/1						loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

Indicators for Problematic Hydric Soils:

- | | | |
|---|--|--|
| <input type="checkbox"/> Histisol (A1) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR R, MLRA 149B) | <input type="checkbox"/> 2 cm Muck (A10) (LRR K, L, MLRA 149B) |
| <input type="checkbox"/> Histic Epipedon (A2) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR R, MLRA 149B) | <input type="checkbox"/> Coast Prairie Redox (A16) (LRR K, L, R) |
| <input type="checkbox"/> Black Histic (A3) | <input type="checkbox"/> Loamy Mucky Mineral (F1) (LRR K, L) | <input type="checkbox"/> 5 cm Mucky Peat or Peat (S3) (LRR K, L, R) |
| <input type="checkbox"/> Hydrogen Sulfide (A4) | <input type="checkbox"/> Loamy Gleyed Matrix (F2) | <input type="checkbox"/> Dark Surface (S7) (LRR K, L) |
| <input type="checkbox"/> Stratified Layers (A5) | <input type="checkbox"/> Depleted Matrix (F3) | <input type="checkbox"/> Polyvalue Below Surface (S8) (LRR K, L) |
| <input type="checkbox"/> Depleted Below Dark Surface (A11) | <input type="checkbox"/> Redox Dark Surface (F6) | <input type="checkbox"/> Thin Dark Surface (S9) (LRR K, L) |
| <input type="checkbox"/> Thick Dark Surface (A12) | <input type="checkbox"/> Depleted Dark Surface (F7) | <input type="checkbox"/> Iron-Manganese Masses (F12) (LRR K, L, R) |
| <input type="checkbox"/> Sandy Mucky Mineral (S1) | <input type="checkbox"/> Redox Depressions (F8) | <input type="checkbox"/> Piedmont Floodplain Soils (F19) (MLRA 149B) |
| <input type="checkbox"/> Sandy Gleyed Matrix (S4) | | <input type="checkbox"/> Mesic Spodic (TA6) (MLRA 144A, 145, 149B) |
| <input type="checkbox"/> Sandy Redox (S5) | | <input type="checkbox"/> Red Parent Material (F21) |
| <input type="checkbox"/> Stripped Matrix (S6) | | <input type="checkbox"/> Very Shallow Dark Surface (TF12) |
| <input type="checkbox"/> Dark Surface (S7) (LRR R, MLRA 149B) | | <input type="checkbox"/> Other (Explain in Remarks) |

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric soil present? N

Remarks:
 No redox features. Surface is not dark enough for A12.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bill Keefer Site City/County: Stillwater Twp/Was Sampling Date: 10/17/2018
 Applicant/Owner: Mick Lynskey/Bill Keefer State: MN Sampling Point: SP-2
 Investigator(s): Kelly Bopray PSS, CWD Section, Township, Range: Sec. 3, T30N, R20W
 Landform (hillslope, terrace, etc.): closed depression Local relief (concave, convex, none): concave
 Slope (%): 1-4% Lat.: _____ Long.: _____ Datum: _____
 Soil Map Unit Name: 49B Antigo silt loam NWI Classification: Not id'ed
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation X, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil X, or hydrology _____ naturally problematic? circumstances" present? No
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u> N </u> Hydric soil present? <u> N </u> Indicators of wetland hydrology present? <u> N </u>	Is the sampled area within a wetland? <u> N </u> If yes, optional wetland site ID: <u> non-wetland </u>
Remarks: (Explain alternative procedures here or in a separate report.) YTD precip was 100-125% of average at the time of the site visit. Per the WETS Table method, antecedent precip was wetter than normal. Soil is a mollisol. Sample area is farmed.	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
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): <u>>25</u> Saturation present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): <u>>25</u> (includes capillary fringe)		Indicators of wetland hydrology present? <u> N </u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: geomorphic position is not applicable because the soil is not hydric. Preliminary review of historical aerials shows rare to no wet signatures.		

VEGETATION - Use scientific names of plants

Sampling Point: SP-2

Tree Stratum					Plot Size (30 ft)			
		Absolute % Cover	Dominant Species	Indicator Status				
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
		<u>0</u>	= Total Cover					
Sapling/Shrub Stratum					Plot Size (15 ft)			
		Absolute % Cover	Dominant Species	Indicator Status				
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
		<u>0</u>	= Total Cover					
Herb Stratum					Plot Size (5 ft)			
		Absolute % Cover	Dominant Species	Indicator Status				
1	<i>Glycine max</i>	100	Y	UPL				
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
		<u>100</u>	= Total Cover					
Woody Vine Stratum					Plot Size (30 ft)			
		Absolute % Cover	Dominant Species	Indicator Status				
1								
2								
3								
4								
5								
		<u>0</u>	= Total Cover					

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: 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:

OBL species	<u>0</u>	x 1 =	<u>0</u>
FACW species	<u>0</u>	x 2 =	<u>0</u>
FAC species	<u>0</u>	x 3 =	<u>0</u>
FACU species	<u>0</u>	x 4 =	<u>0</u>
UPL species	<u>100</u>	x 5 =	<u>500</u>
Column totals	<u>100</u>	(A)	<u>500</u> (B)
Prevalence Index = B/A =			<u>5.00</u>

Hydrophytic Vegetation Indicators:

Rapid test for hydrophytic vegetation

Dominance test is >50%

Prevalence index is ≤3.0*

Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)

Problematic hydrophytic vegetation* (explain)

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

Definitions of Vegetation Strata:

Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.

Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.

Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.

Woody vines - All woody vines greater than 3.28 ft in height.

Hydrophytic vegetation present? N

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

no weed species present

SOIL

Sampling Point: SP-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*	Loc**		
0-8	10YR 3/2						silt loam	
8-14	10YR 3/3						silt loam	
14-19	10YR 3/3						silt loam	
19-25+	10YR 3/3						silt loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)
- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

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

Restrictive Layer (if observed):

Type: _____
 Depth (inches): _____

Hydric soil present? N

Remarks:

no redox features observed. Surface is not dark enough for A12.

WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

Project/Site: Bill Keefer Site City/County: Stillwater Twp/Was Sampling Date: 10/17/2018
 Applicant/Owner: Mick Lynskey/Bill Keefer State: MN Sampling Point: SA-3
 Investigator(s): Kelly Bopray PSS, CWD Section, Township, Range: Sec. 3, T30N, R20W
 Landform (hillslope, terrace, etc.): depression Local relief (concave, convex, none): concave
 Slope (%): 1-3% Lat.: _____ Long.: _____ Datum: _____
 Soil Map Unit Name: 49B Antigo silt loam NWI Classification: not id'ed
 Are climatic/hydrologic conditions of the site typical for this time of the year? No (If no, explain in remarks)
 Are vegetation X, soil _____, or hydrology _____ significantly disturbed? Are "normal
 Are vegetation _____, soil X, or hydrology _____ naturally problematic? circumstances" present? No
 (If needed, explain any answers in remarks)

SUMMARY OF FINDINGS

Hydrophytic vegetation present? <u> N </u> Hydric soil present? <u> N </u> Indicators of wetland hydrology present? <u> N </u>	Is the sampled area within a wetland? <u> N </u> If yes, optional wetland site ID: <u>non-wetland</u>
Remarks: (Explain alternative procedures here or in a separate report.) YTD precip was 100-125% of average at the time of the site visit. Per the WETS Table method, antecedent precip was wetter than normal. Soil is a mollisol. Basin is farmed.	

HYDROLOGY

Primary Indicators (minimum of one is required; check all that apply) <input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water Marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7) <input type="checkbox"/> Sparsely Vegetated Concave Surface (B8)	<input type="checkbox"/> Water-Stained Leaves (B9) <input type="checkbox"/> Aquatic Fauna (B13) <input type="checkbox"/> Marl Deposits (B15) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres on Living Roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Thin Muck Surface (C7) <input type="checkbox"/> Other (Explain in Remarks)	Secondary Indicators (minimum of two required) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Moss Trim Lines (B16) <input type="checkbox"/> Dry-Season Water Table (C2) <input type="checkbox"/> Crayfish Burrows (C8) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Stunted or Stressed Plants (D1) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> FAC-Neutral Test (D5) <input type="checkbox"/> Microtopographic Relief (D4)
Field Observations: Surface water present? Yes _____ No <u> X </u> Depth (inches): _____ Water table present? Yes _____ No <u> X </u> Depth (inches): <u> >24 </u> Saturation present? Yes _____ No <u> X </u> Depth (inches): <u> >24 </u> (includes capillary fringe)		Indicators of wetland hydrology present? <u> N </u>
Describe recorded data (stream gauge, monitoring well, aerial photos, previous inspections), if available:		
Remarks: geomorphic position is not applicable because the soil is not hydric.		

VEGETATION - Use scientific names of plants

Sampling Point: SA-3

Tree Stratum					50/20 Thresholds		
Plot Size (30 ft)		Absolute % Cover	Dominant Species	Indicator Status		20%	50%
1					Tree Stratum	0	0
2					Sapling/Shrub Stratum	0	0
3					Herb Stratum	20	50
4					Woody Vine Stratum	0	0
5							
6							
7							
8							
9							
10							
		0	= Total Cover		Dominance Test Worksheet		
					Number of Dominant Species that are OBL, FACW, or FAC: <u>0</u> (A)		
					Total Number of Dominant Species Across all Strata: <u>1</u> (B)		
					Percent of Dominant Species that are OBL, FACW, or FAC: <u>0.00%</u> (A/B)		
Sapling/Shrub Stratum					Prevalence Index Worksheet		
Plot Size (15 ft)		Absolute % Cover	Dominant Species	Indicator Status	Total % Cover of:		
1					OBL species	<u>0</u> x 1 =	<u>0</u>
2					FACW species	<u>0</u> x 2 =	<u>0</u>
3					FAC species	<u>0</u> x 3 =	<u>0</u>
4					FACU species	<u>0</u> x 4 =	<u>0</u>
5					UPL species	<u>100</u> x 5 =	<u>500</u>
6					Column totals	<u>100</u> (A)	<u>500</u> (B)
7					Prevalence Index = B/A = <u>5.00</u>		
8							
9							
10							
		0	= Total Cover		Hydrophytic Vegetation Indicators:		
					<input type="checkbox"/> Rapid test for hydrophytic vegetation		
					<input type="checkbox"/> Dominance test is >50%		
					<input type="checkbox"/> Prevalence index is ≤3.0*		
					<input type="checkbox"/> Morphological adaptations* (provide supporting data in Remarks or on a separate sheet)		
					<input type="checkbox"/> Problematic hydrophytic vegetation* (explain)		
					*Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic		
Herb Stratum					Definitions of Vegetation Strata:		
Plot Size (5 ft)		Absolute % Cover	Dominant Species	Indicator Status	Tree - Woody plants 3 in. (7.6 cm) or more in diameter at breast height (DBH), regardless of height.		
1	<i>Glycine max</i>	100	Y	UPL	Sapling/shrub - Woody plants less than 3 in. DBH and greater than 3.28 ft (1 m) tall.		
2					Herb - All herbaceous (non-woody) plants, regardless of size, and woody plants less than 3.28 ft tall.		
3					Woody vines - All woody vines greater than 3.28 ft in height.		
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							
		100	= Total Cover		Hydrophytic vegetation present? <u>N</u>		
Woody Vine Stratum							
Plot Size (30 ft)		Absolute % Cover	Dominant Species	Indicator Status			
1							
2							
3							
4							
5							
		0	= Total Cover				

Remarks: (Include photo numbers here or on a separate sheet)
no weed species present

SOIL

Sampling Point: SA-3

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*	Loc**		
0-9	10YR 2/2						silt loam	
9-16	10YR 3/2						silt loam	
16-24+	10YR 2/2						silt loam	

*Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains

**Location: PL=Pore Lining, M=Matrix

Hydric Soil Indicators:

- Histisol (A1)
- Histic Epipedon (A2)
- Black Histic (A3)
- Hydrogen Sulfide (A4)
- Stratified Layers (A5)
- Depleted Below Dark Surface (A11)
- Thick Dark Surface (A12)
- Sandy Mucky Mineral (S1)
- Sandy Gleyed Matrix (S4)
- Sandy Redox (S5)
- Stripped Matrix (S6)
- Dark Surface (S7) (LRR R, MLRA 149B)

- Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
- Thin Dark Surface (S9) (LRR R, MLRA 149B)
- Loamy Mucky Mineral (F1) (LRR K, L)
- Loamy Gleyed Matrix (F2)
- Depleted Matrix (F3)
- Redox Dark Surface (F6)
- Depleted Dark Surface (F7)
- Redox Depressions (F8)

Indicators for Problematic Hydric Soils:

- 2 cm Muck (A10) (LRR K, L, MLRA 149B)
- Coast Prairie Redox (A16) (LRR K, L, R)
- 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
- Dark Surface (S7) (LRR K, L)
- Polyvalue Below Surface (S8) (LRR K, L)
- Thin Dark Surface (S9) (LRR K, L)
- Iron-Manganese Masses (F12) (LRR K, L, R)
- Piedmont Floodplain Soils (F19) (MLRA 149B)
- Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
- Red Parent Material (F21)
- Very Shallow Dark Surface (TF12)
- Other (Explain in Remarks)

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

Restrictive Layer (if observed):
 Type: _____
 Depth (inches): _____

Hydric soil present? N

Remarks:
 No redox features observed. Surface is not dark enough for A12.