

Appendix E – Wetland Delineation Report

Wetland Delineation Report

Regal Solar Project

Benton County, Minnesota

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Introduction

Regal Solar LLC is proposing to develop a new 100 megawatt (MW) solar energy production facility in Benton County, Minnesota. The 812 acre project area is located in Sections 12 and 13 of Township 38 North Range 32 West and Sections 18 and 19 of Township 38 North Range 31 West in Benton County, Minnesota (Figure 1). HDR completed a wetland delineation to identify wetlands and other Waters of the U.S. within the project area.

This report incorporates additional wetland areas identified by the Benton County Technical Evaluation Panel (TEP) during the onsite review on April 17, 2019.

Methods

Evaluation for the presence of wetlands and wetland hydrology within the project area was performed using protocols defined in the July 2016 Minnesota Board of Water and Soil Resources (BWSR) and U.S. Army Corps of Engineers (USACE) *Guidance for Offsite Hydrology/Wetland Determinations* (USACE 2016). Potential wetland areas were identified based on aerial photography interpretation and historical aerial photography review, National Wetland Inventory (NWI), hydric soil map units, 2 foot light detection and ranging (LiDAR) contours, and 2 foot digital elevation models (DEM). These areas were then visited in the field to confirm the presence or absence of wetland characteristics. Wetlands identified in the field were delineated in accordance with methods outlined in the *1987 Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2)* (USACE 2010). The USACE defines areas as wetlands based on the following:

Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas [33 CFR 328 3.b].

Wetland delineations are based on the presence of the following three parameters:

- Indicators of wetland hydrology
- Predominance of hydrophytic vegetation
- Presence of hydric soils

“Atypical” or “problem areas” may be missing one or more of the three parameters, and still be classified as wetlands but must be justified using USACE criteria.

An onsite wetland delineation was performed by HDR wetland scientists on June 25-29, 2018. Additionally, an onsite TEP review took place on April 17, 2019.

Site Description

The project area is located in northern Benton County, approximately 2 miles northwest of Rice, Minnesota within the Eastern Broadleaf Forest – Anoka Sand Plain Subsection as defined by The Minnesota Department of Natural Resources (MNDNR) (MNDNR, 2005). This area is described as flat, sandy lake plain along the Mississippi River. Broad sandy plains occupy much of the subsection (MNDNR 2005). Presettlement vegetation was oak barrens and openings (MNDNR 2005). The project area has been in crop production since at least 1953 based on historical aerial photography review.

Climate Data

The Minnesota Climatology Working Group (MNCWG, 2018) has an online calculator that provides a multi-month precipitation score for any date selected from a calendar. Scores of 6 to 9 are considered “dry”, 10 to 14 “normal”, and 15 to 18 “wet”. For the time of the on-site delineation, precipitation for the Project area was considered “dry” with a score of 8 from MNCWG.

Historical Climate Data

A review of historical climate data for the project area was performed against the dates of historical aerial photos readily available through the Minnesota Historical Aerial Photographs Online (MHAPO) program and Farm Service Agency National Agriculture Imagery Program (NAIP). USACE guidance states that historical photographs should be reviewed for indicators of wetland hydrology when normal precipitation conditions are present (USACE 2016). This review of historical aerial photography was used to evaluate the frequency of occurrence and extent of offsite delineated wetland boundaries. Normal conditions are determined by weighing precipitation data from the three months prior to the date of the imagery against the length of time since the precipitation contributed to the water budget (i.e. more recent precipitation is given greater weight). The Minnesota Climatology Working Group (MNCWG, 2016) has an online calculator that provides a multi-month precipitation score for each aerial image reviewed. Scores of 6 to 9 are considered “dry”, 10 to 14 “normal”, and 15 to 18 “wet”. Of the publically available MHAPO and NAIP aerial photos, 2017, 2009, 2008, 2006 and 1953 had normal precipitation multi-month scores and therefore were selected for use in the historical aerial photography review (Table 1).

Table 1. Historical Aerial Photography Information

Year of Photo	Date of Photo	Source of Photo	MNCWG Multi-Month Score
1953	October 19	MHPO	10 - Normal
2006	June 18	NAIP	10 - Normal
2008	July 5	NAIP	13 - Normal
2009	June 15	NAIP	10 - Normal
2017	July 29	NAIP	12 - Normal

Soils

A summary of the soil map units that occur onsite and their corresponding hydric ratings are listed in Table 2. Soil map units are included in Figure 2.

Table 2. Mapped Soil Types Onsite

Map Unit Symbol	Map Unit name	Hydric Rating
D8E	Sandberg loamy coarse sand, 6 to 30 percent slopes	Non-hydric (0%)
D20A	Isan-Isan, frequently ponded, complex, 0 to 2 percent slopes	Predominantly Hydric (95%)
D67A	Hubbard loamy sand, 0 to 2 percent slopes	Predominantly non-hydric (1%)
D67B	Hubbard loamy sand, 1 to 6 percent slopes	Predominantly non-hydric (3%)
D67C	Hubbard loamy sand, 2 to 12 percent slopes	Non-hydric (0%)
W	Water	NA

Results

Offsite review of historical aerial photography resulted in the identification of 2 potential wetland areas (Table 3). Both locations, Wetland 1 and Wetland 2, tested positive for wetland hydrology based on historical aerial review and were visibly identifiable as wetland areas on 2017 aerial photography. No other areas of the site showed evidence of wetland hydrology.

Table 3. Historical Aerial Photography Interpretation Results

Potential Wetland ID	Hydrology Signature					% Years Wetland Hydrology Signature	Hydric Soil	NWI
	1953	2006	2008	2009	2017			
Wetland 1	WS	WS	WS	WS	WS	100	NA (mapped as water)	Yes
Wetland 2	WS	WS	WS	WS	WS	100	Yes	Yes

WS = Wetland Signature

Areas identified through historical aerial review were delineated in the field and the entire project area was reviewed for additional wetlands. Wetland boundaries for Wetland 1 and Wetland 2 were delineated based on the extent of the hydrophytic vegetation and the toe of slope of the surrounding topography. Wetlands TEP 1 and TEP 2 were identified by the Benton County TEP by utilizing offsite resources after conclusion of the April 17, 2019 onsite TEP review. A total of 6.50 acres of wetland were field delineated in the project area.

Wetland 1 consists of a depressional open pond (PUB/Type 5) feature ringed by a palustrian emergent wetland (PEM/Type 2) dominated by reed canary grass (*Phalaris arundinacea*) and black willow (*salix nigra*) saplings. The adjacent upland vegetation to Wetland 1 consists of row

cropped agricultural land along the north boundary and a stand of planted white pine (*Pinus strobus*) along the southern boundary.

Wetland 2 is a palustrian emergent wetland (PEM/Type 2) dominated by reed canary grass. Wetland 2 extends beyond the Project Area boundary, the area beyond the project boundary consists of a series of open water feature which are bisected by dikes which facilitate a center pivot irrigation to traverse the wetland feature. The adjacent upland to Wetland 2 is agricultural row crop.

TEP 1 and TEP 2 are depressional seasonal wetland features (PEMf/Type 1) that are farmed during years of normal precipitation. The boundaries of TEP 1 and TEP 2 were identified via LiDAR contours by the Benton County TEP.

Table 4 summarizes wetland acreages and wetland types. The delineated wetland boundaries are shown in Figure 2. Photos and USACE routine wetland data forms for the delineated wetlands are included as Appendix A. One additional wetland data form was collected in a closed depressional upland area and is also included in Appendix A. Additional ground level photography of the project area is included in Appendix B, with photo locations shown on Figure 2.

Table 4. Offsite Delineated Wetlands

Wetland ID	NWI Wetland Type	Eggers and Reed Vegetative Community	Area (acres)
Wetland 1	Palustrian Emergent (PEM)	Shallow Marsh	5.49
Wetland 2	Palustrian Emergent (PEM)	Fresh Wet Meadow	0.16
TEP 1	Palustrian Emergent – farmed (PEMf)	Fresh Wet Meadow	0.26
TEP 2	Palustrian Emergent – farmed (PEMf)	Fresh Wet Meadow	0.59
Total			6.50

Conclusions

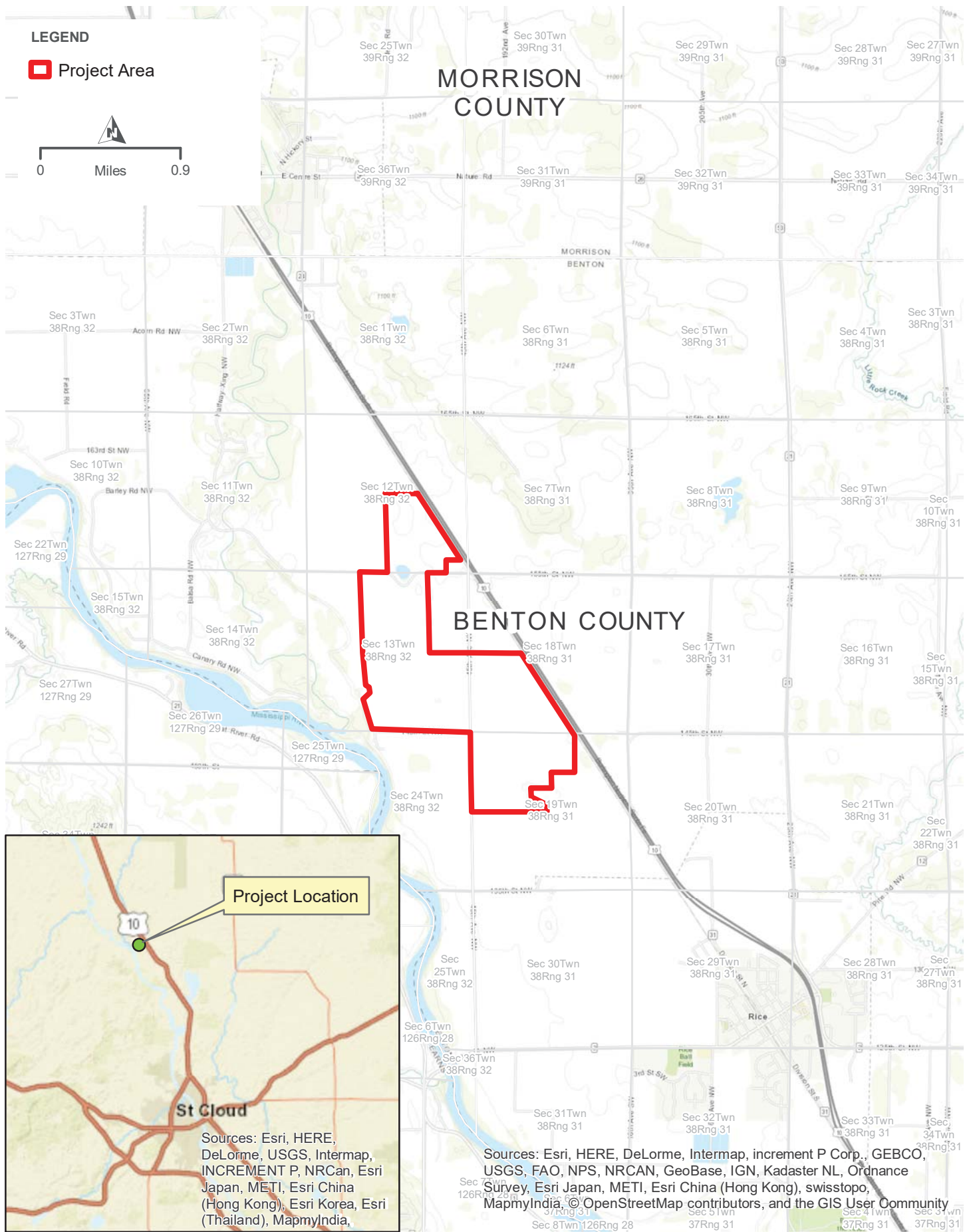
Four wetland areas were identified and delineated within the Project area. The wetland boundaries were delineated in accordance with delineation methodologies as described in the July 2016 USACE and BWSR guidance and the 1987 *Corps of Engineers Wetlands Delineation Manual* (USACE 1987) and the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2)* (USACE 2010) and as directed by the Benton County TEP. Development activities within the boundaries of these wetland areas

is subject to review and approval by the USACE and Benton County (Local Governmental Unit (LGU) responsible for implementing the Minnesota Wetland Conservation Act (WCA)).

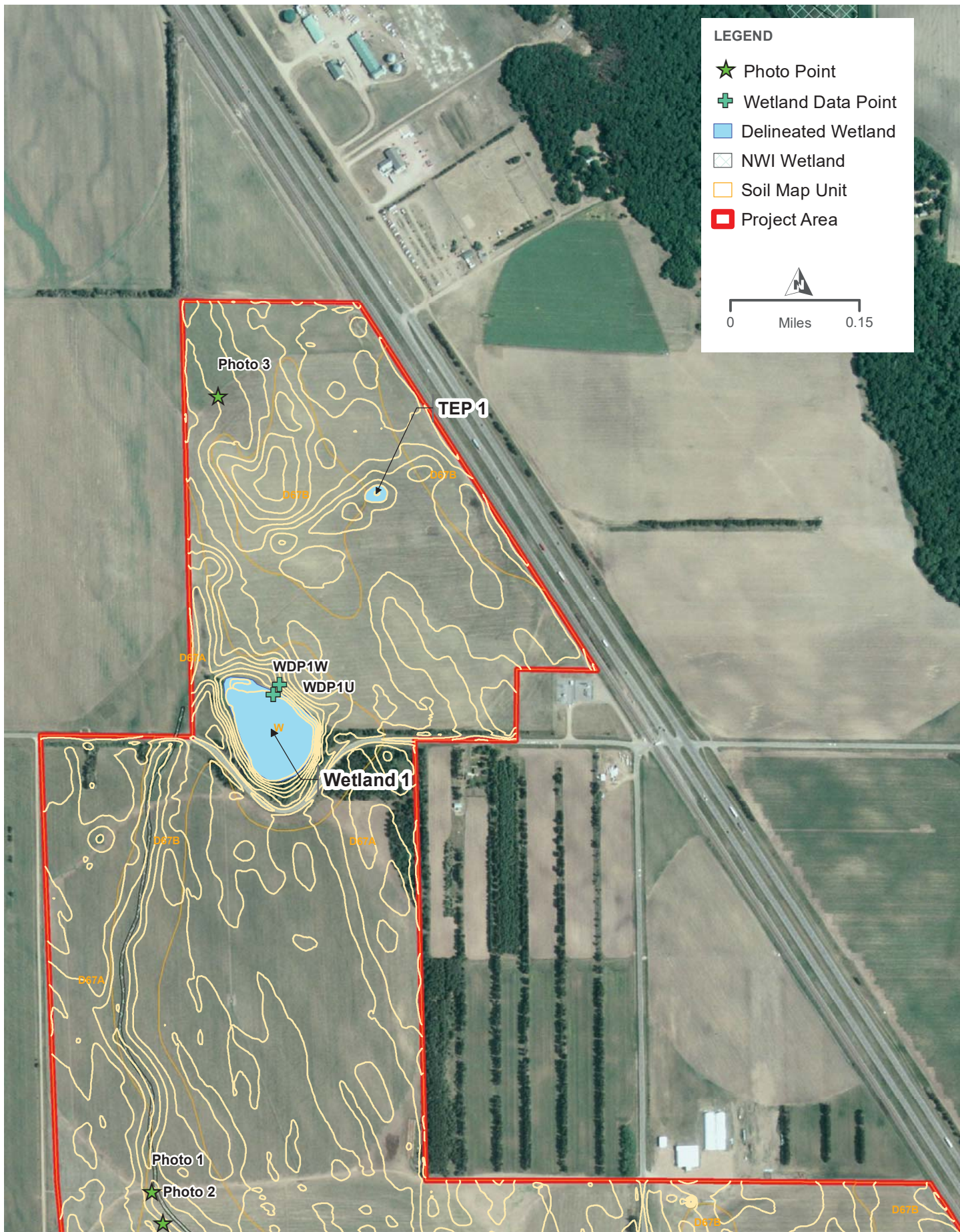
References

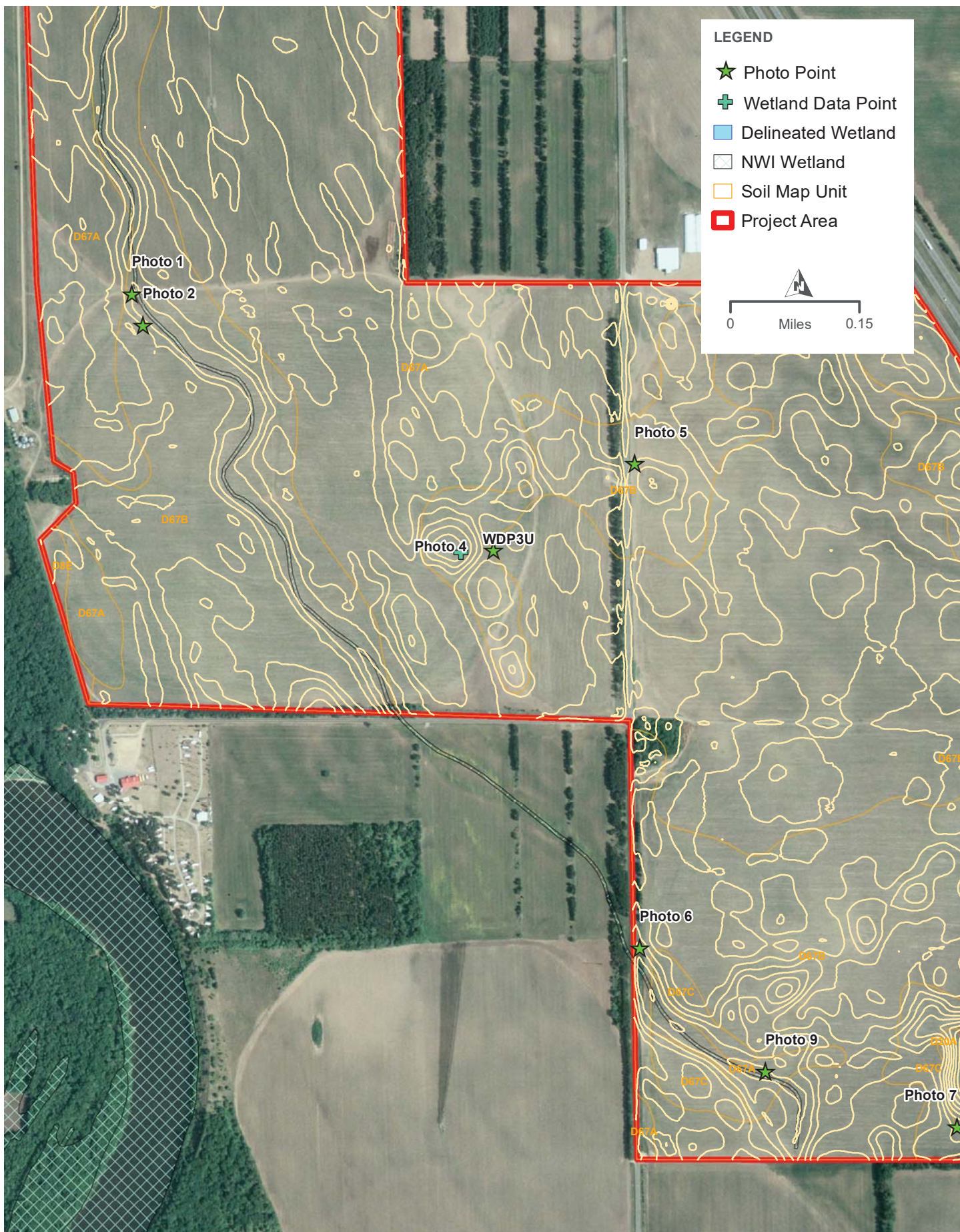
- Minnesota Climatology Working Group. 2018. *Wetland Delineation Precipitation Data Retrieval from a Gridded Database for Two Rivers Township, MN*. http://climate.umn.edu/gridded_data/precip/wetland/wetland.asp.
- Minnesota Department of Natural Resources. 2005. *Field Guide to the Native Plant Communities of Minnesota: The Laurentian Mixed Forest Province*. Ecological land Classification Program, Minnesota County Biological Survey, and Natural Heritage and Nongame Research Program. MNDNR St. Paul, MN.
- Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2018. *The National Wetland Plant List*. 2018 wetland ratings.
- U.S. Department of Agriculture, NRCS. 2018. Web Soil Survey for Benton County, Minnesota. <http://websoilsurvey.nrcs.usda.gov/app/>.
- U.S. Army Corps of Engineers. 1987. *Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1*, U.S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, MS, 100 pp. and appendices.
- U.S. Army Corps of Engineers. 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (Version 2.0)*. ERDC/EL TR-10-16. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
- U.S. Army Corps of Engineers and Minnesota Board of Water and Soil Resources. 2016. *Guidance for Offsite Hydrology/Wetland Determinations*. http://www.bwsr.state.mn.us/wetlands/delineation/Guidance_for_Offsite_Hydrology_and_Wetland_Determinations.pdf

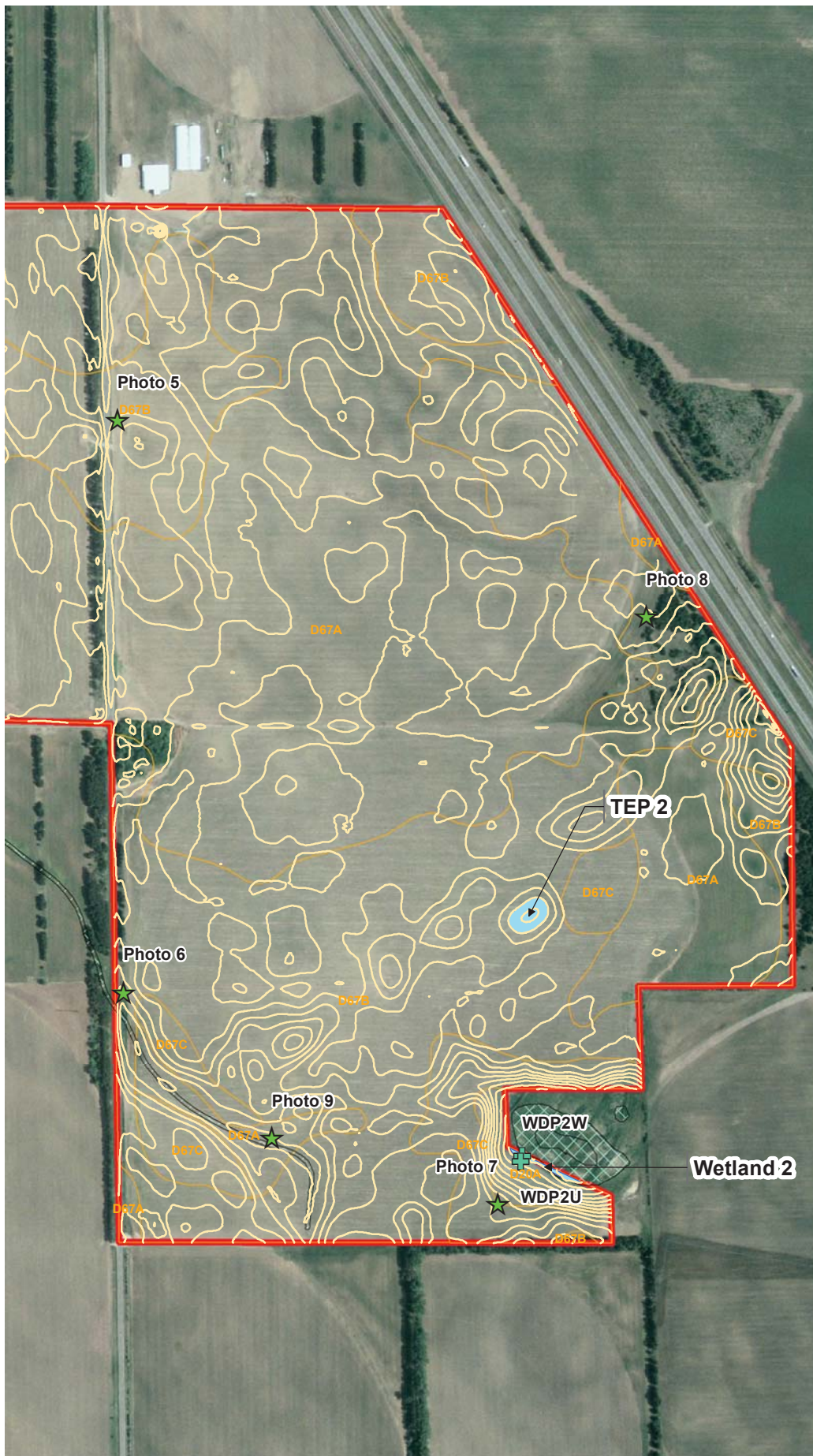
Figures



PROJECT LOCATION
FIGURE 1







LEGEND

- ★ Photo Point
- ⊕ Wetland Data Point
- Delineated Wetland
- ▨ NWI Wetland
- Soil Map Unit
- Project Area



Appendix A

Ground Level Photography



Photo 1. Field verified upland, mapped NWI, orientation north

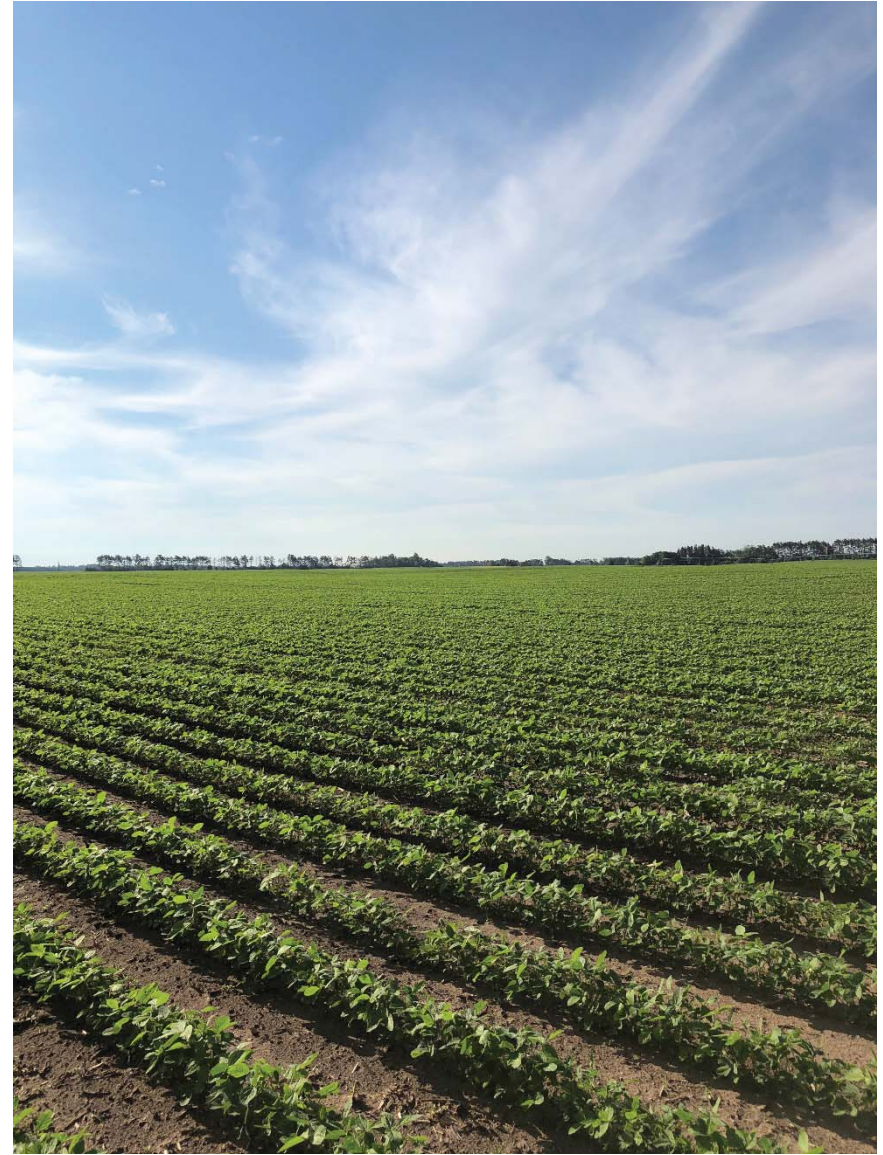


Photo 2. Field verified upland, mapped NWI, orientation south

Appendix A Ground Level Photography

Regal Solar Project
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Photo 3. Upland field edge, orientation north



Photo 4. Slope down to Wetland Data Point WDP3U, orientation west



Photo 5. Upland field edge, orientation south



Photo 6. Field verified upland, mapped NWI, orientation south



Photo 7. Slope to Wetland 2, orientation east



Photo 8. Upland field edge, orientation east



Photo 9. Field verified pland, mapped NWI, orientation south east.

Appendix B

USACE Routine Wetland Delineation Data Forms

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Geronimo Regal Solar City/County: Morrison Sampling Date: 6/28/2018
 Applicant/Owner: Geronimo State: Minnesota Sampling Point: WDP2W
 Investigators: M Swenson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave Slope(%): 3
 Subregion (LRR): _____ Lat: 45.811779 Long: -94.274986 Datum: WGS84
 Soil Map Unit Name: _____ NWI Classification: PUB

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

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

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

Remarks:
 Plot is located adjacent to pond feature. Wetland boundary was delineated based on topographic break line and the presence of hydrophytic vegetation.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: <u>2</u> (A) Total Number of Dominant Species Across All Strata: <u>2</u> (B) Percent of Dominant Species That Are OBL, FACW, or FAC: <u>100</u> (A/B)
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
		= Total Cover			
Sapling/Shrub Stratum	(Plot size:)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species <u>20</u> x1= <u>20</u> FACW species <u>95</u> x2= <u>190</u> FAC species <u>5</u> x3= <u>15</u> FACU species _____ x4= <u>0</u> UPL species _____ x5= <u>0</u> Column Totals: <u>120</u> (A) <u>225</u> (B)
1.	<u>Salix nigra</u>	<u>20</u>	<u>Yes</u>	<u>OBL</u>	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
		<u>20</u>	= Total Cover		
Herb Stratum	(Plot size:)				Prevalence Index = B/A= <u>1.88</u>
1.	<u>Phalaris arundinacea</u>	<u>90</u>	<u>Yes</u>	<u>FACW</u>	
2.	<u>Rumex crispus</u>	<u>5</u>	<u>No</u>	<u>FAC</u>	
3.	<u>Carex vulpinoidea</u>	<u>5</u>	<u>No</u>	<u>FACW</u>	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
8.	_____	_____	_____	_____	
		<u>100</u>	= Total Cover		
Woody Vine Stratum	(Plot size:)				Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.01 Morphological Adaptations1 (Provide data in Remarks or on a separate sheet) Problematic Hydrophytic Vegetation1 (Explain) Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic. Hydrophytic Vegetation Present? Yes <u>X</u> No _____
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
		= Total Cover			
% Bare Ground in Herb Stratum _____		% Cover of Biotic Crust _____			

Remarks:

SOIL

Sampling Point: WDP2W

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		
0-3	10YR 2/1	100					Sandy Clay	
3-14	10YR 4/2	90	10YR 4/6	10	C	M	Sandy Clay	

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

1 cm Muck (A9) (LRR D)

X

Depleted Below Dark Surface (A11)

Thick Dark Surface (A12)

Sandy Mucky Mineral (S1)

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 Depression (F8)

Vernal Pools (F9)

Indicators for Problematic Hydric Soils:

1 cm Muck (A9) (LRR C)

2 cm Muck (A10) (LRR B)

Reduced Vertic (F18)

Red Parent Material (TF2)

Other (Explain in Remarks)

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

X

No

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

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

X

Surface Water (A1)

X

High Water Tables (A2)

X

Saturation (A3)

Water Marks (B1) (Nonriverine)

Sediment Deposits (B2) (Nonriverine)

Surface Soil Cracks (B6)

X

Inundation Visible of Aerial Imagery (B7)

Water-Stained Leaves (B9)

Salt Crust (B11)

Biotic Crust (B12)

Aquatic Invertebrates (B13)

Hydrogen Sulfide Odor (C1)

Oxidized Rhizospheres along Living Roots (C3)

Recent Iron Reduction in Tilled Soils (C6)

Thin Muck Surface (C7)

Other (Explain in Remarks)

Secondary Indicators (2 or more required)

Water Marks (B1) (Riverine)

Sediment Deposits (B2) (Riverine)

Drift Deposits (B3) (Riverine)

Drainage Patterns (B10)

Dry-Season Water Table (C2)

Saturation Visible on Aerial Imagery (C9)

Shallow Aquitard (D3)

X

FAC-Neutral Test (D5)

Field Observations:

Surface Water Present?

Yes

X

No

Water Table Present?

Yes

X

No

Saturation Present?

Yes

X

No

(includes capillary fringe)

Depth (inches):

0.5

Depth (inches):

0.0

Depth (inches):

0.0

Wetland Hydrology Present?

Yes

X

No

Describe Recorded Date (stream gague, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Wetland Hydrology is present

Sampling Site: WDP2W



Photo Name: Photo_180622112525.jpg

Direction:

Caption:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Geronimo Regal Solar City/County: Morrison Sampling Date: 6/28/2018
Applicant/Owner: Geronimo State: Minnesota Sampling Point: WDP1U
Investigators: M Swenson Section, Township, Range: _____
Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave Slope(%): 3
Subregion (LRR): _____ Lat: 45.794312 Long: -94.269089 Datum: WGS84
Soil Map Unit Name: _____ NWI Classification: NA

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

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

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

Remarks:

Plot is located at field edge. Vegetation is disturbed in the form of agricultural row crop activities.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet:			
1.	_____	_____	_____	_____	Number of Dominant Species			
2.	_____	_____	_____	_____	That Are OBL, FACW, or FAC: _____ 0 (A)			
3.	_____	_____	_____	_____	Total Number of Dominant			
4.	_____	_____	_____	_____	Species Across All Strata: _____ 1 (B)			
5.	_____	_____	_____	_____	Percent of Dominant Species			
					That Are OBL, FACW, or FAC: _____ 0 (A/B)			
			= Total Cover					
Sapling/Shrub Stratum	(Plot size:)				Prevalence Index worksheet:			
1.	_____	_____	_____	_____	Total % Cover of: _____ Multiply by: _____			
2.	_____	_____	_____	_____	OBL species _____ x1= _____			
3.	_____	_____	_____	_____	FACW species _____ 5 x2= _____ 10			
4.	_____	_____	_____	_____	FAC species _____ x3= _____ 0			
5.	_____	_____	_____	_____	FACU species _____ 90 x4= _____ 360			
			= Total Cover		UPL species _____ 5 x5= _____ 25			
					Column Totals: _____ 100 (A) _____ 395 (B)			
Herb Stratum	(Plot size:)				Prevalence Index = B/A= _____ 3.95			
1.	Bromus inermis	85	Yes	FACU	Hydrophytic Vegetation Indicators:			
2.	Cirsium arvense	5	No	FACU				
3.	Phalaris arundinacea	5	No	FACW				
4.	Convolvulus arvensis	5	No	UPL				
5.	_____	_____	_____	_____				
6.	_____	_____	_____	_____	Dominance Test is >50% _____			
7.	_____	_____	_____	_____	Prevalence Index is ≤3.01 _____			
8.	_____	_____	_____	_____	Morphological Adaptations1 (Provide			
			= Total Cover		data in Remarks or on a separate sheet)			
		100			Problematic Hydrophytic Vegetation1 (Explain)			
Woody Vine Stratum	(Plot size:)				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.			
1.	_____	_____	_____	_____				
2.	_____	_____	_____	_____				
			= Total Cover					
% Bare Ground in Herb Stratum _____		% Cover of Biotic Crust _____			Hydrophytic			
					Vegetation Yes _____ No <u>X</u>			
					Present?			

Remarks:

SOIL

Sampling Point: WDP1U

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		
0-12	10YR 3/3						Sandy Loam	
12-20	10YR 4/3	95	10YR 4/6	5	C	M	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: (Applicable to all LRRs, unless otherwise noted.)

Indicators for Problematic Hydric Soils:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depression (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

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 ☐ No ☐ X ☐

Remarks:

No indicators of hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Tables (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible of Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? Yes ☐ No ☐ Depth (inches):

(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☐ X ☐

Describe Recorded Date (stream gague, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators of wetland hydrology are present.

Sampling Site: WDP1U



Photo Name: Photo_180622112631.jpg

Direction:

Caption:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Geronimo Regal Solar City/County: Minnesota Sampling Date: 6/28/2018
 Applicant/Owner: Geronimo State: Minnesota Sampling Point: WDP2U
 Investigators: M Swenson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Hillslope Local Relief (concave, convex, none): Concave Slope(%): 4
 Subregion (LRR): _____ Lat: 45.772560 Long: -94.250877 Datum: WGS84
 Soil Map Unit Name: _____ NWI Classification: NA

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

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

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

Remarks:
 Plot is located near toe of slope within planted corn field.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species That Are OBL, FACW, or FAC: _____ 1 (A) Total Number of Dominant Species Across All Strata: _____ 2 (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ 50 (A/B)
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x1= _____ FACW species _____ 10 x2= _____ 20 FAC species _____ x3= _____ 0 FACU species _____ 35 x4= _____ 140 UPL species _____ x5= _____ 0 Column Totals: _____ 45 (A) _____ 160 (B) <i>Prevalence Index = B/A=</i> _____ 3.56
= Total Cover					
Sapling/Shrub Stratum	(Plot size:)				
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
= Total Cover					
Herb Stratum	(Plot size: 5ft)				Hydrophytic Vegetation Indicators: Dominance Test is >50% _____ Prevalence Index is ≤3.01 _____ Morphological Adaptations1 (Provide data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation1 (Explain) _____ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	Bromus inermis	30	Yes	FACU	
2.	Anemone canadensis	10	Yes	FACW	
3.	Cirsium arvense	5	No	FACU	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
8.	_____	_____	_____	_____	
45 = Total Cover					
Woody Vine Stratum	(Plot size:)				
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
= Total Cover					
% Bare Ground in Herb Stratum	_____	% Cover of Biotic Crust	_____		

Remarks:

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		
0-12	10YR 4/3						Loamy Sand	

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

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

Indicators for Problematic Hydric Soils:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depression (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

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 ☐ No ☐ X ☐

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)
<input type="checkbox"/> High Water Tables (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)
<input type="checkbox"/> Inundation Visible of Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)

Field Observations:

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

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

Saturation Present? Yes ☐ No ☐ Depth (inches):

(includes capillary fringe)

Wetland Hydrology Present? Yes ☐ No ☐ X ☐

Describe Recorded Date (stream gague, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No indicators of wetland hydrology are present.

Sampling Site: WDP2U



Photo Name: Photo_180620100948.jpg

Direction:

Caption:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Geronimo Regal Solar City/County: Morrison Sampling Date: 6/28/2018
 Applicant/Owner: Geronimo State: Minnesota Sampling Point: WDP1W
 Investigators: M Swenson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave Slope(%): 3
 Subregion (LRR): _____ Lat: 45.772575 Long: -94.250870 Datum: WGS84
 Soil Map Unit Name: _____ NWI Classification: PEM

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

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

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

Remarks:
 Plot is located in a PEM wetland adjacent to open water.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	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 (A/B)	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
			= Total Cover			
Sapling/Shrub Stratum	(Plot size:)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: OBL species _____ x1= _____ FACW species _____ 90 x2= _____ 180 FAC species _____ x3= _____ 0 FACU species _____ 5 x4= _____ 20 UPL species _____ x5= _____ 0 Column Totals: _____ 95 (A) _____ 200 (B)	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
			= Total Cover			
Herb Stratum	(Plot size:)				Prevalence Index = B/A= _____ 2.11 Hydrophytic Vegetation Indicators: X Dominance Test is >50% X Prevalence Index is ≤3.01 _____ Morphological Adaptations1 (Provide data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation1 (Explain)	
1.	Phalaris arundinacea	80	Yes	FACW		
2.	Urtica dioica	10	No	FACW		
3.	Ambrosia artemisiifolia	5	No	FACU		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
8.	_____	_____	_____	_____		
			95	= Total Cover		
Woody Vine Stratum	(Plot size:)				Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
			= Total Cover			
% Bare Ground in Herb Stratum _____		% Cover of Biotic Crust _____		Hydrophytic Vegetation Present? Yes <u>X</u> No _____		

Remarks:

SOIL

Sampling Point: WDP1W

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		
0-6	10YR 2/2	100					Sandy Clay	
6-18	10YR 4/2	90	10YR 4/6	10	C	M	Sandy Clay	

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

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

Indicators for Problematic Hydric Soils:

<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)	
<input checked="" type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)	
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depression (F8)	
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)	
<input type="checkbox"/> Sandy Gleyed Matrix (S4)		

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 ☒ No ☐

Remarks:

Indicators of hydric soils are present.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)				Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)			
<input type="checkbox"/> High Water Tables (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)			
<input checked="" type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)			
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)			
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)			
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input checked="" type="checkbox"/> Saturation Visible on Aerial Imagery (C9)			
<input type="checkbox"/> Inundation Visible of Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)			
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input checked="" type="checkbox"/> FAC-Neutral Test (D5)			

Field Observations:

Surface Water Present? Yes ☐ No ☒ Depth (inches):

Water Table Present? Yes ☐ No ☒ Depth (inches):

Saturation Present? Yes ☒ No ☐ Depth (inches): 6.0

(includes capillary fringe)

Wetland Hydrology Present? Yes ☒ No ☐

Describe Recorded Date (stream gague, monitoring well, aerial photos, previous inspections), if available:

Remarks:

Indicators of wetland hydrology are present.

Sampling Site: WDP1W



Photo Name: Photo_180620100716.jpg

Direction:

Caption:

WETLAND DETERMINATION DATA FORM - Midwest Region

Project/Site: Geronimo Regal Solar City/County: Morrison Sampling Date: 6/28/2018
 Applicant/Owner: Geronimo State: MN Sampling Point: WDP3U
 Investigators: M Swenson Section, Township, Range: _____
 Landform (hillslope, terrace, etc.): Depression Local Relief (concave, convex, none): Concave Slope(%): 3
 Subregion (LRR): _____ Lat: 45.755421 Long: -94.227097 Datum: WGS84
 Soil Map Unit Name: _____ NWI Classification: NA

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

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

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

Remarks:
 Plot is located in a closed depression within an agricultural field. Although geomorphic position is present, historical aerial review does not indicate presence of wetland hydrology. Hydric soils are not present.

VEGETATION – Use scientific names of plants.

Tree Stratum	(Plot size:)	Absolute % Cover	Dominant Species?	Indicator Status	Dominance Test Worksheet: Number of Dominant Species _____ That Are OBL, FACW, or FAC: _____ (A) Total Number of Dominant Species Across All Strata: _____ (B) Percent of Dominant Species That Are OBL, FACW, or FAC: _____ (A/B)
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
			= Total Cover		
Sapling/Shrub Stratum	(Plot size:)				Prevalence Index worksheet: Total % Cover of: _____ Multiply by: _____ OBL species _____ x1= _____ FACW species _____ x2= <u>0</u> FAC species _____ x3= <u>0</u> FACU species _____ x4= <u>0</u> UPL species _____ x5= <u>0</u> Column Totals: <u>0</u> (A) <u>0</u> (B) <i>Prevalence Index = B/A=</i> <u>NaN</u>
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
			= Total Cover		
Herb Stratum	(Plot size:)				Hydrophytic Vegetation Indicators: Dominance Test is >50% _____ X Prevalence Index is ≤3.01 _____ Morphological Adaptations1 (Provide data in Remarks or on a separate sheet) _____ Problematic Hydrophytic Vegetation1 (Explain) _____ Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
8.	_____	_____	_____	_____	
			= Total Cover		
Woody Vine Stratum	(Plot size:)				Hydrophytic Vegetation Present? Yes _____ No <u>X</u>
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
			= Total Cover		
% Bare Ground in Herb Stratum _____		% Cover of Biotic Crust _____			

Remarks:
 Vegetation is 100% soy bean due to agricultural activities.

SOIL

Sampling Point: WDP3U

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		
0-5	10YR 3/2	100					Sandy Loam	
5-12	10YR 3/2	90	7.5R 4/6	10	C	M	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: (Applicable to all LRRs, unless otherwise noted.)			Indicators for Problematic Hydric Soils:		
<input type="checkbox"/> Histosol (A1)	<input type="checkbox"/> Sandy Redox (S5)	<input type="checkbox"/> 1 cm Muck (A9) (LRR C)	<div>Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.</div>		
<input type="checkbox"/> Histic Epipedon (A2)	<input type="checkbox"/> Stripped Matrix (S6)	<input type="checkbox"/> 2 cm Muck (A10) (LRR B)			
<input type="checkbox"/> Black Histic (A3)	<input type="checkbox"/> Loamy Mucky Mineral (F1)	<input type="checkbox"/> Reduced Vertic (F18)			
<input type="checkbox"/> Hydrogen Sulfide (A4)	<input type="checkbox"/> Loamy Gleyed Matrix (F2)	<input type="checkbox"/> Red Parent Material (TF2)			
<input type="checkbox"/> Stratified Layers (A5) (LRR C)	<input type="checkbox"/> Depleted Matrix (F3)	<input type="checkbox"/> Other (Explain in Remarks)			
<input type="checkbox"/> 1 cm Muck (A9) (LRR D)	<input type="checkbox"/> Redox Dark Surface (F6)				
<input type="checkbox"/> Depleted Below Dark Surface (A11)	<input type="checkbox"/> Depleted Dark Surface (F7)				
<input type="checkbox"/> Thick Dark Surface (A12)	<input type="checkbox"/> Redox Depression (F8)				
<input type="checkbox"/> Sandy Mucky Mineral (S1)	<input type="checkbox"/> Vernal Pools (F9)				
<input type="checkbox"/> Sandy Gleyed Matrix (S4)					

Restrictive Layer (if present): Type: _____ Depth (inches): _____	Hydric Soil Present? Yes _____ No _____ X _____
--	---

Remarks:
Although redox concentrations are present within the soil profile, high choma values disqualify the soils from meeting hydric criteria.

HYDROLOGY

Wetland Hydrology Indicators:			
Primary Indicators (minimum of one required; check all that apply)		Secondary Indicators (2 or more required)	
<input type="checkbox"/> Surface Water (A1)	<input type="checkbox"/> Salt Crust (B11)	<input type="checkbox"/> Water Marks (B1) (Riverine)	
<input type="checkbox"/> High Water Tables (A2)	<input type="checkbox"/> Biotic Crust (B12)	<input type="checkbox"/> Sediment Deposits (B2) (Riverine)	
<input type="checkbox"/> Saturation (A3)	<input type="checkbox"/> Aquatic Invertebrates (B13)	<input type="checkbox"/> Drift Deposits (B3) (Riverine)	
<input type="checkbox"/> Water Marks (B1) (Nonriverine)	<input type="checkbox"/> Hydrogen Sulfide Odor (C1)	<input type="checkbox"/> Drainage Patterns (B10)	
<input type="checkbox"/> Sediment Deposits (B2) (Nonriverine)	<input type="checkbox"/> Oxidized Rhizospheres along Living Roots (C3)	<input type="checkbox"/> Dry-Season Water Table (C2)	
<input type="checkbox"/> Surface Soil Cracks (B6)	<input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6)	<input type="checkbox"/> Saturation Visible on Aerial Imagery (C9)	
<input type="checkbox"/> Inundation Visible of Aerial Imagery (B7)	<input type="checkbox"/> Thin Muck Surface (C7)	<input type="checkbox"/> Shallow Aquitard (D3)	
<input type="checkbox"/> Water-Stained Leaves (B9)	<input type="checkbox"/> Other (Explain in Remarks)	<input type="checkbox"/> FAC-Neutral Test (D5)	
Field Observations:			
Surface Water Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	
Water Table Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	
Saturation Present?	Yes <input type="checkbox"/> No <input type="checkbox"/>	Depth (inches):	
(includes capillary fringe)			
		Wetland Hydrology Present?	Yes <input type="checkbox"/> No <input type="checkbox"/> X <input checked="" type="checkbox"/>

Describe Recorded Date (stream gague, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Indicators of wetland hydrology are present.

Sampling Site: WDP3U



Photo Name: Photo_180622085859.jpg

Direction:

Caption: