

## Phase Ia Cultural Resources Literature Search - Technical Memo

Date: Tuesday, January 20, 2015

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Project: NextEra Marshall Solar Project

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To: Brandon Stankiewicz & Jenny Field, NextEra Energy Resources

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From: Mike Justin, HDR Engineering, Inc.

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Subject: Phase Ia Cultural Resources Literature Search

This memorandum presents the results of a Phase Ia cultural resources literature search (“Phase Ia”) completed for the Marshall Solar Project (“Project”) in Lyon County, Minnesota. Archaeologists at HDR were asked to conduct a Phase Ia for the Project and provide recommendations for future Project-specific cultural resource identification activities. HDR understands that the Project is in preliminary planning stages and that there currently is no federal agency responsible for compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and implementation of regulations found at 36 CFR 800. Because the Project’s formal area of potential effects (“APE”) has not been designated at this time, HDR has defined a Project Area that will likely encompass the APE once it is developed.

HDR staff conducted background research at the Minnesota State Historic Preservation Office (“SHPO”) and the Minnesota Historical Society (“MHS”) in November 2014. Research gathered at SHPO encompassed previous cultural resource surveys, previously identified archaeological sites, and previously identified historic properties. Historic plat maps of the study area were consulted at MHS. Public Land Survey maps from the 19th century were examined online at <http://www.gis.state.mn.us/GLO/Index.htm>.

## Project Overview

Marshall Solar, LLC (“Marshall Solar”), a wholly owned subsidiary of NextEra Energy Resources, LLC (“NextEra”) is currently developing the Marshall Solar Energy Project (“Project”), a 62.25 MW solar photovoltaic facility located in Lyon County, Minnesota. The Project’s output will be delivered to NSP, an Xcel Energy subsidiary under a long-term PPA. The Project would interconnect to the Minnesota electrical system at 115 kilovolts (“kV”) at the Lyon County Substation, which is located adjacent to the Project Area.

## Size and Location

The Project is located on approximately 510 acres of privately owned land in Lyon County, approximately four miles east of the city of Marshall. Marshall Solar has entered into Purchase Option Agreements with the landowner and Marshall Solar would own the property prior to the start of construction. Major roadways in the area include County Highway 9 and County Highway 11, and State Highway 19. The Project Area is bisected by 290<sup>th</sup> Street and lies between State Highway 19 and 320<sup>th</sup> Avenue. All Project components are located within

Township 112 North, Range 40 West, Sections 28 and 33 of the 5th Principal Meridian (Figure 1).

## Proposed Facilities and Energy Conversion Process

The Marshall Solar Project will include the following major components or systems:

- Solar Panel Arrays, Panels, and Support Structures
- Electrical Collection System
- Step-up Transformation/Utility Interconnection
- Access Roads
- O&M Building
- Perimeter Fencing

## General Background

### Environmental Setting

The Project is sited within the Blue Earth Till Plain physiographic area (Wright, 1972), and is mapped as ground moraine associated with the Des Moines Lobe of the Late Wisconsinan glaciation (Hobbs, H.C.; Goebel, J.E., 1982). Before Euro-American settlement, the vegetation in the Project Area consisted of tallgrass prairie. Wildlife within the region that would have been available for exploitation in precontact times includes bison (*Bison bison*), elk (*Cervus Canadensis*), white-tailed deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), weasel (*Mustela sp.*), coyote (*Canis latrans*), rabbit (*Sylvilagus floridanus*), fox (*Vulpes vulpes*), badgers (*Taxidea taxus*), and avian species such as the Greater Prairie Chicken (*Tympanuchus cupido*).

The Project Area is approximately one mile south of the Redwood River and is drained by the Redwood Watershed, with waters eventually flowing into the Minnesota River. In presettlement times, there were pockets of wetland prairies scattered throughout the region. Currently, much of the area has been drained by a judicial ditch system to increase arable land. Agricultural tillage of corn and soybeans predominate the Project Area, with a few patches of hay field or grazing land.

The SSURGO Database for Lyon County indicates the soils on the site as listed in Table 1, along with the hydric status of each mapped soil. The National Wetlands Inventory (“NWI”) did not indicate any mapped wetlands within the proposed Project Area (Figure 2). U.S. Geological Survey (“USGS”) digital mapping (USGS 1962) indicated the presence of two unnamed streams located within the Project Area draining into a mapped Minnesota Department of Natural Resources (“DNR”) Public Waterways named feature to the northeast, and Clear Creek to the southeast. HDR confirmed these to be excavated perennial drainage ditches.

Table 1. Project Area Soils

Map Unit Symbol	Soil Map Unit Name	Hydric Category
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86	Canisteo clay loam	Hydric
127	Sverdrup sandy loam, 0 to 2 percent slopes	Nonhydric
127B	Sverdrup sandy loam, 2 to 6 percent slopes	Nonhydric
246	Marysland loam	Hydric
276	Oldham silty clay loam	Hydric
339	Fordville loam, 0 to 2 percent slopes	Nonhydric
339B	Fordville loam, 2 to 6 percent slopes	Nonhydric
341	Arvilla sandy loam, 0 to 2 percent slopes	Nonhydric
341B	Arvilla sandy loam, 2 to 6 percent slopes	Nonhydric
341C	Arvilla sandy loam, 6 to 12 percent slopes	Nonhydric
421B	Ves loam, 1 to 4 percent slopes	Predominantly Nonhydric
421B2	Ves loam, 3 to 6 percent slopes, eroded	Nonhydric
423	Seaforth loam, 1 to 3 percent slopes	Predominantly Nonhydric
953C	Arvilla-Storden-Ves complex, 6 to 15 percent slopes	Nonhydric
954C2	Storden-Ves loams, 5 to 12 percent slopes, eroded	Predominantly Nonhydric
1029	Pits, gravel	Nonhydric
L84A	Glencoe clay loam, depressional, 0 to 1 percent slopes	Hydric

## Cultural Contexts

The following summaries of cultural contexts relevant to the Project Area are based partially on information contained in a series of statewide historic contexts developed by the Minnesota SHPO (Dobbs 1990a, Dobbs 1990b, SHPO 1993), and an overview entitled “Minnesota’s Environment and Native American Culture History” by Gibbon, Johnson, and Hobbs (2002).

### **Paleoindian Tradition (9500 - 6000 B.C.)**

The earliest human inhabitants of Minnesota entered the area about 11,000 years ago as the glacial front receded out of Minnesota. These peoples, comprising the Paleoindian Tradition, are believed to have been migratory groups of hunter-gatherers that followed herds of large game animals such as bison, woodland caribou, and mastodon into the tundra and open pine and oak forests that characterized Minnesota as the glaciers retreated. There is little archeological evidence of Paleoindian inhabitants in Minnesota, as they did not generate large artifact deposits. Also, cultural materials left by these people are often deeply buried underneath more recent sediment making them more difficult to find. Archaeological evidence from this period consists mainly of isolated discoveries of large and distinct projectile points that are characteristic of this tradition. These points are divided into the Fluted Point Pattern (Clovis and Folsom points) and the non-fluted Lanceolate Point Pattern (Plano). Other tool types associated with the Paleoindian tradition include bifacially flaked knives, simple choppers, and large scrapers for processing kills.

### **Archaic Tradition (6000 - 500 B.C.)**

As Minnesota became warmer and drier, expanses of prairie began to displace the previous forested land. The melting ice exposed new land surfaces with extensive lakes and large, swift rivers fed by the glacial run-off, and quite unlike any in present-day Minnesota.

As the Pleistocene megafauna died out, the human inhabitants adapted to the altered landscape by developing new tool types and means of subsistence associated with the Archaic Tradition. The Archaic Tradition is distinguished from the Paleoindian period by an increased diversity in tool types, the raw materials they were made from, and the exploitation of a larger variety of animal and plant communities. This diversity has been attributed to the adaptation of Archaic peoples to local resources and a relative abundance of animal and plant resources. The archaeological record of the Archaic Tradition displays evidence of the beginnings of cultural variation. Notched and stemmed projectile points, along with ground-stone tools and chipped-stone scrapers, knives, punches, and drills, are found in the Archaic toolkit. About 7,000 years ago, copper implements appeared and continued to about 3,500 years ago.

Four distinct Archaic contexts have been identified in Minnesota including the Shield Archaic, Lake-Forest Archaic, Prairie Archaic, and Eastern Archaic. Site locations during this time are generally tied to locations near water. These locations would have been occupied for longer periods and would show larger amounts of artifact deposition. However, small encampments can be found scattered throughout the environment. These types of sites often represent an area of specific resource extraction or a location that takes advantage of a seasonal event such as a bison kill site, a flora gathering site, or a waterfowl breeding site. Artifact deposition at these locations is generally very minimal.

### **Woodland Tradition (500 B.C. - A.D. 1650)**

Beginning about 3,000 years ago, Minnesota's climate began to stabilize and resembled the climate that exists today. Expanses of prairie were found in the western portion of the state near the current Project Area. A swath of oak savanna, stretching from the northwest to the southeast, separated the prairie from the pine forests of the arrowhead region. Woodland period cultures exhibit evidence of an increasingly sedentary lifestyle. Domestication of plants, ceramic technology, long-term re-occurring occupation of seasonal village sites, and mound construction emerged in the Woodland period. These innovations were not adopted in all areas of the state at the same time or necessarily together. Because they are not as deeply buried, Woodland sites are encountered more often than Paleoindian or Archaic sites. Woodland sites can also be more definitively attributed to a tradition based on ceramics and distinct tool types. Known ceramic traditions have allowed the Woodland period to be divided into an Early, Middle, and Late chronological framework. In Minnesota, the Woodland tradition is also divided into an earlier Initial Woodland period (including the Early and Middle periods, (ca. 500 B.C. - AD 500) and a later Terminal Woodland period (including the Late period, ca. AD 500-1650).

Regional differences in the Woodland period resulted in the identification of distinct regional complexes such as such as Howard Lake, Fox Lake, Malmo, and Laurel. Within central Minnesota, a Transitional Woodland period, from 500 to 1000 A.D., has been defined and is associated with St. Croix and Onamia ceramics. Within Northern Minnesota, the geographic

distribution of the distinctive ceramics and burial practices of the period have allowed archaeologists to identify archaeological cultures such as Kathio, Blackduck, and Psinomani. In northern Minnesota, it was Terminal Woodland people who met the first Europeans to visit the state in the middle of the seventeenth-century (Gibbon, Johnson, and Hobbs, 2002).

### **Mississippian/Plains Village (A.D. 1000 – 1500)**

About 1000 years ago, a new tradition developed in southern Minnesota. In the western part of the state, this tradition is known as the Plains Village Tradition, and in the eastern part of the state, this tradition is known as the Mississippian Tradition. These traditions are distinguished from Woodland traditions by an intensification of agriculture, including cultivation of corn, and larger, more complex societies. These influences spread into southwestern Minnesota from the Missouri River and into southeastern Minnesota from the Mississippi River and have possible ties to cultures of the southern United States and possibly Mexico. Mississippian/Plains Village sites are distinguished by distinct ceramic styles, large village complexes, a greater density of artifacts, and community vegetable storage pits. Effigy mounds in the shape of animals such as birds and snakes, as well as flat-topped mounds and villages encircled by protective palisades, were constructed in this period.

### **Fur Trade/Contact (1630s – 1858)**

By the 1620s, the first European goods may have reached the upper Midwest through trade with the Ottawa and Huron. The first fur trade contact in this area occurred between 1659 and 1660 when two French explorers named Sieur des Groseilliers and Sieur de Radisson entered present day Minnesota in search of natural resources such as furs. Increasing number of explorers and fur traders would reach the area in the years following first contact. This time period is recognized by the establishment, operation, and adaptation of gathering fur-bearing mammals in exchange for other goods and materials. This exchange linked the Northern Plains to a worldwide economic and political system. By the late 1670's a trade agreement had been established between the Dakota and merchants in Quebec and Montreal. This relationship initiated the French period of exploration and occupation in Minnesota, which lasted into the early 1760's. During this period of French influence much of the state and the surrounding region were occupied with an extensive network of forts and fur trading posts.

The 1760s, following the Treaty of Paris, brought a half-century period of British activity to Minnesota. This time period brought further development of the fur trade industry with more trading posts, and consequently, major changes in the distribution of Native American people in the region. By 1800, the Ojibwa took control of the lakes and forests of northern Minnesota, and the Dakota moved south along the Minnesota River valley.

After a peace treaty with the British in 1763, The United States gained legal possession of the state. The United States exerted control of Minnesota after Zebulon Pike's 1805-1807 expedition, and later with the establishment of Fort Snelling at the junction of the Minnesota and Mississippi rivers in 1819. The changes in Native American life brought about by the French and British presence in Minnesota included migrations of Native American populations from the east, depopulation of native peoples in certain areas because of introduced diseases and warfare, and gradual movement of the Ojibwa into northern Minnesota and the Dakotas into southern

Minnesota. The Native American populations in Minnesota also began to switch from hunting for subsistence to hunting for trade, and Native American manufacturing materials began to be replaced by European materials.

Travel and settlement of the state were mostly restricted to corridors along larger bodies of water. In 1837 the Dakota, Winnebago, and Ojibwa signed treaties that opened up east-central Minnesota to logging and settlement, and by 1849 Minnesota had become organized as a territory. Following the establishment of Minnesota as a state in 1858, Euro-American settlement increased, bringing a wave of new towns, cities, and non-fur trade-related enterprises.

Lyon County was organized in 1870, parceled out from a larger Redwood County. Stanley Township lies on the east edge of the county bordering Redwood County. The first permanent Euro-American settler located in Section 24 of Stanley Township in 1867 (Anderson 1970). The township received a large number of Scottish immigrants, primarily in the northern half, with mostly American settlers in the south (Case 1884).

## Literature Search

HDR staff conducted a site file search at the MHS and the SHPO. This site file search focused on previously identified archaeological sites, previously identified architectural properties, and previous surveys within one mile of the proposed development parcel. In addition to the background research conducted at MHS and SHPO, HDR reviewed General Land Office (“GLO”) maps accessed online through the Bureau of Land Management Website at <http://www.gloreCORDS.blm.gov>.

### Previous Archaeological Sites

No previously recorded archaeological sites were identified in the Project Area or within one mile of the Project Area.

### Previous Architectural Properties

No previously recorded architectural properties were identified in the Project Area or within one mile of the Project Area.

### Previous Cultural Resource Surveys

According to the files available at SHPO, there have been seven previous cultural resource investigations within one mile of the Project Area (Table 2 and Figure 3). Three previous investigations (MULT-08-11, MULT-10-04, and MULT-11-11) included Phase I fieldwork and intersects with the Project Area. The remaining previous investigations are either literature reviews only or did not include any survey within the Project Area.



**Table 2. Previous Cultural Resource Surveys within one mile of the Project Area**

Report Number	Report Year	Report Title	Authors	Intersects Project Area
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Report Number	Report Year	Report Title	Authors	Intersects Project Area
LY-07-02	2007	Phase IA Archaeological Resources Assessment of Stanley and Clifton Townships in Eastern Lyon County, Minnesota*	Stemper, C.	No
LY-12-01	2012	Phase I Archaeological Reconnaissance Survey for Lyon County Substation to Cedar Mountain Substation and Cedar Mountain Substation to Franklin Substation Segments of the CapX2020 Brookings County to Hampton 345 kV Transmission Line Project	Eigenberger, D.	No
MULT-80-05	1980	Cultural Resources Literature Search and Records Review of the Upper Minnesota River Subbasin, Southwestern Minnesota and North Eastern South Dakota*	Archaeological Field Services, Inc.	No
MULT-08-11	2008	Great River Energy: Milroy to Sheridan Area 69 kV Transmission Line Projects, Phase I Reconnaissance Survey in Lyon and Redwood Counties, Minnesota	Sabatke, S.	No
MULT-10-04	2010	A Phase I Archaeological Field Investigation for Proposed Rural Waterline Land Corridors on Parts of Lyon and Redwood Counties, Minnesota	Stemper, C.	Yes
MULT-11-11	2011	Phase I Cultural Resources Survey, Woodstock Telephone, Lyon, Pipestone and Rock Counties, Minnesota	Aymond, A. Moose, C. Rothaus, B. Rothaus, R.	Yes
MULT-14-01	2014	Phase I Archaeological Reconnaissance Survey for the SD/MN Border to Lyon Substation Segment of the CapX2020 Brookings County to Hampton 345 kV Transmission Line Project	Eigenberger, D.	No

## GLO Maps

GLO survey maps corresponding to the Project Area were accessed online through the Bureau of Land Management Website at <http://www.gloreports.blm.gov/>. HDR examined the GLO maps to identify areas that may have potential to contain historical era cultural resources, as well as water features that may no longer exist. Archaeological sites may be present where historic resources have been documented on the GLO maps, or near former water features.

Features depicted on the 1867 GLO map within the Project Area include two wagon trails and several marshes. The Redwood River is depicted just north of the Project Area. The Project Area appears to have been relatively wet at the time of Euro-American settlement and witness corners were used for multiple inaccessible locations within marshes. The only cultural resource in the Project Area shown on the plat is a wagon road running through the north half of Section 33. The Detailed information regarding the location and resource types found in the Project Area is presented in Table 3 and in Figure 4.

**Table 3. GLO Resources and Features in the Project Area**

County	Township	Range	Sections	Date	Feature/Locations
Lyon	111 N	40 W	3	1867	Marsh covering large area in the S ½ of the section
Lyon	111 N	40 W	4	1867	Marsh in the SE ¼ of section 4 extending into the NE ¼ of section 9
Lyon	112 N	40 W	20	1867	Marsh in the SE ¼ extending into section 29
Lyon	112 N	40 W	22	1867	Marshes in the SE ¼ extending E
Lyon	112 N	40 W	27, 32, 33, 34	1867	“Wagon Road” running SW-NE from the SW ¼ of section 32, through the N ½ of section 33 and 34 and to the SE ¼ of section 27
Lyon	112 N	40 W	27	1867	Two small marshes depicted in the NE ¼
Lyon	112 N	40 W	29	1867	Marshes in the SW ¼ and in the NE ¼ extending into section 20
Lyon	112 N	40 W	32, 33	1867	Marsh in the NE ¼ and SE ¼ of section 32 extending into the NW ¼ and SW ¼ of section 33
Lyon	112 N	40 W	34	1867	Small marshes in the NE ¼ and SE ¼

### Plat Map of 1916 and 1938 Aerial

A plat of Minnesota counties was published by W.W. Hixson & Company of Rockford, Ill., in 1916. The plat for Lyon County shows two structures in Section 28, in the same locations as shown on existing maps and the 1938 aerial photograph along the west border of the section (the NW ¼ and SW ¼ of section 28) (Figures 5 and 6). There is no structure shown along the border of Sections 28 and 33 where current maps and aerial photos show a residence. Presumably, this rural residence was constructed after 1916.

### Previously Recorded Historic Properties on the National Register

The online National Register of Historic Places (“NRHP”) database was searched for registered properties within the Project Area and within one mile of the Project Area. No NRHP registered archaeological or historic resources are located within one mile of the Project Area.

## Archaeological Potential

The Project Area lies within the Prairie Lakes archaeological region of Minnesota. This region was historically prairie, and offered typical prairie resources to past inhabitants. According to Anfinson (1990), major camps would have been located near the wooded areas surrounding major lakes and streams. Resource procurement areas, such as bison kill sites or prairie plant harvesting areas, could be anywhere in the uplands, but because of extensive agricultural tillage, many of these types of small, ephemeral activity sites have been disturbed and scattered by the plow. The Project Area is not located near any large lake or streams, and while the now-drained wetlands and sloughs in the area would have offered waterfowl hunting opportunities, the archaeological remains of such activities are typically scant. In addition, the flat, featureless landscape offers no prominent vantage point for observing game or for Native American ceremonial activities. Any cultural material found in the Project Area would most likely be related to the historic agricultural period. The Project is not planned to directly affect any of the nearby farmsteads in Sections 28 and 33.

## Recommendations

The absence of listed archaeological and/or historic facility resources does not mean the Project Area is clear of resources eligible for listing on federal or state historic registers. However, the chances are low that significant unrecorded resources may occur within the Project Area. HDR recommends that if a Phase I reconnaissance survey is completed for the Project Area; it should concentrate on landforms composed of nonhydric soils (Figure 2).

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## **Map Resources**

W.W. Hixson & Company of Rockford

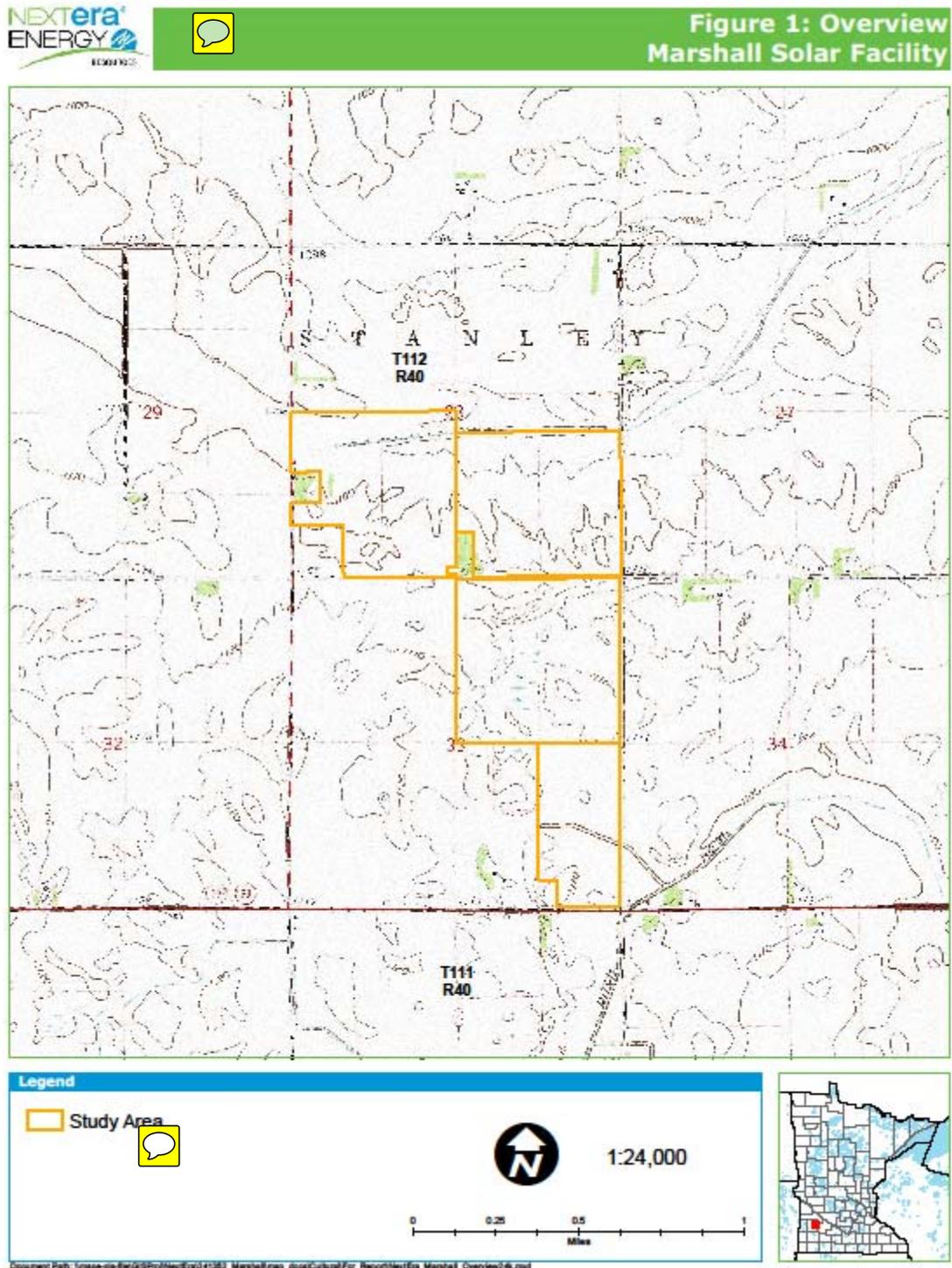
1916 *Illustrated Plat Book of the State of Minnesota*.

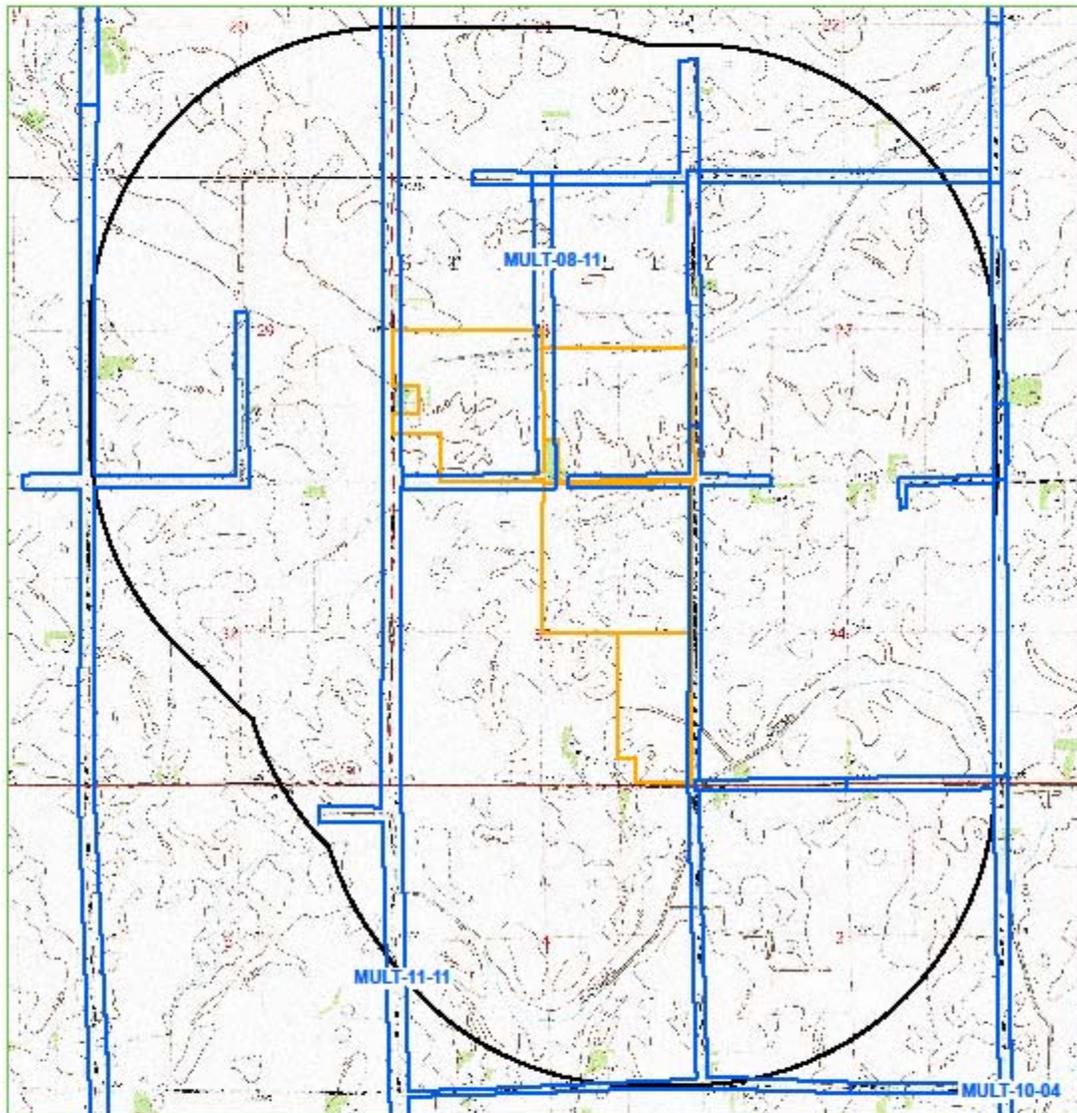
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U.S. Geological Survey digital mapping

1962. Dudley quadrangle, Minnesota. Photorevised 1993. 1:24,000. 7.5 Minute Series. Reston, Virginia: United States Department of the Interior. Accessed online December 2014:  
[http://store.usgs.gov/b2c\\_usgs/usgs/maplocator/\(ctype=areaDetails&xcm=r3standardpitrex\\_prd&care=%24ROOT&layout=6\\_1\\_61\\_48&uiarea=2\)/.do](http://store.usgs.gov/b2c_usgs/usgs/maplocator/(ctype=areaDetails&xcm=r3standardpitrex_prd&care=%24ROOT&layout=6_1_61_48&uiarea=2)/.do)

# Figures



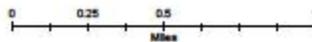


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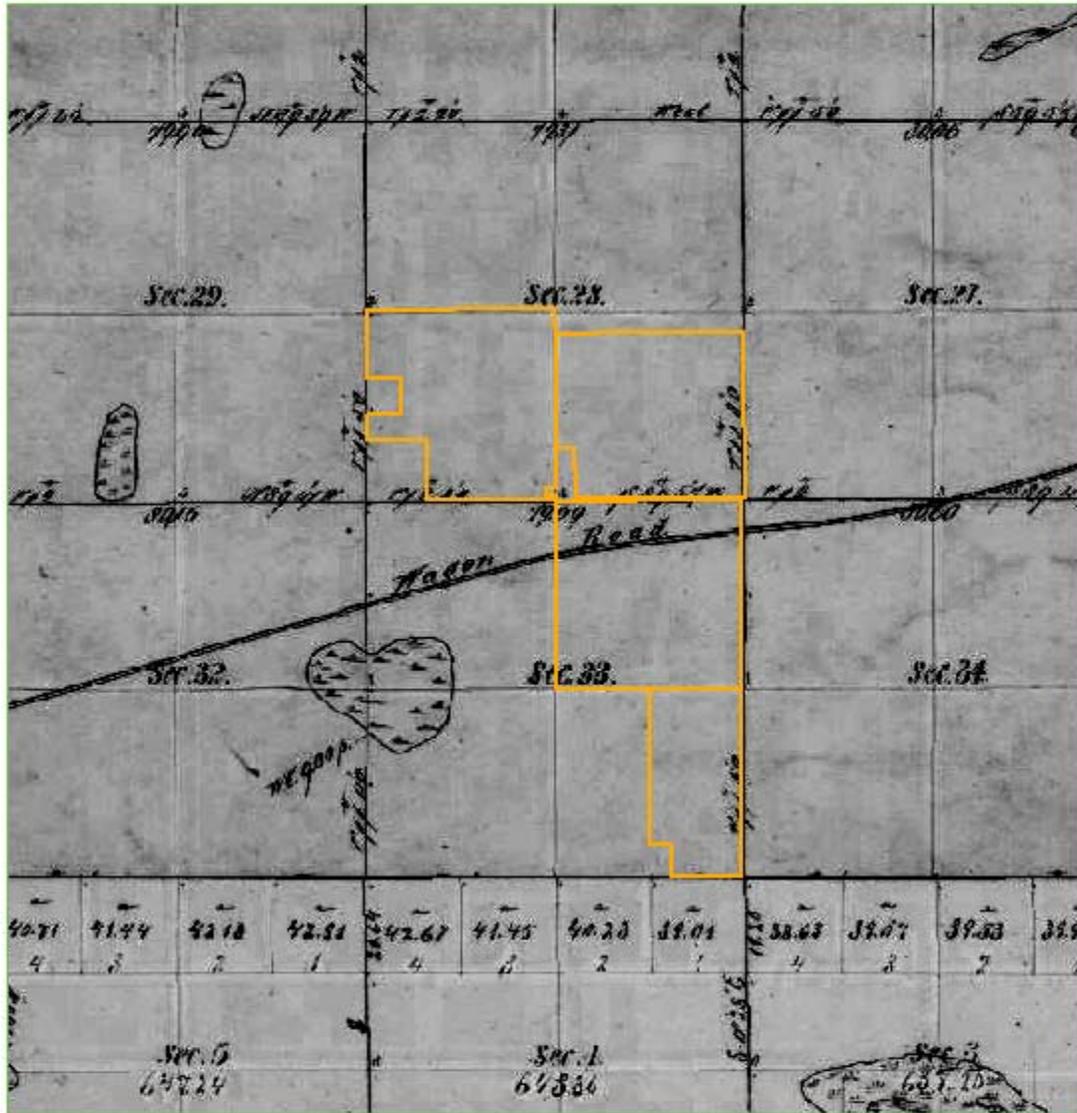
- Study Area
- One-Mile Buffer
- Previous Surveys



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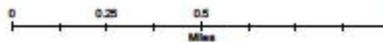


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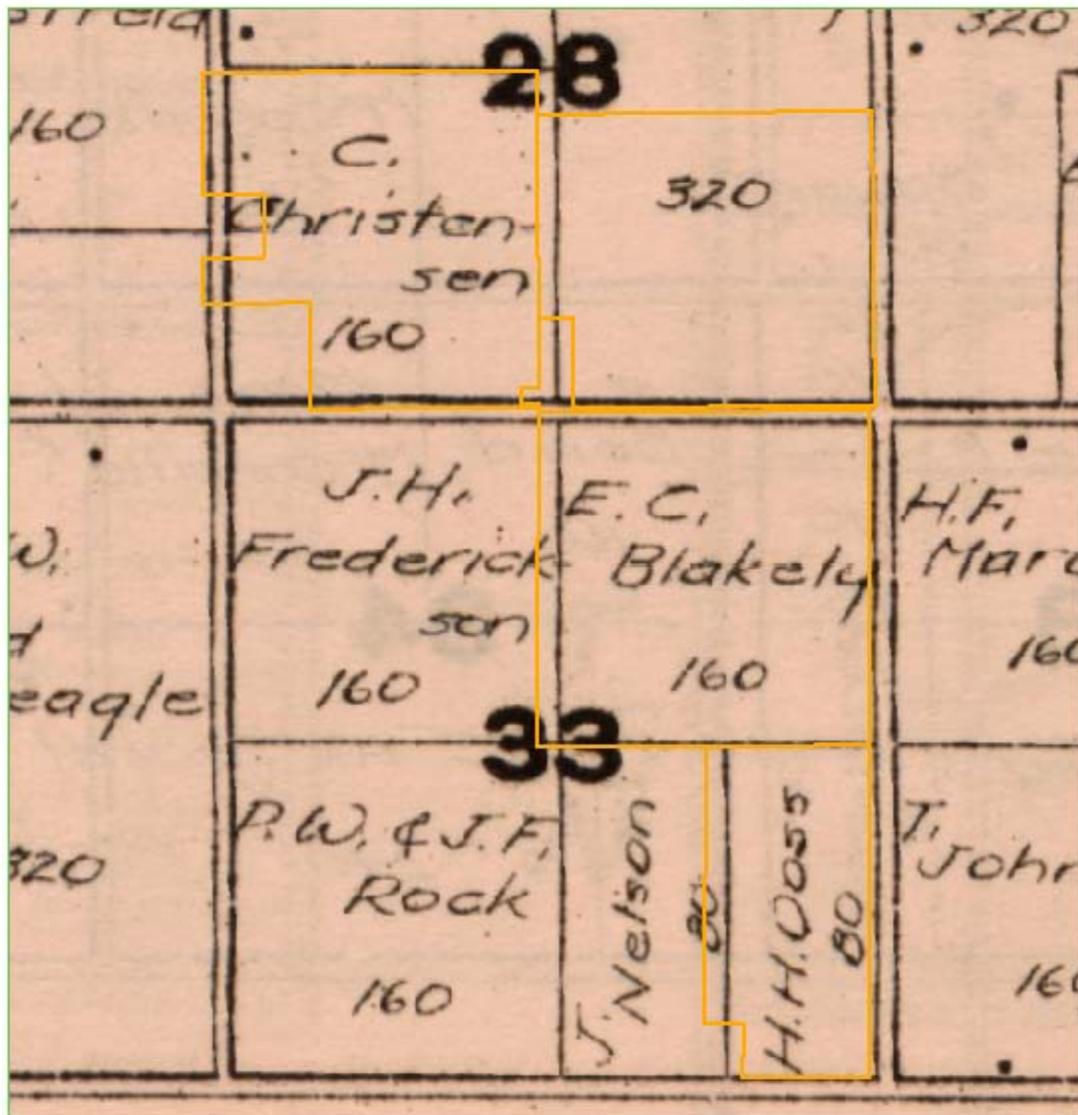


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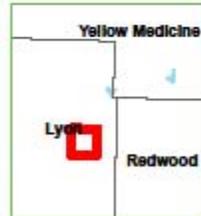
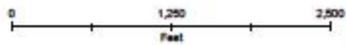


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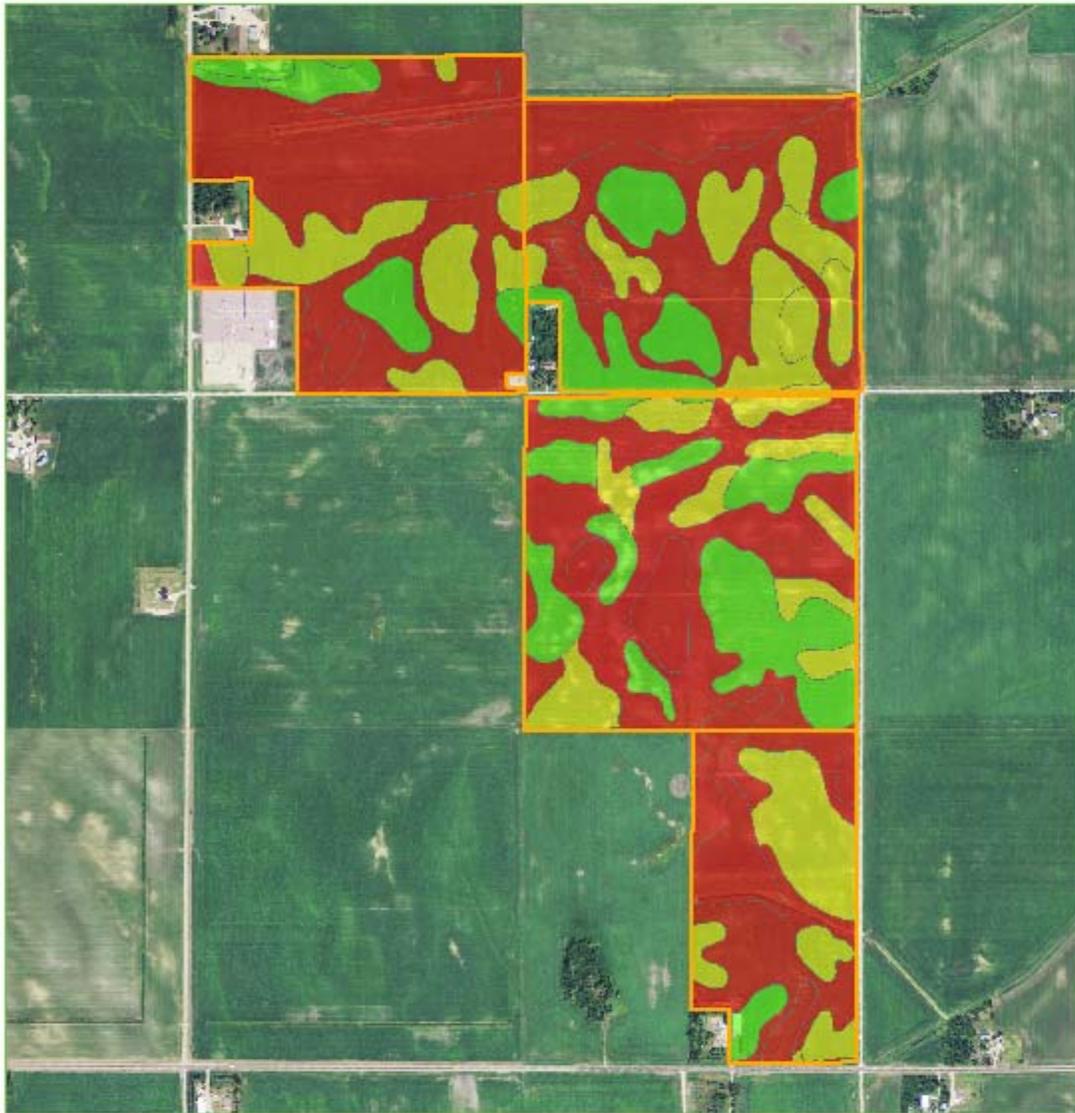
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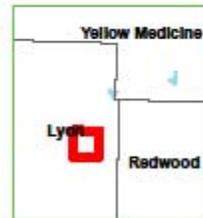
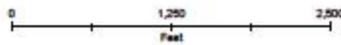


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- Study Area
- Study Area Soils - Hydric Rating
- Hydric
- Predominantly Nonhydric
- Nonhydric



1:13,500



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