Appendix J

Phase I Archaeological Survey Report

Louise Solar Project
Mower County, Minnesota

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A REPORT FOR PHASE I ARCHAEOLOGICAL SURVEY

Louise Solar Project

Mower County, Minnesota

NOVEMBER 25, 2020

PREPARED FOR:

EDF renewables

PREPARED BY:

Westwood

Westwood

Phase I Archaeological Survey

Louise Solar Project

Mower County, Minnesota

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Abstract

EDF Renewable Energy Inc., (EDF-RE) contracted Westwood Professional Services, Inc. (Westwood) of Minnetonka, MN to conduct a Phase I Archeological Survey for the proposed Louise Solar Project in Mower County, MN. To better describe the effects of the Project on archaeological resources under the Power Plant Siting Act, archaeological field investigations were conducted in the Project area. Rigden Glaab, M.A., RPA, served as Principal Investigator for the Project. Field investigations were conducted in October 2020 by Mr. Glaab, Westwood Cultural Resources Manager Ryan P. Grohnke, Permit Lead Dean T. Sather, and Archaeological Technicians Sara Nelson and Daniel Schneider.

The Project area is in the Southeast Riverine West (3w) Archaeological Region of Minnesota. The Project area is approximately 613 acres. Field methods consisted of pedestrian survey generally in agricultural fields exhibiting 25–95% ground surface visibility.

No significant archaeological resources were observed. It is recommended the Project proceed as planned. Should there be additions or changes to the proposed construction plans, Westwood should be contacted to complete additional survey.

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1.0 Introduction

EDF Renewable Energy Inc., (EDF-RE) *retained Westwood Professional Services, Inc.*, (Westwood) to conduct a Phase I Archaeological Survey of the proposed Louise Solar Project (Project). The Project will generate up to 50 megawatts (MW) of solar energy. The Project area is located on 613 acres of agricultural land east of the City of Adams in Mower County in sections 7 and 18 of Township 101N, Range 15W; and section 12 of Township 101N, Range 16W (**Exhibit 1**).

To best describe the effects of the Project on archaeological resources as part of the site permit process under the Power Plant Siting Act, archaeological field investigations were conducted in the Project area. Rigden Glaab, M.A., RPA, served as Principal Investigator for the cultural resource investigations and directly oversaw the field investigations. Mr. Glaab meets the Secretary of the Interior's professional qualification standards, as stipulated in 36 CFR 61, and is licensed to conduct archaeological reconnaissance surveys on MN state lands (License #19-016). Ryan P. Grohnke, Westwood Cultural Resources Manager, assisted in managing the Project.

2.0 Scope of Work

A Phase I Archaeological Survey was conducted to determine whether any undocumented, significant archaeological resources are present within the proposed Project's Area of Potential Effect (APE) and to define vertical and horizontal boundaries of identified sites. If new sites are identified, investigators assess proposed construction impacts and provide recommendations on avoidance or additional work. The APE for this Project is any location where ground disturbance could occur, including the entire 613-acre Project area (**Exhibit 1**).

3.0 Survey Methods

Project survey methods included background research, a literature review, and field investigations in the form of pedestrian survey. Environmental background and historic contexts were used to assess site probability and determine site types most likely to be encountered in the area.

The background research and literature review involved detailed file review in the online Portal maintained by the Office of the State Archaeologist (OSA) and a request for data and files from the Minnesota State Historic Preservation Office (SHPO), specifically examining site maps, archaeological site forms, burial files, and survey reports. Other sources investigated included the Historic Andreas Atlas, Trygg Maps, and county histories and plat books. The background research and literature review identified previous cultural resource investigations and previously recorded archaeological sites, along with levels of disturbance and potential for sites within the APE.

Fieldwork consisted of pedestrian visual ground surface survey, completed in 15-meter interval transects throughout the proposed Project area. Most effective visual inspection is conducted on ground surfaces, such as cultivated fields exhibiting exposed soils. Generally, pedestrian survey

is utilized in areas where surface visibility is greater than 25%. Significant slopes, wetlands, and obviously heavily disturbed areas may be excluded from survey.

4.0 Results of Background Investigations

4.1 Environmental Background

The Project is located in Mower County, a sparsely populated agricultural region in southern Minnesota, and is comprised almost entirely of agricultural land. Ground surface visibility (GSV) ranges from 25% to 95%.

4.1.1 Landscape

The Project is located in the Eastern Iowa and Minnesota Drift Plains (47c) ecoregion of the Western Corn Belt Plains (47) of the Temperate Prairies (EPA 2020). The Western Corn Belt Plains ecoregion level III is composed of nearly-level to gently-rolling glaciated till plains and hilly loess plains (Wilken et al. 2011). At the ecoregion level IV scale, the eastern half of the Eastern Iowa and Minnesota Drift Plains ecoregion is comprised of pre-Wisconsin glacial till (White 2020). The western half of 47c is composed of till plain and till-covered moraines with outwash from the Des Moines Lobe (White 2020). The Eastern Iowa and Minnesota Drift Plains are bound by the Big Woods (51i) and Lower St Croix and Vermillion Valleys (47g) to the North, the Des Moines Lobe (47b) to the west, the Rochester/Paleozoic Plateau Upland (52c) and Blufflands and Coulees (52b) to the east, and the Rolling Loess Prairies (47f) to the south (EPA 2020).

Prior to Euro-American settlement, the landscape of the Eastern Iowa and Minnesota Drift Plains was primarily comprised of bur oak savanna, tallgrass prairies, and maple-basswood forests (White 2020; MnDNR 2020).

Following Euro-American settlement, much of the regional landscape was converted to cropland agricultural production. As the main economic driver, approximately 75 percent of the Western Corn Belt Plains is currently row crop agriculture, with much of the remaining lands used for livestock (Wilken et al. 2011). In 2013, approximately 65 percent of the Eastern Iowa and Minnesota Drift Plains was planted with corn and soybeans, 15 percent pasture/grasslands, and the remaining 20 percent composed of other land uses (White 2020). The Minnesota Department of Natural Resources (MnDNR) notes that fire is the most important disturbance in this region (MnDNR 2020).

4.1.2 Flora

The Eastern Iowa and Minnesota Drift Plains was previously dominated by bur oak savanna, (*Quercus macrocarpa*) and prairie species, such as little bluestem (*Schizachyrium scoparium*), big bluestem (*Andropogon gerardi*), Indiangrass (*Sorghastrum nutans*), switchgrass (*Panicum virgatum*), and numerous forbs (Wilken et al. 2011; MnDNR 2020). Other previously widespread tree species included the northern pin oak (*Quercus ellipsoidalis*) and quaking aspen (*Populus tremuloides*; MnDNR 2020). Much of the area has been converted to agricultural croplands, drastically changing the vegetation composition of the region (MnDNR 2020). The current landscape flora consists predominantly of corn (*Zea mays*) and soybeans

(*Glycine max*; MnDNR 2020). The Eastern Iowa and Minnesota Drift Plains are noted as one of the most productive areas in the world for growing corn and soybeans (Wilken et al. 2011).

4.1.3 Fauna

Given the agricultural landscape of Ecoregion 47c, wildlife species, such as the white-tailed deer (*Odocoileus virginianus*), beaver (*Genus Castor*), and raccoon (*Procyon lotor*) are commonly encountered (Wilken et al. 2011). Avian species present in the region include the Canada goose (*Branta Canadensis*), red-tailed hawk (*Buteo jamaicensis*), barn owl (*Tyto alba*), bobwhite quail (*Colinus virginianus*), western meadowlark (*Sturnella neglecta*), pheasant (*Phasianus colchicus*), gray partridge (*Perdix perdix*), and mallard (*Anas platyrhynchos*; Wilken et al. 2011). The Eastern Iowa and Minnesota Drift Plains contains some rivers; however, waterways are predominantly channelized intermittent and perennial streams. Streams and some natural lakes provide habitat for a variety of species, like walleye (*Sander vitreus*), bluegill (*Lepomis macrochirus),* northern pike (*Esox lucius*), sunfish *(Family Centrachidae*), and others (Wilken et al. 2011).

4.1.4 Soils

Soil data for the Eastern Iowa and Minnesota Drift Plains Ecoregion indicates a pattern of forest soils in the central portion of the region, where bur oak savanna formerly dominated (Aqualfs and Udalfs), and prairie soils (Aquolls and Udolls) to the east and western boundaries, where prairie species were more commonplace (White 2020). For clarification, Aqualfs are wet soils developed under forest vegetation and Udalfs are well-drained soils formed under forest vegetation (MnDNR 2020); Aquolls are typically wet soils developed under prairie vegetation, and Udolls are well drained soils developed under prairie vegetation (MnDNR 2020). The Project soils are composed of silt loam and clay loam, which are somewhat poorly drained and poorly drained soils, respectively (USDA 2020).

4.1.5 Geology

A key to the geological origin of the southeastern Minnesota surface is the glacial advances dating back as early as 1.2 million years ago (MGS 2020). The Project boundary is located in an area of older till, outside of the extent of the Des Moines Lobe to the west and the Driftless Area to the east (MGS 2020). The quaternary geology of the Project site is from Pre-Wisconsinian glaciation and thought to be older than approximately 780,000 years (Lusardi et al. 2019). This region was minimally impacted by the more recent glacial events in the State. The Quaternary overburden associated with the Browerville Formation is generally between 75-200 feet in thickness (Mossler 1998). The glacial materials are overlain by loamy diamicton and pebbly deposits (Lusardi et al. 2019). These areas are moderately dissected by ditches, streams, and creeks, draining into the Little Cedar River. The Project boundary is situated on the eastern edge of the Cedar River Watershed. The drainageways are moderately well-defined in close proximity to the proposed Project.

4.1.6 Geomorphology

Geomorphology of the Project is primarily comprised of thick loess and glacial till cover the Mesozoic and Paleozoic shale, sandstone, and limestone (Wilken et al. 2011). Dominant deposits in the Project include the Skyberg, Protivin, and Tripoli soils (USDA 2020). The soils represent a moderate susceptibility to detachment and produce moderate runoff (USDA 2020). The region is drained mainly by the Little Cedar River, which can be 10 to 25 feet lower than the surrounding uplands. Other rivers in the region include the Wapsipinicon River and Upper Iowa River.

Across the Project footprint, the soils are typically an erosional environment. The Project is absent of substantial rivers, floodplains, and terraces, which could present a depositional environment. Because the overall Project is dominated by erosional morphology, it is determined to be absent of paleosurfaces.

4.2 Cultural History

In general, there are five major archaeological traditions in Minnesota that consist of the Paleoindian, Archaic, Woodland, Plains Village, and the later Mississippian, Oneota and Psinomani periods (Anfinson 1997; Arzigian 2008; Dobbs 1990; Gibbon 2012). These traditions represent varying degrees of cultural adaptations to changing environmental conditions, endemic population growth, and the movement of Native American groups in the past. The following cultural context presents an interpretation of this history based on current archaeological research and broadly accepted models for pre-contact social lifeways. A brief narrative of historic period developments within the state is as follows:

4.2.1 Paleoindian Period (13,000 to 9,000 Before Present [B.P.])

The Paleoindian Period represents the earliest evidence of human occupation in Minnesota, typically separated into the Early Paleoindian (13,000–12,500 B.P.) and Late Paleoindian (12,500–9000 B.P.) periods (Frison 1998). Spear technology is important during this timeframe, as opposed to an emphasis on atlatl and bow and arrow lithic technology seen during later periods. This reflects a subsistence strategy focused on large game hunting and high mobility. However, Gibbon (2012:37) suggests foraging behavior may have been broader spectrum, as evidenced by the long temporal overlap of eastern Archaic and Paleoindian traditions in Minnesota. Paleoindian settlement and mobility patterns constitute a major discussion point in archaeological research.

Clovis culture is commonly regarded as the first evidence of human occupation in Minnesota during the Early Paleoindian period. Its signature implement, the Clovis projectile point, is made from high quality lithic materials and has a central channel flake that extends part way up the proximal shaft of the tool (Frison 1998). Folsom is another Early Paleoindian technology that temporally follows Clovis during the Early Paleoindian Period. Its projectile point is typically made from high quality materials as well, with the central channel flake extending the entire length of the implement to the distal tip (Hofman 1995). Clovis and Folsom projectile points were used to hunt now-extinct forms of game, including Bison antiquus and mammoths. Evidence for Early Paleoindian occupation in Minnesota is limited to isolated finds of projectile points. Clovis isolated finds (N=30) have been found in central and southeastern Minnesota, while Folsom

isolated finds (N=20) are documented in the western and southern parts of the state (OSA 2019).

The Late Paleoindian Period in Minnesota is characterized by an unfluted variety of projectile points similar to earlier lanceolate forms that are associated with the Plano Complex (Dobbs 1990). Agate Basin, Eden, Hell Gap, and Scottsbluff are varieties of projectile points found during this time, which are often associated with bison kill sites. Late Paleoindian sites are significantly more common in Minnesota, with over 200 being recorded. The Browns Valley Site in western Minnesota and the Bradbury Brook Site are important Late Paleoindian localities in the region (OSA 2019).

Paleoindian archaeology in Minnesota mirrors the initial expansion of Homo sapien sapiens during the height of the Eurasian Upper Paleolithic periods into North America (Gilligan 2010:16). The focal point of this migration is hypothesized to have occurred in a region termed Beringia, which extends from the Verkhoyansk Mountains in Siberian Russia to the edge of the now extinct Laurentide glacial ice sheet in western Canada (Hoffecker and Elias 2007). Traditionally, the shallow waters of the Bering Sea are argued to have served as the principal access point into the Americas when sea levels were reduced due to extensive glaciation that occurred during the Pleistocene Epoch (2.588 million to 12,000 B.P.).

The proposition that the Bering land bridge may have served as passageway for early human migrations was first suggested by the Spanish Missionary Fray Jose de Acosta in A.D. 1590 (Hoffecker and Elias 2007:2). Although Spain had not yet explored these waters, de Acosta thought it was the only logical explanation for how indigenous populations would have come to the Americas. Eric Hultén (1937) later coined the term “Beringia” to describe the Quaternary ecology of this unique region. The designation Beringia is named for the famous Danish explorer Vitus Bering, who, by way of Russian contract, was the first European to sail the strait in 1728.

The area associated with the bridge is termed the Bering-Chukchi Platform, which extends 1600 km from the Arctic Ocean to the eastern Aleutians (Hoffecker and Elias 2007:5). Although the majority of this region is flat, the topography is punctuated by a few small islands, such as St. Lawrence Island and Wrangle Island. The majority of the shelf lies beneath less than 100 m of water and drops to 30 m near the Chukotka Peninsula, Russia. Over the 2.6 million year course of the Quaternary Period, 100 Marine Isotope Stages (MIS [Oxygen 16/18 ratios]) have been documented, which show the repeated exposure and inundation of the land bridge constituting 50 glacial/interglacial oscillations (2007:7–8). Initial human migrations into North America appear to be associated with the cold-snap brought on by the Younger Dryas (12,900–11,700 B.P.), which effectively lowered sea-levels by 50 m exposing the platform.

The archaeological record for humans expanding into North America is manifested at both interior and coastal sites. Early interior sites include that of Swan Point, Broken Mammoth, and Healy Lake, Alaska, which suggest population movements between the Laurentide and Cordilleran ice sheets between 13,000–11,000 B.P. (Holmes 2001; Cook 1996; Yesner 2001). Concurrently, a rapid coastal migration is also indicated at several South American localities, such as Monte Verde, which demonstrate potential evidence

for groups moving by boat down the Pacific shoreline at approximately 15,000 B.P. (Dillehay 1989; Dixon 1999; Fladmark 1979). Recent genetic work with mtDNA haplogroups in the Americas and Asia appear to confirm the archaeological evidence, showing simultaneous coastal/interior population movement occurring between 18,700 and 14,200 B.P. (O'Rourke 2009; Perego et al. 2009). Alternatively, although followed by much criticism, Bradley and Stanford (2004) suggest that the progenitors of Clovis, and perhaps other groups, were the product of Atlantic migrations associated with peoples of the Solutrean cultures in France. Current genetic evidence refutes this claim; however, the issue does highlight an important debate in Alaskan archaeology (O'Rourke 2009; Perego et al. 2009).

The Pleistocene history of Minnesota is long and complex with most of the state and surrounding regions being covered in glaciers between 18,000 B.P. and 11,000 B.P. (Manz 2019:23). Glaciers did not fully recede until approximately 10,000 years ago, where only the southwestern and southeastern parts of the state remained unglaciated. A dominant feature following deglaciation was Glacial Lake Agassiz. This overlapped the northwest portion of the state and formed during the retreat of the Des Moines Lobe, which principally drained to the south via Glacial River Warren (Gibbon 2012:38). As Lake Agassiz further retreated north, the modern Red River of the North began to form flowing towards the Hudson Bay. In terms of human occupation potential, the southern part of the state is likely the highest probability area to encounter archaeological sites, as it was unglaciated (Gibbon 2012:Map 2.1). Elk, mammoth, and extinct forms of bison (e.g., *Bison antiquus*) may have been hunted by Pleistocene Native Americans of this time frame in Minnesota; however, other resources were probably equally important.

Waguespack (2007:69–70) highlights current evidence for early migrations into North America that indicate hunter and gatherers may have been generalized foragers, as opposed to explicitly large game predators. Historically, the first evidence for the Paleoindian Period comes from New Mexico where archaeologists uncovered fluted projectile points in association with extinct megafauna at sites, such as Blackwater Draw (Cook 1927; Figgins 1927). These important early finds quickly placed the antiquity of humans on the mid-continent of North America at the end of the Late Pleistocene (Howard 1936). Much of the debate generated by these discoveries overly focused on the role mega-fauna placed in the subsistence economy of Paleoindian hunter and gatherers. This pattern is different than many of the interior localities dating prior to 11000 B.P. (e.g., the Village Lake Site at Healy Lake in Alaska [Cook 1969]), which exhibit a broad spectrum diet. Bison and Wapiti appear to be the predominant large game that were hunted during this early period; however, birds and other small mammals were also exploited (Yesner 2001).

Analogous patterns have been observed outside of Minnesota, including eastern Great Basin sites, such as Bonneville Estates Rock Shelter, which demonstrate a broad spectrum diet occurring between 13,100 and 12,000 B.P. (Goebel 2007; Graf 2007:103). The archaeological record from this site suggests the prehistoric inhabitants were participating in a mixed foraging and hunting strategy. The identification of this trend in the Great Basin has led to the suggestion that this early phase be called the "Paleoarchaic" instead of "Paleoindian" in recognition of the markedly different subsistence strategies that were similar to later archaic groups (Graf and Schmitt 2007;

Willig 1988; Willig and Aikens 1988). Realistically, the debate about whether early Paleoindians were generalized foragers or large game specialists likely rests "on the relationship between what could have been hunted and what was actually taken" (Waguespack 2007:70; Waguespack and Surovell 2003).

In contrast to these views, Kelly and Todd (1988) take the position that early populations of hunter and gatherers entering into the North American continent were heavily dependent on terrestrial fauna, as opposed to plant resources, since this was a more reliable food source. They argue that the strategies employed by these foragers were starkly different than that of modern hunter and gatherers, in that groups were not operating in seasonally restricted spaces. An optimal foraging analysis for procuring large game has recently been conducted by Byers and Ugan (2005). Specifically, they identified variables that may have deterred Paleoindians from focusing exclusively on mega-fauna, including the large number of individuals needed for processing, difficulty in procuring game, and distribution of game within different environmental patches. The authors conclude that the phenomena of exclusive large mammal hunting likely only occurred in a "narrow range" of places where game was abundant and processing time was low, such as in the Great Plains (2005:1625). Minnesota and surrounding areas were likely encompassed by this narrower range, as suggested by Kelly and Todd (1988).

Continuing with the issue of broad spectrum versus predominant large game hunting has been problematic to the debate of humans entering into the North American continent. Guthrie (1990) has supported the notion that humans could have easily followed the wide trails of proboscideans across the land bridge. Haynes (2001) reasons that modern African elephants can serve as an analogy for understanding how Pleistocene hunters may have interpreted herd characteristics. Such behavioral patterns include 1) the speed, direction, and health of an elephant herd based on the distribution/content of dung, and 2) the relative size of the animals based on the track width. Elephants create a series of fixed and habitually used trails that would have allowed initial colonizers into interior Alaska as a means to systematically explore the landscape. Conversely, Yesner (2001:317) sees the process of colonization into interior Alaska as involving a "push-pull" factor, presenting evidence for the existence of proboscideans in Siberia up to 9000 B.P. This suggests that hunters would have been encouraged to remain in western Beringia for a longer period of time to procure this higher ranked resource. Foragers may have only episodically crossed the land bridge as eastward movement began to develop as the principal subsistence cycle.

A theoretical trajectory of incipient occupation into novel landscapes has been proposed by Beaton (1993) to describe the initial colonization of Australia (also see Yesner 2001). His model breaks down human entry into two categories: transient explorers and estate settlers. Beaton suggests that the settlement pattern associated with transient explorers would be lineal, conforming principally to significant geographic features, such as mountains, rivers, etc. This type of occupation may be associated with the earliest sites in Minnesota, which could be situated along the margins of major river corridors (e.g., Glacial River Warren). High mobility and small populations are necessary with the transient model, since groups are entering into an unfamiliar landscape leading to potentially high extinction rates. In contrast, estate settlers inhabit new lands in a more radial fashion, since there is a greater degree of familiarity with the resources present.

Kelly and Todd (1988) argue that immigrant Paleoindians would have needed to switch territories frequently due to unfamiliar landscapes. This would have been an adaptive method to adjust to resource stress by either switching territories or adjusting the types of foods being consumed. In reality, the Early and Late Paleoindian Periods in Minnesota likely represented a combination of these alternating mobility strategies.

4.2.2 Archaic Period (9,000 to 2,500 B.P.)

Approximately 9,000 B.P., a new mode of subsistence strategy began to emerge in the archaeological record across North America (Emerson et al. 2011). The general pattern of this change is the replacement of lanceolate spear-points used during the Paleoindian period, and the adoption of atlatl technology with the presence of groundstone implements. This represents a fundamental difference from earlier forager behavior with a diversification of economy that incorporated more plants into the diets of Native Americans. The Archaic Period in Minnesota began substantially later than other regions starting around 9,000 B.P., principally in the southeastern part of the state (Anfinson 1997; Gibbon 2012). Important Archaic innovations include the use of grooved mauls and axes, canine domestication, copper tools, and incipient horticulture. The Archaic Period in Minnesota is poorly known; however, it comprises its longest temporal frame of human occupation.

Xeric environmental conditions began around 9,000 B.P. with the spread of prairie grassland across most of southern and western Minnesota (Anfinson 1997). Many of the lakes created as a product of Pleistocene glaciation started to dry during this time, leading to a reduction in game (e.g., bison, fish, birds, etc.) dependent on these resources. These environmental transformations promoted a diversification in hunting strategies, which differed dramatically from the Paleoindian period.

Minnesota experienced a wide variety in changing environmental conditions based on its different ecotones across the state during this time. As a consequence, the traditional models of Early, Middle, and Late Archaic found elsewhere in North American do not directly apply. These different environmental regimes necessitated a variety of adaptive strategies to successfully subsist. Archaeologists have defined these internal periods within the state as follows: Prairie Archaic, Lake Forest Archaic, Shield Archaic, and Riverine Archaic (OSA 2019).

The Prairie Archaic Period is found across the western parts of Minnesota, representing an adaption to grassland environments. Key game hunted during this period were bison, which remained a focus throughout the entirety of the Archaic Period. Itasca State Park Site contains one of the best examples of the Prairie Archaic pattern. This site dates approximately to between 9,550 and 7,950 B.P. and yielded the remains of an extinct species of bison and the presence of a side-notched dart point. Other important localities from the Prairie Archaic Period include the Granite Falls Site and the Canning Site. A regional variation of the Prairie Archaic during the later periods is the presence of copper tools in the northwestern part of the state, but few examples in the southwestern areas (Anfinson 1997).

The temporal period known as the Lake Forest Archaic accompanies archaeological sites from about 7,950 B.P. in much of central and northern Minnesota (Anfinson 1997;

Gibbon 2012). Prior to this period, most sites in this region would have mirrored those found in grasslands, whose economy focused on bison hunting. As a result, the Prairie Archaic pattern would have been prevalent during the earliest periods based on the similar environment. The expansion of woodlands during the mesic environments of the post-glacial thermal maximum led to a greater diversification of both plant and animal species. The Mississippi River corridor also served as a conduit for archaic groups from other regions, which ultimately influenced the potential spread of technologies and new lifeways into Minnesota. The site of Petaga Point in Kathio State Park is one of the best examples of the Lake Forest Archaic Period and contains evidence of Old Copper culture.

The Shield Archaic Period characterizes sites from far northeastern Minnesota, whose assemblages are the product of Native American adaptations found farther north in Canada (i.e., Canadian Shield). An important characteristic of Shield Archaic sites is the lack of groundstone tools and copper artifacts found. often associated with archaic groups elsewhere in Minnesota (Anfinson 1997; Gibbon 2012). Shield Archaic sites in Canada are typically found near lakes and rivers where caribou and other migratory game may have crossed. Similar to other northern adapted populations, these groups may have utilized specialized technologies, such canoes, snowshoes, toboggans, bark and skin-covered shelters, bark containers, and efficient winter clothing. The Fowl Lake Site is an important Minnesota site near the Canadian border that exemplifies the archaeological record of this period.

The Riverine Archaic period is found at sites located along the lower Mississippi River and other drainages in southeastern Minnesota (Anfinson 1997; Gibbon 2012). The river valley bottomlands provided a rich and varied source of animals and plants that were exploited by Native American populations. Common riverine resources included aquatic tubers, fish, waterfowl, mussels, deer, elk, and bison may have been taken in the uplands. The fertile floodplains also provided suitable locations for horticulture where plants, such as squash and various early cultigens, were grown. The King Coulee Site in Wabasha County is one of the most complete archaic sites from this region and dates to between 3,450–2,450 B.P. A slate gorget, mussel shells, squash seeds, and stemmed projectile points were recovered during the excavations (OSA 2019).

4.2.3 Woodland Tradition (3,000 B.P. to 950 B.P.)

Substantial cultural changes began to occur in Minnesota approximately 2,500 years ago, with Native American adaptations mirroring broader trends across the southern and eastern United States (Arzigian 2008). This timeframe, known as the Woodland Period, is marked by the presence of burial mounds, pottery, bow and arrow technology (ca. 1,450 B.P.), and intensive plant cultivation. Archaeological settlement patterns show Native American groups beginning to aggregate into larger populations along lakes, rivers, and associated drainages. Woodland archaeological sites are often broken into one of a classic tripartite temporal division of Early (3,000–2,150 B.P.), Middle (2,150–1,450 B.P.), and Late Woodland (1,450–950 B.P.) Periods (Emerson et al. 2008).

Traditionally, variations in the Woodland Period across time and space are argued to derive from broader influences that shaped significant trends in cultural practices. These interaction spheres include the Adena (Early Woodland Period), Hopewell (Middle Woodland Period), and Mississippian (Late Woodland Period) Cultures (Anfinson 1997;

Gibbon 2012). While these divisions work well for other regions of North America, they do not neatly apply to archaeological sites in Minnesota (Arzigian 2008).

Major Woodland complexes in the various regions of the state include Laurel, Brainerd, and Blackduck (northern Minnesota); Malmo, St. Croix, Onamia, and Kathio (central Minnesota); Fox Lake and Lake Benton (southwestern Minnesota); and La Moille, Howard Lake, Sorg, and Effigy Mound (southeastern Minnesota) (Arzigian 2008). Pottery is an important distinguishing characteristic of these complexes, which are commonly named for the associated type site where they were first discovered. Ceramic vessels range in form from globular to conoidal with shell or sand grit as temper, and designs across the body (e.g., net impressions, patterned incisions). Lithic technology during this timeframe shows a preference for smaller projectile points utilized principally in bow and arrow technology.

A hallmark characteristic of the Woodland Period in Minnesota is presence of burial mounds, of which 12,000 have been recorded in the state (OSA 2019). The areas surrounding Red Wing, Lake Minnetonka, and Mille Lacs Lake have the highest concentrations of burial mounds. Many of these structures have been destroyed due to historic and modern development.

The subsistence strategies of Woodland groups in Minnesota varied widely based on the type of resources available. Wild rice was central to groups living in the northeast quarter of the state, which was husked in excavated pits and parched in ceramic vessels (Arzigian 2008). Other resources hunted or gathered included deer, fish, and various plants, such as maple sap for sugar. Farther west, around the Red River Valley and southern Minnesota, bison continued to be important as they were in the Archaic Period (OSA 2019). The “Three Sisters” of squash, beans, and corn were grown in small garden plots, which were further supplemented with other resources (e.g., fish and aquatic mammals).

4.2.4 Mississippian, Oneota, Plains Village, and Psinomani Traditions (950 B.P. to European Contact)

The Woodland Period ends throughout most of Minnesota around 950 B.P., with the exception of the northern portions of the state (Arzigian 2008; Gibbon 2012). The dominant regional influence was the site of Cahokia in the American Bottom near the modern city of St. Louis, Missouri on the Mississippi River (Pauketat 2009). This influence is most clearly seen in archaeological sites near Red Wing, Minnesota, that contain Cahokian-style ceramics, large palisaded villages, and evidence of corn horticulture. The presence of square earthen mounds may reflect Cahokian socio-religious belief systems. In Minnesota, the manifestation of this interaction is called the Silvernale Phase (Gibbon 2012).

A widespread cultural complex called Oneota in Minnesota is concurrent with the regional influences of Cahokia, lasting from approximately 950 B.P. until the time of French contact (Gibbon 2012). These mobile groups shared Middle Mississippian traits that included corn horticulture and shell-tempered ceramics (e.g., globular vessels with high rims), but lacked permanent structures, such as burial mounds. Oneota is manifested in different types called Orr (southeastern Minnesota), Blue Earth (south-

central Minnesota), and Ogechie (central Minnesota). Siouan languages were spoken at the time of French contact (OSA 2019).

Plains Village groups from the region of the Missouri River in the Dakotas began to interact with the Oneota in western Minnesota after 950 B.P. (Anfinson 1997; Ahler and Kay 2007). These groups hunted bison, practiced corn horticulture, and lived within earth-lodges protected within palisaded forts (e.g., Double Ditch Site in North Dakota). Globular shaped ceramic jars with crushed rock temper are a hallmark technology of this period. Important Plains Village ceramic complexes in western Minnesota include Cambria, Great Oasis, and Big Stone (OSA 2019).

Psinomani groups are believed to be the ancestors of the modern Dakota people, who lived in east central Minnesota (Gibbon 2012). The principal ceramic type associated with this group is Sandy Lake, whose form is more similar to a bowl rather than the globular jars of Oneota varieties. There is evidence of blended ceramic styles with Oneota Native Americans.

4.2.5 Contact Period and Post-Contact (A.D. 1650 to Present)

The Fur Trade in Minnesota involving Europeans and Native Americans first started in the early 1600s and marked the beginning of contact between these two populations. The historical implications of this interaction were felt in numerous ways both economically and with great social consequence (e.g., small pox). The major players in this arena of interaction were first the French followed by the British, and much later the Americans. French explorers Marquette and Joliet were among the first Europeans to reach the headwaters of the Mississippi entering Minnesota in 1673 (Kellogg 1917).

Throughout this early period up until the 1850s, fur drove much of the European exploration of Minnesota, leading to the establishment of American settlements, including the important Fort Snelling in 1824 (Hansen 1918). This ultimately led to Minnesota becoming a territory in 1849, later achieving statehood on May 11, 1858. In the 1860s, intensive agriculture and ever-increasing European settlements displaced numerous Native Americans groups. These tensions culminated in the tragic Dakota Conflict of 1862 (Carley 1976).

The period after the 1860s, Minnesota became an epicenter for the agriculture, lumber, and mining industries. Agriculture was prevalent in the southern and western parts of the state, while lumber was cut and iron mined in the northeastern areas. The Mesabi, Cuyuna, and Vermilion Iron Ranges were focal points in the procurement of iron, historically employing thousands of people (Upham 2001). Railroad lines were also economically important in Minnesota, making Minneapolis/St. Paul a focal point in transcontinental railways of the 19th and 20th centuries.

History of Mower County

The Mower County limits were defined by the Minnesota State Legislature in 1855 (Curtiss-Wedge 1911). The county was named after a Minnesota legislative member and early settler of the area, John E. Mower. Early settlers of the area noted long-standing land use by the Dakota, Iowa, Sac and Fox tribes. According to these first accounts, the

land was used as hunting grounds, as well as a place where "sanguinary wars" were also fought (Curtiss-Wedge 1911:11-12).

Prior to the 1853, there are no records of permanent Euro-American settlement in Mower County, although fur traders had been working in the area for many years. The Treaty of Traverse des Sioux opened the land for Non-Indian settlers in the area, and immediately, surveyors divided the land into townships, ranges, and sections. Hunter Clark erected his house in the fall of the same year, earning him the title of the first recorded settler in the county. This house was located near the present-day city of Austin, Minnesota (Upham 2001). Numerous other settlers soon followed, many of them recent immigrants from Germany, Norway, and Ireland. On May 22, 1857, Olmsted County annexed twelve square miles of northeastern Mower County.

The economy of Mower County has historically been based on agriculture. Fertile soils in the area were praised for being very thick, some accounts noting a dark loam, often reaching depths of more than a foot and a half (Curtiss-Wedge 1911:3). The rich soils attracted settlers to the area, but the population did not increase dramatically until the introduction of the railroad in 1860. During the railroad era, most of the villages in Mower County were established along the railroads, and the railroads figured prominently in the economies of those villages. During the mid-to-late nineteenth century, the City of Austin grew as a railroad division center and major agricultural shipping point.

In 1891, the George A. Hormel Company was founded in Austin, and its meat packing facility provided additional employment to the surrounding communities (Hormel Foods website, accessed 2020). The population of Mower County continued to grow until the 1960's, when employment in the agricultural and manufacturing sectors began to level off. In the 1990's, health care, retail, and other professional industries began to attract people to Austin, and the population of Mower County began to increase due to employment opportunities in those sectors. The Hormel Company remains a major employer in the county.

5.0 Literature Review

Westwood updated the literature review for the Project originally completed January 2, 2019. On May 29, 2020, Westwood Cultural Resource Manager Ryan Grohnke requested a database search from the SHPO. Additionally, he reviewed the Minnesota state archaeological site files available via the online Portal maintained by the MN OSA to obtain a list of previously recorded archaeological sites and historic structures located within the proposed Project area.

Due to precautions required by the Minnesota Governor's Stay Safe MN orders placed in response to the COVID-19 pandemic, in person review at SHPO and OSA was not allowed. This limited Westwood's ability to review previous survey reports and other materials housed on-site at these locations. Westwood Architectural Historian, Sara Nelson, assisted in requesting materials from staff at the SHPO offices.

5.1 Previous Surveys

Westwood was unable to review previous reports housed at SHPO or OSA for the 2020 literature review. Based on the literature review dated January 2, 2019, one previous survey occurred in a very limited portion of the Project area. This survey is detailed in the report, "Phase I Archaeological Survey of the High Prairie Wind Farm I, 98.9 MW Large Wind Energy Conversion System, Mower County, MN" (McFarlane Consulting, 2006).

5.2 Previously Recorded Archaeological Resources

The Project area is located in the Southeast Riverine west (3w) Archaeological Region of Minnesota (Anfinson 1990). Archaeological properties related to American Indian occupation and activities are usually found along lakes and streams, or by former large permanent bodies of water on prominent topographic features (i.e. uplands or terraces).

Three previously recorded archaeological sites are within one mile of the Project area, none of which are within the Project area boundaries (Table 5-1). Two of the sites have been determined Not Eligible for listing in the National Register of Historic Places (NRHP), and the third has not been evaluated.

Table 5-1: Previously Recorded Archaeological Sites

Site No.	Site Name	Site Type	NRHP Eligibility	Project/Buffer
21MW0045	Oxley	Lithic Scatter	Not Eligible	Buffer
21MW0046	Wood	Lithic Scatter	Not Eligible	Buffer
21MW0047	Hanson	Artifact Scatter, Structural Ruin	Not Evaluated	Buffer

Key: Site No. = site designation applied by OSA; Site Name = unofficial site name as listed on site form; Site Type = brief description of site as designated on site form; NRHP Eligibility = eligibility or listing status in the National Register of Historic Places; Project/Buffer = location within in Project area or one-mile buffer.

5.3 Previously Recorded Architectural Resources

Eighteen historic/architectural resources have been previously inventoried within one mile, but outside of the Project area (Table 5-2). Trunk Highway 56 bisects the Project boundary and one-mile buffer. The First National Bank of Adams (MW-ADA-001), located within the buffer, is listed in the NRHP. Built in 1924, it was designed by the noted Prairie School architects Purcell & Elmslie. The remaining resources have either not been evaluated for NRHP eligibility or the SHPO inventory forms could not be located.

Table 5 - 2: Previously Recorded Historic / Architectural Resources

Inventory No.	Name	Address	NRHP Eligibility	Project/Buffer
MW-ADA-001	First National Bank of Adams	322 Main St.	Listed in NRHP	Buffer

Inventory No.	Name	Address	NRHP Eligibility	Project/Buffer
MW-ADA-002	Adams Water Works	302 Water St.	Unevaluated	Buffer
MW-ADA-003	Blacksmith Shop	305 Main St.	Unevaluated	Buffer
MW-ADA-004	Krebsbach Building	315 Main St.	Unevaluated	Buffer
MW-ADA-005	Krebsbach Block	321 Main St.	Unevaluated	Buffer
MW-ADA-006	A. Torgerson Block	401 Main St.	Unevaluated	Buffer
MW-ADA-007	Tillman Chevy Dealership	xxx 4th St. *Unconfirmed Location*	Unevaluated	Buffer
MW-ADA-008	House	400 Bergen St.	Unevaluated	Buffer
MW-ADA-009	House	NW corner Bergen St. & 3rd St.	Unevaluated	Buffer
MW-ADA-010	Adams City Hall	303 Main St.	Unevaluated	Buffer
MW-ADA-011	Sacred Heart Catholic Church	SW corner Main St. & 5th St.	Unevaluated	Buffer
MW-ADA-012	Nordine Torgerson House	407 Bergen St.	Unevaluated	Buffer
MW-ADA-013	Andrew Torgerson House	405 Bergen St.	Unevaluated	Buffer
MW-ADA-014	Bridge No. 2553	MUN 14 over stream *Unconfirmed Location*	Unevaluated	Buffer
MW-ADA-015	Bridge 89215	*Unconfirmed Location*	Unevaluated	Buffer
MW-ADM-007	Bridge No. 6470	TH 56 crossing stream *Unconfirmed Location*	Unevaluated	Buffer
MW-LOD-004	Bridge No. L5045	*Unconfirmed Location*	Unevaluated	Buffer
XX-ROD-022	Trunk Hwy 56	Trunk Hwy 56	Unevaluated	Project/Buffer

Key: Inventory No. = designation applied by SHPO; Name = unofficial name or resource type as listed on inventory form; Address = location as listed on inventory form, verified in GIS if possible; NRHP Eligibility = eligibility or listing status in the NRHP; Project/Buffer = location within Project area or one-mile buffer.

5.4 Other Sources

An Illustrated Historical Atlas of the State of Minnesota (Andreas 1874) shows the Project area being bisected by the McGregor Western Railroad, which preceded the modern Chicago, Milwaukee, St. Paul and Pacific Railroad. A river is shown along the northwest boundary of the Project area. Historic Trygg Maps (1969) developed from the original township land surveys indicate the Project area consisted of prairie with a river in proximity.

A review of 1938 and 1954 historic aerial photographs indicate the Project area was predominantly agricultural land. No potential cultural resources were observed.

6.0 Field Investigations

6.1 Archaeology

Westwood Archaeological Principal Investigator Rigden Glaab, Cultural Resources Manager, Ryan P. Grohnke, Permit Lead Dean T. Sather, and Archaeological Technicians Sara Nelson and Daniel Schneider, conducted the field investigations on October 19 - 29, 2020.

Topography throughout the APE is generally level. The land is entirely agricultural with a mix of corn and soybeans. Field conditions generally comprised recently harvested and/or disced fields with ground surface visibility ranging from 25–95%, which enabled the use of pedestrian survey. Representative photographs of the Project area can be viewed in Appendix A. No archaeological resources were observed.

7.0 Summary and Recommendations

The current archaeological survey for the Louise Solar Project identified no archaeological resources. It is recommended that no additional cultural resources investigations are warranted in the current APE, and it is recommended that the Project be allowed to proceed as planned.

Westwood stresses that if construction plans are altered to include areas not previously surveyed, those locations must be examined for cultural resources. Although an archaeological survey was completed, the possibility of unidentified resources remains. If unrecorded archaeological sites are discovered during construction, all ground-disturbing activities in the area should stop and archaeologists at Westwood should be contacted. Further, if human remains are encountered during construction activities, all ground disturbing activity must cease, and local law enforcement must be notified. *Minnesota Statute 307.08, the Private Cemeteries Act, prohibits the intentional disturbance of human burials.*

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Appendix A - Representative Photographs of Area of Potential Effect

Photo 1.

Overview of project area, facing south from northeast end of APE.

Photo 2.

Overview of project area, facing east from northwest portion of APE.

Photo 3.

Overview of project area, facing east from north-central portion of APE.

Photo 4.

Overview of project area, facing west from north-central portion of APE.

Photo 5.

Overview of project area, facing north from southeastern end of APE.

Photo 6.

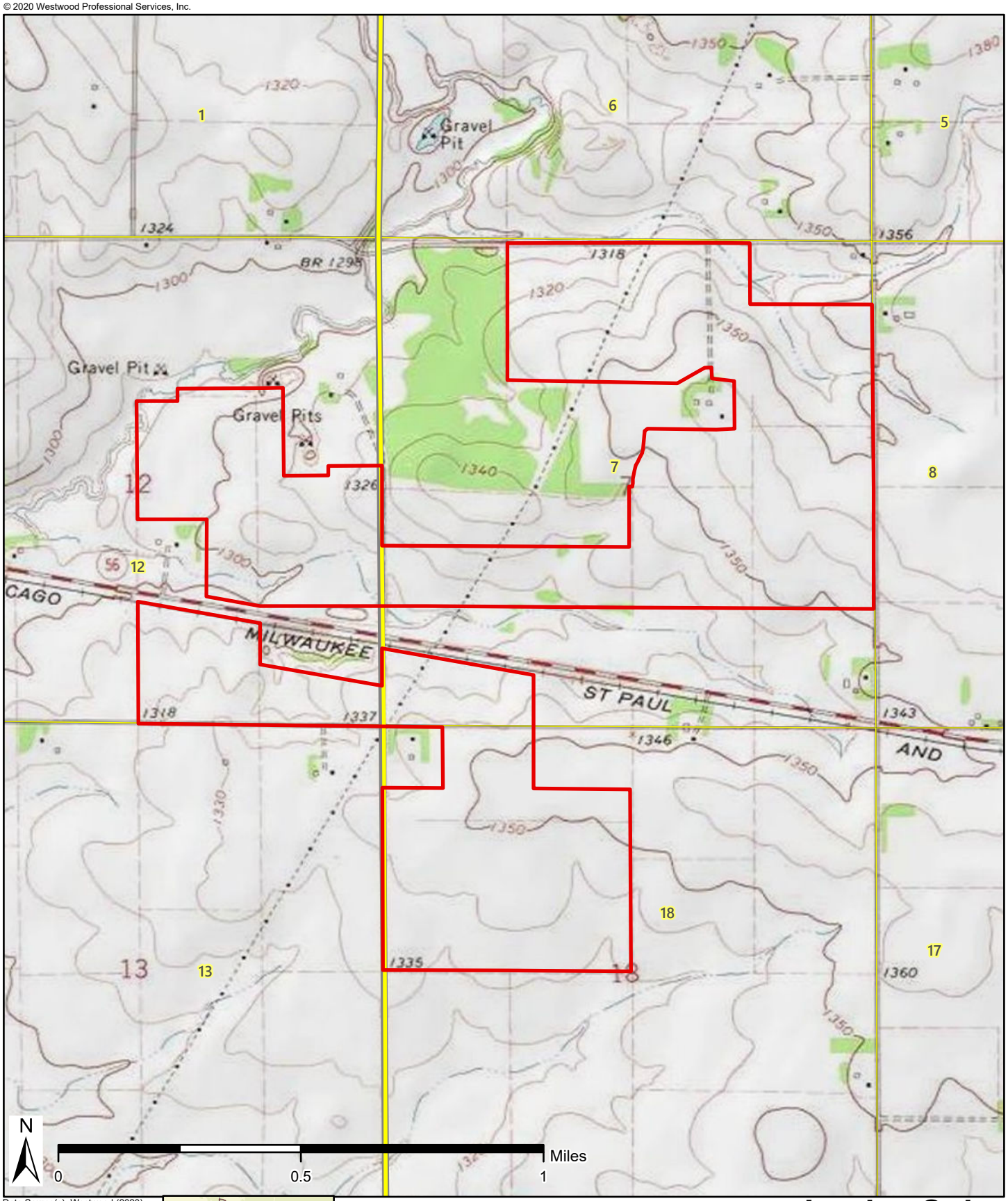
Sandpit in western portion of APE, facing south.

Photo 7.

Facing north along 680th Ave toward Highway 56 in south-central portion of APE.

Photo 8.

Overview of project area, facing southeast from southwestern portion of APE.



Data Source(s): Westwood (2020); USGS Topographic Maps (2013), Esri Street Map.

Legend

- Project Boundary
- Township Boundary
- Section Boundary

Louise Solar

Mower County, Minnesota

Project Location

EXHIBIT 1

Westwood
Toll Free (888) 937-5150 westwoodps.com
Westwood Professional Services, Inc.

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