Appendix I

Phase I Archaeological Resource Investigation for Birch Coulee Solar Project, Renville County, Minnesota SHPO Number: 2023-2896

Appendix I **Phase I Archaeological Resource Investigation for Birch Coulee Solar Project, Renville County, Minnesota SHPO Number: 2023-2896**

In accordance with Minnesota Rules, part 7829.0500, and Minnesota Statutes Chapter 13, Birch Coulee Solar has designated portions of Appendix I as NONPUBLIC DATA–NOT FOR PUBLIC DISCLOSURE because it contains sensitive cultural resource. The Minnesota State Historic Preservation Office Manual for Archaeological Projects in Minnesota provides for restricted access to sensitive cultural resource information. Given the need to include nonpublic information, Birch Coulee Solar has prepared and is electronically filing both NONPUBLIC and public versions of Appendix I.

PUBLIC DOCUMENT - NONPUBLIC DATA HAS BEEN EXCISED

Phase I Archaeological Investigation for the Birch Coulee Solar Project, Renville County, Minnesota SHPO Number: 2023-2896

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March 12, 2024

ABSTRACT

On behalf of Birch Coulee Solar, LLC (Birch Coulee Solar), an affiliate of AES Clean Energy, Barr Engineering, Co. contracted In Situ Archaeological Consulting, LLC (In Situ) to provide archaeological services in support of the Birch Coulee Solar Project (Project). This report presents the results of the intensive Phase I archaeological investigation conducted by In Situ for the Project.

The Project consists of solar energy development on private land partially within and primarily north of the city limits of Franklin, Renville County, Minnesota. The archaeological review for the Project consisted of background literature review and field survey of approximately 1,043.6 acres (Project Area).

Birch Coulee Solar does not anticipate any federal permitting requirements or funding, and the Project Area is not located on federal land. Therefore, the Project is not subject to Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470 [36 CFR 800]).

This assessment informs the potential effects of the Project on archaeological and historic resources pursuant to Minnesota Rules, part 7850.1900, subpart 3(d), the Minnesota Historic Sites Act (Minnesota Statutes, sections 138.661 to 138.669), and the Field Archaeology Act (Minnesota Statutes, sections 138.31 to 138.42).

The Project is within areas consisting of agricultural fields, mixed grasses, utilities, and agricultural infrastructure (outbuildings, gravel drives, etc.). The Phase I investigation included an intensive archaeological field survey of the Project Area.

During the field survey, a total of 1,043.6 acres were inventoried for the Project. One previously recorded archaeological site was revisited during the archaeological survey. The previously recorded resource consists of a historic Euro-American farmstead/artifact scatter site (21RN0038) that has been determined *not eligible* for the NRHP. As a result of the Phase I, site 21RN0038 was found to have been destroyed by the construction of a substation. As a result, no further work is recommended for this resource for this Project.

In addition, during the field survey In Situ was accompanied by Traditional Cultural Specialists (TCS) with the Lower Sioux Community Tribal Historic Preservation Office (THPO) and the Upper Sioux Community THPO. TCS staff with the Lower and Upper Sioux Community THPOs recorded and documented three culturally sensitive areas of tribal concern within the Project Area. The assessment details of these areas are on file with the THPOs.

Pursuant to the Minnesota Historic Sites Act, no historic properties listed on the NRHP or State Register of Historic Places are located within the Project Area. Pursuant to the Field Archaeology Act, no archaeological sites were identified within the Project Area. In compliance with Minnesota Rules, part 7850.1900, subpart 3(d), Birch Coulee Solar will continue coordinating with the Lower and Upper Sioux Community THPOs regarding measures to avoid and/or minimize potential impacts to the culturally sensitive areas of tribal concern. As a result, a recommendation of 'no further work' is considered appropriate for the Project.

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INTRODUCTION

On behalf of Birch Coulee Solar, LLC (Birch Coulee Solar), an affiliate of AES Clean Energy, Barr Engineering, Co. contracted In Situ Archaeological Consulting, LLC (In Situ) to provide archaeological services in support of the Birch Coulee Solar Project (Project). This report presents the results of the intensive Phase I archaeological investigation conducted by In Situ for the Project.

The Project consists of a solar energy development Project on private land just north of Franklin, Renville County, Minnesota. The archaeological review for the Project consisted of background literature review and field survey of approximately 1,043.6 acres (Project Area). Currently, the Project is not considered an undertaking subject to Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended (16 U.S.C. 470 [36 CFR 800]).

This assessment informs the potential effects of the Project on archaeological and historic resources pursuant to Minnesota Rules, part 7850.1900, subpart 3(d), the Minnesota Historic Sites Act (Minnesota Statutes, sections 138.661 to 138.669), and the Field Archaeology Act (Minnesota Statutes, sections 138.31 to 138.42).

The Project is located partially within and primarily north of the city limits of Franklin, Renville County, Minnesota (Table 1). The Project Area is located on privately owned land, within areas consisting of agricultural fields, mixed grasses, utilities, and agricultural infrastructure (outbuildings, gravel drives, etc.). The Phase I investigation included an intensive archaeological field survey of the Project.

Table 1: Legal Locations of the Proposed Project Area

Township (T)	Range (R)	Section(s)
112 North	33 West	6
112 North	34 West	1, 2
113 North	33 West	31
113 North	34 West	36

The literature review was conducted on July 21, 2023, and the Phase I archaeological investigation was conducted on November 13-15, November 20-22, and November 27-28, 2023. The Phase I investigation included a background literature review within and surrounding the proposed Project Area along with an approximate 1,043.6 acres intensive survey of the proposed Project.

Abraham Ledezma served as Principal Investigator for the archaeological investigation. Mr. Ledezma meets the requirements for the Secretary of the Interior's Guidelines for Professional Qualifications in Archaeology. Mr. Ledezma has over 17 years of experience and received an M.S. in Applied Anthropology from Missouri State University in 2012 and a B.A. in Anthropology, with an emphasis in Archaeology from Minnesota State University Moorhead in 2008. Fieldwork was completed by the field crew consisting of Abraham Ledezma, Craig Picka, Benjamin W. Schweer, Sylvia Sandstrom, and John Seidl. During the field investigation, the In Situ field crew was accompanied by Traditional Cultural Specialists (TCS) with the Lower Sioux Community Tribal Historic Preservation Office (THPO) and the Upper Sioux Community THPO. TSC staff included Ms. Cheyanne St. John, Mr. Dane Nelson, and Mr. Bob Larson of the Lower Sioux

Community THPO, and Mr. Drew Brockman of the Upper Sioux Community THPO. Literature review data was compiled by Abraham Ledezma and report figures were completed by Santos Ledezma. All field notes and photographs are maintained on file at In Situ's office located in Eden Prairie, Minnesota.

ENVIRONMENTAL AND GEOMORPHOLOGICAL CONTEXT

At the time of the survey, the topography of the Project Area consisted of fairly flat to undulating terrain. Vegetation observed during the inventory included mixed grasses, harvested corn remnants, harvested soybean remnants, and wooded vegetation. Impacts to the Project Area include natural erosion, agricultural practices, rural development, utilities, and agricultural infrastructure (outbuildings, gravel drives, etc.).

ECOLOGICAL SETTING

The Project Area is located within the Western Corn Belt Plains (47) Level III ecoregion, and more specifically, the Des Moines Lobe (47b) Level IV ecoregion. The Des Moines Lobe is defined as a "vast fertile plain of deep soils dominated by row crops" (U.S. Environmental Protection Agency 2007).

Prehistoric and historic vegetation within the region known as the Upland Prairie within the Minnesota River Prairie, consisted of bluestems, Indiangrass, needle and grama grasses, composites, and other forbs with forests of silver maple, elm, cottonwood, and willow in floodplains along the Minnesota River and other streams. Currently, agriculture is the dominant land use within the region (Minnesota Department of Natural Resources 1988; 2023).

Hundreds of wildlife species are resident or seasonal visitors to the region along with hundreds of native fish species which live in the surrounding rivers and tributaries. Some of the fauna that would have been common and available for historic and prehistoric human use in the Minnesota region include white-tail deer, black bear, elk, opossum, raccoon, cottontail rabbit, squirrel, gray fox, bobcat, mountain lion, wolf, mink, otter, beaver, muskrat, and woodchuck (Gibbon 2012).

CLIMATE

The climate of Minnesota is a continental-type climate that is marked by seasonal variations. The average annual temperatures in Minnesota range from 36 degrees Fahrenheit (ºF) in the extreme north to 49°F in the southeastern corner. The average winter temperature is 17ºF and the average summer temperature is 70ºF (National Climatic Data Center 2017). In Renville County, winters are cold and the summers are warm. Most of the precipitation occurs during spring and summer when about 73 percent of the annual precipitation is received between April and September. The average annual precipitation is about 28.31 inches in the county. The average snowfall is 45.1 inches. The average winter temperature is 15ºF and the average summer temperature is 70ºF (U.S. Department of Agriculture, NRCS 1999).

The Phase I survey was conducted on November 13-15, November 20-22, and November 27-28, 2023. The weather was cool to cold and sunny to cloudy, typical for the region at that time of year.

PHYSIOGRAPHY AND HYDROLOGY

The Project Area is located within the Olivia Till Plain. This area constitutes a till plain that is located north of the Minnesota River and is very similar to the Blue Earth Till Plain, except with weaker linearity through most of its area (Wright 1972). The highest elevation in Renville County

is about 1,125 ft. above sea level with the lowest elevation at about 800 ft. above sea level (U.S. Department of Agriculture, NRCS 1999).

In Renville County, the major drainages include the Minnesota River and its tributaries (U.S. Department of Agriculture, NRCS 1999). County Ditch 109A and County Ditch 14-23 run through the Project Area. Additional nearby water bodies consist of:

- County Ditch 111 (approximately 0.8 miles west of the northwest corner of Project Area),
- Threemile Creek (approximately 3.4 miles south of the southeastern portion of the Project Area),
- Fort Ridgley Creek (approximately 4.4 miles east of the southeastern portion of the Project Area), and
- the Minnesota River (approximately 5 miles south of the Project Area) (Figures 2 and 4).

GEOLOGY

The geology of the Project Area is characterized by migmatitic gneiss, amphibolite, and granite, dating to the Middle to Early Archean and by Cretaceous rocks, undivided, dating to the Cretaceous. The migmatitic gneiss, amphibolite, and granite consist of:

- Montevideo and Morton Gneisses (3600-3000 m.y.) in the Minnesota River Valley, southwestern Minnesota;
- McGrath Gneiss (2750 m.y.) east of Mille Lacs Lake;
- components of Hillman Migmatite southwest of Mille Lacs Lake; and
- Sartell Gneiss in Stearns County.

The migmatitic gneiss, amphibolite, and granite are inferred to include "various younger rocks, including granitoid intrusions in the Hillman Migmatite and pillowed basalt in poorly exposed areas of southwestern Minnesota (Morey and Meints 2000)." The Cretaceous rocks, undivided consist of "Dakota, Graneros, Greenhorn, Carlile, Niobrara, and Pierre formations and their nonmarine equivalents in northwestern, southwestern, and southeastern Minnesota (Morey and Meints 2000)."

SOILS

The Project Area is located within the Canisteo-Okoboji-Nicollet and Clarion-Nicollet-Webster soil associations. Canisteo-Okoboji-Nicollet and Clarion-Nicollet-Webster soils are described as "nearly level to moderately steep soils on ground moraines" (U.S. Department of Agriculture, NRCS 1999). Fifteen specific soil series are mapped in the Project Area, with the most prevalent soil series consisting of Canisteo-Glencoe complex (L107A) (Natural Resources Conservation Service 2023). Table 2 summarizes the mapped soils within the Project Area.

Table 2: Summary of Soil Series within the Project Area.

Soil Series	Parent Material	Drainage	Slope	Landform
Canisteo clay loam (86)	Fine-loamy till	Poorly drained	0-2%	Rims on depressions, ground moraines
Clarion loam (102B)	Fine-loamy till	Moderately well drained	2-6%	Ground moraines
Harps clay loam (112)	Fine-loamy till	Poorly drained	0-2%	Rims on depressions
Crippin loam (118)	Fine-loamy till	Somewhat poorly drained	1-3%	Ground moraines
Delft clay loam (336)	Colluvium over till	Poorly drained	0-2%	Swales on ground moraines
Okoboji mucky silty clay loam, depressional (386)	Fine-silty alluvium	Very poorly drained	0-1%	Depressions on moraines
Klossner muck, depressional, calcareous (519)	Muck herbaceous organic material over fine-loamy till	Very poorly drained	0-1%	Depressions on moraines
Clarion-Swanlake complex (887B)	Fine-loamy till	**Clarion:** Moderately well drained **Swanlake:** Well drained	2-6%	Ground moraines
Clarion-Storden-Hawick complex (920B)	**Clarion/Storden:** Fine-loamy till **Hawick:** Sandy and gravelly outwash	**Clarion/Storden:** Well drained **Hawick:** Excessively drained	2-6%	Hills on moraines
Clarion-Storden-Pilot Grove complex, moderately eroded (1373C)	**Clarion/Storden:** Fine-loamy till **Pilot Grove:** Loamy glaciofluvial deposits over sandy outwash over till	**Clarion/Storden:** Well drained **Hawick:** Somewhat excessively drained	6-10%	Ground moraines
Clarion-Storden complex, moderately eroded (1376C)	Fine-loamy till	Well drained	6-10%	Ground moraines
Webster clay loam (L83A)	Fine-loamy till	Poorly drained	0-2%	Ground moraines
Nicollet clay loam (L85A)	Fine-loamy till	Somewhat poorly drained	1-3%	Ground moraines
Canisteo-Glencoe complex (L107A)	**Canisteo:** Fine-loamy till **Glencoe:** Local alluvium over till	**Canisteo:** Poorly drained **Glencoe:** Very poorly drained	0-2%	**Canisteo:** Rims on depressions, ground moraines **Glencoe:** Depressions
Okoboji silty clay loam (L163A)	Local alluvium over till	Very poorly drained	0-1%	Depressions

Source: Natural Resources Conservation Service (2023).

CULTURAL CONTEXT

The Project location is situated in Renville County, located in south-central Minnesota and within Archaeological Region 2 – Prairie Lake Region (Anfinson 1990, Gibbon 2012; Gibbon et al. 2002). The Prairie Lake Region encompasses all or portions of the following counties:

- Big Stone
- Blue Earth
- Brown
- Carver
- Chippewa
- Cottonwood
- Douglas
- Faribault
- Grant
- Jackson
- Kandiyohi
- Lac Qui Parle
- Le Sueur
- Lincoln
- Lyon
- Martin
- McLeod
- Meeker
- Nicollet
- Nobles
- Otter Tail
- Pipestone
- Pope
- Redwood
- Renville
- Rice
- Scott
- Sibley
- Steele
- Stevens
- Swift
- Traverse
- Waseca
- Watonwan
- Yellow Medicine

The Prairie Lake Region's topography is characterized by swell and sway topography in the interior of the region with hilly end moraines along the northern, eastern, and southern edges. The major topographic feature is the Minnesota River trench that bisects the region west to east and the scarp of the Prairie des Coteau highland in the west. Lakes in the region are shallow, not exceeding 10 m in depth. Most of the rivers within the region empty into the Minnesota River from the north to the south, except Shell Rock River in the southeast that flows into the Cedar River in Iowa (Anfinson 1990; Gibbon 2012; Gibbon et al. 2002).

During the contact period, the southern and western areas of the Prairie Lake Region were covered in tallgrass prairie. Trees were uncommon in the western part of the region. There were forests along the narrow river bottoms, with oak woods along the major river valleys and small patches of woodland in fire-protected areas. The Minnesota River Valley contained the main wood resources for the western part of the region. The eastern area contained extensive Big Woods vegetation in the north and Oak Parkland in the south. The main flora resources included aquatic plants such as water lilies, cattails, and wild rice. In the uplands, flora resources included prairie turnips, ground plums, and acorns. The main fauna resources were the bison with the occasional elk herds in the uplands and prairies with whitetail deer in the Minnesota River Valley and forest areas. The lakes in the southwestern part of the region provided aquatic fauna (i.e., muskrats), waterfowl, and fish (Anfinson 1990; Gibbon 2012; Gibbon et al. 2002).

The following narrative presents condensed pre-contact, contact, and post-contact cultural overviews of the survey area.

PALEOINDIAN (11,500–7,500 BC)

The Paleoindian period in North America dates between approximately 11,500–7,500 BC. This is the period in which the first human populations came to North America and corresponds with the last retreat of the Wisconsin glacial period. The defining characteristics of the Paleoindians were:

- extensive use of exotic cherts,
- specialized lithic technologies,

- small and extremely mobile societies, and
- primary subsistence on large game mammals (J. Morrow 1996; Schermer et al. 1995).

During this period, the environment in Minnesota continually changed from an "open boreal coniferous forest dominated by grasses and scattered conifer trees" (Gibbon 2012:38) to open prairie in the southwest, deciduous forest in center-southeast, and a coniferous forest in the north.

Early Paleoindian (11,500–10,500 BC)

The main characteristic that distinguishes the Early Paleoindian period from the Late Paleoindian period are the use of fluted lanceolate points, and subsistence hunting of large, extinct animals including mammoths, mastodons, and giant bison varieties (Gibbon 2012; J. Morrow 1996; Schermer et al. 1995). Less than 100 Early Paleoindian stone tools have been identified within Minnesota (Gibbon 2012).

The lithic technology of the Early Paleoindian period is characterized by fluted lanceolate points. The fluted styles found in Minnesota include Clovis, Gainey, Folsom, and Holcombe Points (T. Morrow 2016). Fluting is the removal of a flake from the base of the projectile. The earliest known point type in North America is the Clovis, which dates from circa 9,500 to 8,650 BC (T. Morrow 2016). Clovis points are broad, thin, well-made lanceolate points with concave bases and basal flutes that extend one-half to one-fifth the length of the point. Folsom is the second oldest recorded lithic technology and overlaps with Clovis, dating between 8,900 to 8,400 BC (J. Morrow 1996; Schermer et. al. 1995). Folsom points are "thin, finely made, medium sized lanceolate points with a flattened to bi-concave cross-section, parallel to convex sides, and broad flutes that cover at least 60 percent of each face" (T. Morrow 2016:128). Gainey points are fluted points that have a "lanceolate outline, deep and rounded basal concavities, and well-defined primary flutes" (T. Morrow 2016:124). Holcombe points are "small, thin lanceolate points with shallow concavities with broadly convex sides and high midpoint above the center" (T. Morrow 2016:132).

Late Paleoindian (10,500–7,500 BC)

The Late Paleoindian period is characterized by the disappearance of fluted lanceolate styles and replaced with non-fluted lanceolate point types. Stemmed points, some heavy stone tools, and the use of Hixton quartzite from western Wisconsin are also characteristics of the Late Paleoindian period in Minnesota (Gibbon 2012). The majority of Late Paleoindian artifacts have been found as surface finds in plowed fields, which have been removed from their original context. This makes any inferences between the associations between the artifacts of this period difficult. The point types found in Minnesota from this period are Agate Basin, Alberta, Angostura, Browns Valley, Eden, Frederick, Hell Gap, Midland, Plainview, and Scottsbluff. These artifacts tend to be well made with high-quality craftsmanship (Gibbon 2012; T. Morrow 2016).

ARCHAIC PERIOD (10,500–500 BC)

The Archaic Period within Minnesota dates between 10,500–500 BC. Within Minnesota, that Early Archaic period coexisted with the Late Paleoindian period with little definable timeframe. The Archaic Period in Minnesota is characterized by the:

- expansion of a subsistence strategy that relied on a variety of modern game fauna (deer, moose, bison, rabbits, beavers, birds, and fish) and wild flora resources,
- absence of pottery manufacturing,
- appearance of a variety of notched and stemmed projectile points,
- emergence of pecked and groundstone tools, and
- appearance of native copper artifacts, and some exotic materials such as marine shell (Florin et. al. 2016; Gibbon 2012; Stoltman 1997).

During this period, the climate was continuously changing toward a warm and dry climate, a change known as the Altithermal. The dry and hot weather continued for approximately 1,000 years before changing to a cooler, wetter climate that led to a more modern ecology by 3,000 BC (Florin et al. 2016). Deciduous forests dominated the southern area of Minnesota while pine forests replaced the boreal spruce forests in the north. By 8,000 BC, the tallgrass prairie had spread from west to east across the state, pushing the forests east and then receding back to its present position (Gibbon 2012).

Early Eastern Archaic (10,500–7,500 BC)

The Early Eastern Archaic period was contemporaneous with the Late Paleoindian. The Early Eastern Archaic describes the Archaic complexes that derived from the eastern woodlands instead of the western prairie. The Early Eastern Archaic dates between 10,500–7,500 BC (Gibbon 2012). This was a transitional period for cultures, with less reliance upon large game mammals to more reliance upon foraging subsistence (T. Morrow 1996; Schermer et al. 1995). The Early Eastern Archaic points are notched or stemmed styles such as Dalton, Hi-Lo, Quad, Thebes, St. Charles, Graham Cave Side Notched, and Kirk Corners Notched points (Florin et al. 2016; Gibbon 2012). These points are often associated with sparse scatters of non-diagnostic artifacts like scrapers, blades, and point blanks. As with the Paleoindian period, it is likely that organic artifacts like wooden artifacts, cords/textiles, and bone tools have not lasted until modern times (Florin et al. 2016; Gibbon 2012).

Middle Archaic (7,500–3,000 BC)

The Middle Archaic dates approximately between 7,500–3,000 BC. The driest and warmest post-glacial period, the Altithermal, occurred during this period. Due to large climatic changes during this period, many sites may have either been buried or eroded away (Florin et al. 2016; Gibbon et al. 2002). The lithic technology of the Middle Archaic is characterized by a wide range of medium-sized stemmed and notched projectile point types. The projectile points of the Middle Archaic tend to be smaller and poorly made compared to Early Archaic and Late Paleoindian points. This may have been due to an emphasis on using and possibly heat-treating poor quality local lithic resource material rather than the use of higher quality, exotic lithic materials.

Middle Archaic points are smaller than Paleoindian points, with side notches and beveled, re-sharpened edges. These edges seem to be used for both penetration and cutting. The points were used as projectile points for atlatl darts, which first appeared during the Archaic Period. The site types from this period in Minnesota include base camps, short-term camps, kill sites, lithic scatters, burials, lithic quarries, and workshops.

The points of the Middle Archaic are divided into two broad categories, the Plains and the Eastern Woodlands. Projectile point types found in the Eastern Woodlands include LeCroy Bifurcated Stemmed, Fox Valley Truncated Barb, Osceola, Raddatz Side Notched, Eva I, Morrow Mountain I and II, Matanzas Side Notched, Etley, Benton Stemmed, and Elk River Stemmed. The point types found in the Plains are Simonsen, Graham Cave Side Notched, Oxbow, McKean, and Table Rock Stemmed. During this period, ground stone tool technology appears such as grooved stone axes, boatstones, bannerstones, and gorgets (Florin et al. 2016; Gibbon 2012; T. Morrow 1996; Schermer et al. 1995).

Late Archaic (3,000–500 BC)

The Late Archaic in Minnesota, dating between 3,000–500 BC, is characterized by the appearance of different sets of diagnostic points styles; presence of raw exotic materials (e.g., native copper and marine shell); appearance of "unusual" artifacts including birdstones, gorgets, and Turkey Tail bifaces; presence of communal burials sites; lack of ceramics; and an increasingly modern Late Holocene environment (Gibbon 2012:78).

During the Late Archaic, intergroup interactions increased due to an increase in population growth. This increase in population and group interactions created similar subsistence strategies over large areas, which in turn increased each groups' territory size, and increased the number of local, distinctive artifact styles. Trade networks were also developed and established between different communities. The Altithermal ended during this period, causing increased resource stability in areas that were previously inhabitable by humans. A more sedentary lifeway was practiced, as is evidenced by the construction of large communal cemeteries, an increase in wild rice harvesting, and the use of gardens which were cultivated with sunflower, amaranth, and squash (Gibbon 2012; Schermer et al. 1995).

The point types from the Late Archaic are divided into five regional areas: Upper Mississippi River Valley, Northeast, Central Mississippi River Valley, Northern Plains, and Southeast. The Upper Mississippi River Valley consists of:

- Large Side Notched Cluster (Godar, Madison Side Notched, Osceola, and Raddatz Side Notched),
- Durst Cluster (Durst Stemmed) Late Archaic Stemmed Cluster (Karnak Stemmed),
- Turkey Tail Cluster (Turkey Tail),
- Terminal Archaic Barbed Cluster (Delhi and Buck Creek Barbed),
- Early Woodland Straight Stemmed Cluster (Fox Valley Stemmed, Kramer, Robbins), and
- Motley Expanding Stem Cluster (Motley, Atalissa, and Tipton).

The Northeast consists of the Matanza Cluster (Matanzas Side Notched and Brewerton Eared Notched). The Central Mississippi River Valley consists of:

- Table Rock Cluster (Table Rock Stemmed),
- Etley Cluster (Etley),
- Nebo Hill Cluster (Nebo Hill Lanceolate and Sedalia Lanceolate), and

- Wadlow Cluster (Wadlow).

The Northern Plains consists of the McKean Cluster (McKean, Duncan, and Hanna), and the Oxbow Cluster (Oxbow). The Southeast consists of:

- Eva Cluster (Eva II),
- Benton Cluster (Benton Stemmed and Elk River Stemmed),
- Ledbetter Cluster (Ledbetter stemmed) and
- Dickson Contracting Stemmed Cluster (Gary and Little Bear Creek) (T. Morrow 2016; Gibbon 2012).

WOODLAND PERIOD (500 BC–AD 700)

The timeframe for the Woodland Period in Minnesota varies. In southeastern Minnesota, this period dates between 500 BC–AD 700. In central and northern Minnesota, the Woodland Period dates between 200 BC–AD 700. During this period, the environment stabilized and allowed for the development of greater regional variations.

The two main characteristics of the Woodland Period in Minnesota are the appearances of pottery and earthen burial mounds (Johnson 1988). The appearance of these two cultural developments may suggest an increase in social complexity. Hunting and gathering continues within the Woodland period with the "intensification of food resource activities initiated in the Late Archaic period" (Gibbon 2012:93). However, there is also an increasing reliance on domesticated plants and wild rice, which indicates an increase in population growth and sedentism (Johnson 1988; Radford et al. 2015). This document will concentrate on the Initial and Terminal – Woodland periods in southeastern Minnesota.

Initial Woodland in Southeastern Minnesota (500 BC–AD 500)

The Initial Woodland Period in southeastern Minnesota describes the Woodland Period (500 BC-AD 500) in the area east and south of St. Cloud, Minnesota. It is divided by Gibbon (2012) into Early Woodland, Havana-Related Middle Woodland, and Late Middle Woodland.

Early Woodland (500–200 BC)

The most identifiable diagnostic artifact from the Early Woodland period in southeastern Minnesota is the appearance of the La Molle Thick pottery and Black Sand series of pottery. La Molle Thick Pottery has walls ranging between 1-1.5 centimeters thick and has a cordmarked surface with "distinct vertical to oblique cordmarking on the exterior surface and horizontal to oblique cordmarking on the interior surface" (Anfinson 1979; Gibbon 2012). La Molle Thick could be associated with a variety of straight-stemmed points, most commonly the Kramer points. Black Sand series of pottery are decorated with incised lines (Black Sand incised), or with finger or fingernail impressions (Sisters Creek Punctate), although the latter is less common. Waubesa Stemmed points are associated with finger/fingernail impressed pottery. Other point types associated with the Early Woodland of southeastern Minnesota are Adena, Robbins, and Dickson (Florin et al. 2016; Gibbon 2012; T. Morrow 2016).

Havana-Related Middle Woodland. (200 BC–AD 200)

The Havana-Related Middle Woodland period dates from 200 BC–AD 200 and consists of three phases: Howard Lake, Sorg and Malmo. The Howard Lake phase is not well understood nor well investigated. This phase is the northernmost regional variant of the Havana Hopewell from Central Illinois River valley and the Hopewell Interaction Sphere. The Hopewell Interaction Sphere was the propagation of ideas about social organization and relationships, technology, and economic activities from the Hopewellian culture centers in Illinois and Ohio (Perry 1996; Schermer et al. 1995). The Howard Lake phase is centered on many major rivers, lakes, and wetlands of southeastern Minnesota. The greatest site concentration of this phase is within southern Anoka County, where there are large mound concentrations with some small habitation sites. The Sorg phase is concentrated around Spring Lake, south of St. Paul, Minnesota. The Malmo phase is the most common phase of the Havana-Related Middle Woodland period. Sites from this phase are found across much of central and eastern Minnesota (Arzigian 2008; Florin et al. 2016; Gibbon 2012).

The ceramics of the Havana-Related Middle Woodlands are wide-mouthed jars with thick vessel walls (6–12 mm), straight rims, slightly constricted necks, fairly rounded shoulders, and subconoidal bases. They are grit-tempered and are decorated with punctuates, bosses, incised lines, slashes, cordwrapped-stick impressions, and dentate stamping. The point types associated with this period are the Hopewell luster, which includes Snyders, Manker, and Gibson points (Arzigian 2008; Gibbon 2012).

Havana burials within the south of Minnesota were typically grouped from two, three, or 15 conical burial mounds. The mounds varied in size, with the larger mounds measuring 30 feet in height. Mounds over five ft. high almost always contained diagnostic Havana-Hopewell burial items including copper earspools, pan pipes, celts, perforated bear canines, platform pipes, pearl beads, and elongated, nonutilitarian bifaces (Arzigian 2008; Gibbon 2012).

Late Middle Woodland (AD 200–500)

The Late Middle Woodland dates from AD 200–500. The change from the Havana-Related Middle Woodlands to the Late Middle Woodlands appeared to be a gradual process among the local populations. The archaeological record of this period in southeastern Minnesota is largely unknown. Gibbon (2012) assumes Allamakee and Millville cultural phases of northeastern Iowa and southwestern Wisconsin extended into southeastern Minnesota. This period is characterized by the replacement of the widespread use of Havanna ceramic with more spatially restricted imitations, less elaborate cultural practices, and the significant change in ceramic technology (Arzigian 2008; Florin et al. 2016; Gibbon 2012).

Burial practices are still dominated by the use of burial mounds, however, these practices become more simplified with grave goods becoming rarer and with no associated diagnostics. The most notable ceramic type is the Linn wares. The Linn wares of this region are thin-walled diagnostic ceramics that retain some Havana-related decoration (dentates, cordmarking). Ceramic technology also changes with vessels having more globular shapes, complex rims, thinner walls, and much finer tempers. The lithic assemblages consist of side-notched Steuben points and smaller Ansell points (Arzigian 2008; Florin et al. 2016; Gibbon 2012).

Terminal Woodland in Southeastern Minnesota (AD 500–1200)

The Terminal Woodland period in southeastern Minnesota dates from AD 500–1200, just before the first European contact. This period is characterized by changes in ceramic and lithic technologies. One of the most notable changes is the development of the bow and arrow, effigy mounds, elaborate mortuary rituals, increase in long-distance trade networks, acquisition of exotic materials, elaborate smoking-pipe tradition, and the development of socially ranked societies. The human population also increased with a gradually greater dependence on domesticated plants and a more sedentary lifeway. However, not much is known since the archaeological record within the region and period is lacking. Archaeologists must rely on information from sites in Wisconsin, Illinois, and Iowa. The Woodland Period ends with the introduction of corn farming and the appearance of the Mississippian and Plains Village cultures (Florin et al. 2016; Gibbon 2012; Johnson 1988).

Initial Late Woodland (AD 500–700)

The Initial Late Woodland dates between AD 500–700 and is a transitional period between the Late Middle Woodland and the Mature Late Woodland. This period includes two closely related archaeological phases known as the Mill phase in southwestern Wisconsin and Lane Farm phase in northeastern Iowa. The characteristic of both phases is the presence of Lane Farm Cord-impressed ceramic wares. These wares have a somewhat rounded base, constricted neck, are relatively thin, and have a fine, grit temper. They typically have cord-impress decoration on the exterior rim, and rocker stamping over some of the body below the rim. The projectile points associated with this period are small corner-notched points, which are the first arrow points in the region. These may have included the Stueben Stemmed, Maker Corner Notched, Scallorn, Klunk Side-Notched, and Koster Corner-Notched types. Other traits of the period are the appearance of small conical mounds and some elongated linear mounds with limited burial goods (Arzigian 2008; Florin et al. 2016; Gibbon 2012).

Mature Late Woodland (AD 700 – 1000)

During the Mature Late Woodland period, mound construction became more widespread and complex. In southeast Minnesota, the Effigy Mound Complex appeared between AD 700–1000. This culture is characterized by the creation of groups of linear mound complexes, effigy mounds, and conical mounds. The effigy mounds resemble several animals including bears, deer, panthers, turtles, and birds. The mounds rarely exceed two to three feet in height and are about 500 feet or more in length. The mounds are typically located on ridgetops or elevated areas bordering major lakes and rivers. Altogether, there are about 13 to 15 sites in Minnesota that contain effigy mounds or possible effigy mounds (Arzigian 2008; Florin et al. 2016; Gibbon 2012).

Besides the mounds, the most common diagnostic trait of this period are the Madison Ware ceramics. The general characteristics of the vessels are globular shaped, thin walls, fine grit temper, cordmarking on the exterior surface, a constricting neck, and an out-flaring rim. They are typically decorated with cord impressions with geometrical patterns on the exterior rim surface. Angelo Punctate is another ceramic style found in the latter part of this period. They are thin walled and cordmarked, often decorated with punctuates and fine incised lines. The points from this period are small stemmed, side-notched, and unnotched triangular arrow points. This includes Scallorn,

Koster Corner Notched, Klunk Side Notched, and Madison point types (Florin et al. 2016; Gibbon 2012).

Final Late Woodland (AD 1000–1200)

The Final Late Woodland period in Minnesota dates between AD 1000–1200. This period marks profound changes in the archaeological record in southeastern Minnesota and the Upper Mississippi Valley south of the Twin Cities. These changes include a significant reduction in "pure" Late Woodland sites, effigy mounds are no longer being constructed (approximately by AD 1050), stockade sites with Mississippian traits become common in southeastern Wisconsin, northeastern Iowa, and possibly in the Red Wing locality of Minnesota, and large portions of the driftless areas are abandoned. Corn horticulture is found with the Grant series of ceramic wares in western Wisconsin, southeastern Minnesota, northern Iowa, and northern Illinois. Grant ware are grit-tempered, cord-roughened globular jars with prominent castellation, collars, squared orifices, or other special rim treatments that raise the rim height. The most common projectile points from this period include the Madison Triangular, Cahokia, Reed, Harrel, and Des Moines types of the Cahokia Side Notched cluster (Gibbon 2012).

LATE PREHISTORIC (AD 1000–1650)

The Late Prehistoric period dates between AD 1000–1650 and is characterized by the use of earthlodge dwellings, crop surplus, improved storage techniques, and the development of complex social organization within villages. Corn became a staple in the native diets along with bison meat. There is also the increased appearance of bison bone tools within the archaeological record of this period. This is most likely due to less time in the ground with which the bone can deteriorate (Radford et al. 2015; Schermer et al. 1995).

Mississippian (AD 1000–1650)

The Mississippian period dates from AD 1000–1650. The Mississippian Culture was agriculturally intense, depending heavily on maize, beans, sunflowers, and tobacco. There were two major Mississippian centers in Minnesota. One center was located at the junction of the Cannon and Mississippi rivers, just north of Red Wing, Minnesota and the other along the central and upper Minnesota River. These centers seem to have evolved from the great Middle Mississippian center at Cahokia, Illinois. These cultural centers developed different adaptations associated with their environment. The Red Wing locality was adapted to forests and tall grass prairies in the east and the Minnesota River locality was adapted to the timbered river bottoms and grassland in the west. There are four main phases from this period in Minnesota: Silvernale, Great Oasis, Cambria, and Big Stone (Gibbon 2012; Johnson 1988).

Villages in this period were large, possibly housing between 600 and 800 people. Some of these villages had palisades and were frequently located on easily defendable flat river terraces. Deep storage pits were dug throughout the villages. Gardens were planted in the river bottoms while hunting and fishing remained important, with some Mississippian sites depending on bison as a food staple. Many burial mound complexes are associated with this culture (Johnson 1988).

Oneota (AD 1225-1650)

The Oneota is the name given to several post-Woodland groups living on the Prairie Peninsula. This cultural complex appears in Minnesota from AD 1225–1650. This culture complex is most commonly identified by their pottery, which is a shell-tempered globular jar that has a constricted mouth and a round bottom. The shoulder is often decorated with incised, geometric patterns. A common decoration motif on Oneota ceramics are chevrons and other variations. Other artifacts that were common, but not unique to Oneota include:

- bison scapula hoes,
- deer mandible sickles,
- small, unnotched triangular projectile points,
- end scrappers,
- sandstone abraders,
- mauls,
- catlinite discs,
- elbow pipes,
- village areas with numerous storage pits.

They also lived in a variety of house shapes including oval, square, and long rectangle. There are two Oneota phases in Minnesota: Blue Earth Phase and Orr Phase (Fishel 1996; Gibbon 2012).

CONTACT PERIOD (AD 1630–1837)

Before the native population made contact with early French explorers, European trade goods started to appear within Minnesota. Glass beads, iron knives, brass kettles, finger rings, and firearm parts appear within the archaeological record, which were from early French traders. The local native tribes were also indirectly affected by Europeans by the spread of foreign disease, which decimated their populations. At one point or another, parts of Minnesota were claimed by the French, Spanish, British, and United States. Minnesota was first claimed by the French as part of New France (Blegen 1963; Folwell 1956).

The first recorded exploration was by French explorers Daniel Greysolon, Sieur du Lhut; Father Hennepin; and Pierre Charles le Sueur. Greysolon was sent out from Quebec and Montreal to open trade with the Dakota in AD 1679, and for the next 11 years explored the triangle between the Mississippi and St. Croix rivers. Father Hennepin along with Michel Accault and Antonie Aguell were also sent out to explore in the Upper Mississippi River Valley circa AD 1679. In 1731, Canadian-born French explorer Pierre Gaultier de Varennes, Sieur de La Verendrye set out to explore lands west of Lake Superior. In August of 1831, he sailed into Grand Portage and passed over the Canada-United States Border Lakes to establish a trading post at Lake of the Woods. At this post, trading could be conducted with the local tribes. In AD 1763, the Treaty of Paris ceded all the land east of the Mississippi to the British, and eventually the new United States of America. In 1797, Pembina in North Dakota was established by Charles Baptiste Chaboillez of the Northwest Fur Company. Also, the Hudson Bay and American Fur Companies were positioned at Pembina as the fur trade increased and expanded. There were a few native tribes within the southeastern area of Minnesota including the Ioway and the Dakota, described further below

(Blegen 1963; Folwell 1956; Merry 1996; Radford et al. 2015; Schermer et al. 1995; Schwieder 2000).

Ioway

The Ioway are a Siouan group that resided in Missouri and the Mississippi River Valley. The Ioway, Oto, and Missouri were once part of a larger tribe with ancestral roots in Oneota culture from the Plains Village period. The first recorded contact with the Ioway was in AD 1676 by Father Louis Andre in Green Bay, Wisconsin (Anderson 1973b). The Ioway were a semi-sedentary horticultural tribe that spent much of the year away from permanent villages during the summer hunting excursions. The villages were located on terraces above rivers' floodplains. They lived in different types of dwellings including earthlodges, wattle-and-daub houses, and tipis. The annual bison hunt took place from May to August to stockpile meat for winter. During the fall and winter, they supplemented their diet with smaller hunting parties for bison, elk, and deer. They also grew beans, corn, squash, pumpkins, and other native crops (Anderson 1973a; Anderson 1973b; DeMallie 2001; Malinowski et al. 1998).

Dakota

The Dakota originally lived in Minnesota before the Contact Period and are part of the Oceti Sakowin, or Seven Council Fires. This council included the Mdewakanton, Wahpekute, Sisseton, Wahpeton, Yankton, Yanktonai, and Teton tribes. Their first contact with Europeans was with the French traders and Jesuit missionaries in the 1650s. The Dakota were a migrational people relying on hunting and gathering subsistence strategy. They hunted buffalo, deer, and waterfowl and fished using spears and nets. They also foraged for wild flora resources including fruit, acorns, nuts, wild rice, and maple sap. During the 19th century, the Dakota practiced horticulture but planted at irregular intervals. They planted corn, squash, beans, and tobacco. Their crop yields were small and would only last a few weeks (DeMallie 2001; Malinowski et al. 1998).

POST-CONTACT (POST–AD 1837)

Disclaimer: The following discussion is written with a lens of Euro-American bias. The area that includes all of Minnesota and western Wisconsin was considered "Indian Territory" and settlements were not allowed. Although the French, British, and Americans established trading posts in Minnesota, the first official white settlements were established after AD 1837. This was due to the signing of two treaties, one with the Ojibwe and one with the Dakota. The 1837 treaties required the Ojibwe and Dakota to cede their lands east of the Mississippi, which included the Golden Triangle, the land between Mississippi and St. Croix Rivers. The treaties were ratified by Congress in 1838 and the land was open to American settlement. In 1849, Minnesota officially became a territory and on May 11, 1858, was admitted as a State into the United States. In 1862, Congress passed the Homestead Act which allowed up to 160 acres of land to be claimed provided that the person was head-of-household or person over 21 years of age, was a United States citizen, or filed a declaration to become a citizen and stayed on the land and worked the land for five years and paid any administration fees (Blegen 1963; Folwell 1956).

Railroad Development

In the mid-1800s, the construction of railroads was started throughout the United States beginning with the first railroad built near Baltimore, Maryland in 1831 (Schwieder 2000). The railroad system in Minnesota began in 1862, with the construction of the St. Paul and Pacific Railroad, connecting St. Paul and St. Anthony. This resulted in the construction and expansion of major railway lines to the southwest and west, including the Chicago; St. Paul, Minneapolis, and Omaha Railway; Chicago, Milwaukee & St. Paul Railway; and the Chicago & Northwestern Railway. The railroad helped to create the current settlement pattern and economic developments in Minnesota. They are an efficient, inexpensive way to transport goods and people. Also, for the first time, people could travel at any time of the year (Quivik and Martin 1988; Schwieder 2000).

Renville County

Renville County was established on February 20, 1855, and organized on March 1,1866. Olivia is the county seat of Renville County. The county is named after Joseph Renville, a fur trader and British Captain in the War of 1812. Before Europeans visited and settled the area, the Dakota had been living in the area that became Renville County. The first Europeans, or people of European descent to visit the area that would become Renville County were most likely fur traders. The first settler in the area that would become Renville County was Charles Patterson in 1783, who had a trading post in what is now Flora Township. The first railroad reached Renville County in the late 1870s. The population of Renville County at the beginning of the 1900s was 23,123 (Curtiss-wedge 1916; Upham 1920; U.S. Department of Agriculture, NRCS 1999).

Agriculture is the main industry of Renville County, 90% of the land within the county is actively farmed. In 2017, there were 1,026 farms in the county that each had an average of 608 acres. The major crops grown in the county are corn, soybeans, sugar beets, and wheat. The major livestock industry focuses mainly on hogs and poultry with a more minor focus on cattle and sheep (U.S. Department of Agriculture, NASS 2017; U.S. Department of Agriculture, NRCS 1999).

RESEARCH DESIGN AND METHODOLOGY

The Phase I archaeological investigation was conducted in accordance with the SHPO Manual for Archaeological Projects in Minnesota (Anfinson 2005) and OSA's State Archaeologist's Manual for Archaeological Projects in Minnesota (Anfinson 2011).

LITERATURE REVIEW

A literature search was conducted within a 1-mile study area of the proposed Project Area. The task was completed using site data files and previous inventory files maintained at the Minnesota Office of the State Archaeologist (OSA) and Minnesota SHPO. In addition, background research was completed by reviewing:

- National Register of Historic Places (NRHP) data,
- historic maps,
- cemetery/burial records,
- atlases,
- current aerial photographs,
- soil maps,
- topographic and geomorphic data,
- and other sources that might provide information for the locations of historic-era sites, areas of prior disturbance, etc.

ARCHAEOLOGICAL POTENTIAL AND PHASE I METHODOLOGY

In August of 2023, In Situ completed an assessment of archaeological resource potential within the proposed Project Area (Ledezma 2023). Factors including the general terrain, water resources, geomorphological setting, and topography were considered in order to assess the absence or likelihood of any archaeological sites within the Project Area. Areas identified as disturbed, areas with a slope greater than 20 degrees, areas of poorly drained soils, and low lying-wet areas were considered to have a low potential for containing archaeological sites. However, for an area to be considered to have a potential for an archaeological site, the following factors were considered:

- located within undisturbed land;
- located on a topographically significant landscape feature (identified using contour and LiDAR data);
- proximity of a suitable former or existing water source (named waterbody and perennial streams; within 200 m for high potential and within 500 m for moderate potential);
- proximity of a previously recorded archaeological site or historic structure (within 200 m).

Using these parameters, In Situ, in coordination with tribal partners, identified areas of archaeological potential within the Project Area. This archaeological potential generated by In Situ revealed areas of archaeological resource potential within the Project Area. Tribal partners also utilized internal databases and tribal knowledge resources to assist in the identification of culturally significant locations. In Situ used this predictive model in addition to the Minnesota Department of Transportation's archaeological predictive model and survey implementation model, MnModel.

The Project Area is located mostly within agricultural fields with slightly undulating terrain and has some upland landforms with topographically significant landscape features. The Project Area is located on an upland that overlooks the Minnesota River Valley, with the Minnesota River located approximately 1 mile to the south of the Project Area. The nearest streams are County Ditch 14-23 and County Ditch 109A which are manmade ditches and not natural. Both streams cross portions of the Project Area.

Typically, archaeological sites that have been found along intermittent streams are short-term occupation sites with low artifact densities (Anderson and Smith 2003; MNDOT 2002; MNDOT 2019). Sources of fresh water and landforms such as river terraces have high potential for archaeological sites (MNDOT 2002, MNDOT 2019). Long-term occupation sites are more likely to occur along permanent water sources, as more resources are readily available (Anderson and Smith 2003; MNDOT 2002, MNDOT 2019).

Historic plat, topographic, and aerial maps revealed approximately 23 historic map features within the Project Area. These features on the historic maps may include houses, outbuildings, or any other structure within the property and therefore have a higher post-contact archaeological potential within the surrounding areas of these mapped feature locations. The historic plat, topographic and aerial maps, and MnModel data also identified a historic lake (Kelly Lake) in the northeast part of the Project Area that is no longer present, and there may be a higher potential for archaeological sites along the former Kelly Lake shoreline. In addition, there is one previously recorded site (21RN0038) that is not eligible for the NRHP located within the proposed Project Area. Due to these factors, In Situ identified portions of the Project Area with a moderate to high potential for significant archaeological sites. Based on the established archaeological parameters, approximately 520 acres were identified as areas with resource potential within the Project Area. The remaining 523.6 acres within the Project Area were considered to have low potential for significant archaeological sites.

Based on the archaeological potential assessment, In Situ recommended that a Phase I archaeological survey was warranted and recommended a targeted Phase I archaeological survey for the Project, with the focus of the investigation on areas identified as having archaeological potential within the Project Area. Within the areas of moderate/high archaeological potential, In Situ recommended the use of the standard Phase I investigation methods (15 m spacing of pedestrian survey transects and 15 m spacing between shovel tests), as outlined in the SHPO Manual for Archaeological Projects in Minnesota (Anfinson 2005) and OSA's State Archaeologist's Manual for Archaeological Projects in Minnesota (Anfinson 2011), with the option of reducing the spacing of transects and shovel tests in areas of high potential based on the recommendation of the Principal Investigator. Within the areas of low archaeological potential, In Situ recommended the use of wider pedestrian survey transects and shovel test spacing, up to 30 m, in order to verify the absence or presence of any archaeological sites. On October 20, 2023, SHPO issued a letter that concurred with the archaeological potential assessment as well as the proposed methodology for the archaeological survey for the Project.

PHASE I ARCHAEOLOGICAL INVESTIGATION

The Phase I archaeological identification survey for this Project was completed to guidelines of the Minnesota SHPO and OSA (Anfinson 2005; 2011), and following the methodology as described above. The survey conducted within the Project Area used three methods of sampling and testing to identify and evaluate archaeological resources: visual inspection, pedestrian survey, and shovel testing.

- *Visual Inspection* – Locations where archaeological sites were not expected, such as disturbed areas, areas with a slope greater than 20 degrees, and low/wet areas were walked over and visually inspected. This method was used to verify the absence or likelihood of any archaeological sites within these areas. This method was also utilized to document the general terrain and the surrounding area.
- *Pedestrian Survey* – This method was used to survey landforms with slopes that are greater than 20 degrees, or landforms with slopes that are less than 20 degrees and have a surface visibility greater than 25% (e.g., plowed field). The pedestrian survey transect interval was no wider than 15 m in areas of higher archaeological potential and no wider than 30 m in areas of lower archaeological potential. Transect interval spacing was reduced to 5 m and under in order to delineate the area if any artifacts were discovered.
- *Shovel Testing* – This method was used to sample subsurface contexts in areas with slopes less than 20 degrees and ground visibility of less than 25%. A typical shovel test was 40 cm in circular diameter. The shovel tests were excavated on a grid at 15 m intervals, with additional radial shovel tests conducted at 5 m intervals when any artifacts were discovered. Shovel tests were excavated in 10 cm levels. All shovel tests were documented using a sub-meter GPS unit. Excavated soil was screened through 0.25-inch mesh. Shovel tests were excavated no deeper than 1 m or 10 cm into sterile subsoils. Data gathered from the shovel tests included stratigraphy, soil texture, Munsell color, and the presence or absence of cultural materials. All excavated soils were immediately backfilled upon completion.

In addition, tribal partners used varying methodologies for conducting cultural surveys along with the archaeological field methods used for the Project. The crew was directly supervised in the field by a qualified archaeologist who meets the requirements for the Secretary of the Interior's Guidelines for Professional Qualifications in Archaeology. Field personnel used a sub-meter accurate GPS unit utilizing Geographic Information System (GIS) data as well as field maps to collect spatial data and maintained an accurate survey grid that did not extend beyond the Project survey area. All field notes, maps, and photos will be maintained at In Situ's Eden Prairie, MN office.

SITE EVALUATION CRITERIA

The purpose of the archaeological investigation was to identify and record previously undocumented archaeological sites located within the Project Area. If identified, sites are evaluated for their significance as defined by criteria established in Title 36 Code of Federal Regulations 60.4 (National Park Service 1991), which states:

The quality of significance in American history, architecture, archaeology, engineering and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

A. That are associated with events that have made a significant contribution to the broad patterns of our history; or

B. That are associated with the lives of persons significant in our past; or

C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. That have yielded, or may be likely to yield, information important in prehistory or history.

A site may meet one or more of the eligibility criteria listed above, but if the site is considered to not retain sufficient integrity than it may be recommended not eligible for inclusion in the National Register of Historic Places (NRHP).

ARTIFACT ANALYSIS AND CURATION

Any artifacts that were recovered were processed in accordance with the guidelines of the Minnesota SHPO and OSA (Anfinson 2005; 2011).

RESULTS

BACKGROUND RESEARCH

A literature search was conducted within a 1-mile study area of the proposed Project Area (Figures 4-13). Background research was conducted on July 21, 2023. The records search revealed no previous cultural resource surveys, three previously recorded archaeological sites (Table 3), and 19 previously recorded architectural resources within the study area.

The data gathered revealed three previously recorded archaeological sites within the study area (Table 3). Of the previously recorded sites, one (21RN0038) is located within a portion of the proposed Project Area.

[NONPUBLIC DATA BEGINS HERE...

Table 3: Previously Recorded Archaeological Sites within the Study Area.

Site	Legal Description	Cultural Affiliation	Site Type	NRHP Eligibility	Within Project Area
21RN0038	Redacted	Historic Euro-American	Farmstead/ Artifact Scatter	Not Eligible	Yes
21RN0051	Redacted	Unknown Prehistoric	Lithic Scatter	Unevaluated	No
21RNad	Redacted	Historic	Alpha Site – Trading Post	Unevaluated	No

...NONPUBLIC DATA ENDS HERE]

The literature review revealed 19 previously recorded architectural resources within the Study Area (Table 4). Of these resources, there are 18 resources that are *unevaluated* for the NRHP and one resource that has been determined *not eligible* for the NRHP. None of the previously recorded architectural resources are within the proposed Project Area. All but one of the architectural resources are south of the Project Area and mostly within the town of Franklin; one is east of the Project Area.

Table 4: Previously Recorded Architectural Resources within the Study Area.

Site Number	Site Name/Type	Address/Location	NRHP Eligibility	Within Project Area
RN-BCO-002	Finn Town	off Co. Rd. 5	Unevaluated	No
RN-CAM-001	Finnish Lutheran Church	off Mn. Hwy. 19	Unevaluated	No
RN-FRC-001	Grain Elevator	NE corner 1st Ave. & 3rd St.	Unevaluated	No
RN-FRC-002	Methodist Church	NE corner 1st St. & 4th Ave.	Unevaluated	No
RN-FRC-003	Franklin Fire Hall	NW corner 2nd Ave. & 1st St.	Unevaluated	No
RN-FRC-004	St. Luke's Lutheran Church	SE corner 2nd Ave. & 1st St.	Unevaluated	No
RN-FRC-005	Commercial Building	xxx 2nd Ave.	Unevaluated	No
RN-FRC-006	State Bank of Franklin	SW corner 2nd Ave. & 3rd St.	Unevaluated	No
RN-FRC-007	Citizens' State Bank	xxx 2nd Ave.	Unevaluated	No
RN-FRC-008	commercial building	xxx 2nd Ave.	Unevaluated	No
RN-FRC-009	Commercial Building	NW corner 2nd Ave. & 4th St.	Unevaluated	No
RN-FRC-010	House	490 2nd Ave.	Unevaluated	No
RN-FRC-011	House	505 2nd Ave.	Unevaluated	No

Table 4: Previously Recorded Architectural Resources within the Study Area.				
Site Number	**Site Name/Type**	**Address/Location**	**NRHP Eligibility**	**Within Project Area**
RN-FRC-012	Sacred Heart Church & Rectory	555 2nd Ave.	Unevaluated	No
RN-FRC-013	House	xxx 2nd Ave.	Unevaluated	No
RN-FRC-014	House	SW corner 3rd Ave. & 2nd St.	Unevaluated	No
RN-FRC-015	School	SW corner 3rd Ave. & 3rd St.	Unevaluated	No
RN-FRC-016	House	xxx 4th St.	Unevaluated	No
XX-ROD-041	Trunk Hwy 19	from TH 61 in Red Wing to the Minnesota-South Dakota border west of Ivanhoe	Not Eligible	No

ARCHAEOLOGICAL INVESTIGATION RESULTS

A Phase I archaeological investigation was conducted on November 13-15, November 20-22, and November 27-28, 2023, for the proposed Project (Figure 14-21). The survey area of the Project is located within areas consisting of agricultural fields, mixed grasses, utilities, and agricultural infrastructure (outbuildings, gravel drives, etc.) (Figures 22-87). Most of the survey took place within agricultural fields, providing poor to great (0-90%) ground surface visibility (GSV). Pedestrian survey methodologies were used within areas of higher GSV (above 25%). Shovel testing was conducted in areas that had poor (less than 25%) ground surface visibility and that were not in areas that were subject to visual inspection. Visual inspection was conducted within areas of slope, wetlands, and previous disturbance. Existing disturbance within the Project Area includes rural development, utilities, a substation, and agricultural infrastructure (outbuildings, gravel drives, stream ditches, etc.).

Approximately 1,043.6 acres were subject to survey during the archaeological field assessments for the Project. Of the 1,043.6 acres that were surveyed:

- 1,021.6 acres were within agricultural fields with good to great (greater than 25%) GSV and were subject to pedestrian survey (Figure 88);
- 5.4 acres were within wetland/drainage context and visually inspected (Figure 89);
- 16.6 acres were within areas with poor (less than 25%) GSV and were subject to shovel testing (Figures 90-91);

Shovel Testing

The shovel test units are classified as negative, positive, sloped, wet, and disturbed. “Negative” shovel tests have intact soils that contained no cultural material. “Positive” shovel tests have intact soils that contained cultural material. “Sloped” shovel tests were in areas with greater than a 20-degree slope. “Wet” shovel tests have undisturbed soils and contain a shallow water table and/or hydric soils. “Disturbed” shovel tests have mottled soils and/or have been greatly disturbed due to land development. A total of 294 shovel test units were conducted during the survey. Of the 294 shovel tests, all were negative for cultural material and most were in a disturbed context, as mottled soils were present all the way into the subsoil. The disturbances in this area were most likely due to the construction of County Ditch 109A and the Franklin Substation. No cultural materials were observed or recovered.

A typical shovel test within the survey area consisted of a very dark brown (10YR2/2) sandy clay loam soil over a dark yellowish brown (10YR4/4) sandy loam, as demonstrated in Figure 90. A typical disturbed shovel test within the survey area consisted of a very dark grayish brown (10YR3/2) silt loam mottled with a yellowish brown (10YR5/4) silt loam soil over a yellowish brown (10YR5/4) silt loam mottled with very dark grayish brown (10YR3/2) silt loam and light gray (10YR7/1) silt loam, as demonstrated in Figure 91. Shovel tests were terminated at least 10 cm into the sterile subsoil.

CULTURAL RESOURCES

One previously recorded archaeological site was revisited, and no new archaeological sites were identified. TCS staff with the Lower and Upper Sioux Community THPOs recorded and documented three culturally sensitive areas of tribal concern that are currently *unevaluated* for the NRHP. The full assessment details of these areas are on file with the Tribal Historic Preservation Offices. Brief descriptions are provided below. At this time, no archaeological site forms for any of the areas of tribal concern were submitted to the Minnesota OSA. These areas of tribal concern are considered potential traditional cultural properties, but by definition are not considered archaeological sites, as no physical archaeological evidence of a site was found during the survey at these locations. In addition, during the archaeological survey for the Project, a possible stone tool was found and collected for further evaluation at In Situ's lab. After further analysis of the stone by In Situ staff, it was found that it was not an artifact, as it lacked any evidence of intentional human alteration or interaction, and no further work was necessary for the potential find.

Previously Recorded Archaeological Site

21RN0038

Site Type:	Farmstead/Artifact Scatter
Association:	Historic Euro-American
Site NRHP Recommendation:	Not Eligible
Management Recommendation:	No Further Work

[NONPUBLIC DATA BEGINS HERE...

Redacted; Renville County, Minnesota USGS 7.5 Minute Quadrangle: Morton **...NONPUBLIC DATA ENDS HERE]**

Site 21RN0038 is a historic Euro-American farmstead/artifact scatter site with surface features consisting of a foundation/ruin, standing structure, and artifacts including historic metal, wood, and terra cotta (Figures 92-95). The site was first identified in 2012. At that time, the site was determined *not eligible* for the NRHP due to the lack of integrity, and an absence of historical period artifact deposits (Minnesota OSA 2023).

On November 22-23, 2023, the site was revisited by In Situ during the Phase I survey. It was observed that the site no longer exists, as it is within the area where the Franklin Substation was constructed. No archaeological resources were observed or recorded within the Project Area that overlaps with the site.

Newly Identified Cultural Resources

TFS-01

Site Type: Area of Tribal Concern/Historic Lake
Site NRHP Recommendation: Unevaluated
Management Recommendation: Further coordination with THPOs

[NONPUBLIC DATA BEGINS HERE...

Redacted; Renville County, Minnesota USGS 7.5 Minute Quadrangle: Morton SE, 1983

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Resource area TFS-01 is within an agricultural field consisting of harvested corn remnants and a county ditch consisting of mixed grasses, providing poor to adequate (0-40%) GSV (Figures 96-97). The topography of the area consisted of fairly flat to slightly undulating terrain. The Lower Sioux Community THPO identified this area as a historic lake that was known as a wild rice slough that was accessed by the local Mdewakanton bands. The historic plat, topographic, aerial maps, and MnModel data also displayed a historic lake (Kelly Lake) that is no longer present, and there may be a higher potential for cultural resources along the former Kelly Lake shoreline. For further details on this resource, please contact the Lower and Upper Sioux Communities THPOs. No artifacts were observed within this resource area.

TFS-02

Site Type: Area of Tribal Concern/Tree Line
Site NRHP Recommendation: Unevaluated
Management Recommendation: Avoidance / No Adverse Effects

[NONPUBLIC DATA BEGINS HERE...

Redacted; Renville County, Minnesota USGS 7.5 Minute Quadrangle: Morton SE, 1983

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Resource area TFS-02 is within a grassy/wooded field division adjacent to an agricultural field consisting of harvested soy remnants, providing poor to great (0-80%) GSV (Figures 98-99). The topography of the area consisted of fairly flat to slightly undulating terrain. The Lower and Upper Sioux Community TCSs identified an area including a tree line and existing vegetation as culturally sensitive. For further details on this area, please contact the Lower and Upper Sioux Community THPOs. No artifacts were observed within this area.

TFS-03

Site Type: Area of Tribal Concern/Stone Feature
Site NRHP Recommendation: Unevaluated
Management Recommendation: Avoidance / No Adverse Effects

[NONPUBLIC DATA BEGINS HERE...

Redacted; Renville County, Minnesota USGS 7.5 Minute Quadrangle: Morton SE, 1983

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Resource area TFS-03 is within a grassy/wooded field division adjacent to an agricultural field consisting of harvested soy remnants, providing poor to great (0-80%) GSV (Figures 100-101). The topography of the area consisted of fairly flat terrain. The TCSs identified a stone feature as possibly culturally sensitive. For further details on this area, please contact the Lower and Upper Sioux Community THPOs. No artifacts were observed within this area.

Summary of Cultural Resources

During the field survey, a total of 1,043.6 acres were inventoried for the Project. One previously recorded archaeological site was revisited during the archaeological survey of the Project. The previously recorded resource consists of a historic Euro-American farmstead/artifact scatter site (21RN0038) that has been largely destroyed.

In addition, the In Situ field crew was accompanied by TCSs with the Lower Sioux Community THPO and the Upper Sioux Community THPO. TCS staff with the Lower and Upper Sioux Community THPOs recorded and documented three culturally sensitive areas of tribal concern. The assessment details of these areas are on file with the THPOs.

MANAGEMENT RECOMMENDATIONS

An intensive Phase I archaeological investigation was conducted on November 13-15, November 20-22, and November 27-28, 2023, for the proposed Project. The archaeological review for the Project consisted of background literature review and field survey of approximately 1,043.6 acres.

The Project is located partially within and primarily north of the city limits of Franklin, Renville County, Minnesota. The Project Area is located on privately owned land, within areas consisting of agricultural fields, mixed grasses, utilities, and agricultural infrastructure (outbuildings, gravel drives, etc.). The Phase I investigation included an intensive archaeological field survey the Project Area.

During the field survey, a total of 1,043.6 acres were inventoried for the Project. One previously recorded archaeological site was revisited during the archaeological survey of the Project. The previously recorded resource consists of a historic Euro-American farmstead/artifact scatter site (21RN0038) that has been largely destroyed by the construction of a substation. No further work is recommended for this resource for this Project.

In addition, the In Situ field crew was accompanied by TCSs with the Lower Sioux Community THPO and the Upper Sioux Community THPO. TCS staff with the Lower and Upper Sioux Communities recorded and documented three culturally sensitive areas of tribal concern. The assessment details of these areas are on file with the THPOs. Birch Coulee Solar will continue to work with the Lower and Upper Sioux Community THPOs regarding measures (e.g., avoidance, monitoring) to avoid and/or minimize potential impacts to the culturally sensitive areas of tribal concern.

Pursuant to the Minnesota Historic Sites Act, no historic properties listed on the NRHP or State Register of Historic Places are located within the Project Area. Pursuant to the Field Archaeology Act, no archaeological sites were identified within the Project Area. In compliance with Minnesota Rules, part 7850.1900, subpart 3(d), Birch Coulee Solar will continue coordinating with the Lower and Upper Sioux Community THPOs regarding measures to avoid and/or minimize potential impacts to the culturally sensitive areas of tribal concern. No additional work is recommended for the Project to proceed as planned.

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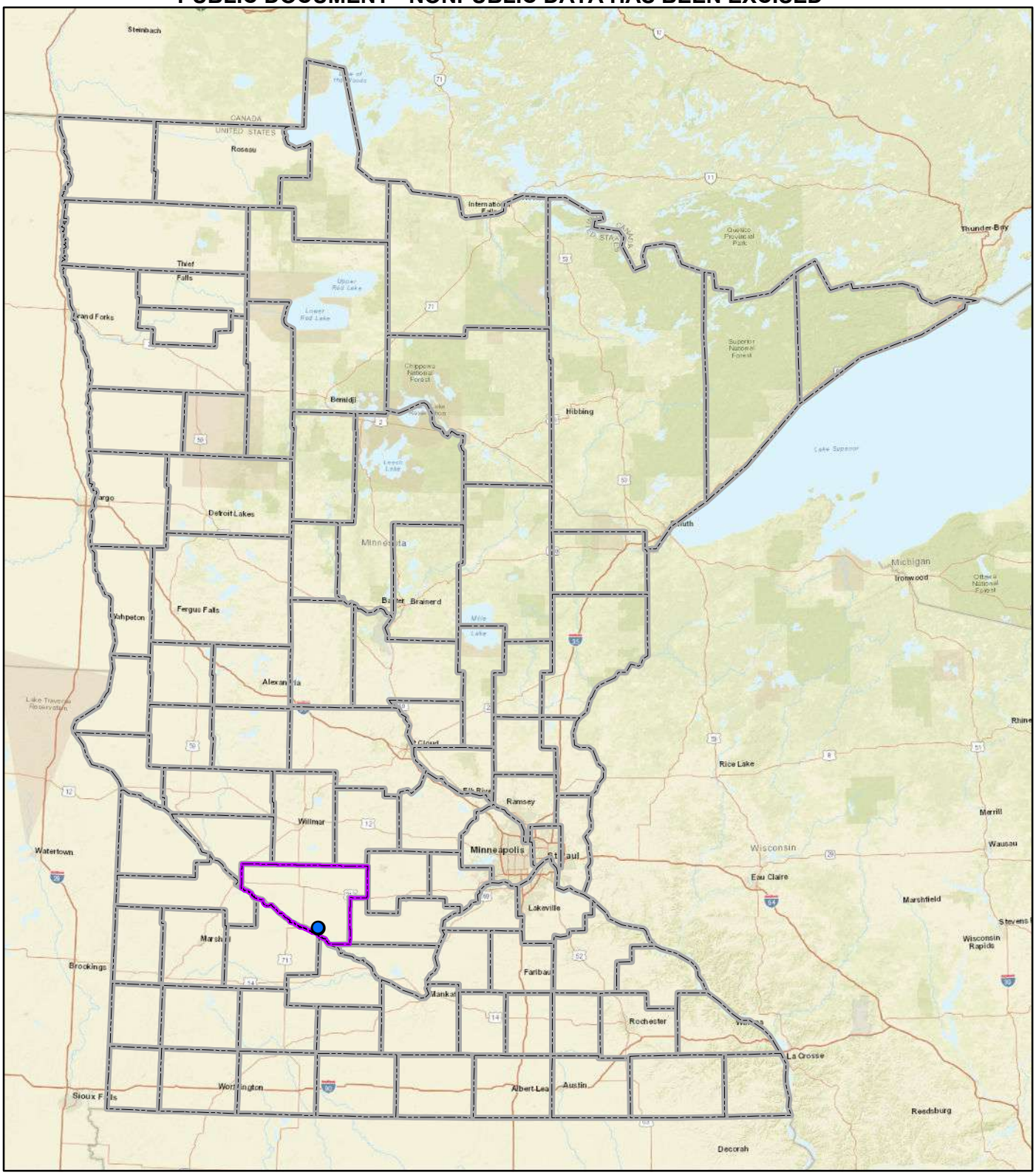
FIGURES



Legend

- Project Location
- Renville County
- County Boundary

N
W E
S

1:3,456,623 1 inch equals 288,052 feet

Approximate Scale in Feet

0 460,000 920,000

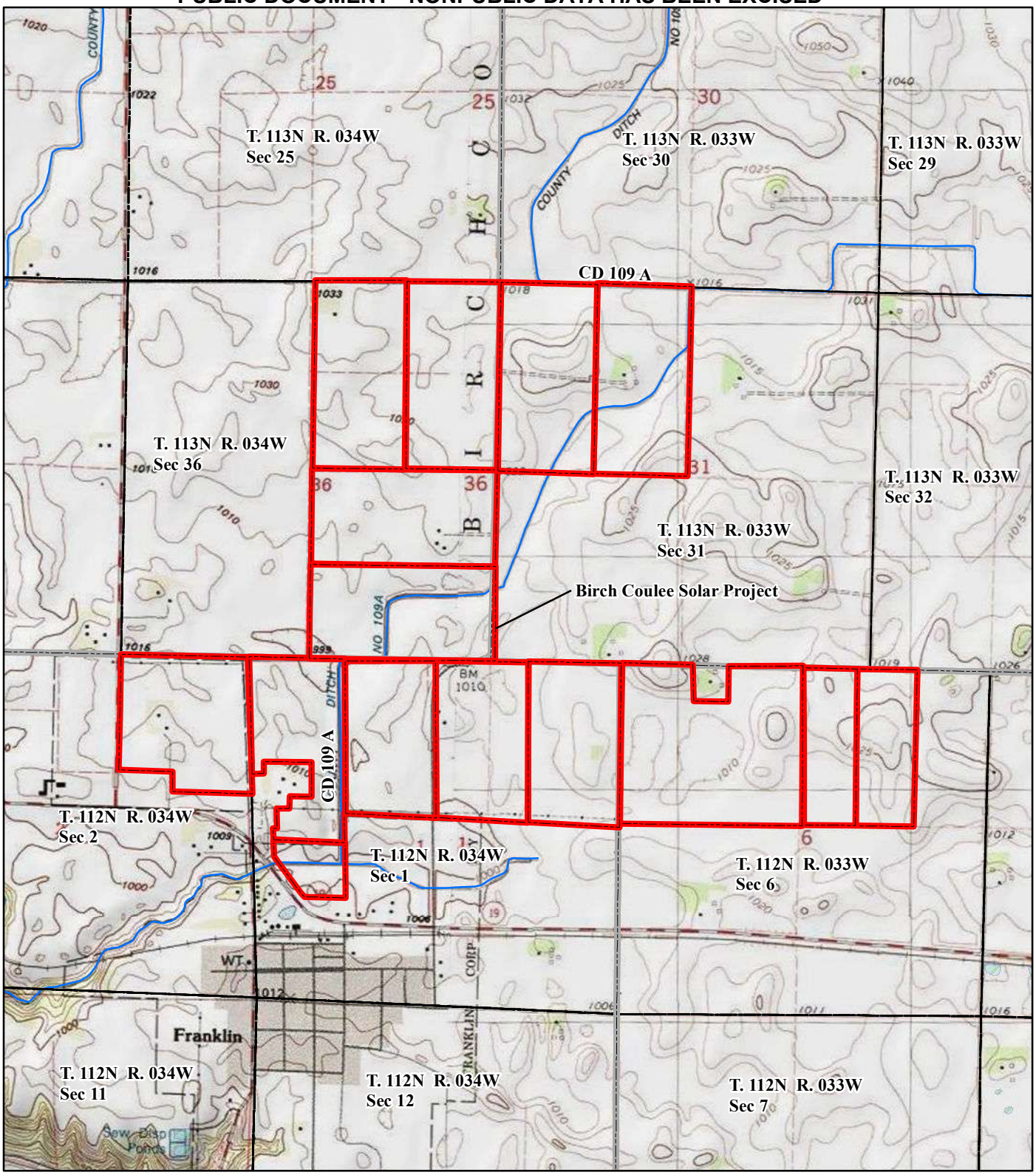
POLITICAL MAP

Birch Coulee Solar Project
Renville County, Minnesota

Note: Imagery courtesy of ESRI

Figure 1. Political map showing project location.

N



Legend

- Project Area
- Township Boundary
- Township/Range/Section
- Stream/River
- Waterbody

N
W E
S

1:24,000 — 1 inch equals 2,000 feet

Approximate Scale in Feet

0 — 3,200 — 6,400

TOPOGRAPHIC MAP

Birch Coulee Solar Project
Renville County, Minnesota

Note: Imagery courtesy of ESRI

Figure 2. Project location on the USGS *1995 Morton, MN* 7.5 minute series topographic map.

T. 113N R. 034W Sec 26
T. 113N R. 034W Sec 25
T. 113N R. 033W Sec 30
T. 113N R. 033W Sec 29
T. 113N R. 034W Sec 35
T. 113N R. 034W Sec 36
T. 113N R. 033W Sec 31
T. 113N R. 033W Sec 32
T. 112N R. 034W Sec 2
T. 112N R. 034W Sec 1
T. 112N R. 033W Sec 6
T. 112N R. 033W Sec 5

CD 109 A

County Road 5
670th Ave
660th Ave
40th St
41st St
Highway 19
Minnesota Prairie Line Inc

Legend

- Project Area
- Soils
- Township Boundary
- Township/Range/Section
- Waterbody
- Stream/River

0 287.5 575 1,150 1,725 2,300
Approximate Scale in Feet

1:13,000 1 inch equals 1,083 feet

Note: Imagery courtesy of ESRI

PROJECT LOCATION

Birch Coulee Solar Project
Renvillle County, Minnesota

Figure 3. Project location on an aerial map.

Figure 4: REDACTED

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Figure 5: REDACTED

Figure 6: REDACTED

Figure 7: REDACTED

Figure 8: REDACTED

Figure 9: REDACTED

Figure 10: REDACTED

Figure 11: REDACTED

PUBLIC DOCUMENT - NONPUBLIC DATA HAS BEEN EXCISED

Birch Coulee Solar Project

113N 34W

113N 33W

112N 34W

112N 33W

Sec.27. Sec.26. Sec.25. Sec.30 A. 575.19. Sec.29. Sec.28.

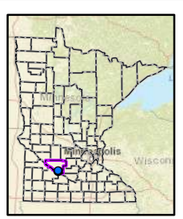
Sec.34. Sec.35. Sec.36. Sec.31. A. 570.92 Sec.32. Sec.33.

Sec.3 A 563.60. Sec.2. A. 573.22. Sec.1. A. 584.23. Sec.6 A. 577.28 Sec.5 A. 588.16 Sec.4 A. 589.91

Sec.10. A. 578.13 Sec.11. A. 611.94 Sec.12. A. 631.09 Sec.7. A. 521.83 Sec.8. Sec.9.

Legend

- Project Area
- Renville County
- Township Boundary
- Township/Range/Section
- Project Location



N W E S

HISTORICAL BLM GLO PLAT MAP

Birch Coulee Solar Project
Renville County, Minnesota

0 2,000 4,000

Approximate Scale in Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of MN Geo

Figure 12. Project location on the 1858 BLM GLO Plat map.

PUBLIC DOCUMENT - NONPUBLIC DATA HAS BEEN EXCISED

113N 34W

113N 33W

112N 34W

112N 33W

CD 109 A

Birch Coulee Solar Project

Minnesota River

Minnesota River

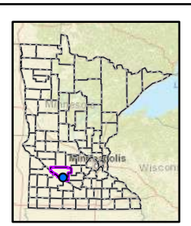
Franklin

Finnish Ch

ST LOUIS

Legend

- Project Area
- Township Boundary
- Township/Range/Section
- Stream/River
- Project Location
- Renville County



HISTORICAL TOPOGRAPHIC MAP
Birch Coulee Solar Project
Renville County, Minnesota

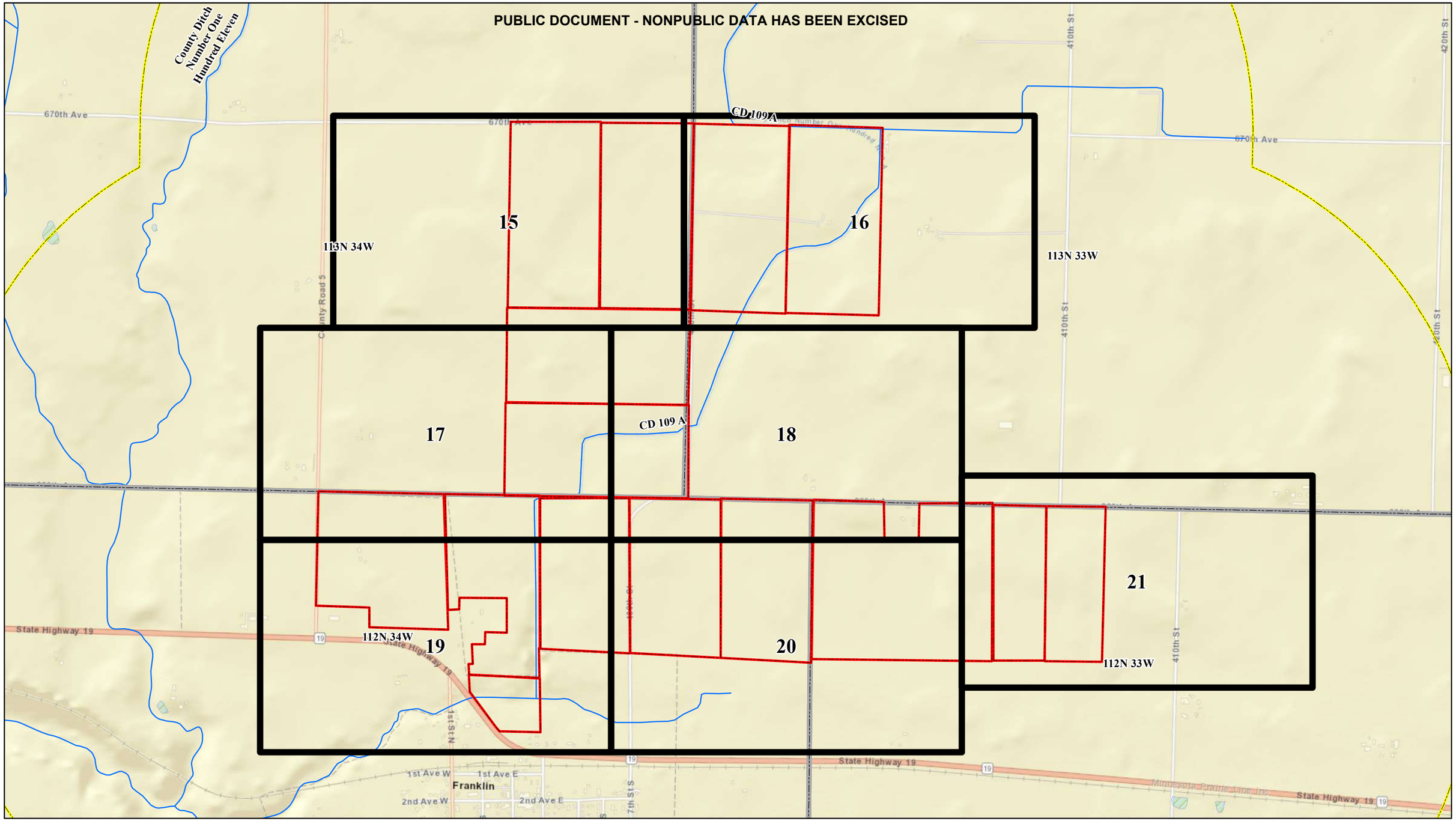
0 2,000 4,000
Approximate Scale in Feet

1:24,000 1 inch equals 2,000 feet

Note: Imagery courtesy of USGS

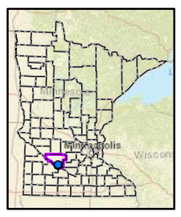
Figure 13. Project location on the *1952 Morton, MN* 62,500 series topographic map.

PUBLIC DOCUMENT - NONPUBLIC DATA HAS BEEN EXCISED



Legend

- Project Area
- 1-Mile Study Area
- Township Boundary
- Mapbook Pages
- Stream/River
- Waterbody
- Project Location
- Renville County



N W E S

LOCATION MAP
(Overview)

Birch Coulee Solar Project
Renville County, Minnesota
DO NOT RELEASE
Archaeological Site Location
Not for Public Disclosure

0 1,299 2,598
Approximate Scale in Feet

1:15,583 1 inch equals 1,299 feet

Note: Imagery courtesy of ESRI

Figure 14. Political map showing mapbook pages for the 1:6000 scale maps showing the results of the fieldwork.

Figure 15: REDACTED

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DOCUMENT - NONPUBLIC DATA HAS BEEN EXCISED

Figure 16: REDACTED

Figure 17: REDACTED

Figure 18: REDACTED

Figure 19: REDACTED

Figure 20: REDACTED

Figure 21: REDACTED

Figure 22: Overview facing south within the project area (DSCN0733).

Figure 23: Overview facing north within the project area (DSCN0730).

Figure 24: Overview facing north within the project area (DSCN0718).

Figure 25: Overview facing south within the project area (DSCN0721).

Figure 26: Overview facing south within the project area (DSCN0712).

Figure 27: Overview facing southwest within the project area (DSCN0698).

Figure 28: Overview facing southeast within the project area (DSCN0689).

Figure 29: Overview facing northeast within the project area (DSCN8784).

Figure 30: Overview facing south within the project area (DSCN8776).

Figure 31: Overview facing northwest within the project area (DSCN8779).

Figure 32: Overview facing southeast within the project area (DSCN0898).

Figure 33: Overview facing west within the project area (DSCN0892).

Figure 34: Overview facing west within the project area (DSCN0904).

Figure 35: Overview facing northeast within the project area (DSCN0912).

Figure 36: Overview facing southwest within the project area (DSCN0919).

Figure 37: Overview facing east within the project area (DSCN0926).

Figure 38: Overview facing northeast within the project area (DSCN0932).

Figure 39: Overview facing northwest within the project area (DSCN8745).

Figure 40: Overview facing north within the project area (DSCN0850).

Figure 41: Overview facing south within the project area (DSCN0855).

Figure 42: Overview facing north within the project area (DSCN0858).

Figure 43: Overview facing north within the project area (DSCN0860).

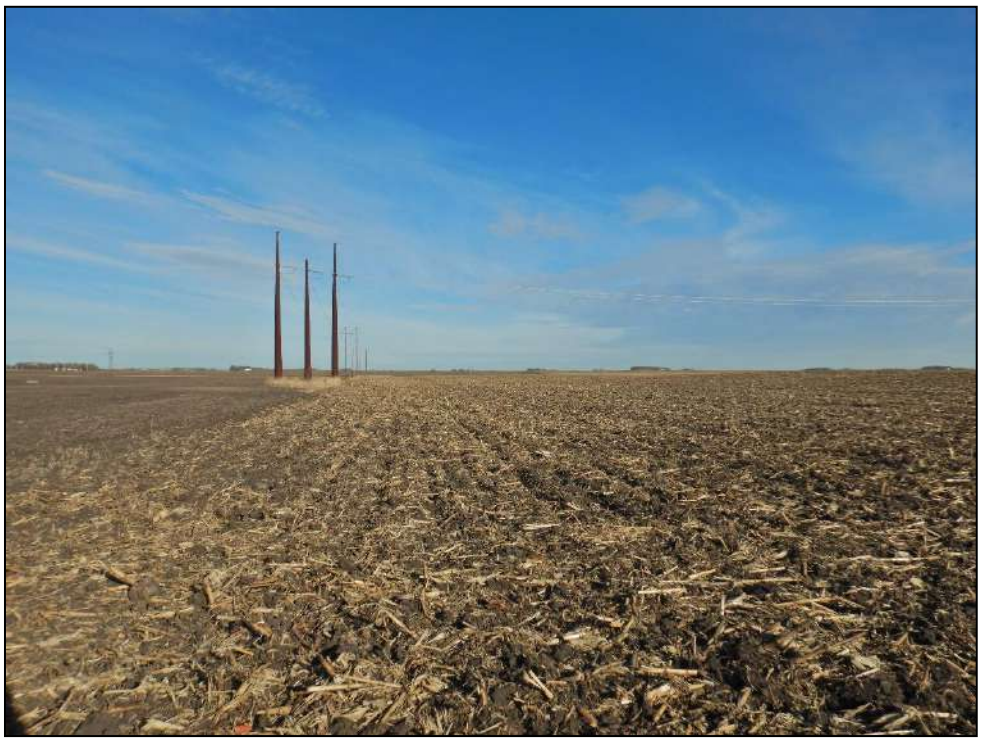


Figure 44: Overview facing north within the project area (DSCN8821).

Figure 45: Overview facing southwest within the project area (DSCN8817).

Figure 46: Overview facing north within the project area (DSCN8815).

Figure 47: Overview facing north within the project area (DSCN8788).

Figure 48: Overview facing east within the project area (DSCN8790).

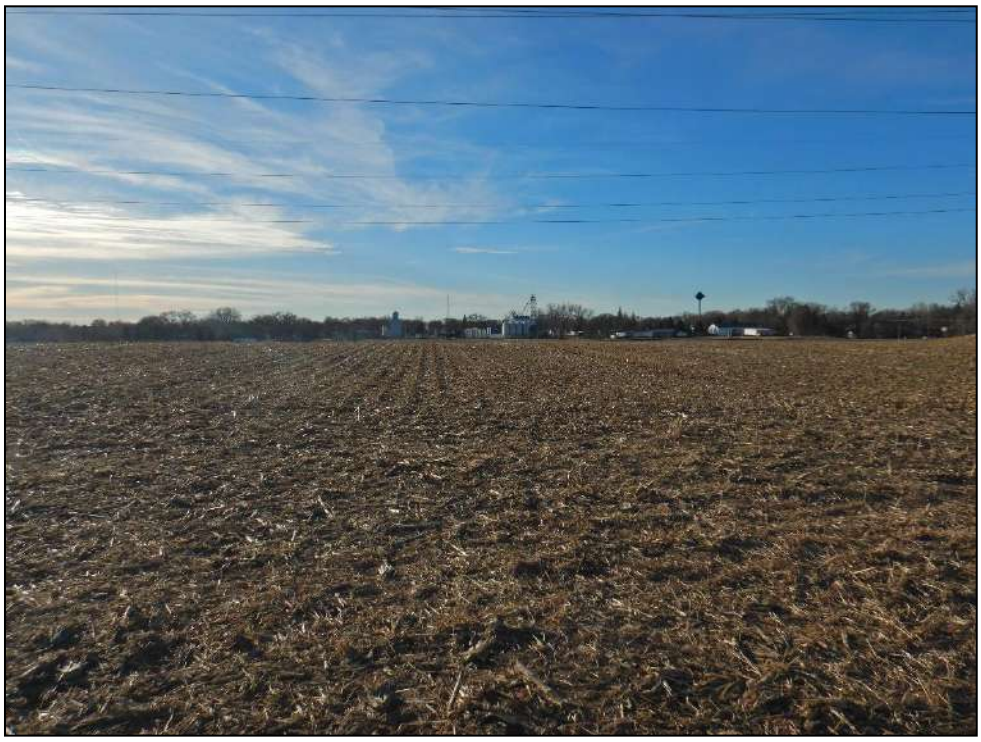


Figure 49: Overview facing south within the project area (DSCN8792).

Figure 50: Overview facing west within the project area (DSCN8794).

Figure 51: Overview facing southwest within the project area (DSCN8809).

Figure 52: Overview facing north within the project area (DSCN8800).

Figure 53: Overview facing south within the project area (DSCN8804).

Figure 54: Overview facing southeast within the project area (DSCN0963).

Figure 55: Overview facing northeast within the project area (DSCN0968).

Figure 56: Overview facing south within the project area (DSCN0951).

Figure 57: Overview facing northwest within the project area (DSCN0947).

Figure 58: Overview facing northwest within the project area (DSCN0848).

Figure 59: Overview facing south within the project area (DSCN0835).

Figure 60: Overview facing south within the project area (DSCN0824).

Figure 61: Overview facing north within the project area (DSCN0814).

Figure 62: Overview facing east within the project area (DSCN0815).

Figure 63: Overview facing south within the project area (DSCN0816).

Figure 64: Overview facing west within the project area (DSCN0817).

Figure 65: Overview facing south within the project area (DSCN0806).

Figure 66: Overview facing north within the project area (DSCN0802).

Figure 67: Overview facing west within the project area (DSCN0804).

Figure 68: Overview facing south within the project area (DSCN0798).

Figure 69: Overview facing south within the project area (DSCN0785).

Figure 70: Overview facing north within the project area (DSCN0781).

Figure 71: Overview facing south within the project area (DSCN0777).

Figure 72: Overview facing north within the project area (DSCN0768).

Figure 73: Overview facing southeast within the project area (DSCN0762).

Figure 74: Overview facing north within the project area (DSCN0758).

Figure 75: Overview facing east within the project area (DSCN0759).

Figure 76: Overview facing northwest within the project area (DSCN0741).

Figure 77: Overview facing south within the project area (DSCN0735).

Figure 78: Overview facing southwest within the project area (DSCN0737).

Figure 79: Overview facing east within the project area (DSCN0941).

Figure 80: Overview facing north within the project area (DSCN8841).

Figure 81: Overview facing east within the project area (DSCN8842).

Figure 82: Overview facing south within the project area (DSCN8843).

Figure 83: Overview facing west within the project area (DSCN8844).

Figure 84: Overview facing southeast within the project area (DSCN0882).

Figure 85: Overview facing southwest within the project area (DSCN0880).

Figure 86: Overview facing northeast within the project area (DSCN0870).

Figure 87: Overview facing west within the project area (DSCN0874).

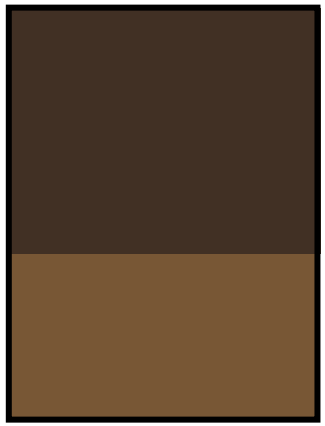
Figure 88: View of typical surface visibility within the project area (DSCN0780/DSCN0696).

Figure 89: View of typical wet conditions within the project area (DSCN8771/DSCN8846).

Representative soil shovel test photo.

Representative soil profile photo.

Representative Soil Shovel Test Profile
Nicollet clay loam (L85A)



Depth to Subsoil: 32 cm
Excavator: SS
Date: 11/28/2023

Scale

0cm 10cm 20cm 30cm 40cm 50cm

A 10YR2/2 Very dark brown sandy clay loam (0-32 cm)

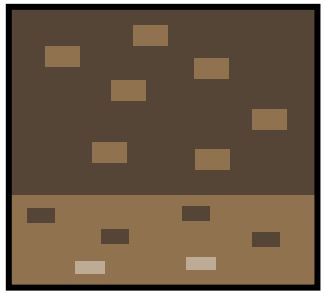
B 10YR4/4 Dark yellowish brown sandy loam (32-54 cm)

Figure 90. A typical shovel test unit excavated within the project area.

Representative soil shovel test photo.

Representative soil profile photo.

Representative Soil Shovel Test Profile
Clarion-Storden-Hawick complex (920B)



Depth to Subsoil: 25 cm
Excavator: SS
Date: 11/27/2023

Scale

0cm 10cm 20cm 30cm 40cm 50cm

A 10YR3/2 Very dark grayish brown silt loam mottled with 10YR5/4 yellowish brown silt loam (0-25 cm)

B 10YR5/4 Yellowish brown silt loam mottled with 10YR3/2 very dark grayish brown silt loam and 10YR7/1 light gray silt loam (25-37 cm)

Figure 91. A typical disturbed shovel test unit excavated within the project area.

Figure 92: REDACTED

[NONPUBLIC DATA BEGINS HERE...

Figure 93: REDACTED

Figure 94: View facing southwest towards site 21RN0038 (DSCN8814).

Figure 95: View facing west towards site 21RN0038 (DSCN8794).

Figure 96: REDACTED

[NONPUBLIC DATA BEGINS HERE...

Figure 97: REDACTED

Figure 98: REDACTED

Figure 99: REDACTED

Figure 100: REDACTED

Figure 101: REDACTED