Appendix C

Agricultural Impact Mitigation Plan

Louise Solar Project
Mower County, Minnesota

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AGRICULTURAL IMPACT MITIGATION PLAN

Louise Solar Project

Mower County, Minnesota

FEBRUARY 2, 2021

PREPARED FOR:

EDF renewables

PREPARED BY:

Westwood

Agricultural Impact Mitigation Plan

Louise Solar Project

Mower County, Minnesota

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Abbreviations and Definitions

AC	Alternating Current
AIMP	Agricultural Impact Mitigation Plan
BMPs	Best Management Practices
Conductor	Electrical wire or cabling
Contractor	Construction Contractor
CSAH	County State Aid Highway
DC	Direct Current
Decompaction	Soil tillage which loosens soil compaction
Drain Tile	Underground drainage system for water removal from soil
GPS	Global Positioning System
kV	Kilovolt
Project Area	land area controlled by the Developer with a purchase or lease option
Louise Solar	Louise Solar Project, LLC (Developer)
LCC	Land Capability Class
Module	Solar panel encapsulating several solar cells
Monitor	Environmental scientist assigned to monitoring
MDA	Minnesota Department of Agriculture
MNDNR	Minnesota Department of Natural Resources
MW	Megawatts
NPDES	National Pollutant Discharge Elimination System Permit
NRCS	Natural Resources Conservation Service
O&M Building	Operations and maintenance building
Development Area	325 acres of land proposed for the Louise Solar Project
Project, Project Site, or Project Area	Louise Solar Project
PV	Photovoltaic
SCADA	Supervisory Control and Data Acquisition
Skid	Modular steel frame or enclosure integrating electrical equipment
SSURGO	Soil Survey Geographic Database
SWPPP	Stormwater Pollution Prevention Plan
TH	Minnesota State Trunk Highway
Tile Contractor	Agricultural drain tile contractor
VMP	Vegetation Management Plan

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1.0 Purpose and Applicability of Plan

The objective of this Agricultural Impact Mitigation Plan ("AIMP" or "Plan") is to identify measures Louise Solar Project, LLC ("Louise Solar" or "Applicant") and its employees and contractors will employ to avoid, correct, and/ or mitigate potential adverse impacts to agricultural land resulting from the construction, operation, and decommissioning of the Louise Solar Project (Project, Project Site, Project Area). Louise Solar has acquired land control needed for the project (including leases, easements, and purchase agreements) in 2018. Use of this land will change from agricultural production to solar photovoltaic electricity production during the life of the Project. This Plan outlines measures to ensure the land will be returned to future agricultural usages following the closure and decommissioning of the Project. This Plan also includes descriptions of best management practices (BMPs) that will be used during construction to minimize long-term adverse impacts to the soil. Louise Solar and the construction contractor (the Contractor) hired to build the facility will adhere to this Plan. It is anticipated that certain methods and practices may be identified by the Contractor that work better and more efficiently and thereby provide a higher degree of safety while constructing the Project.

Louise Solar will coordinate with the Minnesota Department of Commerce Energy Environmental Review and Analysis (EERA), the Minnesota Department of Agriculture (MDA), Minnesota of Natural Resources (MNDNR) and the Minnesota Board of Water and Soil Resources (BWSR) regarding development of the AIMP's contents and site-specific characteristics. In conjunction with these agencies, Louise Solar will work to adjust the AIMP and Vegetation Management Plan (VMP) as needed.

This Plan includes establishing a habitat with beneficial plant species and a potential grazing environment within the project perimeter fence. Native and non-invasive naturalized plant species will be selected that thrive in shade conditions and do not interfere with the operation of the solar panels, yet provide benefits to the soil and pollinators species. Typically, a solar site has a shorter prairie mix within the solar arrays, a taller prairie mix in the open space between the fence and arrays, and a wetland seed mix for wetlands or areas anticipated to retain water. The seed mixes are formulated to be native or naturalized non-invasive plants, and are developed with recommendations from plant specialists in coordination with the Minnesota Department of Natural Resources (MNDNR). The goal is to design seed mixes that will achieve the goals Louise Solar has for efficiently operating the solar facility, promote pollinator habitat, establish stable perennial ground cover, suppress weeds, reduce soil erosion and runoff, and improve water infiltration. Grazing may be implemented as a natural approach to weed management. It is being considered in areas where weed control or use of mechanical equipment may be limited. Seed mixes that are suitable for grazing may differ from a seed mix that is sourced to promote pollinator habitat.

Louise Solar will utilize an adaptive management approach for vegetation management. The VMP will be prepared in consultation with an experienced native plant community restoration company. They will work with Louise Solar to develop plans for maintenance of the site's plantings, potentially including forage plantings, throughout the life of the Project. More information on maintenance of the native plantings is outlined in the VMP.

This Plan is separated into several distinct sections: Section 2 provides an overview of the proposed Project and its components. Section 3 addresses limitations and suitability of the soils at the Project, Section 4 discusses the BMPs that will be used during construction and operation of the Project, and Section 5 outlines decommissioning.

2.0 Project Overview

2.1 Background

Louise Solar Project, LLC, a wholly owned subsidiary of EDF Renewables, Inc., (EDF Renewables) proposes to construct the Louise Solar Project on approximately 613 acres (Project Area) of land in Lodi and Adams Townships, Mower County, Minnesota (Figure 1 – Project Location) (One additional acre of land, outside the Project Area, for cable crossing under Minnesota State Trunk Highway 56 (TH 56), is also assessed for impacts in this document). In Lodi Township, the Project will be in Sections 12, Township 101N, and Range 16W. In Adams Township, the Project will be in Sections 7 and 18, Township 101N, and Range 15W. Louise Solar anticipates that approximately 325 acres (Preliminary Development Area) will be affected by Project facilities (Figure 2 – Land Control and Preliminary Development Areas). The Project lies on both sides of TH 56 between the towns of Adams and Taopi. The Project will generate 50 megawatts (MW) and provide roughly 112,593 megawatt hours (MWh) annually of reliable, deliverable on-peak energy. The Project is to be placed in service by the end of 2022 or 2023.

The Project will interconnect to the adjacent Adams Substation, which is owned and operated by ITC Midwest. Louise Solar selected this site due to its proximity to existing and planned transmission facilities, available transmission capacity, excellent solar resource, existing road infrastructure, willing land owners, and the relatively flat, unobstructed terrain on the Project site. Additionally, in selecting the Project site, Louise Solar also concluded that its development will not result in significant environmental impacts.

The Project Site is on a nearly level to gently rolling landscape with elevations generally ranging from 1,290 to 1,350 feet above sea mean level. It is covered by loamy and silty loam soils used annually for corn and soybean production, which has remained for more than a century the dominant land use for the Project Area.

Louise Solar has entered into lease and/or purchase option agreements with landowners for the parcels on which the Project would be constructed. Louise Solar would exercise its purchase options and hold title to areas with purchase options after the Site Permit is issued and prior to the start of construction. Project facilities shown in the Preliminary Project Layout (Figure 3) and Configuration of Project Components (Figure 4) were sited on land for which Louise Solar currently has either a purchase option or lease agreement. The current land interests under purchase option and lease are sufficient to accommodate the Project's facilities and setback requirements.

2.2 Project Components

The Project will include the following major components, systems and associated facilities:

- Solar modules, racking system, and inverters
- Electrical collection system

- Project substation
- O&M Facility
- Access roads
- Up to four weather stations (up to 20 feet tall)
- Perimeter fencing

Each of these components is described in more detail below.

2.2.1 Configuration of Solar Panels, Arrays, and Racking

The Project will convert sunlight into direct current (DC) electrical energy using photovoltaic (PV) cells combined within protected modules also known as solar panels. The DC electricity is converted to AC by inverters located throughout the arrays. The Project can be considered an aggregate of individual PV solar panels interconnected by electric conductor and equipment at increasing scales to ultimately deliver 50 MW of nameplate alternating current (AC) of electricity to the existing Adams substation currently on the electrical grid and immediately adjacent to the Project. From smallest to largest scales, Project components are described below and presented on Figures 3 and 4 (Preliminary Project Layout and Configuration of Project Components):

1. **Individual PV solar panels** are approximately 4 to 6.5 feet long by 2 to 3.5 feet wide by 2 inches thick and are installed on metal foundations that are driven or screwed into the ground.
2. **Lines** of interconnected PV panels consist of a line of short-edge butted panels approximately 290 feet long, with each line oriented to and rotating along a north-south single axis to optimally track the rotational movement of the earth. These lines represent the racking upon which the individual solar panels are mounted.
3. **Arrays are groups of line of** PV panels.
4. **Construction Units** consist of Arrays of PV panels delineated by their connectivity and relationship. The Project consists of:
   a. a 165-acre (approximate) **Northeast Unit** bounded by 150st Street to the north and 690th Street to the west,
   b. a 42-acre (approximate) **Northwest Unit** bounded by TH 56 to the south, a FEMA flood zone to the north and west, and bordered by wetlands on all sides.
   c. a 90-acre (approximate) **South Unit** bounded by TH 56 to the north, 140th Street to the south of the northern section, 680th Street to the west of the southern section, and an existing power line to the east,
5. Approximately 20,000 feet of electrical collection system connect all units underground and intersects TH 56 twice.

Louise Solar will use a single axis tracking system where the lines of solar modules are rotated by motors to follow the sun throughout the day. The lines in north and south rows will face east in the morning, horizontal during mid-day, and then face west in the afternoon. Tracker motors will be used to rotate the lines of panels manually to the east or west as needed to facilitate maintenance access and vegetation management. Spacing between the panel edges when they are in a horizontal position is typically 13.3 feet and sufficient for maintenance vehicles. Separation of PV Panel lines will typically be 20 feet from the centerline between two adjacent lines turning axis.

2.2.2 Inverters, Transformers, and Electrical Collection System

Electrical wiring will connect the panels to inverters, which will convert the DC power to AC power. The AC power will be stepped up through a transformer from the inverter output voltage to 34.5 kilovolt (kV) and brought via the collection cables to the Project substation. The electrical collection system will be installed below-ground. The type of electrical system will be determined prior to construction based on technology, availability of materials, and costs.

2.2.2.1 Below-ground Electrical Collection System

Power inverters convert approximately 1,500 volts of DC power output from the PV solar panels to between 600-690 volts of AC power. A step-up transformer then converts the inverter AC voltage to an intermediate voltage of 34.5kV. The solar panels deliver DC power to the inverters through electric conductor cabling that will be routed via above-ground means and below-ground trenches (typical trench depth is 4 feet, but in some cases shallower and trench widths of 2 to 4 feet may be used). Below-ground AC electric conductor collection lines will transfer the electricity from the inverter equipment (which is assembled on skids and delivered to the project) to the substation. During trench excavations, the topsoil and subsoil will be removed and stockpiled separately in accordance with Section 4.7 of this Plan. Once the electrical conductor cables are laid in the trench, the trench will be backfilled with subsoil followed by topsoil. Electrical collection technology is changing and will be site-specific depending on geotechnical analysis, constructability, and availability of materials. Final engineering and procurement recommendations will help determine the construction method for the electrical collection system.

For below-ground cabling, inverter skids will be placed at locations throughout the Project and will include a transformer to which the inverters will feed electricity. The final number of inverters for the Project will depend on the inverter size, inverter and module availability, as well as the final array configuration. Skids provide the steel foundation for the enclosed inverter, transformer, and Supervisory Control and Data Acquisition (SCADA) systems. The height of a skid is approximately 8-12 feet above grade. The skids will be placed atop a poured reinforced concrete slab or pier foundations and will typically measure 10 feet wide by 25 feet long. Concrete foundations will be poured onsite or precast and assembled off-site. The inverters skids are located within the interior of the Project along access roads.

A specific solar inverter has not yet been selected for the Project. Several are under consideration, including units manufactured by FIMER, Power Electronics, SMA, Sungrow, and TMEIC. Louise Solar will consider the costs and performance of each option as well as environmental and safety standards when making its final selection. For the purposes of generation estimates, Louise Solar has modeled the SMA Solar Technology 4200 UP-US inverter. For the purposes of this AIMP, these technologies are substantially similar physically.

2.2.3 Project Substation and Operations and Maintenance Building

The Project will have an on-site step-up substation with metering and switching gear required to connect to the transmission electrical grid. The substation will be located within the Project Area Southern Unit and in proximity to the existing Adams Substation as depicted in Figures 2 and 4. It will be designed according to regional utility practices, Midcontinent Independent Transmission System Operator Standards, Midwest Reliability Organization Standards, and National Electrical Safety Code. The area within the substation will be graveled to minimize vegetation growth in the area and reduce risk of fire. Secondary containment areas for the transformer will be installed as necessary. The gated and locked substation will be fenced with a 6 or 8 foot fence for security and safety purposes as described in Section 2.2.5. The substation's area will be approximately 521 feet by 525 feet once construction is complete. Final dimensions will depend on equipment selection, engineering and design specifications.

An operation and maintenance (O&M) facility for the project is currently planned on approximately 1 acre in the southwest corner of the project substation location (Figure 3). From this facility, the solar modules and other electrical systems equipment will be remotely monitored using a SCADA system, and vehicles, tools and maintenance equipment can be stored.

2.2.4 Access Roads

The Project will include approximately 3.9 miles of internal graveled access roads between the arrays, inverters substations and other infrastructure. The final length of the access roads will depend on the equipment selected and final engineering. These roads are approximately 12-16 feet wide along straight portions and wider along curves at internal road intersections (approximately 45 feet). There are four access points to the Project from existing public roads and four access points from existing private roads: two to the Northwest and Southern construction units, three to the Northeastern construction unit, and one to the Project substation. Access points were designed in areas with less traffic, efficient access, and to provide safe ingress and egress for emergency responders, visitors and employees. Entrances to the Louise Solar site will have locked gates. Louise Solar has optimized the amount of access points and roads within the Preliminary Development Area.

Upgrades or other modifications to the public roads may be required for construction entrances or operation of the Project. Louise Solar will work with Mower County to facilitate public road upgrades that meet the required public standards. Louise Solar will continue to coordinate with County and State agencies as the Project develops. Driveway changes utilizing county roadways will require an entrance permit from Mower County, which will be obtained prior to construction. If an entrance utilizing TH 56 would be used, it would require submittal of an application for access (driveway) permit from the Minnesota Department of Transportation.

2.2.5 Permanent Fencing

Security fencing will be installed along the project perimeter of the North and South Unit's Preliminary Development Areas. Fencing will be secured to posts that will be directly embedded in the soil or set in concrete foundations as required for structural integrity. The fencing will consist of either a 6 or 8 foot chain link fence with a top guard angled out and upward at 45 degrees with 3-4 strands of smooth wire (no barbs), or an agricultural type fencing will be installed.

2.2.6 Stormwater Drainage Basins

Louise Solar has preliminarily designed 18 stormwater drainage basins throughout the Preliminary Development Area that have been engineered to meet standards for rate control and water quality. These basins are located in existing low areas that also contain hydric soils and for which the preliminary design for solar facilities has avoided. These areas will be vegetated with a wet seed mix that will help stabilize soils after rain events. Overall Project Site drainage patterns will not be significantly altered with solar development.

2.2.7 Transmission System

The Project will interconnect into the existing Adams Substation via a 161-kV overhead gen-tie transmission line of approximately 700 feet. There will be a single dead-end structure within the Project substation and several transmission structures needed to enter the Adams Substation with an overall length currently estimated to be approximately 700 feet, pending final engineering. The transmission structures will likely be made of wood and/or steel and will be less than 150 feet tall. The type of conductor will be determined following the completion of detailed electrical engineering design. Per Minn. Stat. 216E.01 subd. 4, the proposed transmission line does not meet the high voltage transmission line definition because it is less than 1,500 feet long.

2.2.8 Temporary Facilities

Louise Solar will use up to three temporary laydown areas within the Preliminary Development Area, totaling approximately 12 acres. It is anticipated that roughly 5-10 acres of laydown will be needed for a project of this size, but roughly 12 acres have been identified for optionality. These areas will serve both as a parking area for construction personnel and staging areas for Project components during construction. These laydown areas have been sited to avoid tree clearing. After construction, the laydown areas within the Preliminary Development Area will be reseeded as described in the VMP.

2.3 Construction

2.3.1 Site Clearing & Vegetation Removal

Depending on timing of the start of construction, the Project may require the clearing of crop residue from farm fields. Alternatively, and depending on construction timing, Louise Solar may plant a cover crop in spring 2022 that is compatible with the VMP. This cover crop would stabilize soils if agricultural crops are not planted that year.

2.3.2 Earthwork

Mass grading on the site is not planned. A grading heat map was created for the project that shows earthwork areas and volumes. The majority of soil disturbances will occur during the first phase of Project construction when grading (generally limited to, building internal access roads, substation construction, and preparation for inverter skid locations) takes place. The Contractor may need to move soils in some areas to “flatten” parts of the site or, to complete minor grading of topsoil. Soil grading will involve removing and segregating the upper 12 inches of topsoil from the subsoil when construction grading or excavation take place; this will preserve topsoil so it can be placed back as the top soil layer when construction is complete. The topsoil stockpile area(s) would be near the location where it was removed, accurately located (GPS boundary, soil depth) and graded to facilitate long term preservation and revegetation. Subsoil would be removed and re-used as needed or to an acceptable pre-established and approved area for storage. As part of decommissioning, subsoil would be replaced first (as needed), followed by topsoil. The soil would be replaced and brought back to pre-construction contours to allow for farming. The earthwork activities will be completed using typical earthmoving construction equipment – scrapers, bulldozers, front-end loaders, excavators and skid-steers. BMPs that will be used during these earthmoving activities are described in detail in Section 2.3.3.

2.3.3 Access Road Construction

As a component of earthwork, permanent entrances, access roads and turnouts will be constructed for the Project as indicated in Figure 3. This work would start with the stripping and segregating of topsoil materials from the proposed roads. The Contractor will then compact the subgrade materials typically 16 feet wide to the specified compaction requirements as laid out by the civil and geotechnical engineer plans. As specified, a geo-fabric may be used, depending on the soil type and location, a layer of 4 to 12 inches of gravel will be applied and compacted. The gravel will be placed level with the existing grade to facilitate drainage and minimize ponding. After the road surface is compacted, the Contractor will shape Project drainage ditches as designed on the grading plan.

Louise Solar has chosen flatter areas within the Project Area to support Project infrastructure thus minimizing the amount of topsoil that will need to be removed due to grading. Topsoil removed from permanent access roads will be stockpiled as described in Section 2.3.2 in suitable locations on-site to facilitate final reclamation during decommissioning.

2.3.4 Solar Array Construction

After grading activities are complete, the solar array racking system supports will be constructed using steel piling driven into the ground. In some situations, where soils are low strength or consist of loose, non-cohesive sand, helical screw or auger-type foundation posts may be used. Foundations typically use galvanized steel where high load bearing capacities are required. The piles are driven using a hydraulic ram, screw or pneumatic equipment that moves on tracks. This task requires two workers. Soil disturbance for this task would be negligible since the solar pile driver equipment does not excavate soil. The pile driving equipment is about the size of a small tractor. It is equipped with tracks to disperse its weight over a larger ground surface and reduce soil disturbance, rutting and compaction.

The remainder of the racking system will be installed by construction crews using hand tools and specialized equipment. Array racking and steel cross-members will be bolted to the foundation piling to create a “rack” to which the solar panels are fastened.

During array and racking assembly, multiple crews and various types of vehicles will be working within the Project Area. To the extent practicable, vehicular traffic will be limited to permanent and temporary access roads to minimize soil disturbance and compaction. All soil mixing will be avoided. These vehicles will likely include flatbed trucks for transporting array components, small all-terrain vehicles, and pick-up trucks to transport equipment and workers. Panels will be staged in advance throughout the Project Area and will be brought to specific work areas for installation by wagon-type trailers pulled by small tractors or all-terrain tracked equipment.

2.3.5 Electrical Collection System

The collection system will either be buried in a trench or conduit. Part of the underground collection system will be horizontally directionally drilled under TH 56 in two separate locations. Final engineering and procurement will determine the detailed construction method that will be used. For the purposes of this Plan, Louise Solar provides construction methods and BMPs for trenching.

The electrical collection cabling will be installed using a trenching machine or excavator. The trencher will cut an exposed trench. Cabling will be installed to a minimum depth of 4 feet. The upper 12 inches of topsoil will be stripped from the trench and temporarily stockpiled using a small backhoe. After cables are installed, the trenches would be backfilled, first with subsoil removed. Stockpiled topsoil would then be replaced over the subsoil in sufficient quantities to ensure restoring the trench to the original grade after settling. BMPs that will be used during these earthmoving activities are described in detail in Section 3.

2.3.6 Inverter Installation

Inverter installation will begin with topsoil removal; it will be scraped and stockpiled at designated locations and graded to facilitate revegetation. Underground conduit and junction boxes will be installed throughout the Project to facilitate required cabling connecting equipment. The inverters units will then be placed on frost-footing supported concrete pads or on driven/helical screw pier foundations that will be designed to specifications necessary to meet the local geotechnical conditions. A truck with a flatbed trailer will deliver the premanufactured skids with an inverter, transformer and SCADA equipment to each inverter foundation. They will typically be set in place using a rough-terrain type hydraulic crane.

2.3.7 Project Substation Construction

Construction work within the proposed substation will begin by scraping and segregating topsoil and placing it in a designated location. Additional site preparation will include installation of substructures and electrical equipment. Installation of concrete foundations and embedments for equipment will require the use of trenching machines, concrete trucks, pumpers and vibrators, forklifts, boom trucks, and cranes. Above-ground and below-ground conduits from this equipment will run to a control enclosure that will house the protection, control, and automation relay equipment. A station service transformer will be installed for primary AC power requirements. Batteries and battery chargers will be installed inside the enclosure providing power to the switchyard's control system. Crushed rock will be placed over the substation and adequate lighting will be installed around the substation for worker safety during construction and operation.

Substation foundations will typically be installed as follows: Method 1 would be to use a small rubber tire backhoe to excavate major foundations prior to pouring the concrete slabs. Method 2 would use an auger/drill type machine for minor foundations.

Using either method, the disturbance limit will be within the footprint of the substation for both the foundation equipment and the concrete delivery trucks. BMPs that will be used during these earthmoving activities are described in Section 3. Soil disturbance for the substation area will be excavated and restored as described in Section 2.3.2.

2.3.8 Stormwater Drainage Basins

Similar to Project substation construction described above, drainage basins would have topsoil removed and temporarily stored in a pre-established suitable location. Subsoil would then be excavated to the design depths and the slopes to accommodate inlets and outlets. Excavated subsoil would be distributed throughout the site as fill material in areas where grading is required. Topsoil would be replaced and the basins vegetated with a wet tolerant seed mix.

2.3.9 Generator-Tie Line Construction

Given the close proximity of the Adams Substation and the proposed Project substation, a 161kV gen-tie line of approximately 700 feet will be required. This includes approximately 5 wood or steel direct embedded structures.

2.3.10 Project Fencing Installation

A fencing company will be contracted to construct fencing, as described in Section 2.2.5, around the perimeter of the Project. Additional fencing around the substation will be installed. It will comply with the National Electric Code. Posts for fence around the Project substation will be spaced approximately 10 feet on center. Corner posts will be augured 3.5 feet and embedded in concrete for structural support. Tangent posts will be direct buried 3.5 feet similar to corner posts. The Site will have doors and gates installed, as needed.

3.0 Limitations and Suitability of Site Soils

Soil varies considerably in its physical and chemical characteristics that strongly influence the suitability and limitations that soil has for construction, reclamation, and restoration. Major soil properties include:

- Soil texture
- Drainage and wetness
- Presence of stones, rocks, and shallow bedrock
- Fertility and topsoil characteristics
- Soil slope

Interpretative limitations and hazards for construction and reclamation are based to a large degree on the dominant soil properties, and include:

- Prime farmland status
- Hydric soil status
- Susceptibility to wind and water erosion
- Susceptibility to compaction
- Fertility and Plant Nutrition
- Drought susceptibility and revegetation potential

3.1 Land Use Considerations

Based on an aerial imagery and written history, nearly all of the Project Area has been in agricultural use for decades. The area was originally settled in the mid 1800's. Ninety-eight percent of the soils in Mower County are classified as prime farmland or prime farmland if drained. Typically, high value crops such as corn and soybean rotations are grown in the area. Louise Solar will maintain the existing subsurface and surface drainage systems during Project operation, with modifications limited to the extent required to avoid conflict with planned project features such as foundation piles and piers. Upon decommissioning, the land will be restored for agriculture uses. The subsurface drainage infrastructure will not be removed, preserving the general drainage characteristics of the land similar to the pre-construction condition.

3.2 Important Soil Characteristics

The Soil Survey Geographic Database (SSURGO) is the digitized county soil survey and provides a GIS database relating soil map unit polygons to component soil characteristics and interpretations. Soil map unit polygons in the SSURGO database were clipped to the Project and internal infrastructure boundaries, including the major pieces of infrastructure:

- Fenced area hosting solar panels, racks, and arrays
- Inverter locations
- Access roads
- Laydown areas
- Project substation

The acreage of major Project features sharing physical properties, classifications, and limitation interpretations important for construction, use, revegetation, and reclamation were determined by spatial queries of the GIS database. Soils within the Project Area not anticipated to be affected by construction or operations are indicated in the tables below. The following analysis only includes the 325 acres that will be affected by construction (Preliminary Development Area).

A soil map of the Project Area is provided along with a table of selected characteristics of site soils including physical properties, classifications, and construction-related limitations in Appendices A and B.

3.2.1 Selected Physical Characteristics: Texture, Slope, Drainage and Wetness, Topsoil Depth, Bedrock and Presence of Stones and Rocks

There are approximately 613 acres within the Project Area, plus 1 acre of land where cables will be installed under TH 56 (totaling 614 acres). Selected physical characteristics of site soils are broken down by acreage within the 325-acre Preliminary Development Area and the 289-acre undisturbed area in Table 1.

Soil texture affects water infiltration and percolation, drought tolerance, compaction, rutting, and revegetation among other things. Soil texture is described by the soil textural family, which indicates the range of soil particle sizes averaged for the whole soil. The soils within the Preliminary Development Area (325 acres) are Fine Loamy (285 acres, 88 percent), Fine Loamy over Sandy or Sandy-skeletal (17 acres, 5 percent), and Fine (12 acres, 4 percent) textural families, indicating medium-textured soils dominated by soil particles in the loam and silt fractions with fewer particles in the clay and sand fractions. Medium-textured soils typically have good physical and available-water characteristics to support plant growth if not in excessively steep or wet conditions. They have high water-holding capacity, with most of the water being readily available for plant growth.

Slope affects constructability, water erosion, revegetation, compaction and rutting, among other properties. The soils (325 acres, 100 percent) within the Preliminary Development Area are nearly level soils with representative slopes falling within the 0-5 percent slope range.

Soil drainage indicates the wetness in the soil profile along with the speed at which internal water moves. Soil Drainage affects constructability, erosion by wind and water, and revegetation success. Most of the soils within the Preliminary Development Area are in the somewhat poorly drained and poorly drained classes (209 and 90 acres, respectively, cumulatively 92 percent of the Preliminary Development Area acreage), with smaller areas mapped into Well Drained (18 acres, 6 percent) and Moderately Well Drained (5 acres, 1 percent) drainage classes. Excessively drained soils cover 4.2 acres, or 1 percent of the soils, subjecting them to drought. Soils in Somewhat Poor and Poor drainage classes are highly productive when drained and are frequently converted to agriculture after installation of subsurface drain tile. Moderately well and somewhat poorly drained soils typically are not droughty or wet and are typically well suited to intensive agriculture.

Table 1: Acreage of Soils with Selected Physical Characteristics

Project Feature	Total Acres[1]	Textural Family[2]						Slope Range[3]		Drainage Class[4]						Topsoil Thickness[5]			Shallow Bedrock/ Stony[6]
		Fine	Fine-Loamy	Coarse-Loamy	Fine-Loamy over Clayey	Fine-Loamy over Sandy or Sandy-skeletal	N/A	Slope 0-5%	Slope >5-8%	E	W	MW	SWP	P	VP	>6-12	>12-18	>18	
	Acres																		
Preliminary Development Area (Potential Disturbance)																			
Fenced Area	287.2	12.2	251.54	6.05	0.91	12.54	3.95	287.16	0	3.95	17.24	4.14	179.3	82.54	-	122.26	21.66	143.24	-
Access Roads	9.9	-	9.29	-	-	0.54	0.09	9.93	-	0.09	0.21	0.38	6.70	2.55	-	5.12	0.83	3.97	-
Inverters	0.1	-	0.11	-	-	-	-	0.11	-	-	0.01	0.01	0.05	0.04	-	0.04	0.02	0.05	-
O&M/ Substation	6.0	-	6.04	-	-	-	-	6.04	-	-	-	-	5.89	0.15	-	5.89	-	0.15	-
Collection	3.4	-	2.98	0.03	-	0.25	0.13	3.37	-	0.13	0.34	-	1.38	1.52	-	1.14	0.67	1.56	-
Sediment Basins, Riprap, Berms	6.5	0.06	5.46	-	-	0.95	0.04	6.51	-	0.04	0.34	-	3.05	3.08	-	1.95	0.50	4.06	-
Laydown	12.24	-	9.77	-	-	2.46	-	12.24	-	-	-	-	12.24	-	-	9.77	-	2.46	-
Subtotal	**325.3**	**12.2**	**285.2**	**6.1**	**0.9**	**16.7**	**4.2**	**325.4**	**-**	**4.21**	**18.14**	**4.52**	**208.6**	**89.97**	**-**	**146.2**	**23.5**	**155.5**	**-**
Land Under Control but Not Currently Planned for Development																			
Undisturbed	288.7	1.51	232.69	0.83	5.31	37.19	11.15	283.73	4.97	10.39	19.96	5.09	140.93	112.25	0.07	106.42	43.56	138.87	-
Grand Total																			
TOTAL	**614.0**	**13.7**	**517.9**	**6.9**	**6.2**	**53.9**	**15.4**	**609.1**	**5.0**	**14.6**	**38.1**	**9.6**	**349.6**	**202.1**	**0.1**	252.42	67.25	294.37	-

1 Total acres of Project features that are anticipated to be disturbed by supporting construction equipment traffic, excavation, and grading. Data obtained by merging Project facility polygons with the SSURGO spatial data in ArcGIS. Summations were performed in ArcGIS Pro or Microsoft Excel.

2 Data available directly from the Natural Resources Conservation Ser4vice (NRCS) SSURGO spatial or attribute database via geospatial query of the spatial or attribute data.

3 Representative slope values are taken directly from the SSURGO database. The SSURGO database provides representative slope values for all component soil series. Slope classes represent the slope class grouping in percent that contains the representative slope value for a major component soil series. For example, a soil mapped in the 2-6% slope class has an average slope of 4% which is within the 0-5% slope range.

4 Drainage class as taken directly from the SSURGO database.

5 Topsoil thickness is the aggregate thickness of the A horizon described in the SSURGO database.

6 Depth to bedrock taken directly from the SSURGO database. Stony/Rocky soils are those soils that have either a cobbley, stony, boulder, shaly, very gravely or extremely gravelly modifier to the textural class of the surface layer or that have a surface layer with >5% stones or rocks >3 inches in dimension.

Topsoil depth affects soil plant nutrition and surface soil structure. To maintain soil productivity, soils with thick topsoil will require larger areas for storage of larger volume of topsoil stripped from permanent infrastructure footprints such as permanent access roads, inverters, and the Project substation. Most of the soils within the Preliminary Development Area are Mollisols and are characterized by the presence of relatively thick topsoil greater than 12 inches in depth (179 acres, 55 percent).

The presence of bedrock near the soil surface and rocks and stones in the soil profile affects constructability and revegetation. No soils in the Preliminary Development Area are underlain by shallow bedrock. However, occasional cobbles and boulders were encountered during geotechnical investigation for the project, which is consistent with the predominantly glacial depositional environment of the soils.

3.2.2 Selected Classification Data: Prime Farmland, Land Capability Classification, Hydric Soils.

Selected classification information for site soils are broken down by acreage within the 325-acre Preliminary Development Area and the 289-acre undisturbed area in Table 2.

Natural Resources Conservation Service (NRCS)-designated prime farmland soils have the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and are also available for these uses[1]. Of the soils in the Project Area, 96 percent are classified into prime farmland or prime farmland if drained. Within the Preliminary Development area, 97 percent of the soils are classified into prime farmland or prime farmland if drained.

Per Minnesota Rule 7850.4400, subpart 4, "no large electric power generating plant site may be permitted where the developed portion of the plant site… includes more than 0.5 acres of prime farmland per megawatt of net generating capacity." Minnesota's Department of Commerce came out with guidance stating what needs to be evaluated when a project is on more prime farmland than the rule allows. This includes describing why alternatives were not chosen, how avoidance of certain impacts influenced site selection, and prove that good faith consideration was given to nearby nonprime farmland areas.

Most of Mower County soil is classified as prime farmland or prime farmland if drained, so siting came down to a location where other disturbances were minimized, and efficiency and ease of access could be maximized. As mentioned in Section 2.2.4, other sites could not be obtained in close proximity to the Adams Substation to make efficient use of existing equipment, minimize line loss, and avoid the need for large transmission construction that had a higher potential to negatively impact the environment. Louise Solar will utilize an adaptive management approach for vegetation management in order to provide the best care and protection for the prime farmland from year to year. Louise Solar is committed to ensuring the vitality of the soils during and after the project.

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[1] [Prime farmland] has the combination of soil properties, growing season, and moisture supply needed to produce sustained high yields of crops in an economic manner if it is treated and managed according to acceptable farming methods. In general, prime farmland has an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, an acceptable level of acidity or alkalinity, an acceptable content of salt or sodium, and few or no rocks. Its soils are permeable to water and air. Prime farmland is not excessively eroded or saturated with water for long periods of time, and it either does not flood frequently during the growing season or is protected from flooding.

Table 2: Acreage of Soils with Selected Classification Data

Project Feature	Total Acres[1]	Prime Farmland			Land Capability Class										Hydric Soil[2]
		All Soils	If Drained	Not Prime	1	2e	2s	2w	3s	3w	4s	5w	6s	N/A	
	Acres														
Preliminary Development Area (Potential Disturbance)															
Fence Area	287.2	131.60	145.57	10.00	168.31	7.51	10.44	73.17	6.05	17.73	3.95	-	-	-	82.54
Access Roads	9.9	4.30	5.54	0.09	6.20	0.38	0.54	2.33	-	0.39	0.09	-	-	-	2.55
Inverters	0.1	0.05	0.06	-	0.06	0.01	-	0.03	-	0.01	-	-	-	-	0.04
O&M/Substation	6.0	-	6.04	-	5.89	-	-	0.15	-	-	-	-	-	-	0.15
Collection	3.4	0.84	2.38	0.15	1.16	-	0.25	1.77	0.03	0.04	0.13	-	-	-	1.52
Sediment Basins, Riprap, Berms	6.5	2.87	3.60	0.04	2.07	-	0.74	3.60	-	0.06	0.04	-	-	-	3.08
Laydown Yards	12.24	9.84	2.40	-	9.77	-	2.46	-	-	-	-	-	-	-	-
Sub-total	**325.3**	**149.5**	**165.6**	**10.3**	**193.5**	**7.9**	**14.4**	**81.1**	**6.1**	**18.2**	**4.2**	**-**	**-**	**-**	**89.9**
Land Under Control but Not Currently Planned for Development															
Undisturbed	288.7	122.98	152.36	13.35	99.64	13.30	32.85	125.82	0.83	3.71	6.91	1.37	0.76	4.20	112.32
Grand Total															
Grand Total	**614.0**	**272.5**	**317.9**	**23.6**	**294.1**	**21.2**	**47.3**	**206.9**	**6.9**	**21.9**	**10.4**	**1.4**	**0.8**	**4.2**	**200.7**

1 Total acres of Project features that are anticipated to be disturbed by supporting construction equipment traffic, excavation and grading. Data obtained by merging facility polygons with the SSUGO spatial data in ArcGIS. Summations were performed in ArcGIS Pro and Microsoft Excel.
2 Data available directly from the NRCSS SSURGO spatial or attribute databases via geospatial query of the spatial or attribute data.

Land Capability Class (LCC) is a system of grouping soils primarily on the basis of their capability to produce common cultivated crops and pasture plants without deteriorating over a long period of time. Soils within the Preliminary Development Area are in LCC 1, 2e, 2s, 2w, 3s, 3w, and 4s. A numerical value of 1 and 2 indicates soils with no or few limitations that restrict the choice of plants or require very careful management. 296.8 acres or 91 percent of soils within the Preliminary Development Area belong to LCC classes 1, 2e, 2s, and 2w. Soils in LCC classes 1 and 2e are typically considered prime farmland and soils in LCC class 2W are considered prime farmland if drained.

Hydric soils are generally described as soils in poorly drained to very poorly drained drainage classes. Hydric soils are formally a component of regulated wetlands and can be used to indicate areas with potential jurisdictional wetlands. Most of the soils are non-hydric (235 acres, 72 percent), with 90 acres (28 percent) being considered hydric soils.

3.2.3 Construction-Related Interpretations: Highly Erodible Land (Wind and Water), Compaction Prone, Rutting Prone, and Drought Susceptible with Poor Revegetation Potential.

Selected construction-related interpretative data for site soils are broken down in Table 3 by acreage within the 325-acre Preliminary Development Area and the 289-acre undisturbed area.

Highly erodible land is identified as being susceptible to water and wind erosion. The majority of soils in the Preliminary Development Area are low relief, medium-textured soils with intermediate water infiltration characteristics that limit soil erosion by the agent of water. None of the Preliminary Development Area has soils that are highly water erodible.

Wind erosion was evaluated using the wind erodibility group. Highly wind erodible soils are medium textured, relatively well drained soils with poor soil aggregation, resulting in soils with soil surfaces dominated by particles that can be dislodged and carried by the wind. None of the soils within the Preliminary Development Area are considered highly wind erodible.

Soils prone to compaction and rutting are subject to changes in soil porosity and structure as a result of mechanical deformation caused loading by equipment during construction. Compaction and rutting are related to moisture content and texture, and are worse when medium- and fine-textured soils are subject to heavy equipment traffic when wet. Compaction and rutting susceptible soils cover 299 acres (92 percent) if they are trafficked when wet.

Soils susceptible to drought include coarse textured soils in moderately well to excessive drainage classes. Revegetation during seed germination and early seedling growth is severely compromised during dry periods on droughty soils. None of the soils within the Preliminary Development Area are susceptible to drought.

Table 3: Acreage of Soils in Selected Construction - Related Interpretations

Project Feature	Total Acres[1]	Highly Erodible[2]		Compact Prone[3]	Rutting Hazard[4]			Drought Susceptible[5]
		Water	Wind		Slight	Moderate	Severe	
	Acres							
Preliminary Development Area (Potential Disturbance)								
Fenced Area	287.2	-	-	261.84	-	10.00	277.16	-
Access Road	9.9	-	-	9.24	-	0.09	9.84	-
Inverter	0.1	-	-	0.09	-	-	0.11	-
O&M/Substation	6.0	-	-	6.04	-	-	6.04	-
Collection	3.4	-	-	2.90	-	0.15	3.22	-
Sediment Basins, Riprap, Berms	6.5	-	-	6.13	-	0.04	6.47	-
Laydown Yards	12.2	-	-	12.24	-	-	12.24	-
Subtotal	**325.3**	**-**	**-**	**298.5**	**-**	**10.3**	**315.1**	**-**
Land Under Control but Not Currently Planned for Development								
Undisturbed	288.7	-	-	253.24	-	7.02	277.45	-
Grand Total								
Grand Total	**614.0**	**-**	**-**	**551.7**	**-**	**17.3**	**592.5**	**-**

1 Total acres of Project features that are anticipated to be disturbed by supporting construction equipment traffic, excavation and grading. Data obtained by merging facility polygons with the SSUGO spatial data in ArcGIS. Summations were performed in ArcGIS Pro and Microsoft Excel.

2 Highly Erodible Water includes soils in Land Capability Cass 4e through 8e or that have a representative slope value greater than or equal to 9%. High Erodible Water includes soils in wind erodibility groups 1 and 2.

3 Includes soils that are somewhat poorly drained to very poorly drained soils in loamy sands and finer textural classes.

4 Rutting potential hazard based on the soil strength as indicated by engineering texture classification, drainage class, and slope. In general, soils on low slopes in wetter drainage classes, and compromised of sediments with low strength will have potential rutting hazards.

5 Includes soils with a surface texture of sandy loam or coarser that are moderately well to excessively drained.

3.2.4 Summary of Major Soil Limitations at the Louise Solar Project

3.2.4.1 Prime Farmland

Soils within the Louise Solar Project Area are typically silt and clay loams suited for the existing agricultural production. Most of the site consists of flat to gently rolling hills which are used for agricultural production. Nearly all of the soils within the Project Area are prime farmland, or prime farmland when drained. The primary limitations for the soils during construction, operations and maintenance, and decommissioning include compaction and rutting that may occur when the soils are trafficked when wet, and the need to reserve and store large volumes of topsoil.

While soils classified as prime farmland will be impacted by the solar facility, Louise Solar will implement BMPs during construction detailed in Section 4.0 including soil segregation and decompaction, wet weather conditions, erosion and sediment control. After construction, and for the life of the Project, soils will be stabilized and soils given an opportunity to rest, as the site is revegetated with a perennial cover of native and naturalized species according to seeding and management specifications agreed to between Louise Solar and the MNDNR. The establishment of a perennial plant community will improve soil health compared to the existing annual row crop agricultural practices; it will reduce runoff and erosion, increase soil organic matter and carbon sequestering. Upon decommissioning, the land could be returned to its pre-construction agricultural use or to another use if the economic conditions at that time indicated another use is an appropriate use for the site. Louise Solar anticipates that the property will be restored to agricultural use on decommissioning of the Project.

Louise Solar explored Mower County for a solar project based on the good solar resource in this portion of the state and the positive experiences its parent company, EDF Renewables, had in developing a portfolio of 20 community solar gardens for Xcel Energy's Community Solar Garden Program. The vast majority of Mower County is Prime Farmland, but other locations were avoided due to a greater potential for more significant environmental impacts. The location also provides great proximity to a substation and had willing landowners to sell or lease land for the Project.

Initial post-construction revegetation efforts and maintenance of vegetation during operations and maintenance will consider selecting suited plants, managing seeding times for late spring early summer when soil moisture is optimum for germination, use of mulch and other BMPs. Existing tile drainage systems will be maintained during Project operations. If an interruption occurs, it will be resolved by Louise Solar.

3.2.4.1 Topsoil Storage

Topsoil thickness currently ranges from 12 to greater than 18 inches, is relatively high in organic matter, and fertile. Storing topsoil in large deep stockpiles is not recommended as deep piles of top soil may not have the same biotic interaction of existing top soil. It is recommended to have larger areas of shallower topsoil stockpiles. To the extent practicable, topsoil should be conserved by preselecting areas to receive excess topsoil from nearby areas, grading and seed bed preparation as appropriate, and revegetation to maintain a rhizosphere suitable for plant growth.

3.2.4.2 Compaction and Rutting

Compaction and rutting are potential limitations in the Preliminary Development Area. Louise Solar will design construction access and manage construction passes to minimize the number of trips occurring on a given soil and will implement wet weather procedures when rutting is observed. Deep compaction is not anticipated to be a significant problem as the number of construction equipment passes over a given area is limited, and construction equipment consists of smaller, low-ground-pressure tracked vehicles. If compaction becomes an issue, decompaction of the soil by tilling or ripping may be performed if safely away from buried utilities.

4.0 BMPs During Construction and Operation

The Project will be constructed and operated on property owned or leased by Louise Solar. As stated above, the Project is located on highly productive farmland occupying a flat to gently rolling dense till with a thin layer of loess in southeastern Minnesota.

Because construction activities will be limited to land owned or leased by Louise Solar, no direct impacts to adjacent land are expected. Additionally, the technology to be deployed at this facility does not require that the entire Project Site be completely flat or a uniform grade. Because most of the Project site is currently nearly level or has slightly rolling terrain (Table 1), the amount of grading anticipated within the Preliminary Development Area is expected to be minimal. The PV arrays can be designed to follow the existing grade of the Project Site within certain tolerances, which allows the designer of the facility to minimize the amount of earthmoving activities that are required (see Figure 3)

While some grading activities may be required to raise or lower certain areas within the Project Site, the majority of the Project Site's topography would be left unchanged. The remainder of earthmoving activities would consist of work on the interior access roads, trenches for the DC and AC collection system, and foundational work for the Project substation and inverter skids, as necessary. The sections below describe the measures that the Contractor will implement to minimize the physical impacts to the integrity of the topsoil and topography of the Project Site.

4.1 Environmental Monitor

Louise Solar will contract with a third-party to monitor earthmoving and other activities during Project construction to ensure appropriate measures are taken to properly segregate and handle the topsoil. Louise Solar will coordinate with MDA to identify a suitable environmental monitor (Monitor). The Monitor will have a variety of duties, including but not limited to:

- Perform weekly inspections during the major earthmoving phase of Project construction;
- Observe construction crews and activities to ensure that topsoil is being segregated and managed appropriately;
- For areas returning to agriculture after construction, monitor the site for areas of potential soil compaction and rutting (except within access roads) and make specific recommendations for decompaction;
- Make recommendations to the construction manager for Louise Solar;
- Assist in determining if weather events have created "wet weather" conditions and provide recommendations to the construction manager on stormwater BMPs; and
- Submit a report of adherence by Louise Solar to soil BMPs to MDA on a weekly basis during the major earthmoving phase of Project construction and upon completion of earthmoving activities.

Potential issues with BMPs will be reported to the Louise Solar construction manager and to MDA. The construction manager will use discretion to either correct the activity or stop work.

4.2 Soil Segregation and Decompaction

During construction, one of the primary means to protect and preserve the topsoil at the Project Site will be to separate the topsoil from the other subgrade/subsoil materials when earthmoving activities or excavation are taking place during grading, road construction, cable installation, foundation installation, etc. There may be limited situations where excavated subsoil must be stored on adjacent undisturbed topsoil. In these situations, subsoil will be returned to the excavation with as little disturbance of the underlying topsoil as practicable. Laying down a thin straw mulch layer as a buffer between the subsoil and topsoil may be used as practicable to facilitate more effective separation of the subsoil and underlying topsoil during the excavation backfill process.

Based on SSURGO data, topsoil thickness is typically over 12 inches. This will be confirmed with soil tests prior to earthwork activities on the site. Louise Solar will identify the appropriate depth of topsoil that should be stripped and segregated from other subsoil materials during earthwork activities. This information will be provided with a recommendation on specific segregation methods/techniques to the Monitor for review and input. As an interim recommendation, Louise Solar suggests that the full depth of topsoil be stripped up to 12 inches in thickness in areas of construction grading. Topsoil greater than 12 inches from the soil surface would be treated similarly to the underlying subsoil. During the activities that require temporary excavations and backfilling (i.e., trenching activities) the subgrade material will be replaced into the excavations first and compacted as necessary, followed by replacement of topsoil to the approximate locations from which it was removed. Topsoil will then be graded to the approximate pre-construction contour. Louise Solar will strive to avoid compaction in other areas where it is not required by the design.

Following earthwork activities that require segregation of topsoil/subsoil, topsoil materials will be re-spread on top of the backfilled and disturbed areas to maintain the overall integrity and character of the pre-construction farmland. Excess topsoil material would be re-spread on the Project Site at pre-established locations on the site. The location and amount of topsoil will be documented to facilitate re-spreading of topsoil after decommissioning. This practice is described in more detail below for each of the earthmoving activities that are anticipated for this Project.

4.3 Wet Weather Conditions

During the construction of the Project, when periods of wet weather arise, a temporary halt of construction activities may be called if adverse impacts to soil occur. The Construction Manager for Louise Solar will have responsibility for halting activities if weather conditions pose a risk to worker safety, or if conditions are such that heavy equipment would cause significant soil compaction or rutting of the Project Site. Following initial grading at the Site, many activities could still proceed in wet weather given the lack of heavy equipment required for those tasks. However, the Construction Manager for Louise Solar would be responsible for ensuring that topsoil erosion, rutting, compaction, or damage to drain tiles (as present) is avoided to the extent possible. The Construction Manager will ensure that proper techniques and practices are used to loosen soil appropriately when encountered. Soil loosening with chisel plows prior to disking and planting will typically be a standard method of soil preparation in areas proposed for seeding. Agricultural equipment capable of operating within the approximate 20-foot wide space between panel lines when panels are oriented vertically would be used to loosen soil, prepare a seedbed, and plant suited seed mixes.

4.4 Adaptive Management During Construction

Should weather or site conditions during construction require different BMPs than those that are described in this section, Louise Solar will work with the Monitor, MDA and other appropriate agencies to discuss potential new approaches to the specific conditions that are encountered.

Louise Solar will remain flexible and implement new practices/procedures that will help ensure the quality of the land while maintaining the safety of the workers.

4.5 Initial Grading/Road Construction/Array Construction

The first phase of Project construction will be the general civil works at the Project Site where major cut and fill activities will be performed by the Contractor. Louise Solar will identify the appropriate depth of topsoil up to 12 inches that should be stripped and segregated from other materials during initial grading activities. Based on soil information, topsoil in this region of Minnesota may reach depths of 3 feet. This will be confirmed with tests prior to grading activities. If needed, Louise Solar will provide this information and a recommendation on specific segregation methods/techniques to the MDA for review and input.

The Contractor will first strip topsoil that sits higher than other areas. This will ensure that the topography falls within the tolerances allowed for by the solar array design. Based on preliminary design, engineering expects approximately 104 acres to require grading. During this civil work, topsoil will be pushed outside of the cut/fill areas and collected into designated spots for later use. Once topsoil is removed from the cut/fill areas, the sub-grade materials will be removed as required from on-site hills and relocated to on-site low spots. Prior to relocating subgrade materials to the low spots, top soil in the low areas will be stripped and set aside before the fill is added, then respreads over the new fill. The sub-grade materials would be compacted in place. When compaction is complete, the topsoil spoil piles will be re-spread over the reconditioned sub-grade areas.

This newly spread topsoil will be loosely compacted and/or “tracked” and employ the wind and stormwater erosion prevention BMPs.

After the majority of the major earthwork activities have been completed, the Contractor will start construction of the internal road network. This work would start with the stripping of topsoil materials from the roadbeds to a depth of at least 12 inches. Topsoil will be windrowed to the edges of each roadbed. Windrowing will consist of pushing materials into rows of stock piles adjacent to the road which will be loosely compacted and/or “tracked” with stormwater and wind erosion BMPs in place. The Contractor will then compact the sub-grade materials. After gravel is installed and compacted to engineers’ requirements, the Contractor will shape Project drainage ditches as identified on the final grading plan. Previously stripped and windrowed topsoil will be re-spread throughout the Preliminary Development Area.

Following grading and road construction, the Contractor will begin the installation of foundation piles for the solar PV array racking system. This work will consist of directly driving the pile into the soil with pile driving equipment. These vehicles would operate on the existing surface of the ground and impacts would be limited and similar to a vehicle driving over the soil surface. Very little soil disturbance is expected from this activity.

4.6 Foundations

The Contractor will perform foundation work for the Project substation and inverters. For the substation, the Contractor will strip topsoil off the substation area, install the pier-type foundations, compact sub-grade materials, re-grade spoils around the substation yard, and then install clean rock on the surface. Topsoil stripped from the substation area will be pushed outside of the substation area and collected into designated locations for later use. These topsoil piles will be windrowed or piled and loosely compacted and/or "tracked" with stormwater and wind erosion BMPs in place. Once substation construction is advanced, the topsoil piles would be distributed in a thin layer adjacent to the substation area.

Where inverters are installed, topsoil will be stripped and placed adjacent to the inverter. The inverter foundations will then be excavated using an excavator followed by installation of rebar and concrete. After the concrete cures and its testing strength is completed, the subgrade soils will be compacted around the inverters. After the inverter are set, the adjacent topsoil will be re-spread around the inverter.

4.7 Trenching

Construction of the Project may require trenching for the underground installation of both DC and AC collection lines. If the collection lines are buried, the Contractor will be installing AC and DC collection cables in trenches of approximately 4 feet deep using the "open trench" method. Topsoil and subgrade materials would be excavated from the trench using typical excavating equipment or backhoes and segregated as described above. The bottom of each trench may be lined with clean fill or imported bedding to surround the cables. Louise Solar anticipates that native subsoil will be rock free (Table 1). After cables have been installed on top of fill or bedding materials in the trench, 1 foot of screened, native backfill subsoil will be placed on the cables followed by additional 2 feet of unscreened native backfill trench spoil. This material would be compacted as necessary. The last 1 foot of each trench will then be backfilled with topsoil to return the surface to its finished grade after settling.

4.8 Temporary Erosion and Sediment Control

By adhering to a site specific Stormwater Pollution Prevention Plan (SWPPP) required under the National Pollutant Discharge Elimination System (NPDES) permitting requirement that will be administered by the Minnesota Pollution Control Agency, Louise Solar will minimize the risk of excessive soil erosion on lands disturbed by construction.

Prior to construction, Louise Solar will work with engineers or the Contractor to outline the reasonable methods for erosion control and prepare the SWPPP.

These measures would primarily include silt fencing on the downside of hills, near waterways, and near drain tile inlets. This silt fencing would control sediment transport from stormwater. Check dams and straw waddles will also be used to slow water during rain events in areas that have the potential for high volume flow. In addition, the Contractor can use erosion control blankets on steep slopes, although given the site topography, this BMP will not likely be required. Lastly, as outlined above, topsoil and sub-grade material will be piled and loosely compacted and / or "tracked" while stored. The BMPs employed to mitigate wind and stormwater erosion on these soil stockpiles will include installing silt fence on the downward side of the piles as needed and installation of straw waddles if these spoil piles are located near waterways.

The SWPPP will identify designated onsite SWPPP inspectors to be employed by the Contractor for routine inspections as well as for inspections after storm events per the plan outlined in the SWPPP.

4.9 Drain Tile Identification, Avoidance and Repair

Louise Solar is aware of the presence of drain tile within the Project Area, which appears to be adequately draining the Project Area and discharging off site primarily into the county managed ditches. To minimize unforeseen repairs or damages to existing drain tile lines and/or drain tile systems, Louise Solar is committed to preserve soil drainage conditions as it currently exists; drain tile lines and drainage systems will be maintained, repaired or replaced by Louise Solar as needed.

4.9.1 Pre-Construction Tile Mapping and Repair

Pre-construction tile mapping challenges often exist on projects. Identifying and locating drain tiles is complicated because of missing, incomplete and inaccurate mapping. Louise Solar will review available drain tile maps and attempt to avoid or relocate existing drainage systems. Drain tile or drainage system adversely affected by Louise Solar will be identified, repaired, relocated, or replaced as needed to achieve the function and scope to its original size and capacity. Replacement or rerouting of tile will take place during construction or as it is identified in order to maintain the integrity of the drainage lines. This practice should minimize interruption of drainage on site or on neighboring farms that may drain through the property. New or modified drain tile systems installed by Louise Solar will be located using GPS equipment and archived in the Decommissioning Plan.

The following considerations will also apply:

- Tiles will be repaired with materials of the same or better quality as that which was damaged.
- Tile repairs will be conducted and located in a manner consistent with industry-accepted methods.
- Before completing permanent tile repairs, tiles will be examined within the work area to check for tile that might have been damaged by construction equipment. If tiles are found to be damaged they will be repaired.
- Louise Solar will make efforts to complete permanent tile repairs within a reasonable timeframe, taking into account weather and soil conditions.

4.9.2 Project Design Considerations

Louise Solar's engineers will attempt to design around the tiles to ensure placement of solar racking systems does not damage the tile to the extent feasible. In some areas, re-routing of the tile is necessary and this re-routing work will take place immediately prior to or during construction.

4.9.3 Construction Measures

In areas where it will be impossible to design solar arrays around tile locations, steps will be taken to ensure the integrity of the drainage system will remain intact both during and after construction. Tile lines that are in direct conflict with solar array installation or trenches (i.e., collection lines) will be rerouted around the conflict area. Tile lines that have the potential to be damaged by construction traffic will be bridged or reinforced to maintain integrity.

4.9.4 Operational Measures

Following completion of construction, Louise Solar will inspect the Project Site after significant snow melt or rainfall events for evidence that tile systems are functioning adequately. If localized wet areas or standing water are observed, it is likely the tile system is not operating as anticipated. In this situation, the Tile Contractor will be reengaged to pin-point damaged tile that may have been missed during construction. Tile would be repaired following the process outlines above.

4.10 Construction Debris

Construction-related debris and unused material will be removed by Louise Solar and the Contractor. Below-grade, unusable materials will be removed and loaded immediately onto trucks for subsequent disposal at a designated off-site location. The Contractor will use locally sourced dumpsters and removal services to regularly check and schedule pick-ups for full dumpsters which will be switched out for empty ones. To the extent practicable, recyclable materials (i.e., cardboard) will be sorted and recycled at a local facility.

Debris/trash collection points and dumpsters will be located both in the laydown yards as well as at strategically designated locations close to where actual work is being performed. If loose debris fails to be deposited into dumpsters or if it becomes wind-blown, the Contractor will inspect and clear fence lines of debris on a daily basis to ensure that debris and trash does not leave the Project Area. Contaminated materials are not expected; however, if such materials are encountered during construction, specialized dumpsters and handling instructions will be employed to suit the types of contaminated materials discovered. Contaminated materials will be disposed of at the nearest appropriate facility in accordance with applicable laws, ordinances, regulations, and standards.

5.0 Decommissioning

At the end of the Project's useful life, Louise Solar will either take necessary steps to continue operation of the Project (such as re-permitting and retrofitting) or will decommission the Project and remove facilities. Decommissioning, detailed in the Louise Solar Decommissioning Plan, will include:

- Removing the solar arrays, transformers, electrical collection system, fencing, lighting, and substations, and possibly the O&M building (depends on whether the O&M building is on site/is being used for other purposes);
- Removal of below-ground electrical cables to prescribed depths (cables buried below prescribed depth will be left in place);
- Removal of buildings and ancillary equipment to a prescribed depth;
- Removal of surface road material and restoration of the roads to substantially the same physical condition that existed immediately before construction. If the Project is decommissioned, Louise Solar would retain access roads the landowner requested be retained;
- Grading, adding or re-spreading topsoil, and reseeding according to the NRCS technical guide recommendations and other agency recommendations, areas disturbed by the construction of the facility or decommissioning activities, grading and soil disturbance activities will be kept to the minimum necessary to restore areas where topsoil was stripped in construction, topsoil in decommissioned roads and compaction only in areas

that were compacted during decommissioning activities so that the benefits to the soil that were achieved over the life of the Project are not counteracted by decommissioning; and

- Standard decommissioning practices would be utilized, including dismantling and repurposing, salvaging/recycling, or disposing of the solar energy improvements, and restoration.

5.1 Timeline

Decommissioning is estimated to take 20 weeks to complete to and the decommissioning crew will ensure that equipment is recycled or disposed of properly.

5.2 Removal and Disposal of Project Components

The removal and disposal details of the Project components are found below:

- **Panels**: Panels inspected for physical damage, tested for functionality, and removed from racking. Functioning panels packed and stored for reuse (functioning panels may produce power for another 25 years or more). Non-functioning panels packaged and sent to the manufacturer or a third party for recycling or another appropriate disposal method.
- **Racking**: Racking uninstalled, sorted, and sent to metal recycling facility or reused.
- **Poles**: Poles will be dismantled/removed and will be sent to a metal recycling facility. Holes will be backfilled.
- **Wire**: below-ground wire abandoned in place at depths greater than 4 feet. Wire above 4 feet removed and packaged for recycling or disposal, unless below the top of bedrock (cable between 2 feet to 4 feet deep may be abandoned in place if below the top of bedrock).
- **Conduit**: Above-ground conduit disassembled onsite and sent to recycling facility.
- **Junction boxes, combiner boxes, external disconnect boxes, etc.**: Sent to electronics recycler.
- **Inverter/Transformer**: Evaluate remaining operation life and resell or send to manufacturer and/or electronics recycler.
- **Concrete pad(s)**: Sent to concrete recycler.
- **Fence**: Fence and metal posts will be sent to metal recycling facility and wooden posts, if used, will be properly disposed.
- **Computers, monitors, hard drives, and other components**: Sent to electronics recycler. Functioning parts can be reused.

5.3 Restoration/Reclamation of Facility Site

After equipment is removed, the facility could be restored to an agricultural use, in accordance with the AIMP or to another use if the economic conditions at that time indicate another use is an appropriate use for the site. Holes created by fence poles, concrete pads, re-claimed access road corridors and other equipment, as well as trenches/drains excavated by the Project, will be filled in with soil to existing conditions and seeded. Grading and other soil disturbance activities during decommissioning will be kept to the minimum necessary to effectively decommission the site to maintain the soil benefits realized during the long-term operation of the Project, such benefits include: building topsoil through plant matter decay, carbon capture, and beneficial soil bacteria that are often absent from soil subject to row crop agriculture. This will include the revegetation in accordance with the details of the VMP. Erosion and sediment control measures will be left in place, as needed, until the site is stabilized.

Louise Solar reserves the right to extend operations instead of decommissioning at the end of the site permit term. In this case, a decision may be made on whether to continue operation with existing equipment or to retrofit the facilities with upgrades based on newer technologies. If the decision is made to continue operations, the Project will be re-permitted.

Exhibits

Louise Solar Project
Mower County, Minnesota

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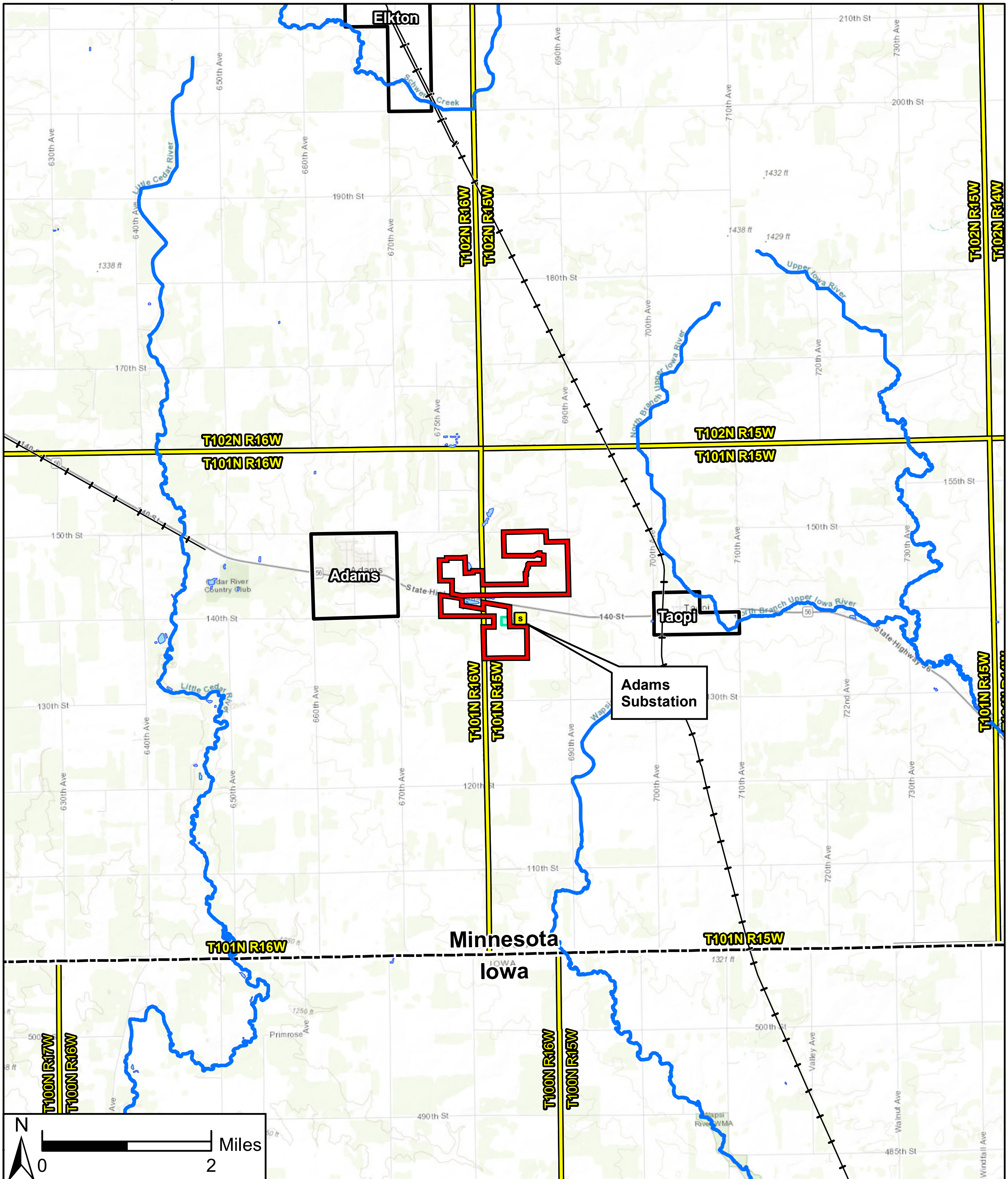

Data Source(s): Westwood (2020); MNDNR (Various Dates); US Census Bureau (2019); NED (2016); Ducks Unlimited, and St. Mary's University of Minnesota (2015); USGS NHD Dataset (2013); USFWS NWI (2017).

Legend

- Project Area Boundary
- Project Substation
- Existing Substation
- NHD Flowline
- Railroad
- Municipal Boundary
- County Boundary
- State Boundary
- PLS Township Boundary

Louise Solar Project

Mower County, Minnesota

Project Location

FIGURE 1

Westwood

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Map Document: N:\0014192.01\GIS\Permit Maps\Louise_Figure01_ProjectLocation_201104.mxd 11/17/2020 8:35:46 AM bmhardel

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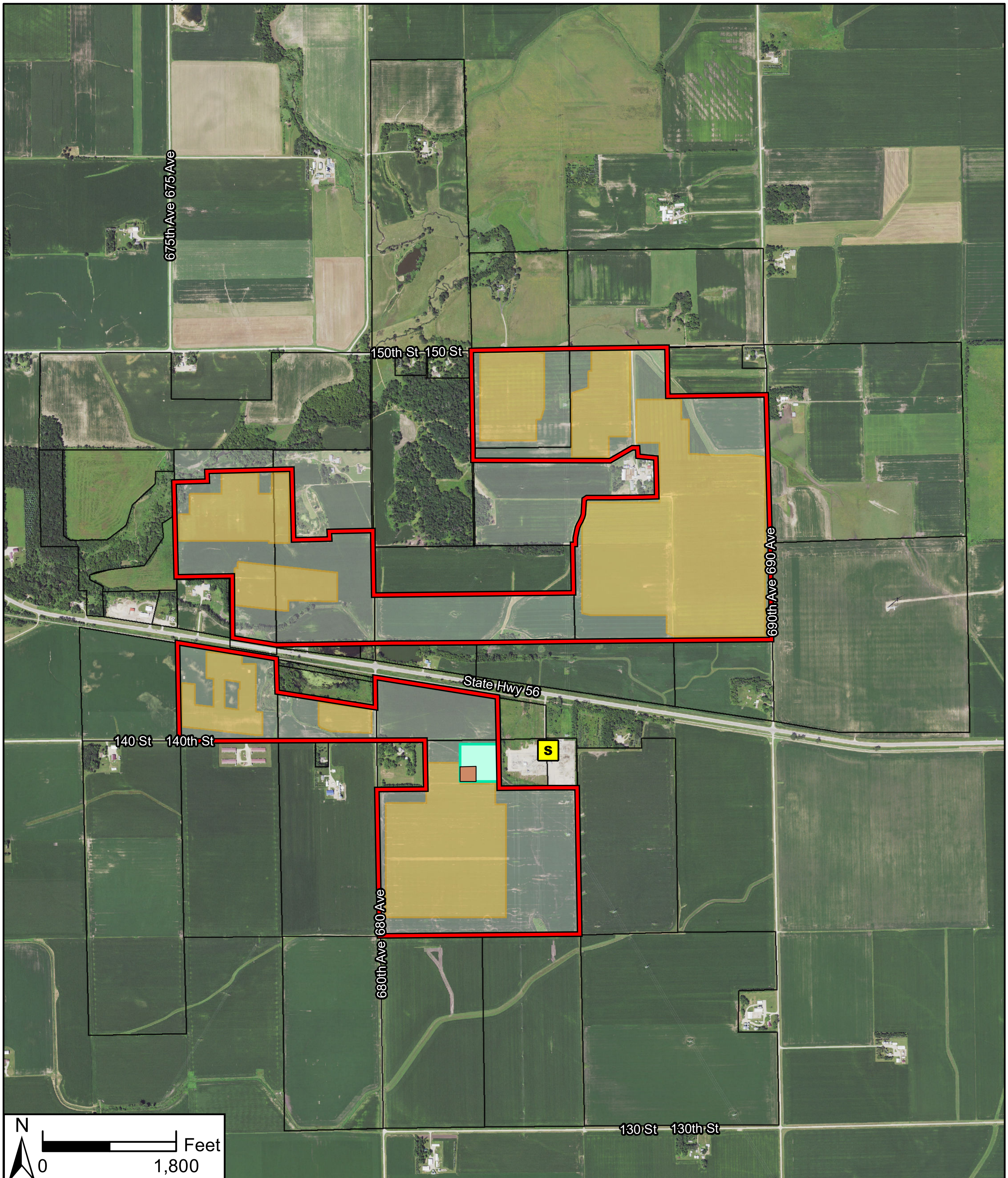
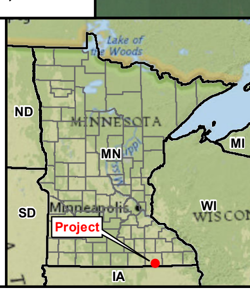


Data Source(s): Westwood (2020); MNDNR (Various Dates); US Census Bureau (2019); NED (2016); Ducks Unlimited, and St. Mary's University of Minnesota (2015); USGS NHD Dataset (2013); USFWS NWI (2017); USGS Imagery (2019, 2017).



Legend

- Project Area Boundary
- Participating Parcel
- Non-Participating Parcel
- Project Substation
- Existing Substation
- Proposed O&M Building
- Preliminary Development Area
- Road
- County Boundary
- Municipal Boundary

Louise Solar Project

Mower County, Minnesota

Land Control and Development Areas

FIGURE 2

Westwood

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Map Document: N:\0014192.01\GIS\Louise_Fig02_LandControlDevelopmentAreas_201214.mxd 12/14/2020 10:09:19 AM bmhardel

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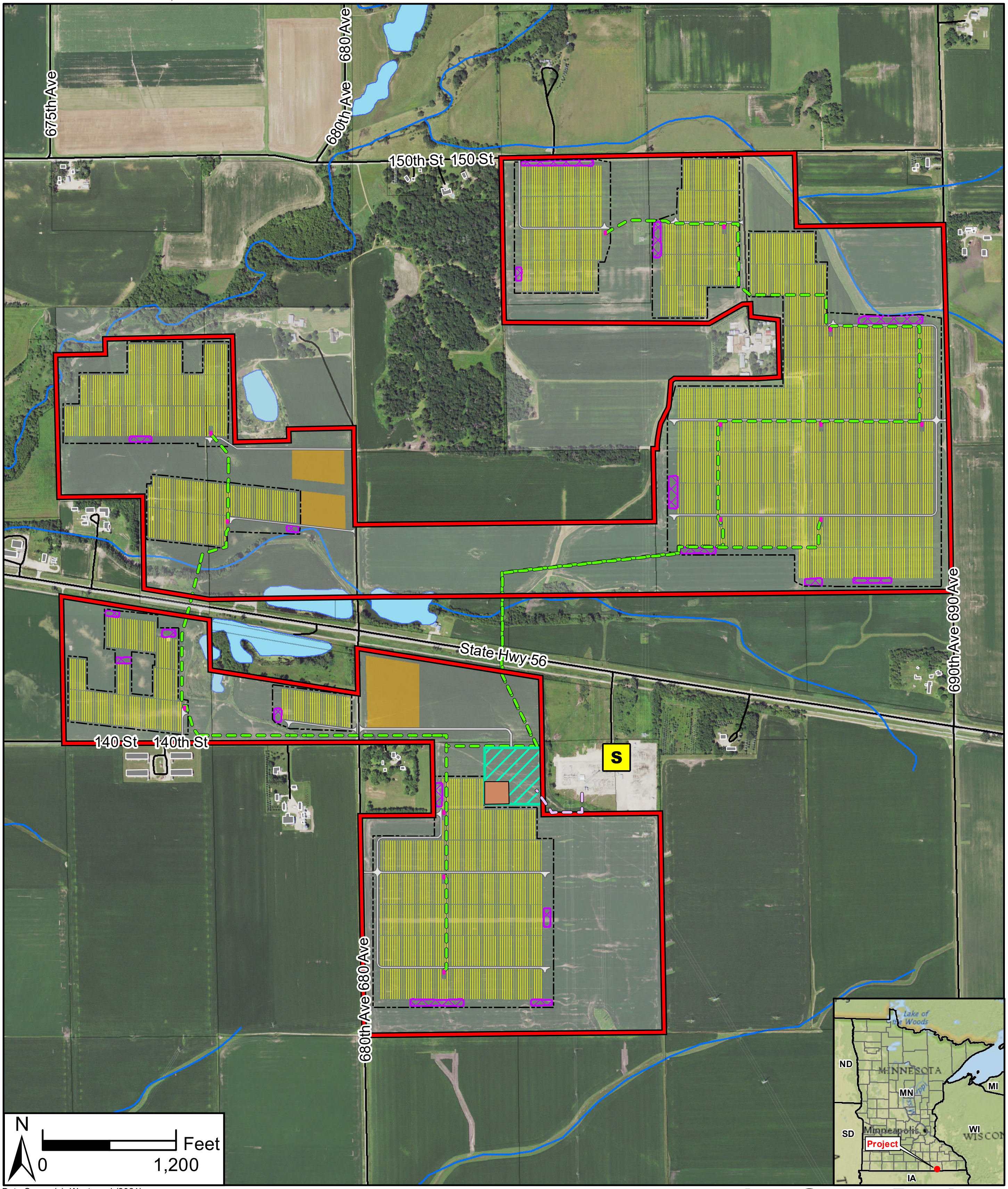

Data Source(s): Westwood (2021); MNDNR (Various Dates); US Census Bureau (2019); NED (2016); Ducks Unlimited, and St. Mary's University of Minnesota (2015); USGS NHD Dataset (2013); USFWS NWI (2017); USGS Imagery (2019, 2017).

Legend

- Project Boundary
- Project Substation
- Existing Substation
- Solar Array
- Inverter
- Proposed Collection
- Proposed Transmission Line
- Building Footprint
- Proposed Access Road
- Proposed Fence
- Proposed O&M Building
- Laydown Yard
- Stormwater Pond
- Participating Parcel
- Non-Participating Parcel
- NHD Flowline
- NHD Waterbody
- Road
- County Boundary
- Municipal Boundary

Louise Solar Project

Mower County, Minnesota

Preliminary Project Layout

FIGURE 3

Westwood

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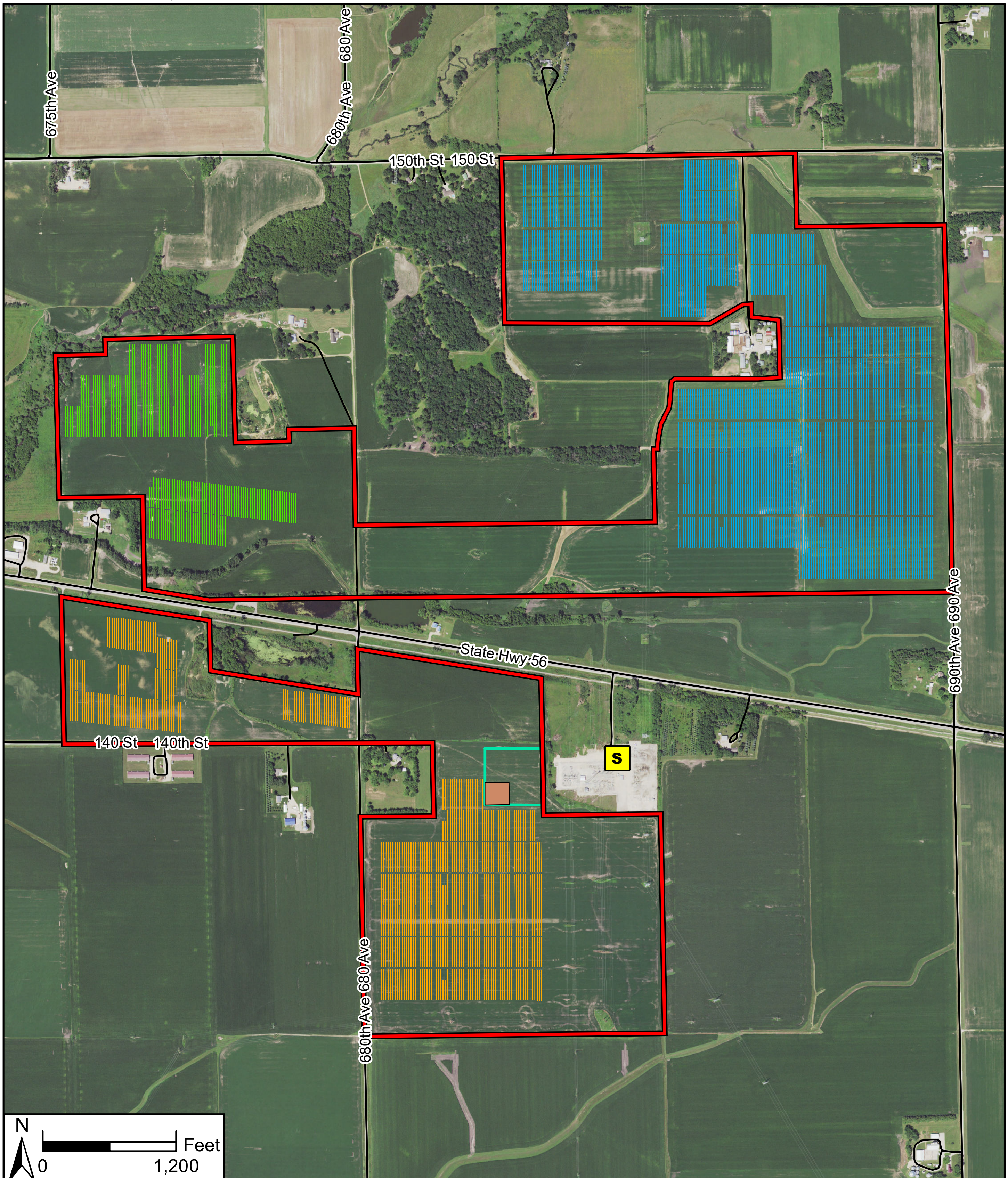
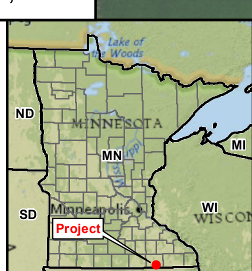


Data Source(s): Westwood (2020); MNDNR (Various Dates); USGS Imagery (2019, 2017); US Census Bureau (2019).



Legend

Project Boundary
Proposed O&M Building
Project Substation
Existing Substation
Road
County Boundary
Municipal Boundary

Array Section

Northeast
Northwest
South

Louise Solar Project

Mower County, Minnesota

Configuration of Project Components

FIGURE 4

Westwood

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Map Document: N:\0014192.01\GIS\Louise_Fig04_ConfigurationOfProjectComponents_201214.mxd 12/14/2020 10:36:22 AM bmhardel

Appendix A

Selected Soils Physical Features, Classifications, Interpretations, and Limitations

Louise Solar Project
Mower County, Minnesota

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Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations																	
				Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations					
Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
Access Road	0.02	88	Clyde silty clay loam, 0 to 3 percent slopes	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.17	479	Floyd silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	0.26	24B	Kasson silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	0-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	0.54	485	Lawler silt loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	0.09	244A	Lilah sandy loam, 0 to 2 percent slopes	not used	0-5	Excessively drained	12-18	No	Not prime farmland	4s	No	No	No	No	Moderate	No
	1.36	631	Oran silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.21	2A	Ostrander loam, 0 to 2 percent slopes	fine-loamy	0-5	Well drained	12-18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	1.13	634	Protivin silt loam	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.51	M51 1A	Readlyn silt loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.39	307	Sargeant silt loam	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	2.99	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	2.13	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.00	1904	Udolpho silt loam, loamy substratum	fine-loamy over sandy or sandy-skeletal	0-5	Poorly drained	0-12	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.11	334B	Vlasaty silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
Collection	0.03	79B	Billett fine sandy loam, 2 to 6 percent slopes	coarse-loamy	0-5	Well drained	>18	No	Not prime farmland	3s	No	No	No	No	Moderate	No
	0.35	88	Clyde silty clay loam, 0 to 3 percent slopes	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.29	479	Floyd silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	0.08	485	Lawler silt loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	0.13	244A	Lilah sandy loam, 0 to 2 percent slopes	not used	0-5	Excessively drained	12-18	No	Not prime farmland	4s	No	No	No	No	Moderate	No
	0.16	2A	Ostrander loam, 0 to 2 percent slopes	fine-loamy	0-5	Well drained	12-18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	0.02	634	Protivin silt loam	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.12	M51 1A	Readlyn silt loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.04	307	Sargeant silt loam	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if	3w	Yes	No	No	Yes	Severe	No

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations																
				Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
									drained							
	0.87	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	1.13	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.16	483B	Waukee loam, 2 to 5 percent slopes	fine-loamy over sandy or sandy-skeletal	0-5	Well drained	0-12	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
Fenced Area	6.05	79B	Billett fine sandy loam, 2 to 6 percent slopes	coarse-loamy	0-5	Well drained	>18	No	Not prime farmland	3s	No	No	No	No	Moderate	No
	4.39	88	Clyde silty clay loam, 0 to 3 percent slopes	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.91	135	Donnan silt loam	fine-loamy over clayey	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	3.37	516B	Dowagiac loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	7.46	479	Floyd silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	2.00	190	Hayfield loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	12-18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	1.27	24B	Kasson silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	0-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	3.50	485	Lawler silt loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	3.95	244A	Lilah sandy loam, 0 to 2 percent slopes	not used	0-5	Excessively drained	12-18	No	Not prime farmland	4s	No	No	No	No	Moderate	No
	29.95	631	Oran silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	2.88	2A	Ostrander loam, 0 to 2 percent slopes	fine-loamy	0-5	Well drained	12-18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	64.57	634	Protivin silt loam	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	7.88	M511A	Readlyn silt loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	5.57	307	Sargeant silt loam	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	63.03	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	12.17	1884	Stateline silt loam	fine	0-5	Poorly drained	0-12	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	58.30	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	2.11	1904	Udolpho silt loam, loamy substratum	fine-loamy over sandy or sandy-skeletal	0-5	Poorly drained	0-12	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	2.87	334B	Vlasaty silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

				Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
	4.94	483B	Waukee loam, 2 to 5 percent slopes	fine-loamy over sandy or sandy-skeletal	0-5	Well drained	0-12	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
Inverter	0.02	631	Oran silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.01	2A	Ostrander loam, 0 to 2 percent slopes	fine-loamy	0-5	Well drained	12-18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	0.02	634	Protivin silt loam	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.01	307	Sargeant silt loam	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	0.02	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	0.03	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.01	334B	Vlasaty silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
Laydown Yard	2.46	485	Lawler silt loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	2.84	631	Oran silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	4.54	M51 1A	Readlyn silt loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	2.40	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
Sediment Basins, Berms, Riprap	0.46	88	Clyde silty clay loam, 0 to 3 percent slopes	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.58	479	Floyd silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	0.40	485	Lawler silt loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	0.04	244A	Lilah sandy loam, 0 to 2 percent slopes	not used	0-5	Excessively drained	12-18	No	Not prime farmland	4s	No	No	No	No	Moderate	No
	0.34	631	Oran silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.72	634	Protivin silt loam	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.49	M51 1A	Readlyn silt loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	0.52	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	0.06	1884	Stateline silt loam	fine	0-5	Poorly drained	0-12	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	2.36	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

				Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
Feature Type[1]	**Acres[2]**	**Map Unit Symbol[3]**	**Map Unit Name[3]**	**Particle Size Family[3]**	**Slope Range[4]**	**Drainage Class[5]**	**Topsoil Thickness[6]**	**Shallow Bedrock/ Stony and Rocky[7]**	**Prime Farmland[3]**	**Land Capability Classification[3]**	**Hydric Soil Rating[3]**	**Highly Erodible Water[8]**	**Highly Erodible Wind[9]**	**Compaction Prone[10]**	**Rutting Potential[11]**	**Droughty[12]**
	0.21	1904	Udolpho silt loam, loamy substratum	fine-loamy over sandy or sandy-skeletal	0-5	Poorly drained	0-12	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	0.34	483B	Waukee loam, 2 to 5 percent slopes	fine-loamy over sandy or sandy-skeletal	0-5	Well drained	0-12	No	All areas are prime farmland	2s	No	No	No	No	Severe	No
Substation	5.89	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	0.15	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
Undeveloped Area	0.76	1078	Anthroportic Udorthents, 2 to 9 percent slopes	not used	>5	Moderately well drained	0-12	No	Not prime farmland	6s	Unranked	No	No	No	Severe	No
	0.83	79B	Billett fine sandy loam, 2 to 6 percent slopes	coarse-loamy	0-5	Well drained	>18	No	Not prime farmland	3s	No	No	No	No	Moderate	No
	28.03	88	Clyde silty clay loam, 0 to 3 percent slopes	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	1.37	1974	Coland-Spillville loams, frequently flooded	fine-loamy	0-5	Poorly drained	>18	No	Not prime farmland	5w	Yes	No	No	Yes	Severe	No
	5.31	135	Donnan silt loam	fine-loamy over clayey	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	1.43	516B	Dowagiac loam, 2 to 6 percent slopes	fine-loamy	0-5	Well drained	>18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	13.26	479	Floyd silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2w	No	No	No	Yes	Severe	No
	4.16	190	Hayfield loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	12-18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	0.96	1841	Hayfield loam, loamy substratum	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	2.93	24B	Kasson silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	0-12	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	21.26	485	Lawler silt loam	fine-loamy over sandy or sandy-skeletal	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	2s	No	No	No	Yes	Severe	No
	4.12	244A	Lilah sandy loam, 0 to 2 percent slopes	not used	0-5	Excessively drained	12-18	No	Not prime farmland	4s	No	No	No	No	Moderate	No
	2.06	244B	Lilah sandy loam, 2 to 6 percent slopes	not used	0-5	Excessively drained	0-12	No	Not prime farmland	4s	No	No	No	No	Moderate	No
	10.12	631	Oran silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	3.66	2A	Ostrander loam, 0 to 2 percent slopes	fine-loamy	0-5	Well drained	12-18	No	All areas are prime farmland	1	No	No	No	No	Severe	No
	7.55	2B	Ostrander loam, 2 to 5 percent slopes	fine-loamy	0-5	Well drained	12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	4.20	1030	Pits, sand and gravel		>5	Excessively drained	0-12	No	Not prime farmland	Not Rated	Unranked	No	No	No	Not Rated	No

Appendix A: Selected Soil Physical Features, Classifications, and Interpretations and Limitations

				Selected Soil Physical Features					Selected Soil Classifications			Construction/Reclamation Interpretations and Limitations				
Feature Type[1]	Acres[2]	Map Unit Symbol[3]	Map Unit Name[3]	Particle Size Family[3]	Slope Range[4]	Drainage Class[5]	Topsoil Thickness[6]	Shallow Bedrock/ Stony and Rocky[7]	Prime Farmland[3]	Land Capability Classification[3]	Hydric Soil Rating[3]	Highly Erodible Water[8]	Highly Erodible Wind[9]	Compaction Prone[10]	Rutting Potential[11]	Droughty[12]
	24.89	634	Protivin silt loam	fine-loamy	0-5	Somewhat poorly drained	>18	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	19.57	M511A	Readlyn silt loam, 1 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	All areas are prime farmland	1	No	No	No	Yes	Severe	No
	2.13	307	Sargeant silt loam	fine-loamy	0-5	Poorly drained	12-18	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	0.07	517	Shandep clay loam	fine-loamy	0-5	Very poorly drained	12-18	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	41.40	23	Skyberg silt loam, 0 to 3 percent slopes	fine-loamy	0-5	Somewhat poorly drained	0-12	No	Prime farmland if drained	1	No	No	No	Yes	Severe	No
	1.51	1884	Stateline silt loam	fine	0-5	Poorly drained	0-12	No	Prime farmland if drained	3w	Yes	No	No	Yes	Severe	No
	74.89	331	Tripoli silty clay loam, 0 to 2 percent slopes	fine-loamy	0-5	Poorly drained	>18	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	4.32	1904	Udolpho silt loam, loamy substratum	fine-loamy over sandy or sandy-skeletal	0-5	Poorly drained	0-12	No	Prime farmland if drained	2w	Yes	No	No	Yes	Severe	No
	1.40	334B	Vlasaty silt loam, 1 to 4 percent slopes	fine-loamy	0-5	Moderately well drained	12-18	No	All areas are prime farmland	2e	No	No	No	No	Severe	No
	6.49	483B	Waukee loam, 2 to 5 percent slopes	fine-loamy over sandy or sandy-skeletal	0-5	Well drained	0-12	No	All areas are prime farmland	2s	No	No	No	No	Severe	No

1 Project Area include soils under Elk Creek Solar lease but that are not anticipated to be disturbed during construction or operations.
2 Data obtained by merging facility polygons with the SSURGO spatial data in ArcGIS. Summations were performed in Microsoft[tm] Access.
3 Obtained directly by query of the SSURGO geospatial database.
4 Representative slope values are taken directly from the SSURGO database. The SSURGO2 database provides representative slope values for all component soil series. Slope classes represent the slope class grouping in percent that contains the representative slope value for a major component soil series. For example, a soil mapped in the 2-6% slope class has an average slope of 4%, which is within the 0-5% slope range.
5 Drainage class as taken directly from the SSURGO database. ED, PD, and VPD indicate Excessively Drained, Poorly Drained, and Very Poorly Drained soils, respectively.
6 Topsoil thickness is the aggregate thickness of the A horizons described in the SSURGO database.
7 Shallow Bedrock taken directly from the SSURGO database. Stony/Rocky soils are those soils that have either a cobbley, stony, boulder, shaly, very gravelly or extremely gravelly modifier to the textural class of the surface layer or that have a surface layer with > 5% stones or rocks > 3 inches in any dimension.
8 Includes soils in land capability classes 4e through 8e or that have a representative slope value greater than or equal to 9%.
9 Includes soils in wind erodibility groups 1 and 2.
10 Includes soils that are somewhat poorly drained to very poorly drained soils in loamy sands and finer textural classes.
11 Rutting potential hazard based on the soil strength as indicated by engineering texture classification, drainage class, and slope. In general, soils on low slopes in wetter drainage classes, and comprised of sediments with low strength will have potential rutting hazards.
12 Includes soils with a surface texture of sandy loam or coarser that are moderately well to excessively drained.

Appendix B

NRCS Soils Map for the Project

Louise Solar Project
Mower County, Minnesota

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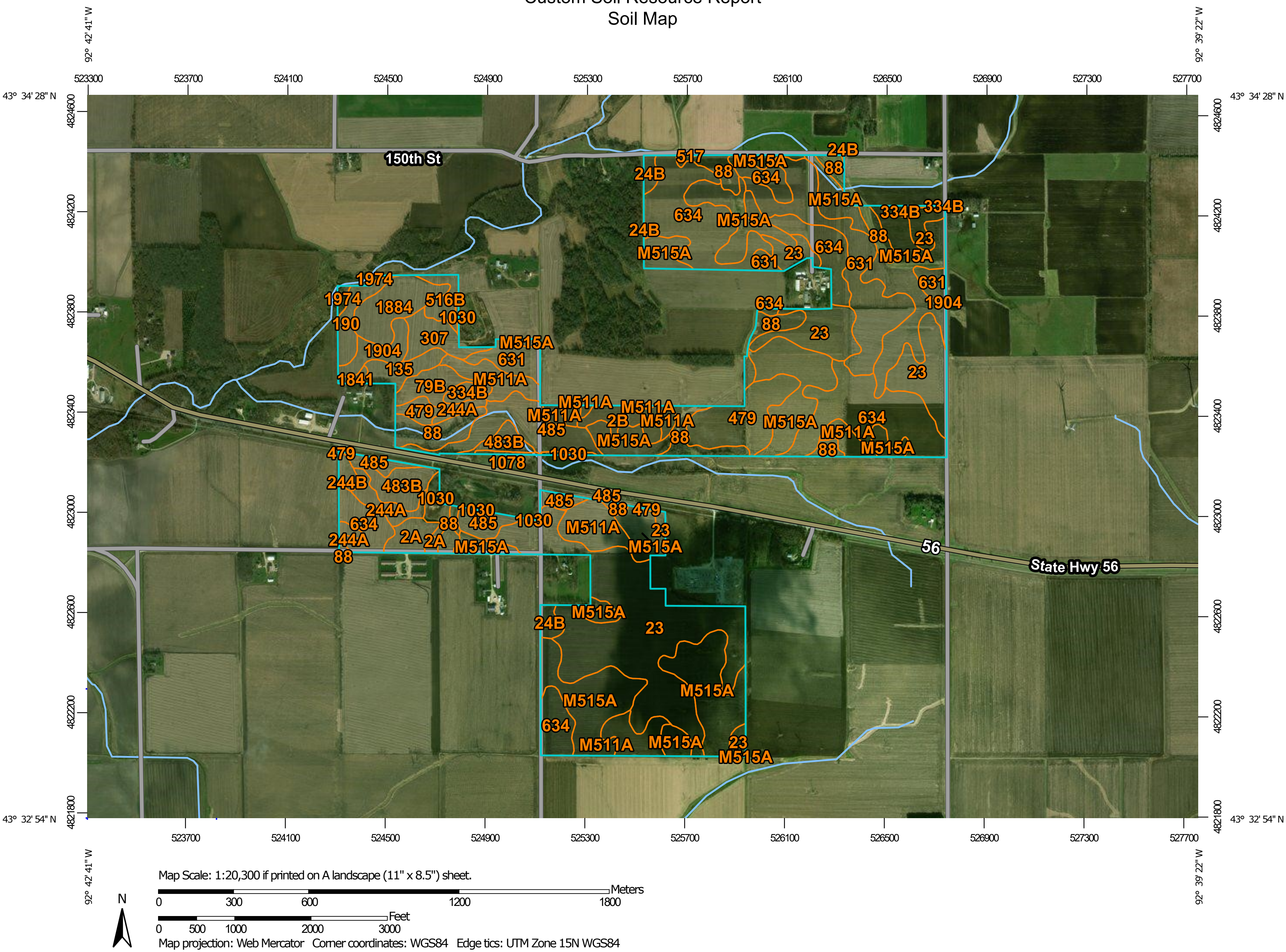
Soil Map


92° 42' 41" W
92° 39' 22" W
523300
523700
524100
524500
524900
525300
525700
526100
526500
526900
527300
527700
43° 34' 28" N
43° 32' 54" N
4824600
4824200
4823800
4823400
4823000
4822600
4822200
4821800
150th St
56
State Hwy 56
517
24B
88
M515A
634
M515A
334B
334B
24B
M515A
88
23
631
23
634
631
M515A
631
1904
634
88
23
23
1974
1974
1884
516B
1030
190
307
M515A
631
1904
135
1841
M511A
79B
334B
479
244A
88
M511A
M511A
485
2B
M511A
M515A
88
479
M515A
634
M511A
88
M515A
483B
1030
1078
479
485
244B
483B
1030
244A
1030
634
88
485
1030
485
485
88
479
M511A
23
244A
2A
2A
M515A
M515A
88
24B
M515A
23
M515A
M515A
634
M511A
M515A
23
M515A
N
Map Scale: 1:20,300 if printed on A landscape (11" x 8.5") sheet.
0
300
600
1200
1800
Meters
0
500
1000
2000
3000
Feet
Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)
- Area of Interest (AOI)

Soils
- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features
- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features
- Streams and Canals

Transportation
- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background
- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Mower County, Minnesota
Survey Area Data: Version 16, Jun 5, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 6, 2015—Nov 20, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
2A	Ostrander loam, 0 to 2 percent slopes	7.0	1.1%
2B	Ostrander loam, 2 to 5 percent slopes	7.5	1.2%
23	Skyberg silt loam, 0 to 3 percent slopes	115.5	18.9%
24B	Kasson silt loam, 1 to 4 percent slopes	4.3	0.7%
79B	Billett fine sandy loam, 2 to 6 percent slopes	6.9	1.1%
88	Clyde silty clay loam, 0 to 3 percent slopes	32.9	5.4%
135	Donnan silt loam	6.3	1.0%
190	Hayfield loam	6.1	1.0%
244A	Lilah sandy loam, 0 to 2 percent slopes	8.3	1.4%
244B	Lilah sandy loam, 2 to 6 percent slopes	2.0	0.3%
307	Sargeant silt loam	8.1	1.3%
334B	Vlasaty silt loam, 1 to 4 percent slopes	4.3	0.7%
479	Floyd silt loam, 1 to 4 percent slopes	21.5	3.5%
483B	Waukee loam, 2 to 5 percent slopes	11.9	1.9%
485	Lawler silt loam	27.9	4.6%
516B	Dowagiac loam, 2 to 6 percent slopes	4.7	0.8%
517	Shandep clay loam	0.0	0.0%
631	Oran silt loam, 1 to 4 percent slopes	44.7	7.3%
634	Protivin silt loam	91.4	15.0%
1030	Pits, sand and gravel	4.3	0.7%
1078	Anthroportic Udorthents, 2 to 9 percent slopes	0.7	0.1%
1841	Hayfield loam, loamy substratum	1.0	0.2%
1884	Stateline silt loam	13.7	2.2%
1904	Udolpho silt loam, loamy substratum	6.6	1.1%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
1974	Coland, frequently flooded-Spillville, occasionally flooded complex, 0 to 2 percent slopes	1.3	0.2%
M511A	Readlyn silt loam, 1 to 3 percent slopes	33.1	5.4%
M515A	Tripoli clay loam, 0 to 2 percent slopes	138.9	22.7%
Totals for Area of Interest		**611.0**	**100.0%**