Appendix **B** - Prime Farmland Assessment

Westwood

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MEMORANDUM

Date: **November 21, 2022**
Re: **Prime Farmland Impact Assessment**
Lake Wilson Solar Project, Murray County, MN
File No. R0012861.01
To: **Lake Wilson Solar Energy LLC**
From: **Westwood Professional Services, Inc.**

1.0 Introduction

On behalf of and in coordination with Lake Wilson Solar Energy LLC (Lake Wilson Solar), Westwood Professional Services, Inc. (Westwood) prepared this memorandum to address siting a utility-scale photovoltaic (PV) solar energy conversion and battery storage facility in Minnesota on soils designated as prime farmland. The Lake Wilson Project is a proposed up to 150-megawatt alternating current (MWac) solar project and associated up to 95 MW battery storage facility to be located in Leeds Township, Murray County, MN (Project; **Figure 1**).

In addition to the proposed Project site, Invenergy Solar Development North America LLC (Invenergy Solar Development), owner of Lake Wilson Solar, identified and evaluated another potential site (the Hat Trick site) in Roseau County near Warroad Minnesota in an attempt to find a location for the Project that would utilize fewer acres of prime farmland (**Figure 2**). The Hat Trick site is not considered an alternate to the proposed Project site but is described in this memorandum to document Lake Wilson Solar's consideration of a potential site for the Project in another area of Minnesota to demonstrate compliance with the 'prime farmland exclusion rule' found in Minnesota Rules 7850.4400, subp. 4 (Rule). At one point in time, Invenergy Solar Development was able to secure leases on non-prime farmland at the Hat Trick site from local landowners for potential use as solar photovoltaic electricity generation.

Invenergy Solar Development ultimately ruled out the Hat Trick site because the project area did not have a suitable point of interconnection that would enable the Project to obtain the requisite Network Resource Interconnection Service (NRIS) that would make the project attractive to customers, and because the Hat Trick site was unable to meet the 0.5 acre of prime farmland per MW of net generating capacity limit set in the Rule due to existing environmental constraints. Invenergy Solar Development no longer has any leases or purchase options that would allow it to use the Hat Trick site for the Project. Invenergy Solar Development does not have condemnation rights and therefore is unable to force any landowner to grant Invenergy Solar Development a lease, easement or purchase option in any other area. The assessment of the Hat Trick site included review of the feasibility of the site for the Project, the prime farmland impacts that would result from use of this site for solar, and a determination that the Hat Trick site was not feasible or prudent. Accordingly, there are no feasible or prudent alternatives to the proposed Project Area (as herein defined) for the Project.

This prime farmland impact assessment for the Project follows guidance issued by the Minnesota Department of Commerce Energy Environmental Review Analysis (EERA) in May 2020 (Guidance) as it relates to the Rule.[1] The EERA Guidance was prepared to help developers define factors they should consider and describe steps they should take when developing a permittable solar site on prime farmland. This assessment supports pertinent sections of the Site Permit Application (SPA) being prepared for the Project.

The following presents a summary of the Rule, Project description, the need for the Project, and permitting requirements. This is followed by an analysis of siting constraints listed in the Guidance, which addresses factors driving choice of region where the Project is located and assessment of a suitable site for compliance with the Rule. The assessment results show there are no feasible and prudent alternatives to the proposed Project location and therefore Lake Wilson Solar has complied with the Rule and the Project can occupy more than 0.5 acre of prime farmland per MW.

2.0 Prime Farmland Exclusion Rule

In its Guidance, EERA indicates "expansion of solar development frequently conflicts with the Public Utilities Commission (Commission or PUC) Rule to exclude energy generating installations from prime farmland (a federal designation of soil types). Specifically, no such installation may be permitted that includes more than 0.5 acre of prime farmland per MW of net generating capacity" unless the project qualifies for an exemption from the Rule or there is no feasible and prudent alternative to the chosen location.

Specifically, Minnesota Rule 7850.4400, subpart 4, provides:

> *No large electric power generating plant site may be permitted where the developed portion of the plant site*, excluding water storage reservoirs and cooling ponds, *includes more than 0.5 acres of prime farmland per megawatt of net generating capacity,* or where makeup water storage reservoir or cooling pond facilities include more than 0.5 acres of prime farmland per megawatt of net generating capacity, *unless there is no feasible and prudent alternative*. Economic considerations alone do not justify the use of more prime farmland. "Prime farmland" means those soils that meet the specifications of Code of Federal Regulations 1980, title 7, section 657.5, paragraph (a). These provisions do not apply to areas located within home rule charter or statutory cities; areas located within two miles of home rule charter or statutory cities of the first, second, and third class; or areas designated for orderly annexation under Minnesota Statutes, section 414.0325 (emphasis added).

The following assessment takes into account the above Rule, the Guidance, as well as the Commission's recent orders considering the Rule for other solar energy projects permitted by the Commission.

3.0 Project Description

The Project is an up to 150 MWac utility-scale solar photovoltaic electric generation facility and associated up to 95 MWca battery energy storage system (BESS) located within a project area of approximately 2,621

[1] *Solar Energy Production and Prime Farmland – Guidance for Evaluating Prudent and Feasible Alternatives* (Minnesota EERA, May 19, 2020). See also https://mn.gov/eera/web/doc/13929/.

acres (Project Area) in Leeds Township, Murray County, Minnesota as indicated in **Figure 1**. The current layout and proposed equipment are preliminary and subject to change as the design advances.

Lake Wilson Solar has secured site control for the entire Project Area via easement agreements and one purchase option agreement for the parcel of land that will host a new switchyard to be owned by Northern States Power Company, d/b/a Xcel Energy (hereinafter referred to as Xcel Energy), as well as the approximately 6-acre BESS yard, project collection substation, Operation & Maintenance building, and some solar arrays. The Xcel Energy Switchyard, or Xcel Switchyard, is described below and shown on **Figure 3**. With the exception of the property that will host the Xcel Switchyard and aforementioned facilities (which will be purchased), in each instance, the landowners chose to grant solar or transmission easements over their land rather than sell their land. The use of agricultural land for the Project is temporary and is reversible because the project land agreements are for a finite term and, if granted a site permit and certificate of need (CN), the Project will have a Decommissioning Plan to describe the process of project removal and site restoration, with provisions for financial security to ensure the decommissioning work can be performed. The term of the solar easements for Project operation is 35 years (with a possible extension of another 35 years). At the end of the Project operation, the land will be restored to its original condition and will likely return to agricultural use or any other use chosen by the applicable landowners. A Vegetation and Soil Management Plan (VSMP) and an Agricultural Impact Mitigation Plan (AIMP) will be implemented during construction and operation of the Project.

Within the 2,621-acre Project Area, approximately 1,526 acres are currently designated as a possibility to host proposed Project facilities (Preliminary Development Area) as shown on **Figure 3**. The excess acreage allows for planned buffers, avoidance of county drain-tile and agricultural drainage ditches, and flexibility in overall Project design. Lake Wilson Solar does not anticipate requiring the whole 1,526 acres to host 150MWac of solar generating facilities and associated BESS facilities, however, this assessment analyzed the up to 1,526 acres that may be occupied for the Project. The final footprint will be dependent on the permitting process, final field surveys, engineering and geotechnical studies, and equipment selection. Lake Wilson Solar will optimize the Project to the degree practicable to minimize the overall impact of the Project. Certain portions of the Project Area that are not used for the Project and are located outside of the fenced Project Area may be used by the underlying landowner to continue farming operations or will be vegetated/revegetated in accordance with the VSMP and landowner preference. The electrical collection lines between the solar arrays/inverters and Project Substation will be 34.5 kilovolt (kV) feeders and may be either installed above ground or direct buried in a trench at a reasonable and standard industry practice depth. Directional boring may be used to install collectors in some portions of the Project.

The Project will connect to the grid on the existing Xcel Energy Fenton-Chanarambie 115 kV high voltage transmission line (HVTL) within the Project Area (**Figure 3**). All electricity generated by the Project will be routed to the BESS and a new substation (Project Substation) via underground collector cables. The Project Substation will be connected to the new Xcel Switchyard using a short approximately 200 – 400 foot long, 115 kV overhead electrical transmission line (Project Gen-Tie Line) (**Figure 3**). The new Xcel Switchyard will contain switching gear/meter (which will be the point of interconnect [POI]) and connect to the existing Xcel Energy Fenton-Chanarambie 115 kV HVTL via an approximately 250 – 300 foot long 115 kV overhead electrical transmission line (Xcel Line Tap). The Project Substation and Project Gen-Tie Line will be constructed, owned, and operated by Lake Wilson Solar. The Xcel Switchyard and Xcel Line Tap will be permitted, constructed, owned, and operated by Xcel Energy.

4.0 Project Need, Permitting & Schedule

The Project is being developed, designed, and permitted to meet or exceed applicable state and local requirements to the extent practicable. The Project will specifically address Minnesota's mandate and goals found in the Renewable Energy Standard (RES), Governor Walz's "One Minnesota Path to Clean Energy" (to require 100% carbon-free energy by 2050), and applicable energy planning requirements.[2] It will serve consumers growing demand for renewable energy under various utility-sponsored programs and for utilities, independent power purchasers and corporations seeking to use renewable energy for business growth.

The Project will also benefit the local community through investment in construction spending, operation of the Project, property and business taxes, and landowner payments. The Project will generate up to 150 MWac of power which will provide electricity to approximately 28,000 homes annually and prevent emission of approximately 489 million pounds (222,000 metric tons) of carbon dioxide equivalent annually. [3] Reduced emissions associated with the Project as compared to traditional carbon-based energy generation will further benefit the environment and overall health of the regional community (i.e., reduced potential mortality due to harmful air pollutants, associated health care costs, reduction in water consumption, etc.) which is summarized in the SPA.

The Project is needed to meet the growing demand for additional renewable resources driven by the Solar Energy Standard set forth in Minnesota Statutes, commercial and industrial customer demand and other clean energy requirements in Minnesota. A 150 MW Generator Interconnection Agreement (GIA) for the Project was executed with the Midcontinent Independent System Operator, Inc. (MISO) September 2021 after completion of applicable interconnection studies. Lake Wilson Solar filed two queue positions in MISO's Definitive Planning Phase (DPP) for the Project. An initial 150 MW solar queue position was filed in the MISO DPP-2017-AUG study cycle and a 20MW battery storage queue position was filed in the MISO DPP-2018-APR study cycle. Of all solar related queue positions filed for the state of Minnesota from the 2017 cycle through the 2021 cycle (as publicly available)[4], 33 projects totaling more than 4300 MW in 26 different counties have been withdrawn (i.e., unable to secure an interconnection agreement). Out of these study cycles, only 7 projects to date, totaling approximately 800 MW have received a GIA, including Lake Wilson Solar's 150 MW queue position. This is indicative of the importance of transmission system interconnection to the viability of a utility-scale solar development. Project location is a key factor in interconnection feasibility, and projects that can obtain a GIA are a necessity to meet Minnesota's clean energy goals. The GIA for the Lake Wilson Project was amended and restated in June 2022 and incorporates both the solar and BESS queue positions totaling 170 MWac. Lake Wilson Solar will seek a further GIA amendment to utilize the Surplus Interconnection process to expand the size of the BESS to more efficiently utilize the network upgrades the project is already funding, and to expand the benefits that come from the BESS. The anticipated Project construction schedule facilitates an in-service date by the end of 2025 or later.

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[2] See Minnesota Statutes §§216B.1691, 216C.05, and 216E.02, Subd. 1.

[3] This is based upon the U.S. Environmental Protection Agency (EPA) Greenhouse Gas Equivalencies Calculator and 321,900,000 kWh (321,900 MWhs) annual production PVSYST model as estimated in an emissions analysis for the Project. See also Greenhouse Gas Equivalencies Calculator | Energy and the Environment | US EPA.

[4] This data can be seen by downloading the MISO queue at the from the misoenergy.org website and filtering by Request Status, Queue Date, State, and Fuel type (https://www.misoenergy.org/planning/generator-interconnection/GI_Queue/gi-interactive-queue/)

5.0 Siting Constraints Analysis – Factors Driving Choice of Region

Lake Wilson Solar provides the following description of specific constraints that drove it to propose building the Project in this portion of southwest Minnesota. As discussed below, this area of southwest Minnesota contains both a high-quality solar resource and access to adequate transmission infrastructure to deliver the project's output to market as shown in **Figures 4-6** which makes it an ideal region for solar generation. The area also poses significant challenges to identifying a similar sized site that would require less than 0.5 acre per MW given the high concentration of prime farmland that was also near transmission infrastructure with available capacity.

When Invenergy Solar Development began searching for Project locations, Minnesota was identified as a state supportive of solar deployment based on utility and regulatory interest, as well as previous development activity in the state. Invenergy Solar Development initially reviewed the entire state of Minnesota during the Project site selection process. While the entirety of Minnesota was reviewed to find the most suitable site for the Project, the Project Area and the Hat Trick site were considered as potential options for the Project. The constrained electrical grid played a significant role in determining potential Project locations and, ultimately, the final site for the Project. A multi-faceted approach factoring in numerous State, regional, and local characteristics was implemented to identify the Project Area and Hat Trick site. The Project Area in Murray County met all the site selection criteria necessary to advance development of the Project. The Hat Trick site was eventually ruled out due to electrical interconnection constraints.

As detailed in Sections 5.1-5.3 below, Invenergy Solar Development considered several factors and land use characteristics to further identify economically and environmentally viable sites within Minnesota. Large portions of the state were identified as being heavily wooded and were therefore determined unsuitable for solar development. Specifically, the northeastern and eastern-most portions of the State are more densely forested than the northwestern and southwestern parts of the State and were eventually removed from further consideration. At a high level the southwestern-most portion of the state has the strongest solar resource in the state, a significant amount of high voltage transmission lines that enable access to the wholesale electricity market, and also has conducive existing land, including but not limited to, flat open agricultural lands that are more viable for hosting solar facilities, than other regions of Minnesota. However, Invenergy Solar Development also noted the potential for solar development opportunities in far northern/north-western Minnesota due to open land cover characteristics on certain large tracts of land, a lower preponderance of prime agricultural farmland than the southwestern part of the state, and apparent access to the wholesale electrical market via high voltage transmission facilities. As a result of these findings, Invenergy Solar Development proceeded to further evaluate these regions for potentially hosting the Project.

5.1 Choosing a Region & Description of Solar Resource in the Proposed Region v. Otherwise Compliant Areas - *General Identification of Good Solar Resource Sites in Minnesota*

One of Invenergy Solar Development's key goals in siting the proposed Project was to identify a highly productive solar resource in Minnesota which will allow economic operation of a high net capacity factor solar energy generation facility to optimize the solar resources, allow for efficient and effective use of installed facilities and minimize impacts to human settlement and natural resources.

Invenergy Solar Development assessed publicly available solar generation data in Minnesota to determine solar potential in southwestern and northwestern Minnesota. According to data compiled by the Minnesota Solar Suitability Analysis (MSSA) program, southern Minnesota has some of the best locations for exposure to the sun's solar radiation (insolation) and, thus, highest net capacity factors in the state (see **Figure 7**).[5] Pockets of relatively high, but lower net capacity areas are in northwestern Minnesota. (**Figure 7**).

Using this data, Lake Wilson Solar then focused on identifying a suitable Project site near an existing substation with available capacity to maximize solar generation in an area where it can economically be delivered to the electrical grid.

5.2 Identification of Substations & Determination of Available Interconnection Points - *Available Interconnection Capacity and Likely Low Interconnection Costs*

Identifying existing electrical infrastructure with available capacity was the largest driving factor in selecting a suitable Project location. Invenergy Solar Development searched within southwestern and northwestern Minnesota for existing substations and transmission lines that had available capacity to support the initially proposed 150 MW interconnection capacity of the Project. This analysis was conducted during the first and second quarters of 2017 just before the filing deadline for the MISO 2017 queue for this Project. Invenergy Solar Development was able to identify the planned POI within the currently proposed Project Area and the Roseau County substation with what was believed to be available capacity to interconnect the Project where no pending interconnection applications existed.

The Roseau County Substation is located within the central portion of the Hat Trick site and the section of existing Fenton – Chanarambie 115 kV line to which the Project will interconnect is located adjacent to the western edge the Project Area, approximately two miles southeast of the City of Lake Wilson (**Figures 5, 10,** and **11**).

Invenergy Solar Development consulted with the MISO regarding potential interconnection for the Hat Trick site. MISO ultimately indicated that it would not be able to give NRIS to the project (which would enable the Project to offer Capacity to the grid) through its interconnection process, in part, resulting in the termination of the pursuit of the Hat Trick site.

An interconnection request was submitted for the proposed Project Area near Lake Wilson in August 2017 (the request included the 150 MW of solar generation). The Project signed a GIA for these facilities in September 2021. Lake Wilson Solar made another interconnection request for 20 MW of BESS in April 2018. The GIA was amended and restated in June 2022 and incorporates both the solar and BESS queue positions. In late 2022, Lake Wilson intends to submit a surplus interconnection application to add 75 MW of BESS to the 150 MW solar interconnection.

5.3 Identification of Suitable Developable Sites Near Substations; Site Selection & Avoidance of Other Prohibited Areas; Good Faith Consideration of Alternative Site Configurations or Technologies

[5] The MSSA is an ongoing project led by graduate students in the Masters of Geographic Information Science program at the University of Minnesota. The project aims to map solar potential on a large scale across Minnesota using LiDAR data and GIS technology with the goal of providing free and open-source tools and data to the GIS community. See https://solar.maps.umn.edu/app/.

Invenergy Solar Development then studied the land within five (5) miles of the two (2) potential POIs to search for land suitable to construct the Project. The five (5) mile search radius was largely driven by Project economics of solar construction. Based on the experience of Invenergy Solar Development, a solar project of this size requiring more than five (5) miles of electrical transmission infrastructure is generally uneconomical due to the costs of constructing the transmission infrastructure and the line losses that would be realized over distances greater than five (5) miles. Option sites that would require longer transmission facilities needed to connect a project to the grid (compared to the Project Area site and Hat Trick site) would result in higher costs for tasks such as design, permitting, and construction that would not support a cost-effective project; it would also necessitate completing a routing study, identifying possible suitable land and willing landowners, potentially impacting significantly more natural and cultural resources, creating additional visual impacts, and requiring additional operation and maintenance needs.

The shorter transmission lines also best support State policies of: non-proliferation of transmission facilities; locating transmission lines in a manner that "minimize[s] adverse human and environmental impact while ensuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion" (Minnesota Statutes Section 216E.02, Subd. 1); and the efficient use of resources, especially if a viable, feasible and prudent alternative (such as minimizing transmission gen-tie to 200-400 feet as is the case with the proposed Project) exists.

Invenergy Solar Development then specifically identified potential project areas within five (5) miles of the potential interconnection points based on the following characteristics:

- Significant tracts of cleared land available within the area;
- Specific areas of the region that were determined suitably flat to allow for economical construction of solar energy generation equipment;
- Initial and ongoing community and landowner outreach indicated community support and acceptance of the Project in the proposed area;
- Local landowners willing to enter into voluntary leases or easements; and
- Invenergy Solar Development performed preliminary environmental reviews to determine sensitive environmental resources within the five (5) mile radius so as to avoid or minimize any potential adverse environmental impacts.

Based on these analyses, two sites were identified (i.e., the Project Area and the Hat Trick site). The results of the environmental analyses of the five (5) mile radius of the potential POIs that helped to identify the two sites is presented below. Please note that a single factor is not definitive over another factor and that all factors were reviewed in selecting the proposed Project Area.

The Project Area is comprised of open land primarily utilized for row crop agriculture. The Project Area is located within the Loess Prairies and Des Moines Lobe regions of the Western Corn Belt Plains Ecoregion (USEPA 2015). Topography within the Project Area generally consists of gently rolling hills, particularly in the eastern portion of the Project Area and average ground slope decreases to the west (with an average surface slope of approximately 4.4%). Elevation within the Project Area ranges from 1,618 to 1,784 feet above mean sea level (amsl). The area is mostly devoid of permanent landcover and environmental constraints. Lake Wilson Solar was able to secure sufficient easement agreements to allow it to design the Project around existing agricultural drainage features (e.g., Judicial Ditch 14 and county drain tile) that are instrumental to the local agricultural producers in the region. No other significant environmental constraints were identified in or near the Project Area (see **Figures 3, 4, 4a, 11, & 13**).

While the Hat Trick site is generally located in a more heavily wooded portion of the state, this site was identified due to the northern portions of the state generally having less prime farmland than the southern portions of the state, and the lack of permanent vegetative cover (i.e., used for row crop agriculture) on relatively large swaths of land that was available for development near existing transmission infrastructure with available capacity. The Guidance indicates that "otherwise compliant areas" refers to areas not specifically prohibited (subpart 1) or generally excluded (subpart 3) for energy development as enumerated in Minnesota Rules 7850.4400, including subpart 1. When it began its search for a site in northern Minnesota, Invenergy Solar Development evaluated otherwise compliant areas and assumed it would be able to identify a site near available transmission capacity that would require less than 0.5 acre per MW of prime farmland due to the general scarcity of prime farmland in this part of the State but was ultimately unable to do so as described below.

Invenergy Solar Development created and analyzed constraints mapping and other site selection criteria in a good faith effort to further develop and consider the Hat Trick site, which is an approximately 10,529-acre area within which lease and easement agreements were secured in 2018-2019. This targeted large area of land was evaluated with the understanding that not all of it could be used for the proposed Project based upon various constraints. This area includes the Roseau County Substation facility and associated transmission lines which would serve as the Project POI. Land use within the Hat Trick site includes row crop agriculture, public roads, a railroad line, electric transmission facilities, a logging operation, an aggregate surface mining operation, and several rural residences/farmsteads.

The Hat Trick site is relatively flat with an average surface slope of 2.8%. Elevation within the site ranges from 1,071 to 1,112 feet amsl. The site contains some pockets of forested and vegetated areas, although a majority of the site is generally cleared and in agriculture use. Cleared areas that may be suitable for development of a solar project are located northwest and southeast of the Roseau County Substation, which is somewhat centrally located in this site area just south of Highway 11 (**Figures 12 & 12a**). Within the Hat Trick site area there are approximately 6,763 acres (64%) of prime farmland (**Figure 10 & 10a**) within the overall 10,529-acre site with the remaining 3,766 acres being non-prime farmland (36%). However, after accounting for existing site constraints that would preclude solar development, such as sensitive environmental resources, public infrastructure, public lands, and existing land use and land cover, it is not possible to site the Project at the Hat Trick site (or within 5 miles of the Roseau County Substation) in a manner that uses less than 0.5 acres per MW (see **Figure 10b and Section 6.1 below**).

A small part of the north-central portion of the site contains and is near a Minnesota Biological Survey (MBS) Site of Biodiversity Significance (**Figure 12**). Woodland, large wetland areas, and few waterways, including a public waterway that is subject to the County's shoreland ordinance, are present within this site which would limit development and use as a solar facility. Longitudinal infrastructure, such as Highway 11, a rail line, multiple high voltage transmission lines, and other local roads, including their associated setback areas, also cross through the site and would need to be avoided if a solar facility was constructed in this area (**Figures 12 & 12a**). Large swaths of the southern portion of the site contain two MBS Site of Biodiversity Significance and are within a 100-year floodplain. Accordingly, these areas were therefore further excluded as feasible land for constructing the Project. The southeast corner of the site contains an impaired stream. As discussed below, after excluding land with sensitive environmental resources, woodland, wetland, areas within the 100-year floodplain, and prime farmland, approximately 969 acres (or ~9%) of the overall Hat Trick site was non-prime farmland that could be used for development of the Project.

In addition to steep slopes, topography, woodland, and other constraints discussed above, the analysis of State-regulated prohibited and exclusion sites and related factors found in Minn. R. 7850.4400, Subp. 1 and Minn. R. 7850.4400, subp.3, respectively, was also completed. With the exception of the Roseau Trailblazers Trail/BISF #1 snowmobile trail located adjacent to the existing rail line north of Highway 11, no prohibited or exclusions sites are located within the Hat Trick or Project Area sites (**Figures 11** and **12**); however, several State Conservation and Resource Management areas, sensitive environmental resources (MBS Sites of Biodiversity Significance and other MNDNR NHIS sites), woodland and wetland areas are also located near the Hat Trick site (**Figures 10 & 12**), which further limited consideration of those areas for the Project. The east-central portion of this site and the area east of the Hat Trick site contain transportation infrastructure, residential dwellings, retail/commercial businesses, woodland and the City of Warroad, a majority of which was not available for consideration due to existing land use(s), urban development, and landowners not willing to participate in the Project. The areas west and north of the Hat Trick site also contain and wetlands (**Figure 12**).

In summary, while several constraints were identified and assessed that indicate development of the Project and connection to the Roseau County Substation could be challenging given the location of the Hat Trick site and its proximity to the Roseau County Substation in a moderately developed area of Warroad, it would not be possible to develop a Project at this site within the acre per MW limit. Most significantly and as noted above, transmission congestion and the inability to obtain NRIS for the Hat Trick site did not make the Project viable at this location. The presence of these constraints indicates the Hat Trick site is neither a feasible nor a prudent alternative for the Project.

6.0 Assessment of Suitable Sites for Compliance with Prime Farmland Exclusion Rule

Nearly all land described as prime solar land in Minnesota is also classified as prime farmland. Willing landowner participation and transmission interconnection were more significant factors in Project siting than utilization of prime vs non-prime farmland. Lake Wilson Solar relies on voluntary easements with landowners. At bottom, participants voluntarily decided that participation in the Project was a better and more economical use of their land than traditional agricultural uses.

The following summary follows the Guidance to demonstrate compliance with the Rule requirement that there is no “feasible and prudent” alternative site. Invenergy Solar Development considered each of the Guidance factors and determined that the proposed Project Area site is the only feasible and prudent alternative site it was able to identify for the Project. It explains how Invenergy Solar Development determined the proposed Project Area meets the Guidance requirements and how it was unable to find a reasonable and prudent alternative to the Lake Wilson Project Area.

6.1 Good Faith Consideration of Non-Prime Farmland Sites Near Interconnection Sites

The Project Area contains approximately 2,113 acres of prime farmland (**Figure 4**), which is approximately 81% of the 2,621-acre Project Area. Under the Rule (as applied to this proposed 150 MWac Project), no more than 75 acres of prime farmland can be used without seeking an exemption or otherwise demonstrating an inability to find a feasible or prudent alternative (0.5 acres of prime farmland per MW of net generating capacity). Approximately 1,526 acres of the Project Area would be used for construction of the Project as shown on the Preliminary Development Area map (**Figure 3**). None of the Project Area is exempt from the prime farmland exclusion rule due to proximity to applicable city designations.

Of the 1,526 acres of development area, a total of approximately 1,185 acres (78%) are considered prime farmland (~762 acres [50%] are *prime farmland*, ~415 acres [27%] are *prime farmland if drained,* ~7 [0.5%] are *prime farmland if protected from flooding or not frequently flooded during the growing season)*, approximately 191 acres (13%) are farmland of statewide importance, and approximately 150 acres (10%) are not prime farmland. *(*see **Figure 4a**).[6]

Because the Project is planned to be up to 150 MW and the area required for Project development at the Project Area includes ~1,186 acres (78% of the development area) of prime farmland, it does not meet the 0.5 acre per MW limit in the Rule. Neither the proposed Project Area nor the Hat Trick site contain acreage within the exempt home rule charter/statutory city areas.

Lake Wilson Solar attempted to increase use of non-prime farmland to the maximum extent practicable at the Project Area site. Lake Wilson Solar also identified and reviewed non-prime farmland and prime farmland designated areas within the Project Area (**Figures 4/4a**), within five miles of the Project Area (**Figure 5**) and within Murray County (**Figure 6**) for consideration of other sites for the Project. Lake Wilson Solar was unable to locate any sites within 5-miles of the POI or within Murray County generally that would be compliant with the Rule. Large tracts of non-prime farmland in Murray County are generally associated with floodplain, lakes and wetlands, which are not suitable for solar construction, nor agriculture.

Within the overall targeted 10,529-acre Hat Trick site there are approximately 6,763 acres (64%) of prime farmland and 3,766.5 acres (35.8%) of non-prime farmland (**Figures 10 & 10a**). As discussed above, the available area within the Hat Trick site that is not-prime farmland and is otherwise available for solar development after accounting for existing environmental and site constraints is approximately 969 acres (**Figures 10b & 12a)**, whereas The Project could require up to approximately 1,500 acres of land for the development area. As previously indicated, to be compliant with the Rule, the Project can only impact up to 75 acres of prime farmland. Subtracting 75 acres from the needed approximate 1,500 acres would indicate that 1,425 acres of non-prime farmland would be needed to be Rule compliant. However, only 969 acres of non-prime farmland are available at the Hat Trick site after accounting for significant environmental and infrastructure constraints at the site. Moreover, the 969 acres of non-prime farmland are not contiguous and it is likely that several portions of this non-prime farmland acreage could not be utilized due to the dispersed positioning of the non-prime farmland soils, engineering design requirements and other constraints. Accordingly, it would not be possible to construct a 150 MWac solar energy generation project at the Hat Trick site in a manner that meets the 0.5 acre per MW limit in the Rule. The Hat Trick site was eliminated from further consideration upon determining it could not be Rule compliant and the Project could not economically interconnect to the electrical grid.

After applying the Guidance, Invenergy Solar Development determined that the proposed Project Area is justifiably located within southwestern Minnesota where a conflict may be present with the Rule. As noted herein, the best solar resource areas generally overlap with more heavily focused prime farmland areas and agriculture land use in southern Minnesota. Lake Wilson Solar also evaluated the Hat Trick site to identify an otherwise Rule-compliant site and determined that it was not a feasible or prudent alternative to the selected Project Area.

[6] Note that the *prime farmland if drained* and *prime farmland if protected from flooding or not frequently flooded during the growing season* designations acreages are considered prime farmland and to be included in prime farmland acreage; *farmland of statewide importance* is not considered prime farmland and not included.

Avoidance & Minimization Considerations

As discussed above, the Project Area is an optimal site for development of the proposed 150 MWac solar generating and 95 MW storage facility and is superior to the other evaluated site considered for various reasons. Lake Wilson Solar has avoided and minimized impacts to prime farmland given the amount of non-prime farmland in the developable Project Area at the site in comparison to the surrounding area. Lake Wilson Solar further minimized impacts to prime farmland and overall agricultural impacts within the Project Area by siting and designing Project facilities in non-prime farmland areas to the greatest extent possible, designing the Project around agricultural infrastructure (e.g., County drain tile and judicial ditches), and allowing landowners to continue to farm buffer areas and other areas not utilized by the Project. For example, approximately 15.5% of the land in Murray County, and 18.3% of the land within 5-miles of the Project POI, are not considered prime farmland (**Figures 5 & 6**). Nonetheless, the Project Area is comprised of approximately 19% non-prime farmland, which shows a good faith effort by Lake Wilson Solar to avoid prime farmland in selecting the Project Area site.

Impacts, Mitigative Measures and Benefits

In addition to this assessment, the SPA provides a description of prime farmland at the Project Area site and surrounding area, and potential impacts to prime farmland from the Project. The SPA, as well as an AIMP and a VSMP prepared for the Project area and attached to the SPA as Appendices B and F (incorporated herein by reference), also discuss a number of mitigative actions and the numerous benefits the Project will provide to site soil and affected prime farmland area within the Project Area.

Project Benefits

Lake Wilson Solar is committed to being a good steward to the community, landowners and the environment as part of the development of the Project. In addition to mitigative measures discussed above and in the SPA, other Project offsetting benefits are described in this section. The proposed Project is predominantly located within the Des Moines River Watershed District (DMRWD), with a small portion at the southern end of the Project Area being located within the Rock Watershed District. The DMRWD is a primarily agricultural watershed rich with unique natural features and diverse water resources. Two main river systems form the main arteries of this watershed: the West Fork Des Moines River and the East Fork Des Moines River. In May 2021 the Des Moines River Watershed Partnership, on behalf of the members, began development of a comprehensive watershed management plan through the One Watershed, One Plan program for the DMRWD.[7] While early in the watershed management planning process, the goal is to develop a plan to address water quality and quantity, groundwater, drinking water, habitat, recreation and other identified issues specific to this watershed. Through temporary conversion of the Project Area from active agriculture to renewable energy generation and vegetation management, the Project will provide several direct and tangible benefits to both of the watershed districts it is located in and will positively impact development of the DMRWD One Watershed, One Plan management plan.

As introduced above, upon construction of and implementation of the mitigative measures described in the SPA, AIMP and VSMP, the Project will directly and indirectly provide benefits and improve the water quality in the Des Moines Headwaters and Rock Watershed Districts. These benefits include:

[7] See Des Moines River Watershed One Watershed, One Plan (murraycountymn.com) and Microsoft Word - 1W1P Fact Sheet 2018 (revize.com) for more information.

- decreasing the amount of nutrients (including phosphorous and nitrogen) applied to the Preliminary Development Area during the anticipated 35-year life of the Project (i.e., row crop agricultural operations would temporarily cease during Project construction and operation);
- managing nutrients at the Project site through incorporation, installation, establishment and maintenance of native vegetative plant species, as detailed in the VSMP and AIMP that will be implemented for the life of the Project;
- designing, engineering, permitting, constructing, operating and maintaining a stormwater management system (i.e., stormwater ponds) in accordance with applicable Minnesota Pollution Control Agency (MPCA) rules and regulations to effectively address stormwater runoff from the Project site;
- obtaining and implementing a National Pollutant Discharge Elimination System construction stormwater runoff permit/Stormwater Pollution Prevention Plan from the MPCA during construction to address, manage and control erosion, stormwater runoff from construction activities and re-establishment of vegetative cover post-construction;
- possibly increasing the water storage capacity and controlling flow structures with the installation and establishment of native or regionally appropriate plant species in the vegetative cover in combination with the stormwater management facilities (ponds) to be installed for operation of Project facilities which will help improve site soil health and related conditions (installation of these Project facilities will improve downstream water quality, and improve site soils over time); and
- maintaining county drain tile and judicial drainage ditches across the Project site to ensure no impact to neighboring agricultural land uses and field drainage

As the permitting process advances and the Project becomes more developed, additional offsetting benefits may be identified. Lake Wilson Solar is committed to identifying additional benefits and evaluating incorporating such benefits into Project plans as it deems practicable.

Conclusions & Recommendations

For all of these reasons and as shown in the above analysis, Lake Wilson Solar believes it has met prime farmland Guidance and requirements of the Rule to determine that there is no feasible or prudent alternative site to the Project Area.

Attachments

A MSSA Report - Project Area Site (Murray County)
B MSSA Report - Hat Trick Evaluation Site (Roseau County)

Figures

Figure 1 Project Area & USGS Topography
Figure 2 Preliminary Identification of Potential Project Sites
Figure 3 Site Control & Preliminary Development Area
Figure 4 Project Area Prime Farmland
Figure 4a Prime Farmland within the Preliminary Development Area
Figure 5 Prime Farmland within Five Miles of Project Area
Figure 6 Prime Farmland within Murray County
Figure 7 Solar Resources in Minnesota
Figure 8 MSSA Insolation at Project Area Site
Figure 9 MSSA Insolation at Hat Trick Site

References

C.F.R. 657.5(a)

Minn. Rule 7850.4400, subpart 4

Solar Energy Production and Prime Farmland – Guidance for Evaluating Prudent and Feasible Alternatives (Minnesota EERA, May 19, 2020). https://mn.gov/eera/web/doc/13929/

Solar Siting in Agricultural Landscapes: Stakeholder Input Summary" September 16, 2019, MN Management and Budget, Management Analysis and Development, https://mn.gov/eera/web/doc/13928

Solar Suitability Report

Latitude: 43.988129 Longitude: -95.905289

mn.gov/solarapp

Fri Nov 12, 2021

Site Name

Site Address

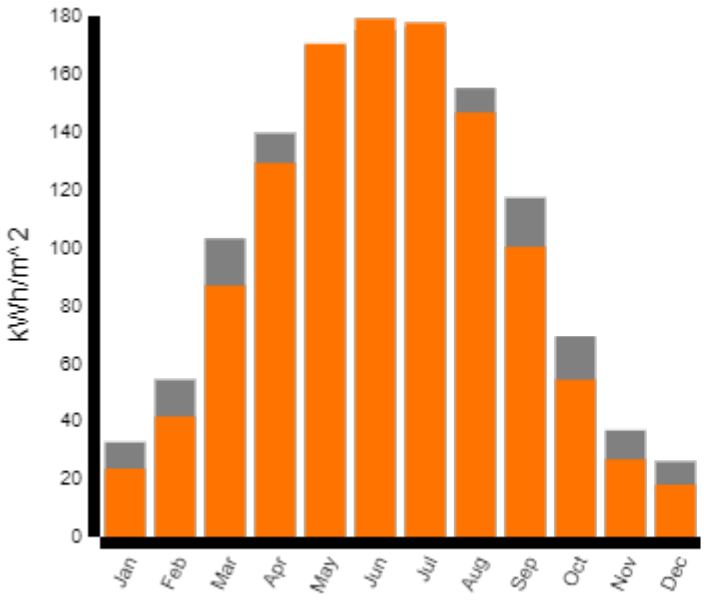
Site Notes

This site is **Good**. It would need a **4.85 kW** system to generate **50%** of average household use. This system would cost approximately **$18,187**. System payback is **13.2 years** after tax credit.

Utility Service Provider:
Nobles Cooperative Electric
P.O. Box 788
Worthington, MN 56187
www.noblesce.coop

Site Details:
Total Annual Insolation: 1153.62 kWh/m^2
Avg Insolation per Day: 3.16 kWh/m^2
Source Data: Spring and Fall 2010

Amount Actual Sun



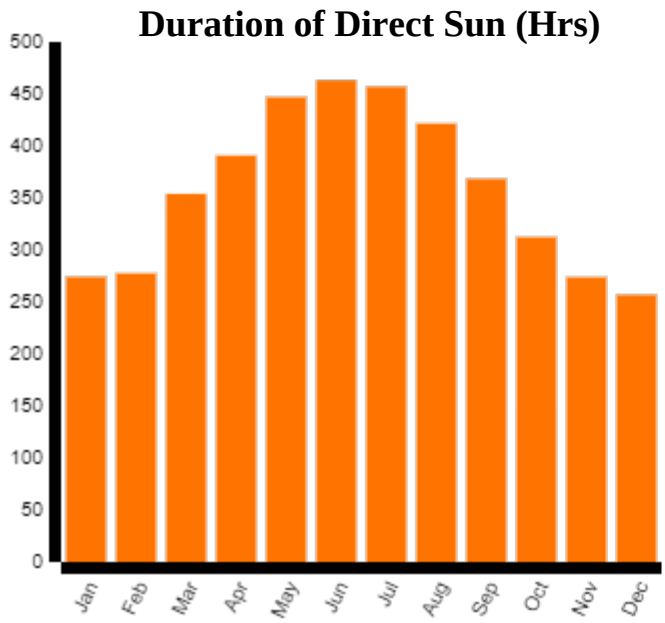
Solar Calculator

User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	$0.12/kWh	Minnesota's average residential cost of electricity is $0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	4.85 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	$18,187	Result is based on an average 2020 Minnesota residential system cost of $3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	17.87 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	13.23 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.

Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	72%	23.57	274.1
February	77%	41.61	277.5
March	84%	86.83	354.0
April	93%	129.18	390.8
May	100%	170.43	447.0
June	100%	179.13	463.1
July	100%	177.69	457.0
August	95%	146.67	421.6
September	86%	100.23	368.4
October	78%	54.27	312.4
November	73%	26.76	273.9
December	69%	18.04	256.9

**These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application



This service made possible by:

COMMERCE DEPARTMENT
ENERGY RESOURCES

Solar Suitability Report

Latitude: 48.898117 Longitude: -95.434304

mn.gov/solarapp

Fri Nov 12, 2021

Site Name

Site Address

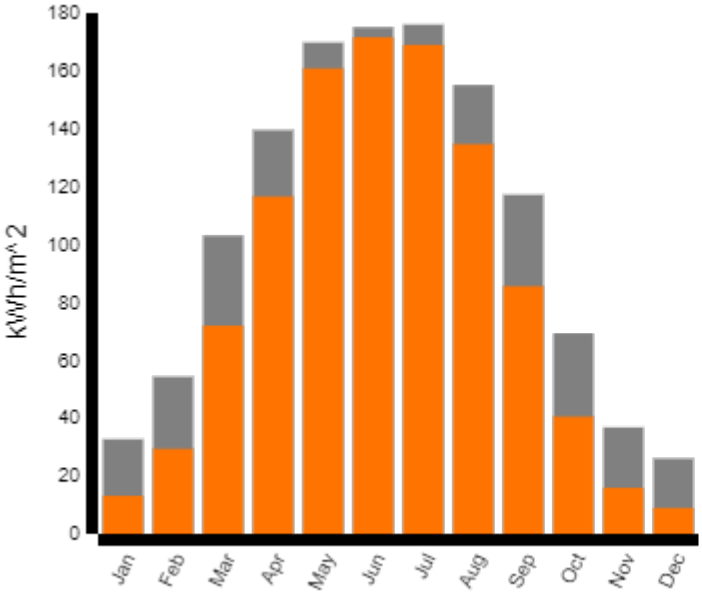
Site Notes

This site is **Marginal**. It would need a **5.53 kW** system to generate **50%** of average household use. This system would cost approximately **$20,747**. System payback is **15.1 years** after tax credit.

Utility Service Provider:
Roseau Electric Cooperative Incorporated
P.O Box 100
Roseau, MN 56751
(218) 463-1543
www.roseauelectric.coop

Site Details:
Total Annual Insolation: 1009.99 kWh/m^2
Avg Insolation per Day: 2.77 kWh/m^2
Source Data: Spring 2008-Spring 2010

Amount Actual Sun



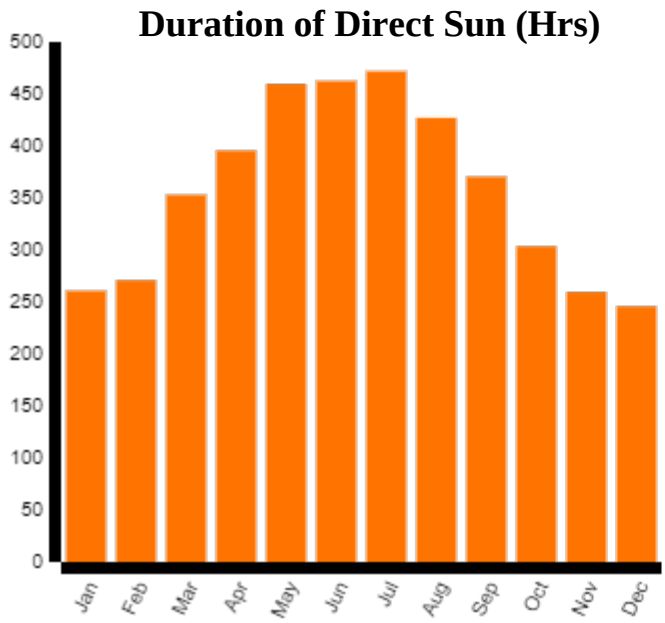
Solar Calculator

User Input	Value	Tips and Notes
Average utility use (per month)	800 kWh	The average residential household uses 800 kWh/month. If you know your monthly usage, fill it in here.
Cost / kWh	$0.12/kWh	Minnesota's average residential cost of electricity is $0.12/kWh. If you know your cost of electricity enter it here.
Percent of electricity provided by solar	50%	Experiment with different percentages here to see how system cost varies. Think about how energy efficiency improvements bring down the cost of your solar system.

Outputs	Value	Tips and Notes
Size of system needed	5.53 kW	Result is based on values provided for monthly electricity use and desired percentage covered by solar. It also includes a derate of 0.87. A factor accounting for conversion of the array's DC nameplate capacity to the system's AC power rating at Standard Test Condition.
System cost estimate	$20,747	Result is based on an average 2020 Minnesota residential system cost of $3,750 per kW. Costs will vary depending on the specifics of your system.
Payback without incentives	20.39 years	Result assumes that electricity costs will rise 3.5% each year over 25 years.
Payback with Tax Credit	15.09 years	Your system may be eligible for a federal tax credit. This result shows the payback of your system with the 26% tax credit applied.

Month	Actual % Sun**	Total kWh/m2	Duration (Hrs)
January	40%	13.14	260.7
February	54%	29.36	270.9
March	70%	71.93	353.0
April	84%	116.56	395.6
May	95%	160.83	459.6
June	98%	171.60	462.5
July	96%	168.96	471.9
August	87%	134.66	427.1
September	73%	85.56	370.5
October	59%	40.51	303.5
November	43%	15.91	259.5
December	34%	8.92	245.8

**These percentages should be used as the monthly shading derate factors % on the Xcel Solar Rewards application



This service made possible by:

COMMERCE DEPARTMENT
ENERGY RESOURCES

Lake Wilson City

Hadley City

Chanarambie Township

Leeds Township

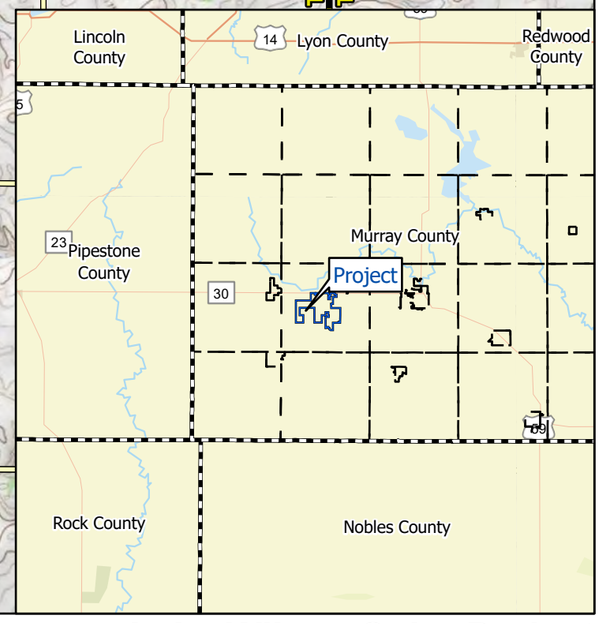
Slayton Township

T.106N R43W

T.106N R42W

T.106N R42W

T.106N R41W



Data Source(s): Westwood (2022); ESRI WMS USGS Topographic & World Streets Basemaps (Accessed 2021).

Legend

- Project Area
- Municipal Boundary
- County Boundary
- PLS Township
- PLS Section

N

0 Feet 2,800

Lake Wilson Solar Project

Murray County, Minnesota

Project Location & USGS Topography

FIGURE 1 (October, 2022)

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

Map Document: N:\0012861.01\GIS\ArcPro\LW_InvenergyPrimeFarmExhibits_211012\LW_InvenergyPrimeFarmExhibits_220104.aprx 10/6/2022 8:50 PM EMBolsen

Hat Trick Site

Lake Wilson Solar Project Area

NORTH DAKOTA

SOUTH DAKOTA

MINNESOTA

IOWA

MICHIGAN

WISCONSIN

Data Source(s): Westwood (2022); U.S. Census Bureau (2020); MNDOT (2021).

Legend

- Lake Wilson Solar Project Area
- Hat Trick Site
- County Boundary
- State Boundary
- MN State Boundary
- State Boundary
- province

N

0 50 Miles

Lake Wilson Solar Project

Murray County, Minnesota

Preliminary Identification of Potential Project Sites

FIGURE 2 (October, 2022)

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

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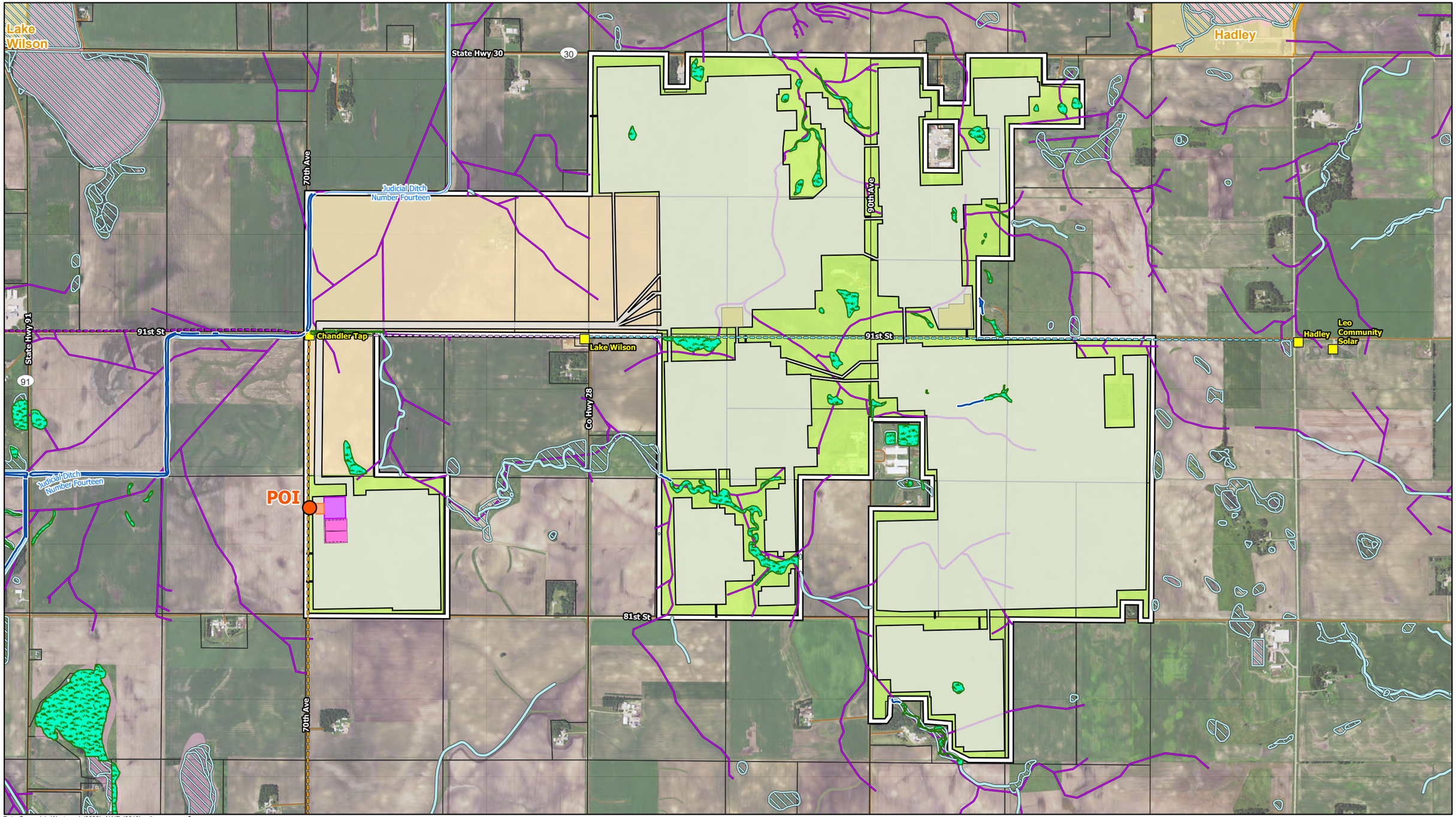

Data Source(s): Westwood (2022); NAIP (2019); U.S. Census Bureau (2020); Ventyx Velocity Suite (2021); MNDOT (2021); USFWS NWI (2016); USGS NHD (2015). Existing pipeline routes are approximate.

Legend

- Project Area
- Preliminary Development Area
- Proposed Switchyard
- Proposed Substation
- Proposed Battery Energy Storage System
- Proposed Laydown Yard
- Field Delineated Waterway
- Field Delineated Wetland
- Named NHD Flowline
- NWI Wetland
- 1% Annual Flood Chance
- Drainage Ditch
- Parcel Boundary
- Participating - Solar Agreement
- Participating - Transmission Agreement
- Municipal Boundary
- Existing Substation

Existing Transmission Lines

- Chandler Tap to East Ridge Tap 69 kV
- Fenton Wind Power Plant to Chanarambie 115 kV
- Hadley to Lake Wilson 69 kV
- Lake Wilson to Chandler Tap 69 kV
- South Ridge to Chandler Tap 69 kV
- Woodstock Windfarm Tap to South Ridge 69 kV
- Project Point of Connection (POI)

N

0 Feet 1,700

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

Lake Wilson Solar Project

Murray County, Minnesota

Site Control & Preliminary Development Area

FIGURE 3 (November, 2022)

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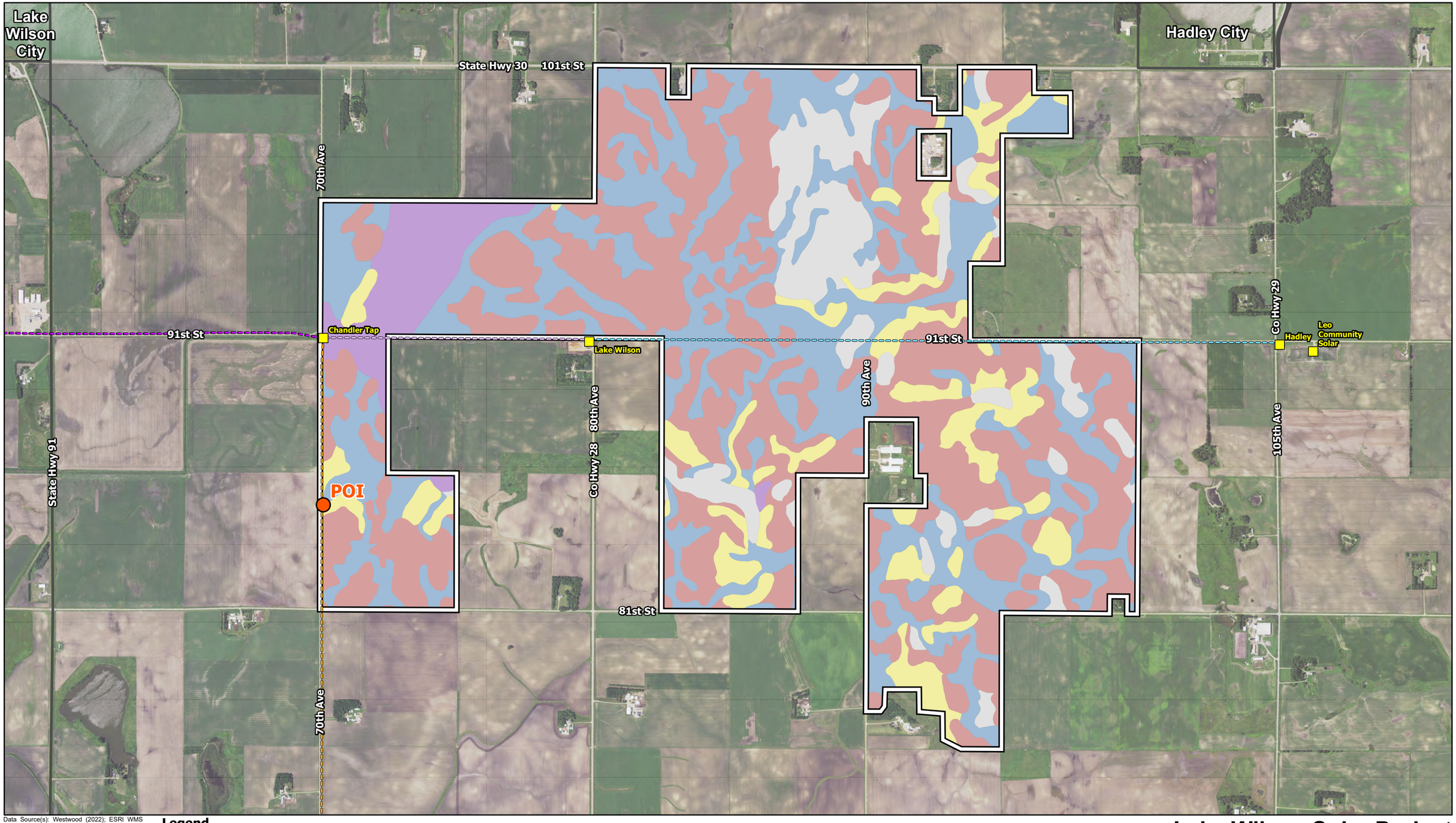

Data Source(s): Westwood (2022); ESRI WMS Imagery and World Streets Basemaps (Accessed 2021); U.S. Census Bureau (2020); Natural Resources Conservation Services (Accessed 2021); Ventyx Velocity Suite (2021).

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

Legend

- Project Area
- Project Point of Connection (POI)
- Existing Substation
- Municipal Boundary

Existing Transmission Lines

- Chandler Tap to East Ridge Tap 69 kV
- Hadley to Lake Wilson 69 kV
- Lake Wilson to Chandler Tap 69 kV
- South Ridge to Chandler Tap 69 kV

Prime Farmland Classification - Project Area Acres (Percent Total)

- All areas are prime farmland - 1,139 Acres (43.46%)
- Farmland of statewide importance - 266 Acres (10.17%)
- Not prime farmland - 241 Acres (9.20%)
- Prime farmland if drained - 839 Acres (32.02%)
- Prime farmland if protected from flooding or not frequently flooded during the growing season - 135 Acres (5.16%)

N

0 Feet 1,700

Lake Wilson Solar Project

Murray County, Minnesota

Project Area
Prime Farmland

FIGURE 4 (November, 2022)

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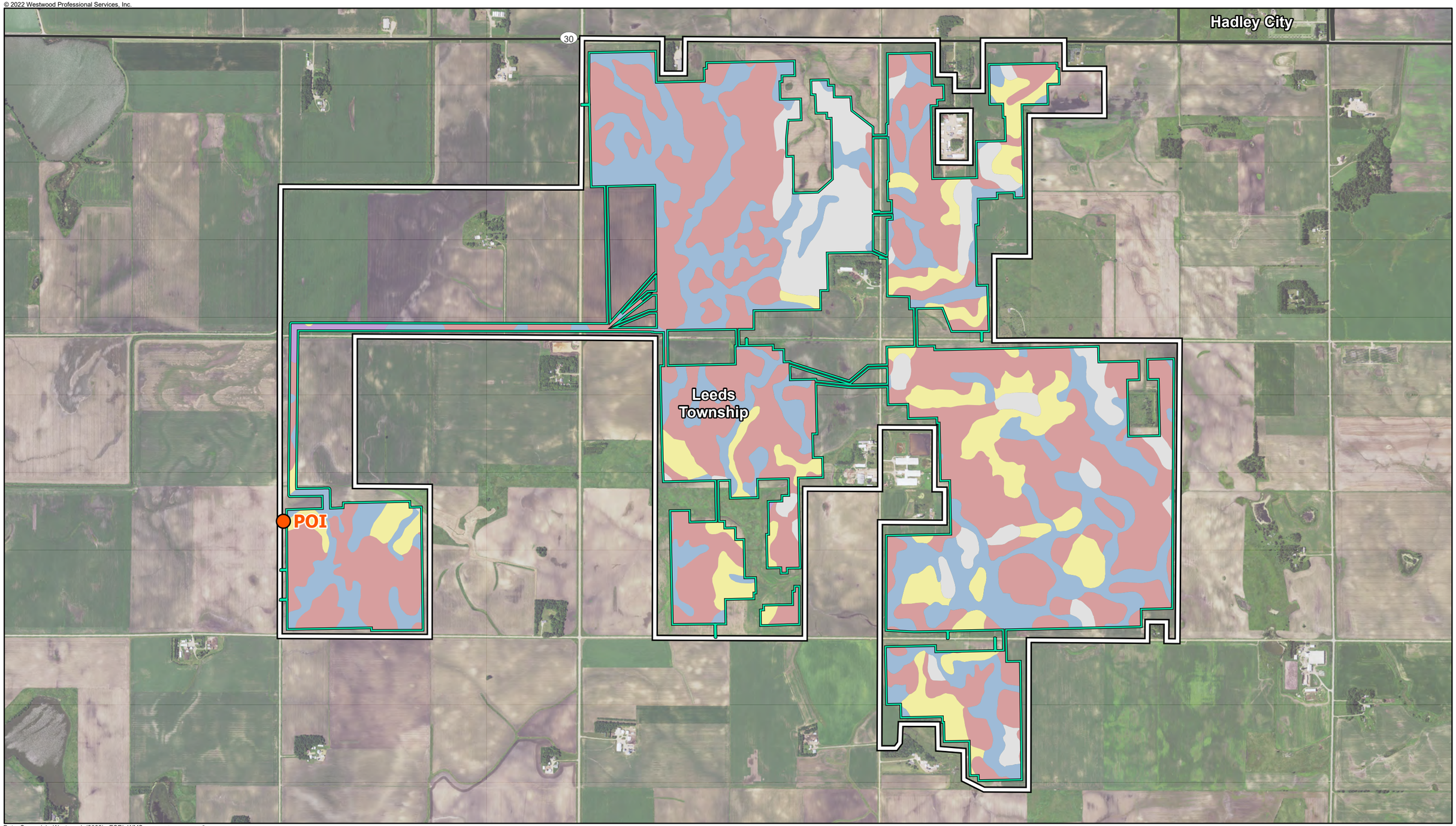

Data Source(s): Westwood (2022); ESRI WMS Imagery Basemap (Accessed 2021); U.S. Census Bureau (2020); Natural Resources Conservation Services (Accessed 2021); Ventyx Velocity Suite (2021).

Legend

- Project Area
- Preliminary Development Area
- Project Point of Connection (POI)
- Existing Substation Near Project Area
- Major Road
- Municipal Boundary

Existing Transmission Lines

- Chandler Tap to East Ridge Tap 69 kV
- Fenton Wind Power Plant to Chanarambie 115 kV
- Hadley to Lake Wilson 69 kV
- Lake Wilson to Chandler Tap 69 kV
- South Ridge to Chandler Tap 69 kV
- Woodstock Windfarm Tap to South Ridge 69 kV

Prime Farmland Classification - Preliminary Development Area Acreage (Percent Total)

- All areas are prime farmland - 762.26 Acres (49.96%)
- Farmland of statewide importance - 191.16 Acres (12.53%)
- Not prime farmland - 149.78 Acres (9.82%)
- Prime farmland if drained - 415.13 Acres (27.21%)
- Prime farmland if protected from flooding or not frequently flooded during the growing season - 7.48 Acres (0.49%)

N

0 Feet 1,600

Lake Wilson Solar Project

Murray County, Minnesota

Prime Farmland within the Preliminary Development Area

FIGURE 4a (November, 2022)

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

Map Document: N:\0012861.01\GIS\ArcPro\LW_InvenergyPrimeFarmExhibits_211012\LW_InvenergyPrimeFarmExhibits_220104.aprx 11/11/2022 9:47 AM EMBoisen

Boeve Windfarm LLC
Ridgewind Wind Project
Fey Windfarm LLC
Chanarambie to Lake Yankton 115 kV
Windcurrent Farms LLC
Chanarambie to Pipestone 115 kV
K Brink Windfarm LLC
Chanarambie
Chanarambie to Lake Yankton 115 kV
Chanarambie to Pipestone 115 kV
Kas Brothers Windfarm
Stoneray Wind
91
Northern Wind Project
South Ridge Power Partners, LLC Wind Project
Lake Wilson City
30
Hadley City
59
Slayton Solar Project
Slayton City
Auriga Community Solar
Slayton
Slayton Distribution
Currie to Slayton 69 kV
Rock River Tap to Woodstock Windfarm Tap 69 kV
Woodstock Windfarm Tap
Woodstock Windfarm to Woodstock Windfarm 4 kV
Woodstock Windfarm
Woodstock Windfarm Tap to South Ridge 69 kV
Fenton-Chanarambie 115kV
South Ridge
South Ridge to Chandler Tap 69 kV
Lake Wilson to Chandler Tap 69 kV
Hadley to Lake Wilson 69 kV
Slayton to Hadley 69 kV
Hadley
Leo Community Solar
Chandler Tap
Lake Wilson
PIPESTONE COUNTY
MURRAY COUNTY
Viking Wind Power Project
POI
Chandler Tap to South Ridge Tap 69 kV
East Ridge Wind Project (MN)
East Ridge Tap
91
267
Chandler City
Moulton Wind Power
Chandler Hills Wind Farm
East Ridge Tap to Fenton Wind Power Plant 69 kV
Iona City
Valley View Windfarm Tap to Rock River 69 kV
Valley View Windfarm Tap
Valley View Transmission
Champepaden Wind Power
Chandler
Chandler to Fenton Wind Power Plant 69 kV
Chandler to Valley View Windfarm Tap 69 kV

Data Source(s): Westwood (2022); ESRI WMS Imagery Basemap (Accessed 2021); U.S. Census Bureau (2020); Natural Resources Conservation Services (Accessed 2021) .

0 6,500 Feet

Westwood

Toll Free (888) 937-5150 westwoodps.com

Westwood Professional Services, Inc.

Legend

- Project Area
- Project Point of Connection (POI)
- POI 5-Mile Buffer
- Existing Substation
- Existing Transmission Line
- Major Road
- Municipal Boundary
- County Boundary

Prime Farmland Classification - POI 5-Mile Buffer Acreage (Percent Total)

- All areas are prime farmland - 24,915.94 Acres (49.57%)
- Farmland of statewide importance - 4,599.51 Acres (9.15%)
- Not prime farmland - 4,622.64 Acres (9.2%)
- Prime farmland if drained - 12,792.77 Acres (25.45%)
- Prime farmland if protected from flooding or not frequently flooded during the growing season - 3,333.94 Acres (6.63%)

Lake Wilson Solar Project

Murray County, Minnesota

N

Prime Farmland within Five Miles of POI

FIGURE 5 (November, 2022)

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