



Appendix F

Vegetation Management Plan

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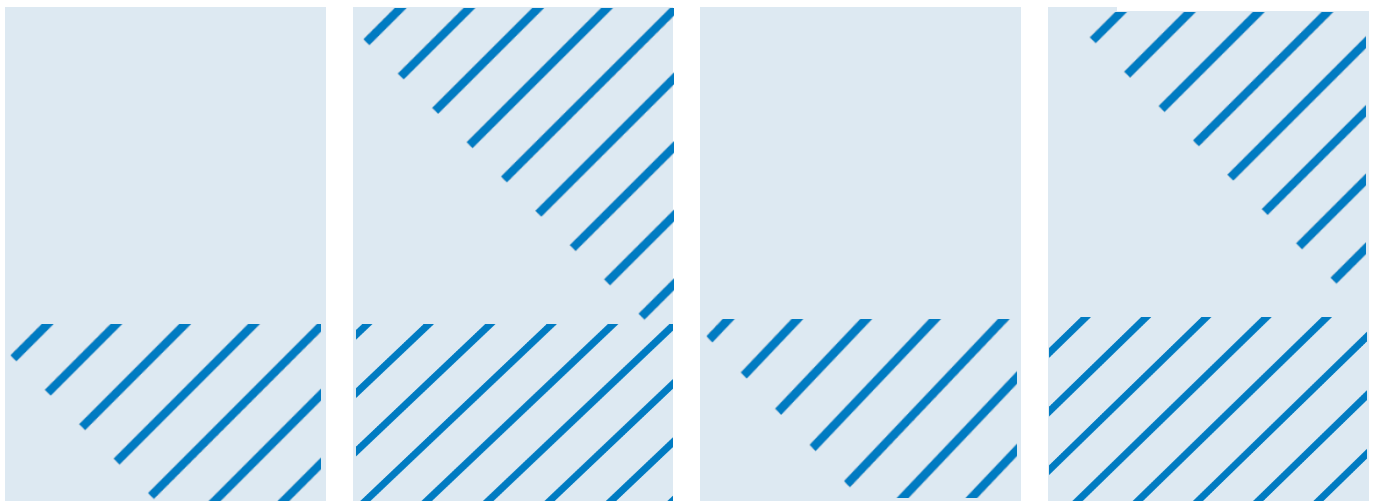
Vegetation Management Plan

Birch Coulee Solar Project, Renville County, Minnesota



Birch Coulee Solar LLC

July 2024



Vegetation Management Plan

July 2024

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Attachments

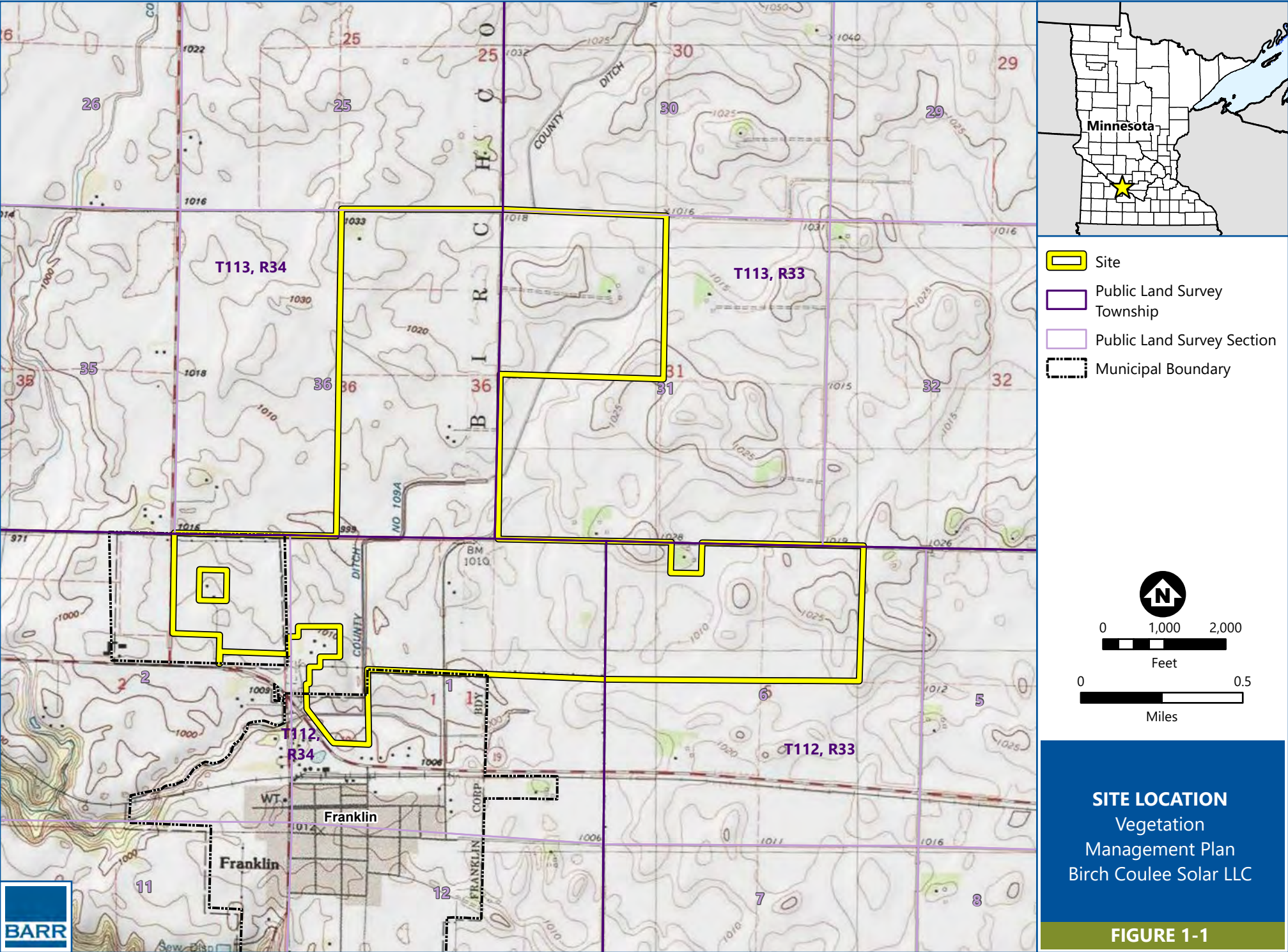
Attachment 1	Habitat Friendly Solar Site Assessment Form for Project Planning
Attachment 2	Seed Mixes

Abbreviations

AA	Assessment Area
BWSR	Minnesota Board of Water and Soil Resources
DNR	Minnesota Department of Natural Resources
IPP	independent power producer
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MW	megawatt
NPC	native plant community
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
O&M	Operations and maintenance building
PLSS	Public Land Survey System
Project	Birch Coulee Solar Project
PV	photovoltaic
PWI	Public Water Inventory
SBS	Sites of Biodiversity Significance
SWPPP	Stormwater Pollution Prevention Plan
VMP	Vegetation Management Plan
VMU	Vegetation Management Unit

1 Executive Summary

This Vegetation Management Plan (VMP) outlines measures to meet the vegetation management objectives and goals for the Birch Coulee Solar Project (Project). The Project involves construction of an up to 125-megawatt (MW) photovoltaic (PV) solar energy generating facility within and north of the City of Franklin in Renville County, Minnesota (Figure 1-1). The Project will abut the existing Franklin 115-kV Substation, operated by Xcel Energy. The Project will be constructed within the 1,041.6-acre Site (Figure 1-1). Birch Coulee Solar LLC (Birch Coulee Solar) is an independent power producer (IPP) that will construct, operate, and own the Project. Through implementation of this VMP, Birch Coulee Solar will establish native perennial vegetation that is compatible with Project operations and maintenance needs, while improving the soils and benefiting native pollinators. Birch Coulee Solar intends to meet Minnesota's Habitat Friendly Solar Standard, Minn. Stat. Sec. 216B.1642 and meet the requirements set forth by the Minnesota Board of Water and Soil Resources (BWSR) in its pollinator guidance documents. Birch Coulee will demonstrate that it meets the standard by using the BWSR *Solar Site Pollinator Habitat Assessment Form for Project Planning*.



2 Overview of the Vegetation Management Plan

This VMP follows best practices for establishment of native vegetation based on guidance from the BWSR and Minnesota Department of Commerce (references (1); (2)). Birch Coulee Solar is using the BWSR Habitat Friendly Solar program's *Solar Site Pollinator Habitat Assessment Form for Project Planning* for project planning and ongoing evaluation to help guide the plan for the site; refer to Attachment 1. Birch Coulee Solar's primary vegetation management goals and objectives are:

- **Goal 1: Establishment of diverse, native perennial vegetation over 70 percent of the plantable areas within the Site (this area would not include roads and infrastructure; the final plantable area will be determined at 90% design).**
 - o *Objective 1a.* Quickly establish vegetation to minimize the duration and extent of bare soil.
 - o *Objective 1b.* Design native-dominant seed mixes appropriate for this region and expected conditions with high diversity of grasses and forbs.
- **Goal 2: Establish vegetation that will be compatible with the Project operations and minimize maintenance requirements and costs.**
 - o *Objective 2a.* Use primarily native species within the arrays that are short-statured and will not impede or shade solar panels and will not obstruct maintenance and access.
 - o *Objective 2b.* Establish plant species that do not require extensive maintenance, provide complete cover, and minimize invasion by tall or otherwise undesirable species which may interfere with panels and equipment.
- **Goal 3: Provide soil stability and improve soil health over the duration of the Project while also benefiting native pollinators.**
 - o *Objective 3a.* Use plant species that provide habitat and nectar sources throughout the growing season to support native pollinators.
 - o *Objective 3b.* Use diverse native plant species that stabilize soils and improve soil health and carbon sequestration with their deep and varied root structures.
 - o *Objective 3c.* Implement a long-term management plan that utilizes integrated vegetation management techniques and emphasizes regular maintenance and monitoring to minimize the need for widespread herbicide applications and height reduction mowing.
- **Goal 4: Minimize invasive species, noxious weeds, and other undesirable species in the Site.**
 - o *Objective 4a.* Plan for long-term monitoring and maintenance to quickly detect new infestations and effectively control undesirable species.
 - o *Objective 4b.* Install and selectively manage for desirable plant species which are competitive and reduce available space for potential invasive, noxious, and other undesirable plant species.

3 Site Description

3.1 Site Location

The Site is comprised of approximately 1,041.6 acres of contiguous, privately-owned land within and north of the city of Franklin in Renville County, Minnesota (Figure 1-1). The Project is in the city of Franklin, Birch Cooley Township, Camp Township, and Bandon Township, within the following Public Land Survey System (PLSS) sections:

- Section 6 of Township 112 North, Range 33 West
- Sections 1 and 2 of Township 112 North, Range 34 West
- Section 31 of Township 113 North, Range 33 West
- Section 36 of Township 113 North, Range 34 West

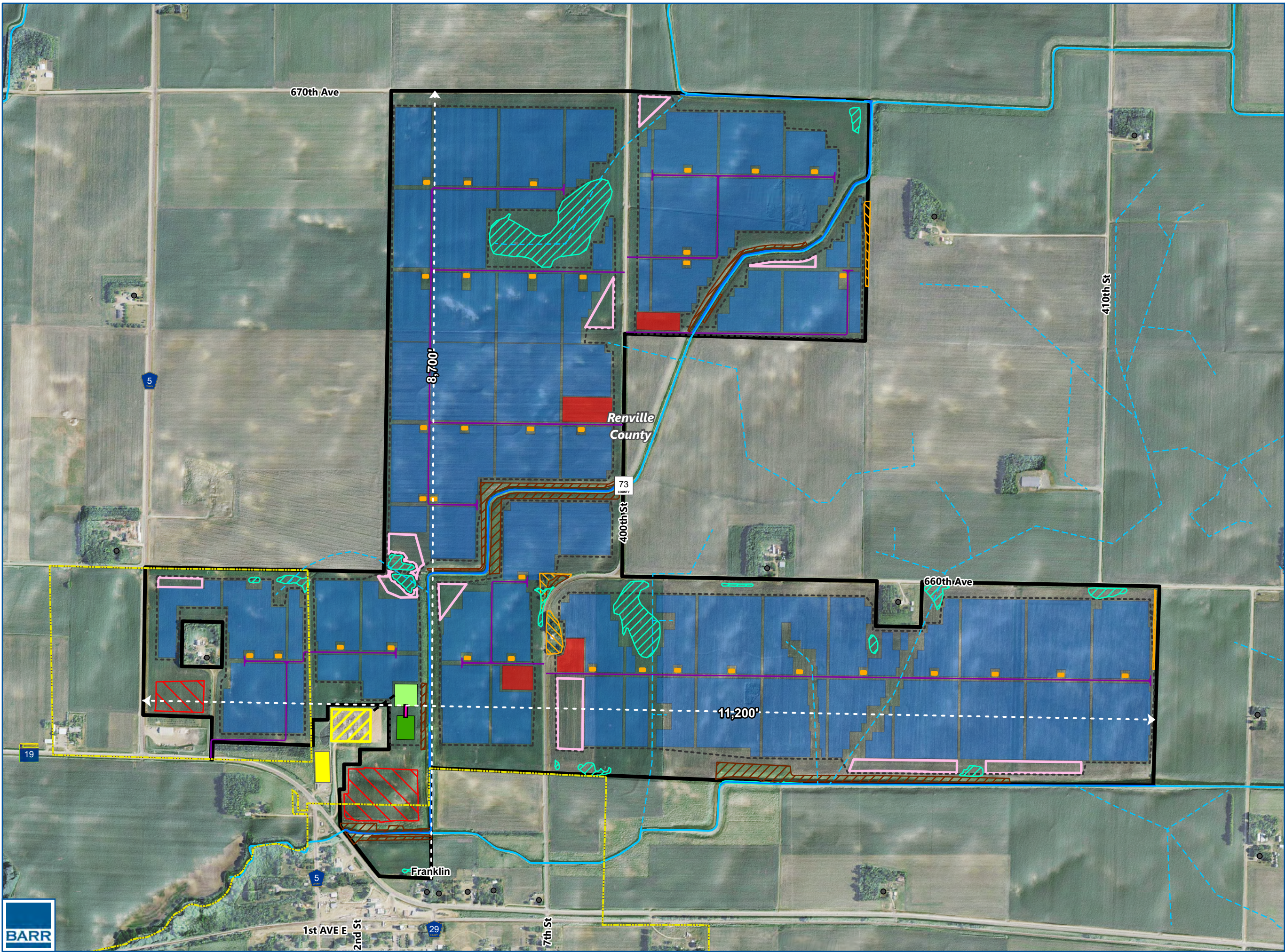
In addition to the city of Franklin, other nearby incorporated areas include Redwood Falls (approximately ten miles to the west), Morton (approximately five miles to the west), and Fairfax (approximately seven miles to the east). These incorporated areas are located along MN-19 W/Lincoln Ave E/Minnesota River Valley Scenic Byway.

The Site is generally north of MN-19, west of 410th Street, south of County Road 2, and east of County Road 5. It primarily consists of agricultural fields, small isolated wooded areas, agricultural ditches, agricultural related structures, and overhead transmission lines. The Minnesota River is approximately one mile south of the Site (Section 3.6).

The Project consists of the following major components, systems, and associated facilities (Figure 3-1):

- Single-axis tracking PV arrays installed on driven piles or helical screws
- Inverters, which house AC – DC inverters and medium-voltage step-up transformers
- Buried electrical collection line cables
- Project substation
- Step-up transformers
- Metering equipment
- Supervisory Control and Data Acquisition (SCADA) systems
- Short (<500 feet) 115 kV generation tie line
- Gravel access roads
- Security fencing and gates
- Stormwater management system

- Temporary laydown areas, some of which will be permanently used for operational purposes within the Anticipated Development Area
- Operations and maintenance (O&M) building
- Weather stations



Minnesota

- Site
- Anticipated Development Area
- Proposed Solar Arrays
- Access Routes
- Stormwater Basin
- Laydown Yard (temporary or permanent)
- Laydown Yard (temporary)
- Project Substation
- Utility-Owned Switchyard
- Inverter
- Franklin 115 kV Substation
- Utility Distribution Substation
- Gen-Tie
- Field-Identified Watercourse
- Field-Identified Wetland Boundaries
- Tree Areas
- Native Vegetation Areas
- Municipal Boundary
- Tile Lines (Renville Co)
- Open Ditches (Renville Co)
- Dwelling

0 500 1,000
Feet
USDA NAIP Imagery, 2021

SITE LAYOUT
Vegetation
Management Plan
Birch Coulee Solar LLC

FIGURE 3-1



3.2 Vegetation

According to the Minnesota Department of Natural Resources (DNR) Ecological Classification System, the Site is within the Minnesota River Prairie (251Ba) ecological subsection of the Prairie Parkland Province (Figure 3-2) (reference (3)). Agriculture is the current dominant land use of this subsection. Natural vegetation in this subsection is characterized as tallgrass prairie (reference (4)), with many islands of wet prairie (reference (3)). Forests of silver maple, elm, cottonwood, and willow are found along streams and floodplains.

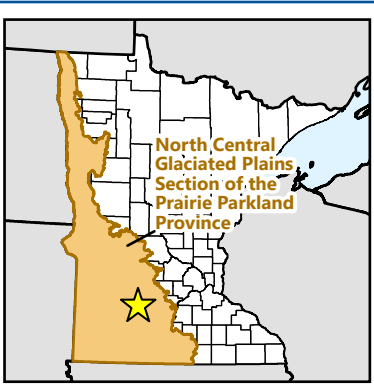
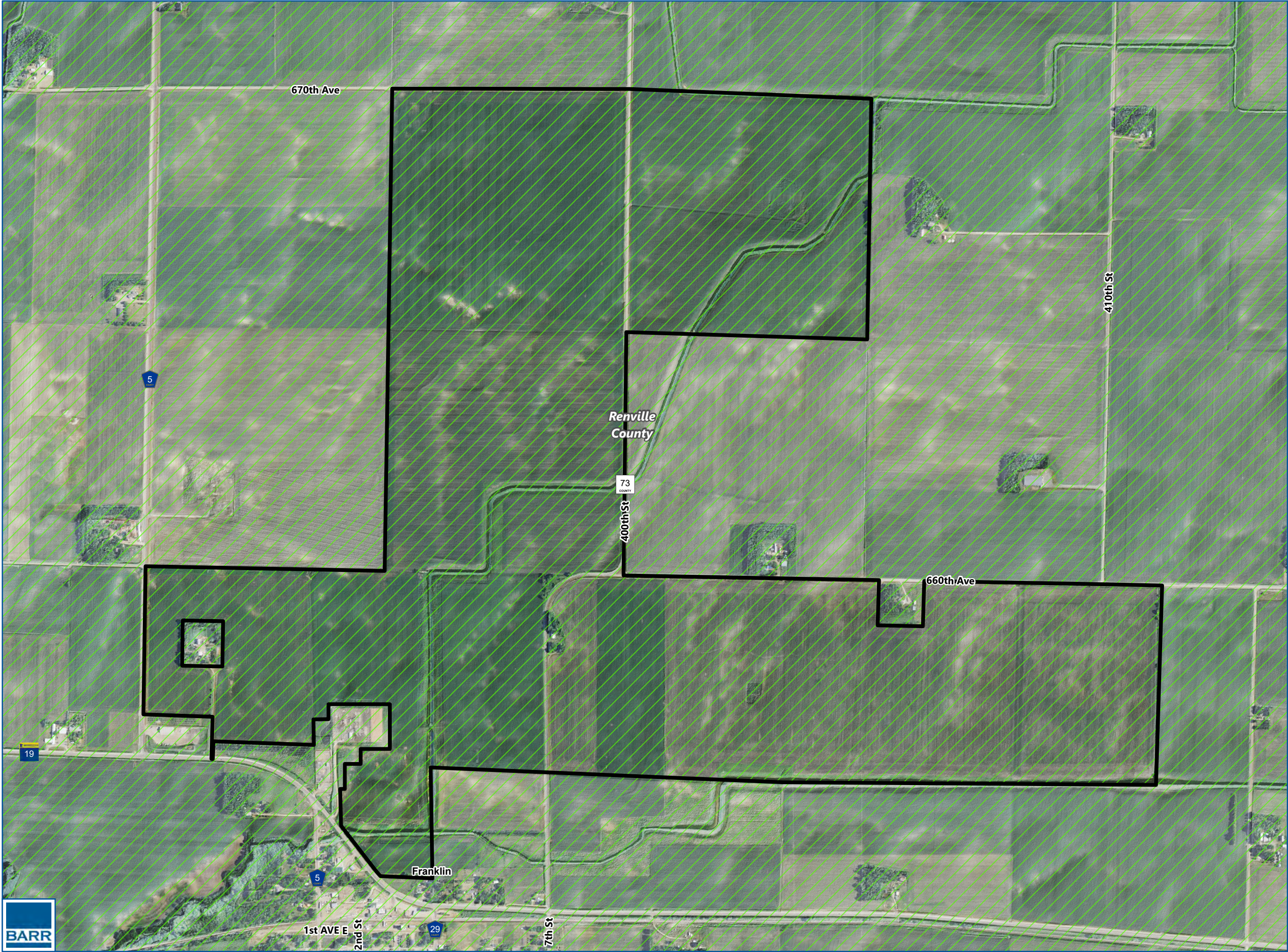
Fire was the most common natural disturbance before European settlement. Fire suppression after European settlement allowed woodlands to develop from what were originally oak openings or brush prairies (reference (4)).

Over a ten-year period (2022 and 2013), corn and soybeans have been the primary land cover within the Site (Table 3-1) (references (5); (6); (7); (8); (9); (10)).

Table 3-1 Primary Land Cover for the Site

Year	Primary Land Cover
2022	Soybeans
2021	Corn
2020	Soybeans
2019	Corn
2018	Soybeans
2017	Corn
2016	Soybeans
2015	Corn
2014	Soybeans
2013	Corn

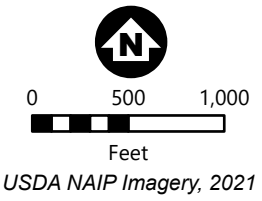
Figure 3-3 shows land cover types observed within the Site.



 Site

Ecological Subsection

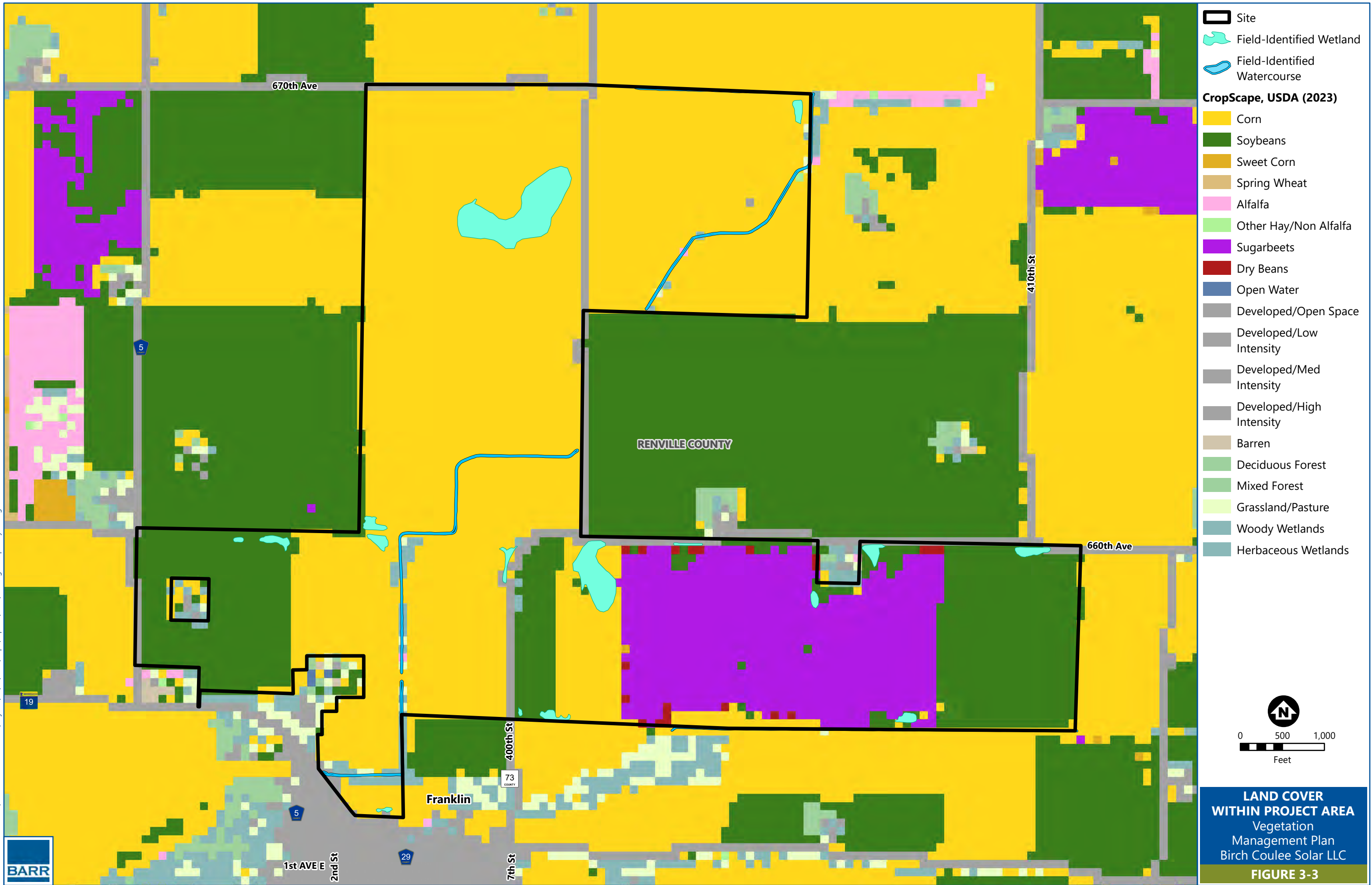
 Minnesota River Prairie



ECOLOGICAL CLASSIFICATION SYSTEM SUBSECTION
Vegetation Management Plan
Birch Coulee Solar LLC

FIGURE 3-2





The following species were identified outside of the agricultural areas and present within the Site during a July 2023 site visit:

- big bluestem (*Andropogon gerardii*)
- Canada wild rye (*Elymus canadensis*)
- Canadian goldenrod (*Solidago canadensis*)
- hedge false bindweed (*Calystegia sepium*)
- Kentucky bluegrass (*Poa pratensis*)
- Maximillian sunflower (*Helianthus maximiliani*)
- prairie Rose (*Rosa arkansana*)
- sawtooth sunflower (*Helianthus grosseserratus*)
- side oats grama (*Bouteloua curtipendula*)
- smooth brome (*Bromus inermis*)
- stiff goldenrod (*Solidago rigida*)
- sunchoke (*Helianthus tuberosus*)
- switch grass (*Panicum virgatum*)
- water horsetail (*Equisetum fluviatile*)
- western wheatgrass (*Pascopyrum smithii*)
- whorled milkweed (*Asclepias verticillata*)
- yellow coneflower (*Ratibida pinnata*)

The following vegetation types were present within wetlands during a July 2023 site visit:

- Canada thistle (*Cirsium arvense*)
- clasping dogbane (*Apocynum sibiricum*)
- giant goldenrod (*Solidago gigantea*)
- Jerusalem artichoke (*Helianthus tuberosus*)
- lesser bladder sedge (*Carex vesicaria*)
- reed canary grass (*Phalaris arundinacea*)
- sandbar willow (*Salix interior*)
- stunted corn/soybean/sugar beet crops
- tall scouring-rush (*Equisetum hyemale*)

Several of the species observed onsite during the wetland delineations are state prohibited noxious weeds, invasive plants, and/or native plants:

- **State Prohibited Noxious Weed** (reference (11)): Canada thistle.
- **Invasive Plant species** (references (12); (13)): Canada thistle, reed canary grass, and smooth brome.
- **Native plants of Minnesota** (reference (14)): Canada goldenrod, big bluestem, clasping dogbane, giant goldenrod, Jerusalem artichoke, Maximillian sunflower, and sandbar willow.

3.3 Land Use

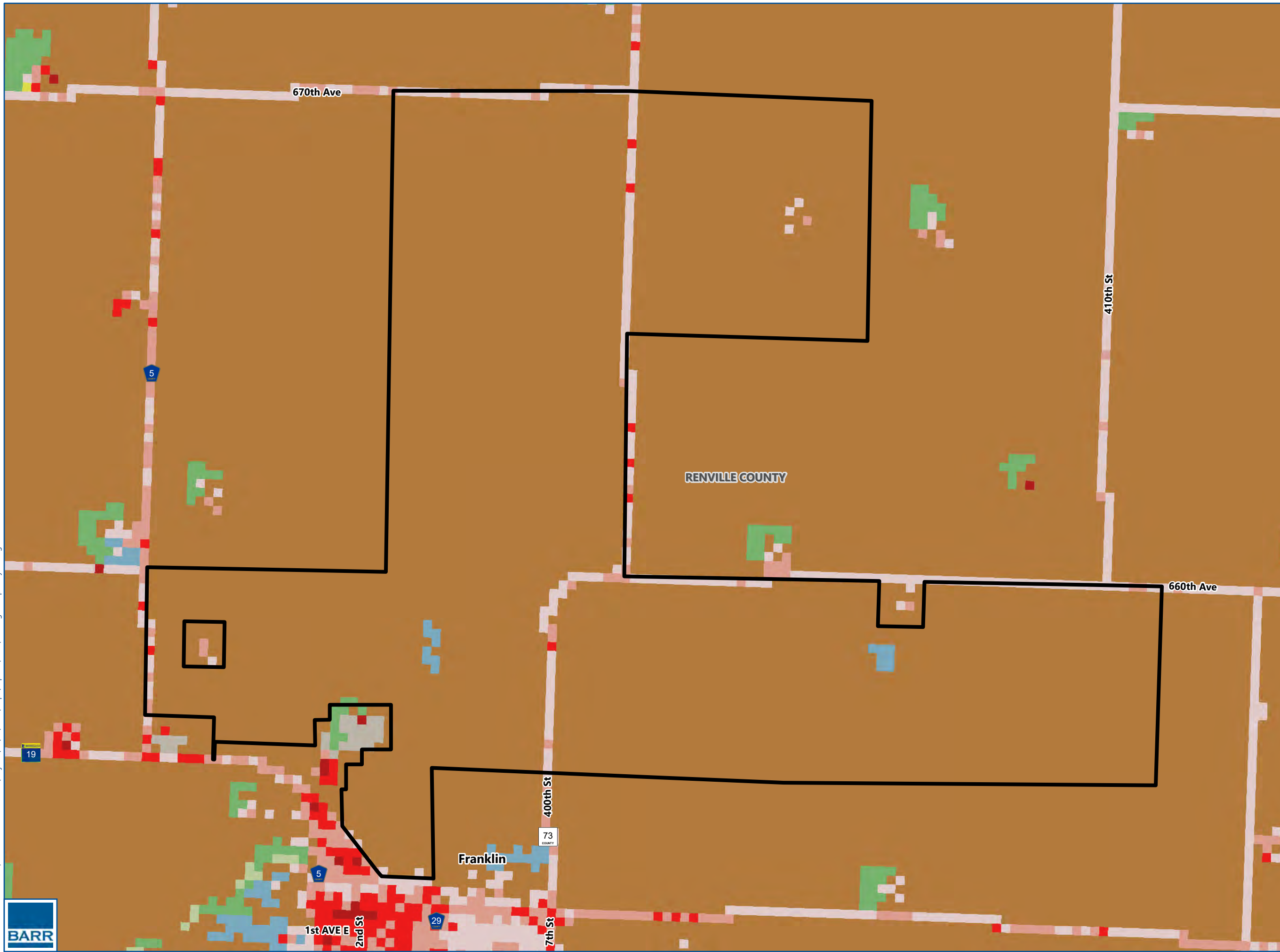
Land use within and adjacent to the Site is predominantly agricultural (Figure 3-4). The Site includes agricultural fields with cultivated crops, agricultural ditches, and a county drain (109A), and agricultural related structures. Nearly all of Renville County is comprised of agricultural land.

The most developed area near the Project is the city of Franklin (Figure 3-4). Except for residences in the city of Franklin, residences in the vicinity of the Site are primarily associated with farms. Less than 6 percent (approximately 43 acres) of the Anticipated Development Area is within the city of Franklin municipal boundary. The major traffic routes in the area are County Highway 5, which runs north and south to the east of the Project, and Minnesota Highway 19, which runs east and west just south of the Site. A railroad owned and operated by Minnesota Prairie Line, Inc., whose parent railroad is Twin City & Western Railroad, runs east to west through the city of Franklin.

Some lands designated as high value resources, as defined by the DNR issued Commercial Solar Siting Guidance, are present near the Site. Figure 3-5 provides the locations of the following:

- DNR Minnesota Biological Survey (MBS) mapped native plant communities (NPCs),
- DNR mapped Native Upland Prairie, and
- Sites of Biodiversity Significance (SBS) that are documented as having an MBS ranking of “below”, “moderate”, or “outstanding” within a 1-mile radius of the Site.

These resources represent areas with more vegetation diversity compared to the surrounding agricultural areas. The implementation of this VMP will not impact the surrounding properties since management will be confined to the Site. Management of noxious and invasive weeds at the Site (Section 7) will reduce this invasive plant seed source for the surrounding area.



 Site

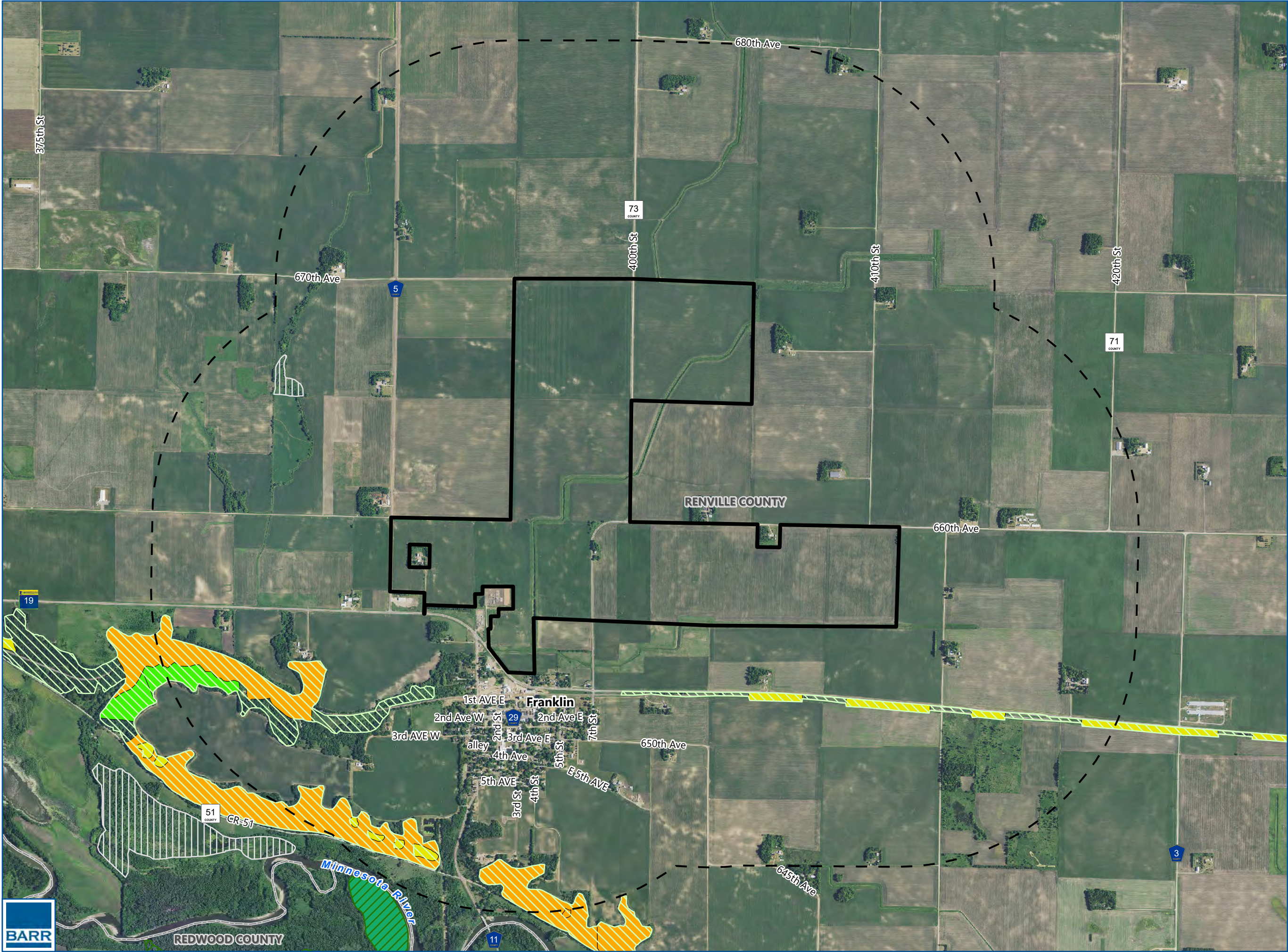
Land Use, NLCD (2021)

-  Developed, Open Space
-  Developed, Low Intensity
-  Developed, Medium Intensity
-  Developed, High Intensity
-  Barren Land
-  Deciduous Forest
-  Mixed Forest
-  Cultivated Crops
-  Emergent Herbaceous Wetlands


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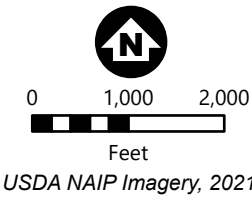
LAND USE WITHIN SITE
Vegetation
Management Plan
Birch Coulee Solar LLC
FIGURE 3-4





- Site
- 1 Mile Site Radius
- County Boundary
- Wildlife Management Areas (WMA)*
- Scientific and Natural Area*
- DNR Native Plant Communities**
 - Fire-Dependent Forest/Woodland System
 - Floodplain Forest System
 - Mesic Hardwood Forest System
 - Upland Prairie System
- MBS Sites of Biodiversity Significance**
 - Outstanding
 - Moderate
 - Below

*None within view extent



**RARE AND UNIQUE
NATURAL FEATURES**
Vegetation
Management Plan
Birch Coulee Solar LLC
FIGURE 3-5



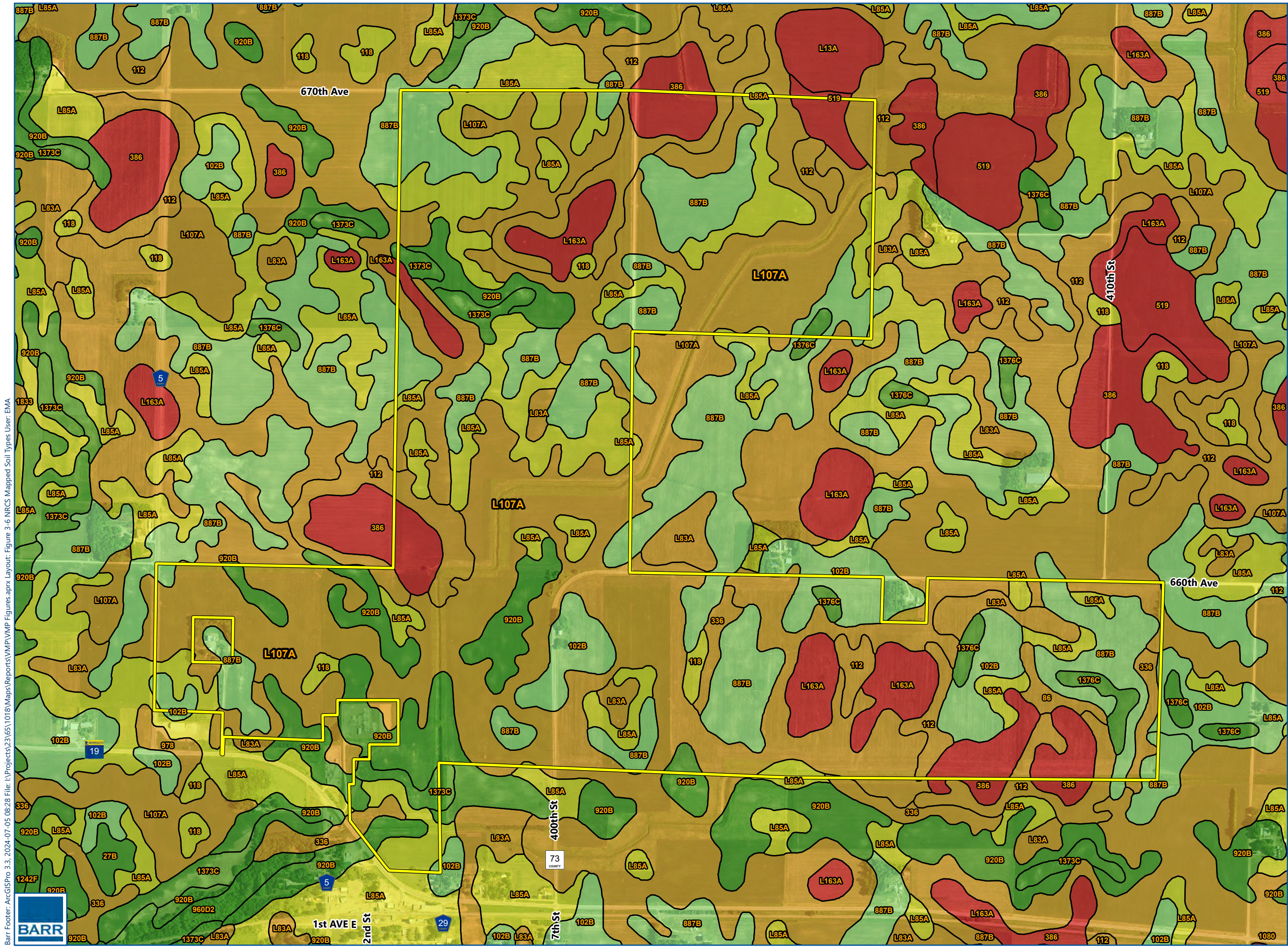
3.4 Soils

There are 15 mapped soils located within the Site according to the Natural Resource Conservation Service (NRCS) Web Soil Survey. Approximately 44 percent of the Site is mapped with soils classified as non-hydric or predominantly non-hydric, while 56 percent of the soils are classified as hydric or predominantly hydric (Table 3-2). Most of the soils are poorly drained (either poorly drained or very poorly drained). Figure 3-6 shows the distribution of the soil map units within and surrounding the Site. Birch Coulee Solar plans to complete a geotechnical investigation and will update this plan prior to implementation if field results differ significantly from the NRCS data used to develop this plan.

Table 3-2 Site Soil Characteristics

Soil Map Unit	Extent in Site (Ac)	Hydric Soil (%) [1]	Drainage Class [2]	Depth of Topsoil (cm)	Depth to Water Table (cm)	Frequency of Flooding	Prime Farmland (Ac) [3]	Farmland of State Importance (Ac) [4]
102B-Clarion loam, 2 to 6% slopes	46.0	5	MWD	41	90	None	Yes	No
112-Harps clay loam, 0 to 2% slopes	64.2	100	PD	41	0	None	Yes*	No
118-Crippin loam, 1 to 3% slopes	6.7	10	SPD	41	45	None	Yes	No
1373C-Clarion-Storden-Pilot Grove complex, 6 to 10% slopes, moderately eroded	13.1	1	WD	20	140	None	No	Yes
1376C-Clarion-Storden complex, 6 to 10% slopes, moderately eroded	12.2	5	WD	20	140	None	No	Yes
336-Delft clay loam, 0 to 2% slopes	13.5	95	PD	99	0	None	Yes*	No
386-Okoboji mucky silty clay loam, depressional, 0 to 1% slopes	41.4	100	VPD	89	0	None	Yes*	No
519-Klossner muck, depressional, calcareous, 0 to 1% slopes	7.4	100	VPD	86	0	None	No	Yes
86-Canisteo clay loam, 0 to 2% slopes	5.2	100	PD	41	0	None	Yes*	No
887B-Clarion-Swanlake complex, 2 to 6% slopes	160.5	5	MWD	41	90	None	Yes	No
920B-Clarion-Storden-Hawick complex, 2 to 6% slopes	72.0	15	WD	36	110	None	No	Yes
L107A-Canisteo-Glencoe complex, 0 to 2% slopes	392.1	90	PD	41	0	None	Yes*	No
L163A-Okoboji silty clay loam, 0 to 1% slopes	43.7	100	VPD	84	0	None	Yes*	No
L83A-Webster clay loam, 0 to 2% slopes	20.5	95	PD	51	0	None	Yes*	No
L85A-Nicollet clay loam, 1 to 3% slopes	143.0	10	SPD	43	45	None	Yes	No

[1] Soils that are classified as hydric (100 percent), predominantly hydric (67-99 percent), or partially hydric (34-66 percent) by Soil Survey Geographic Database.
[2] WD = well drained, MWD = moderately well drained, SPD =somewhat poorly drained, PD=poorly drained, VPD = very poorly drained.
[3] Includes soils that are classified as “prime farmland” by the NRCS. Seven soil map units are classified as “prime farmland” if a limiting factor is mitigated: prime farmland if drained (*).
[4] Includes soils that are classified as “farmland of statewide importance” by the Natural Resources Conservation Service (NRCS).



Site

Soil Map Unit

Drainage Class

Very poorly drained

Poorly drained

Somewhat poorly drained

Moderately well drained

Well drained

102B-Clarion loam, 2 to 6% slopes

112-Harps clay loam, 0 to 2% slopes

118-Crippin loam, 1 to 3% slopes

1373C-Clarion-Storden-Pilot Grove complex, 6 to 10% slopes, moderately eroded

1376C-Clarion-Storden complex, 6 to 10% slopes, moderately eroded

336-Delft clay loam, 0 to 2% slopes

386-Okoboji mucky silty clay loam, depressional, 0 to 1% slopes

519-Klossner muck, depressional, calcareous, 0 to 1% slopes

86-Canisteo clay loam, 0 to 2% slopes

887B-Clarion-Swanlake complex, 2 to 6% slopes

920B-Clarion-Storden-Hawick complex, 2 to 6% slopes

L107A-Canisteo-Glencoe complex, 0 to 2% slopes

L163A-Okoboji silty clay loam, 0 to 1% slopes

L83A-Webster clay loam, 0 to 2% slopes

L85A-Nicollet clay loam, 1 to 3% slopes

0

500

1,000

Feet

USDA NAIP Imagery, 2021

NRCS MAPPED SOIL TYPES

Vegetation

Management Plan

Birch Coulee Solar LLC

FIGURE 3-6

Barr Footer: ArcGISPro 3.3, 2024-07-05 08:28 File: \\Projects\\23\\6511018\\Maps\\Reports\\VMP\\VMP Figures.aprx Layout: Figure 3-6 NRCS Mapped Soil Types User: EMA

3.5 Topography

The Site generally slopes toward the southwest. Ground elevations in the Site range from 990 to 1,038 feet above mean sea level (Figure 3-7). Most of the Site, within the agricultural fields, has very gradual and minimal relief. The lowest elevations are associated with deep drainage ditches that eventually drain to Purgatory Creek and then the Minnesota River west and south of the Project.