Site Permit Application to the Minnesota Public Utilities Commission for the North Star Battery Energy Storage System Project

MPUC Docket No. IP-7155/ESS-25-123

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ACRONYM LIST

AADT	Annual Average Daily Traffic
AC	alternating current
Application	Site Permit Application
AQI	Air Quality Index
ARMER	Allied Radio Matrix for Emergency Response
BCC	Birds of Conservation Concern
BCR	Bird Conservation Region
BESS	Battery Energy Storage System
BGEPA	Bald and Golden Eagle Protection Act
BMP	best management practice
CO	carbon monoxide
CREP	Conservation Reserve Enhancement Program
CRP	Conservation Reserve Program
CSAH	County State Aid Highway
dBA	A-weighted decibels
DC	direct current
DESRI	DESRI Renewables, L.L.C. a Delaware limited liability company
DOC	Minnesota Department of Commerce
EMF	electromagnetic field
EPA	U.S. Environmental Protection Agency
EPC	engineering, procurement, and construction
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
gen-tie line	generation tie line
GHG	greenhouse gas
GIS	Geographic Information System
IAA	Impact Assessment Area
IPaC	Information for Planning and Conservation
IUOE	International Union of Operating Engineers
L_{10}	noise levels experienced for ten percent of any hour
L_{50}	noise levels experienced for fifty percent of any hour
Land Control Area	The 77.5-acre area where North Star Energy Storage LLC has site control as shown on Figure 1.0-1 and Map 1. The Land Control Area is used to describe the existing environment.
LFP	Lithium Iron Phosphate
LGU	local government unit
LIUNA	Laborers' International Union of North American

MBTA	Migratory Bird Treaty Act
mbps	megabytes per second
MCE	Minnesota Conservation Explorer
MDH	Minnesota Department of Health
mG	milliGauss
Minn. R.	Minnesota Rule
Minn. Stat.	Minnesota Statute
MN DEED	Minnesota Department of Employment and Economic Development
MNDNR	Minnesota Department of Natural Resources
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
MPUC	Minnesota Public Utilities Commission
MW	megawatt
MWh	megawatt hour
NAAQS	National Ambient Air Quality Standards
NABCI	U.S. North American Bird Conservation Initiative
n.d.	no date
NHIS	Natural Heritage Information System
NIEHS	National Institute of Environmental Health Sciences
NLCD	National Land Cover Database
NO_2	nitrogen dioxide
North Star Storage	North Star Energy Storage, LLC, a Delaware limited liability company
North Star PV	North Star Solar PV, LLC, a Delaware limited liability company
NPC	native plant community
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSA	Noise Sensitive Area
O_3	ozone
O&M	operations and maintenance
Pb	lead
PEM	palustrine emergent wetland
PFO	palustrine forested
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
PM_{10}	particulate matter less than 10 microns in diameter
POI	Point of Interconnection
Preliminary Development Area	The 26.6-acre area that will be required for construction Project as shown in Figure 2.1-2 and Map 2. The Preliminary Development Area is used for the assessment of Project impacts.

Project	North Star Battery Energy Storage System Project
PSS	palustrine scrub shrub
SCADA	Supervisory Control and Data Acquisition
SGCN	Species of Greatest Conservation Need
SHPO	State Historic Preservation Office
Site Permit	A site permit for an energy storage system
SO_2	sulfur dioxide
Solar Facility	North Star Solar Facility
SPCC Plan	Spill Prevention, Control, and Countermeasures Plan
SSURGO	Soil Survey Geographic Database
SWAP	Minnesota's State Wildlife Action Plan
SWPPP	Stormwater Pollution Prevention Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAN	Wildlife Action Network
WCA	Wetland Conservation Act
WMA	Wildlife Management Area
Xcel Energy	Northern States Power Company, a Minnesota Corporation, doing business as Xcel Energy

1.0 INTRODUCTION

North Star Energy Storage, LLC, a Delaware limited liability company (North Star Storage), an affiliate of DESRI Renewables, L.L.C. a Delaware limited liability company (DESRI) respectfully submits this Site Permit Application (Application) to the Minnesota Public Utilities Commission (MPUC) for a site permit for an energy storage system (Site Permit), pursuant to the Minnesota Power Plant Siting Act (Minnesota Statute [Minn. Stat.] Chapter 216E and Minnesota Rules (Minn. R.) Chapter 7850.

North Star Storage proposes to construct the North Star Battery Energy Storage System (BESS) Project (Project) in Township 35N, Range 21W, Section 36, Chisago County, Minnesota (see Figure 1.0-1). The Project is located within the municipal boundary of the City of North Branch, adjacent to the existing North Star Solar Facility (Solar Facility), which is owned and operated by North Star Solar PV LLC, a Delaware limited liability company (North Star PV) an affiliate of North Star Storage. The Solar Facility received a Site Permit from the MPUC in February 2016 under MPUC Docket Number IP-6943/GS-15-33,[1] and has been in operation since December 2016. The location of the proposed Project falls entirely within the portion of Section 36 that was reviewed as part of the site permit proceedings for the Solar Facility. As such, all land required for construction and operation of the Project was previously reviewed for compliance with the environmental information and siting factors in Minn. R. Chapter 7850.1900, Subd. 3 and Minn. R. Chapter 7850.4100, respectively.

North Star Storage anticipates that the Project will be sited directly adjacent to the existing Solar Facility's collector substation and the existing infrastructure that connects the Solar Facility to the Chisago County Substation. The Chisago County Substation is the Point of Interconnection (POI) for the Solar Facility and will be the POI for the Project as well. North Star Storage anticipates that the Project will connect to the Solar Facility's collector substation via buried 34.5 kilovolt medium voltage collection lines and, as a result, no new high voltage transmission line or generation tie line (gen-tie line) are required.

The Project will have a nameplate capacity of up to 80 megawatts (MW) and the capability to store at least 320 megawatt hours (MWh) of energy at a given time. The Project is being developed in response to the Northern States Power Company, a Minnesota Corporation, doing business as Xcel Energy (Xcel Energy) Request for Proposals in MPUC Docket Number E-002/CN-23-212 and will aid the region's ongoing transition to renewables, ensure reliable electric service in the area, and provide significant economic benefits to local residents.

Since its founding in 2010, DESRI has developed over 10 gigawatts of solar and wind power generation and battery storage projects in 24 states throughout the U.S. DESRI prides itself on working with communities and partners to support the replacement cycle for decarbonization of energy infrastructure and has a diversified portfolio grounded in long-term power purchase agreements. For every project, DESRI draws on its extensive experience and capabilities and strong network of relationships to create value throughout all stages of the project lifecycle, including development, construction, financing, and operations. From 2011 to 2022, DESRI's gross MW operation capacity grew at a compound annual growth rate of over 60 percent.

[1] Order Granting Site and Route Permits with Conditions (February 16, 2026). E-docket ID Number 20162-118336-01. Available online at: https://www.edockets.state.mn.us/documents/%7BE7800A6D-2709-432B-8240-5FCEE36103A0%7D/download?contentSequence=0&rowIndex=3.

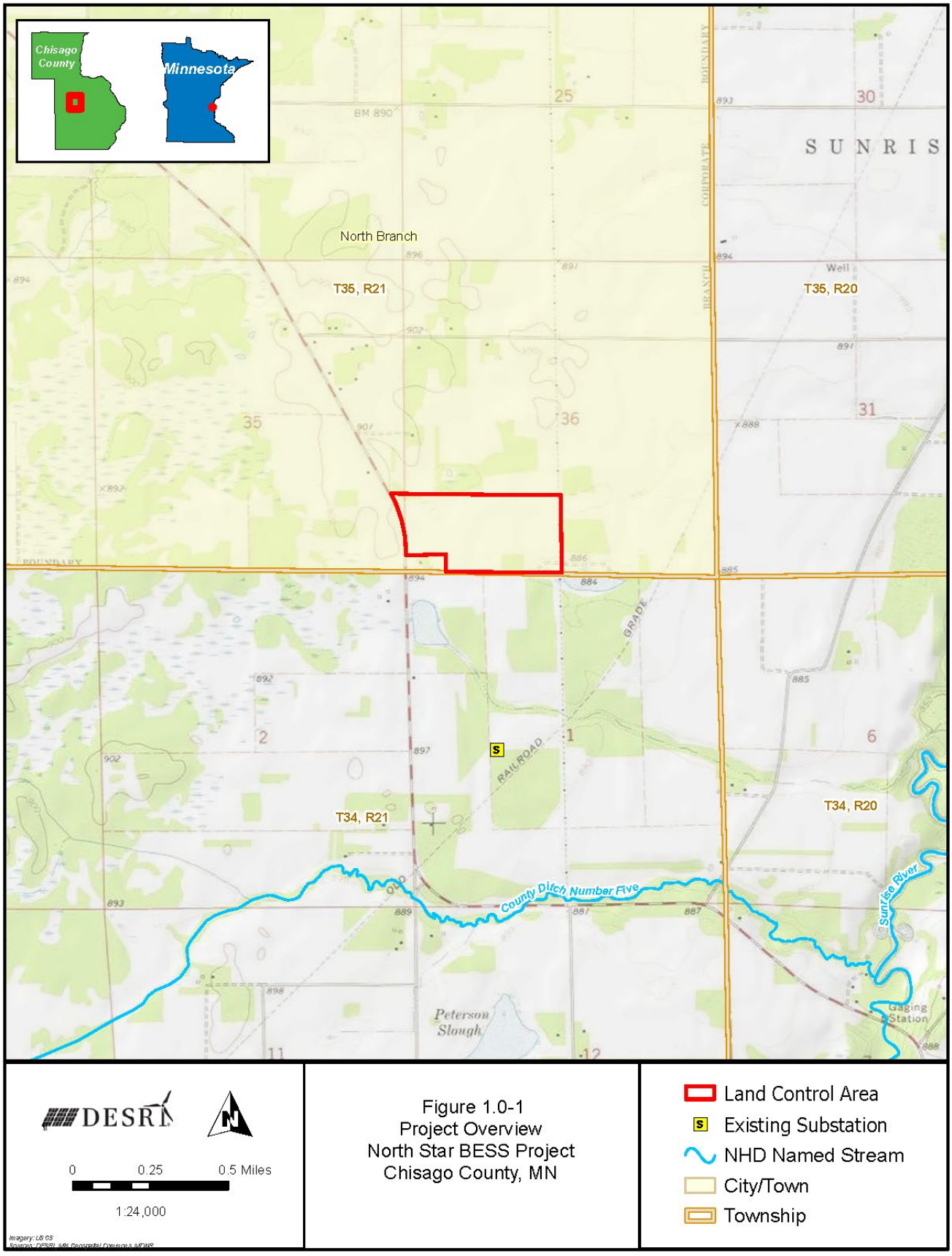

Figure 1.0-1
Project Overview
North Star BESS Project
Chisago County, MN

1.1 PURPOSE AND NEED

The Project will be designed to store 320 MWh of electricity at a given time, with a maximum injection capacity of 80 MW into the electric transmission grid via the POI. The Project is being developed in response to Xcel Energy's Request for Proposals in MPUC Docket Number E-002/CN-23-212 and will aid the region's ongoing transition to renewables, ensure reliable electric service in the area, and provide significant economic benefits to local residents. North Star Storage is developing the Project in accordance with industry best practices and to meet or exceed applicable state and local requirements.

In 2023, the "100 Percent by 2040" legislation was enacted, establishing a standard for utilities to provide Minnesota customers with energy generated from carbon-free sources (State of Minnesota, 2023). Since then, renewable energy generation has increased throughout Minnesota as utilities build or acquire renewable energy generation sources.

The Project offers a critical benefit to Minnesota consumers and local communities by helping bring emission-free energy resources to the electric grid. The Project will support grid stability and reliability by allowing the grid to respond to sharp changes in demand for power and balance intra-day supply and demand dynamics. Without energy storage resources, blackouts and brown outs are more likely, which cost businesses and families significant losses each year. As more intermittent energy resources are added to the grid, the Project will help ensure that power is available when it is needed.

The Project could, by charging its batteries, reduce the need for curtailment of renewable energy generation sources by capturing and storing excess energy from renewable energy generation systems when it is generated and then, during the daytime or evening hours when demand is higher, discharge this stored energy back to the grid supplementing existing generation and, potentially, reducing the need for the use of traditional thermal (e.g. natural gas) generation. This shifting of energy from periods of low demand to higher demand not only increases the availability of renewable energy to ratepayers but also, for renewable projects located in Minnesota, could also increase the production tax benefits of such facilities.

Battery storage facilities such as the Project allow for storage of excess electricity generated by other power producers during periods of low electricity demand, with the ability to send the electricity back to the grid when demand increases. The proposed Project is expected to contribute to Minnesota's transition to a carbon-free electricity supply by allowing wind and solar projects to continue to produce clean energy when they would otherwise be curtailed due to low demand. For example, solar facilities produce their power in the daylight hours; however, the demand for energy on a given day may occur after the sun sets and the solar facility stops producing power for the day. By storing this energy when it is available to be generated and then disbursing the energy during the evening hours when demand is higher the Project can supplement other existing generation and potentially reduce the need for the use of traditional thermal (e.g. natural gas) generation. This shifting of energy from periods of low demand to higher demand not only increases the availability of renewable energy to ratepayers but also, for renewable projects located in Minnesota, could also increase the production tax benefits of such facilities.

The Project will also provide valuable ancillary and reliability services required to safely and reliability operate the grid. The Project will use battery, inverter, and other technologies which will allow it to provide critical services to assist the grid operator with maintaining the voltage and frequency of the transmission system. As load and generation change moment to moment (e.g.

appliances turning on, increasing load, or a cloud passes over a solar project, decreasing generation) the grid operator must increase or decrease the production from other generators to maintain the grid frequency as close to 60.00 hertz as possible since, if the frequency deviates significantly from 60 hertz, more drastic actions, such as load-shedding (the intentional temporary disconnection of significant numbers of customers) may be required to maintain overall system reliability and prevent damage to grid infrastructure. Currently the majority of this moment-to-moment frequency management is provided by ramping up and down the output of certain natural gas generators (similar to pushing down or letting up on the gas pedal of a gasoline car); BESS will not only provide this same service more efficiently (by responding instantly) but do so at an expected lower cost and could also reduce the need to burn natural gas or other fossil fuels.[2]

The impact to the grid from the integration of a BESS will be positive, including:

- **Supports integration of renewable energy:** The integration of BESS enables higher and more efficient use of existing and new renewable energy sources, which are the lowest cost sources of energy.

- **Frequency response and regulation:** Strong BESS infrastructure provides moment-to-moment stability of the electrical system more efficiently than existing natural gas resources.

- **Reduces energy waste:** BESS stores energy when there is excess supply and discharges that energy back onto the grid when supply is low.

- **Grid Resiliency:** BESS can support recovery from storms and other grid emergencies by more efficiently using the operating portions of the grid and providing the grid operator and utility additional flexibility while they work to restore the system.[3]

The Project will also benefit the local community through investment in construction spending, long-term property and business tax receipts with minimal operational demand on public service infrastructure.

The Project will provide cost-effective energy storage to Minnesota and regional ratepayers by providing energy storage services on the transmission system. Benefits to rate payers are derived indirectly through enhancement and stabilization of the regional electrical transmission grid without other system enhancements such as new lines or reconductoring existing lines. Grid stabilization services provided by batteries typically respond faster than traditional fossil fuel sources and can provide such services at a lower cost than existing alternatives. Storage of energy generated at times of surplus that can then be released at times of high demand also off-sets the need for additional peak generating capacity.

The Project will utilize a flat-fee contractual structure based on the MW capacity of the system rather than per-unit energy production. North Star Storage anticipates entering into an Energy Storage Agreement with Xcel Energy after being shortlisted in Xcel Energy's Request for Proposals in MPUC Docket Number E-002/CN-23-212. Under a capacity payment structure the

[2] Snowshoe BESS, LLC Site Permit Application. (October 7, 2024). E-docket ID Number 202410-210785-02. Available online at: https://www.edockets.state.mn.us/documents/%7B70DF6892-0000-C938-AE8A-5882AFB4B67A%7D/download?contentSequence=0&rowIndex=24.

[3] American Clean Power Association. 2025. Clean Energy Storage Facts. Available online at: https://cleanpower.org/facts/clean-energy-storage/.

Project will be available for Xcel Energy to charge and discharge at its discretion to support the transmission system. For example, North Star Storage will receive a monthly fee based on its nameplate capacity (80 MW) that stands as a fixed payment throughout the Energy Storage Agreement's term. In return, North Star Storage is responsible for ensuring that its contracted capacity is available for Xcel's use when needed, in accordance with agreed upon technical operating parameters. To ensure the project performs and provides the expected benefits noted above, the project will be held to certain availability and guaranteed operating standards. If such standards are not achieved, reductions to monthly payments, obligations to pay liquidated damages, or make-whole payments for utility lost revenue may result.

It is also possible the Project could operate under a different revenue structure after the expiration of the Energy Storage Agreement's initial term. For example, the Project could provide energy, capacity, and ancillary services on the wholesale power market on a merchant basis.

1.2 APPLICANT INFORMATION

1.2.1 Permittee and Contact Information

The permittee for the Site Permit Application is:

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575 Fifth Avenue, 24th Floor
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The contact persons regarding the Site Permit Application are:

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1.2.2 Ownership at Time of Filing

The Project will be owned and operated by North Star Energy Storage, LLC an affiliate of DESRI Renewables, L.L.C. and North Star Solar PV, LLC.

1.2.3 Proposed Ownership after Commercial Operations

North Star Storage intends to be the lifetime owner and operator of the Project. North Star Storage maintains the right to sell the Project at any time but currently intends to maintain ownership in

the long term. Any sale of the Project or assignment of the Site Permit would require approval by the MPUC. Any future buyer or assignee will be required to meet Site Permit conditions.

1.2.4 Capacity and Power Purchase Agreements

The Project will be an up to 80 MW/320 MWh BESS, with a maximum injection capacity of 80 MW into the electric transmission grid.

North Star Storage is currently negotiating the Project's offtake agreement with Xcel Energy after being shortlisted in Xcel Energy's Request for Proposals in MPUC Docket Number E-002/CN-23-212. The agreement will be a long-term contract for the Project to provide energy storage capacity to Xcel Energy's service territory. North Star Storage expects to execute the contract with Xcel Energy in the second quarter of 2025 and is hopeful the MPUC will approve the contract in the second or third quarter of 2025.

1.3 PROJECT SCHEDULE

North Star Storage anticipates receiving MPUC approval for the Project's Site Permit in the fourth quarter of 2025. After MPUC approval is received and all other required permits and approvals are received, construction is anticipated to begin in the first quarter of 2026 with an anticipated commercial operation date of second quarter of 2027. Table 1.3-1 provides a breakdown of key milestones for the Project.

TABLE 1.3-1
Anticipated Schedule for the Project

Activity	Timeline
Interconnection Study Received	1st Quarter 2025
Offtake Agreement Finalized	1st Quarter 2025
Land Acquisition	Complete
Site Permit Order Issued	4th Quarter 2025
Equipment and Contractor Acquisition	4th Quarter 2025
Other Permits	4th Quarter 2025
Construction	1st Quarter 2026
Testing and Commissioning	1st Quarter 2027
Commercial Operations Date	1st Quarter 2027

1.4 STATE POLICY AND REQUIRED PERMITS

1.4.1 Certificate of Need

Under Minn. Stat. § 216B.243, subd. 8(9), a Certificate of Need is not required for energy storage systems. Therefore, a Certificate of Need is not required for the proposed Project.

1.4.2 Site Permit

Energy storage systems with a nameplate capacity of 10,000 kilowatts or greater require a Site Permit from the MPUC prior to construction (Minn. Stat. § 216E.01, subd. 3a and § 216E.03, subd. 1). Pursuant to Minn. Stat. § 216E.04, subd. 2(9), North Star Storage seeks approval of this Application under the alternative review process provided under Minn. Stat. § 216E.04 and Minn. R. Chapter 7850.2800 to 7850.3900. North Star Storage has filed a Notice of Intent to Submit a

Site Permit Application under the Alternative Permitting Process to the MPUC on February 13, 2025.

The Site Permit is the only site approval needed for the construction of the Project (Minn. Stat. § 216E.10, subd. 1). The Site Permit Completeness Checklist is provided in Appendix A.

1.4.3 Other Potential Permits and Approvals

North Star Storage will obtain all permits, licenses, and approvals that are required following issuance of the Site Permit. Table 1.4.3-1 lists the permits or approvals potentially applicable for the construction and operation of the Project. Copies of agency correspondence are provided in Appendix B. Additional information about agency outreach as of this Application filing is provided in Section 7.0.

TABLE 1.4.3-1
Potential Permits/Approvals for the Project

Agency	Permit	Applicability	Status and Timing
FEDERAL			
U.S. Army Corps of Engineers (USACE) – St. Paul District	Federal Clean Water Act Section 404 Permit(s): Individual, Nationwide Permi), or Regional General Permit	Construction or operation of the project that results in the discharge of dredge or fill to Waters of the United States	Not anticipated to be required
U.S. Fish and Wildlife Service	Endangered Species Act	Compliance with Section 9 of the Endangered Species Act is mandatory. Without a federal nexus, no “unauthorized take” can occur without a Habitat Conservation Plan	The Project is in compliance with the Endangered Species Act and a Habitat Conservation Plan is not anticipated to be needed or required.
U.S. Environmental Protection Agency	Spill Prevention Control and Countermeasure (SPCC) Plan (signed by licensed engineer, no agency approval required)	SPCC Plan needed if project construction or operations will require oil storage in excess of 1,320 gallons.	To be developed prior to construction start.
STATE			
Minnesota Public Utilities Commission	Site Permit	Construction of a proposed energy storage system 10 MW or greater in size.	Submitted February 28, 2025; Approval anticipated by Q4 2025
Minnesota Pollution Control Agency	Clean Water Act Section 401 Water Quality Certification	Construction activities requiring a Section 404 permit (see USACE above) also require certification under Section 401 of the Clean Water Act.	Not anticipated to be required
	Clean Water Act Section 402 National Pollutant Discharge Elimination System General Permit and Stormwater Pollution Prevention Plan	Land disturbance from construction Project that disturb one acre or more of land through clearing, grading, excavating, or stockpiling of fill material.	To be obtained prior to construction start.

TABLE 1.4.3-1
Potential Permits/Approvals for the Project

Agency	Permit	Applicability	Status and Timing
Minnesota Department of Labor and Industry	Electrical inspection of installed equipment	Necessary to comply with state electrical codes	Inspection to be conducted during construction and prior to operation.
Minnesota Department of Natural Resources (MNDNR)	Public Waters Work Permits Program approvals	Activities occurring below the ordinary high water level in public waters and wetlands. Regulated activities potentially relevant include fill, excavation, bridges, culverts, and dredging.	Not anticipated to be required
	Utility Crossing License	A utility line crosses a public water or state land.	Not anticipated to be required
	Water Appropriation / Dewatering Permit	Required for all users withdrawing more than 10,000 gallons of water per day or 1 million gallons per year (dewatering)	To be obtained prior to construction start, as needed.
	Coordination / State-listed species permit (if take is unavoidable)	Activities that cause take (incidental or otherwise pursuing, catching, killing, injuring, transporting, possessing, etc.) of state-listed endangered and threatened species.	Not anticipated to be required
Minnesota Board of Water and Soil Resources and Local Government Unit (LGU)	Wetland Conservation Act (WCA) Program - Formal "Determination" Required by the LGU (Chisago County Soil and Water Conservation District)	Draining, filling, and in some cases, excavation of jurisdictional wetlands that are not Public Waters (see MNDNR above).	Not anticipated to be required
Minnesota Department of Administration, State Historic Preservation Office (SHPO)	Section 106 Consultation	Required for any project that receives federal funding, permits, or approvals; also required for various state level permitting requirements, including any that require MPUC review.	Not anticipated to be required
	Cultural and Historic Resources Review; State and National Register of Historic Sites Review	Projects that require state permits or affect state register properties or require Section 106 compliance	On December 4, 2024, the SHPO agreed that the 2014 survey was adequate and that additional survey is not required for the Project (see Appendix B).
Minnesota Department of Transportation (MnDOT)	Application for Utility Accommodation on Trunk Highway Right-of-Way	Installing utilities along, across, or within trunk highway right-of-way	Not anticipated to be required
	Access (Driveway) Permit	Required for construction of a driveway/access road utilizing MnDOT rights-of-way	Not required.

TABLE 1.4.3-1
Potential Permits/Approvals for the Project

Agency	Permit	Applicability	Status and Timing
	Oversize/Overweight Permit	Vehicles delivering equipment, materials, and supplies that exceed applicable MnDOT height/length limits and weight limits	To be obtained prior to construction start.
Minnesota Department of Health	Well construction permit	Required for installation of a well.	Not anticipated to be required
LOCAL			
Chisago County	Oversize/Overweight Vehicle Permit	Chisago County requires permits on all County Highways.	To be obtained prior to construction start, as needed.
	Access Permit	Access permits are required for any changes proposed to driveway access along County Highways.	To be obtained prior to construction start, as needed.
	Utility Permit	Utility permits are required for work proposed in the County Highway right of ways.	Not anticipated to be necessary or required.
	Miscellaneous Work Permit	A miscellaneous work permit is required for work on any Chisago County highway that doesn't fall under any of the above permits.	To be obtained prior to construction start, as needed.
	Well Permit (Construction and Maintenance)	Chisago County requires a permit to construct or reconstruct a well or seal a well. A maintenance permit is required for a well which has not been properly sealed and is inoperable.	To be obtained prior to installation of restroom facility, if on-site restroom facilities are needed.
	Septic Permit	A perc test, specific design proposal, and septic permit are required for the installation, repair, alteration or addition to a septic system.	To be obtained prior to installation of restroom facility, if on-site restroom facilities are needed.

2.0 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW AND LOCATION

The Project is an energy storage system that will not generate electricity but will receive energy (charge) from the electrical grid via the existing POI for the Solar Facility, store that energy on site, and then later deliver energy (discharge) back to the POI to be delivered back to the electrical grid. This technology allows for energy to be stored during low demand periods or periods of excess generation for use at times of higher demand or lower electrical generation. The technology can further enhance renewable energy generation to supply electricity in the evening during peak electrical use periods after solar generation has ceased for the day.

The Project will be located within the municipal boundary of the City of North Branch in Township 35N, Range 21W, Section 36, Chisago County, Minnesota (see Figure 1.0-1). North Star Storage has sited the Project adjacent to the existing Solar Facility, which is owned and operated by North Star PV. The Project will connect to the existing POI for the Solar Facility (the Chisago County Substation), using existing 34.5 kilovolt medium voltage collection lines already in place to interconnect the Solar Facility to the POI. As a result, a gen-tie line is not required to interconnect the Project.

The location of the proposed Project falls entirely within the portion of Section 36 that was reviewed as part of the Site Permit proceedings for the Solar Facility (refer to Figure 2.1-1). As such, all land required for construction and operation of the Project was previously reviewed for compliance with the siting factors in Minn. R. Chapter 7850.1900, Subd. 3 and Minn. R. Chapter 7850.4100. However, North Star Storage is providing a full review of potential Project impacts throughout this Application, to provide the Commission with the information necessary to assess the current Project.

Collectively, the easements for which North Star Storage has site control in Section 36 cover about 77.5 acres; this 77.5-acre area is herein referred to as the Land Control Area. Within the Land Control Area, the area that would be needed to construct the Project, based on the preliminary design described herein, would affect about 26.6 acres; the area required for construction of the Project is herein referred to as the Preliminary Development Area. Operation of the Project is anticipated to require less than 10.0 acres within the Preliminary Development Area, based on preliminary design. Figure 2.1-2 and Map 2 in the Maps appendix show the Land Control and Preliminary Development Areas.

North Star PV owns the easternmost parcel in the Land Control Area and has negotiated a lease agreement with North Star Storage for the western parcel of the Land Control Area for development of the Project. The western parcel, which will be leased by North Star Storage, is owned by the Phil & Clarice Anderson Family Revocable Living Trust. North Star Storage is contemplating two options for the permanent access road to the BESS:

- Western Access Road: This access road option would approach the Project from Lincoln Trail which is west of the Project site. It would be approximately 0.4 mile (2,112 feet) long by 25 feet wide.

- Eastern Access Road: This access road option would approach the Project from an existing internal access road within the Solar Facility. During operation of the Project, personnel would travel through the Solar Facility beginning at an existing entrance to the

Solar Facility from 367th Street, travel south toward the Project site, then turn right onto the eastern access road, which would be approximately 295 feet long by 25 feet wide.

Both options for access may be utilized for construction and operations access, dependent on further discussions with engineering, procurement, and construction (EPC) contractors and operations and maintenance (O&M) staff for the Solar Facility. If the western access road is utilized, North Star Storage would seek an access permit from Chisago County and an easement agreement from the landowner for construction and operation of the western access road from Lincoln Trail. The eastern access road would be sited entirely on land under North Star Storage's control and no additional easement agreements would be needed. Both access road options are included in the Preliminary Development Area described throughout this Application and reviewed for environmental effects in Section 6.0.

Preliminary design of the Project includes up to 120 BESS containers at full build-out after augmentation, that contain multiple battery cells installed in purpose-built enclosures, an onsite maintenance area, and a stormwater basin (see Map 3). Within the Project, underground collection and communication lines will be installed to connect the BESS units to the existing collector substation for the Solar Facility. Security fencing will encompass all BESS components and warning signs will be installed on the security fencing in accordance with the National Electrical Safety Code. Gates will be installed at the entrance to the Project site and a sign will be installed on the entrance gate providing a 24-hour emergency response number. The area within the fence line of the Project will be graveled and the BESS units will be spaced to allow operations personnel to drive between the BESS units as needed during operation of the Project. A detailed description of the Project engineering and operational design is presented in Section 4.0.

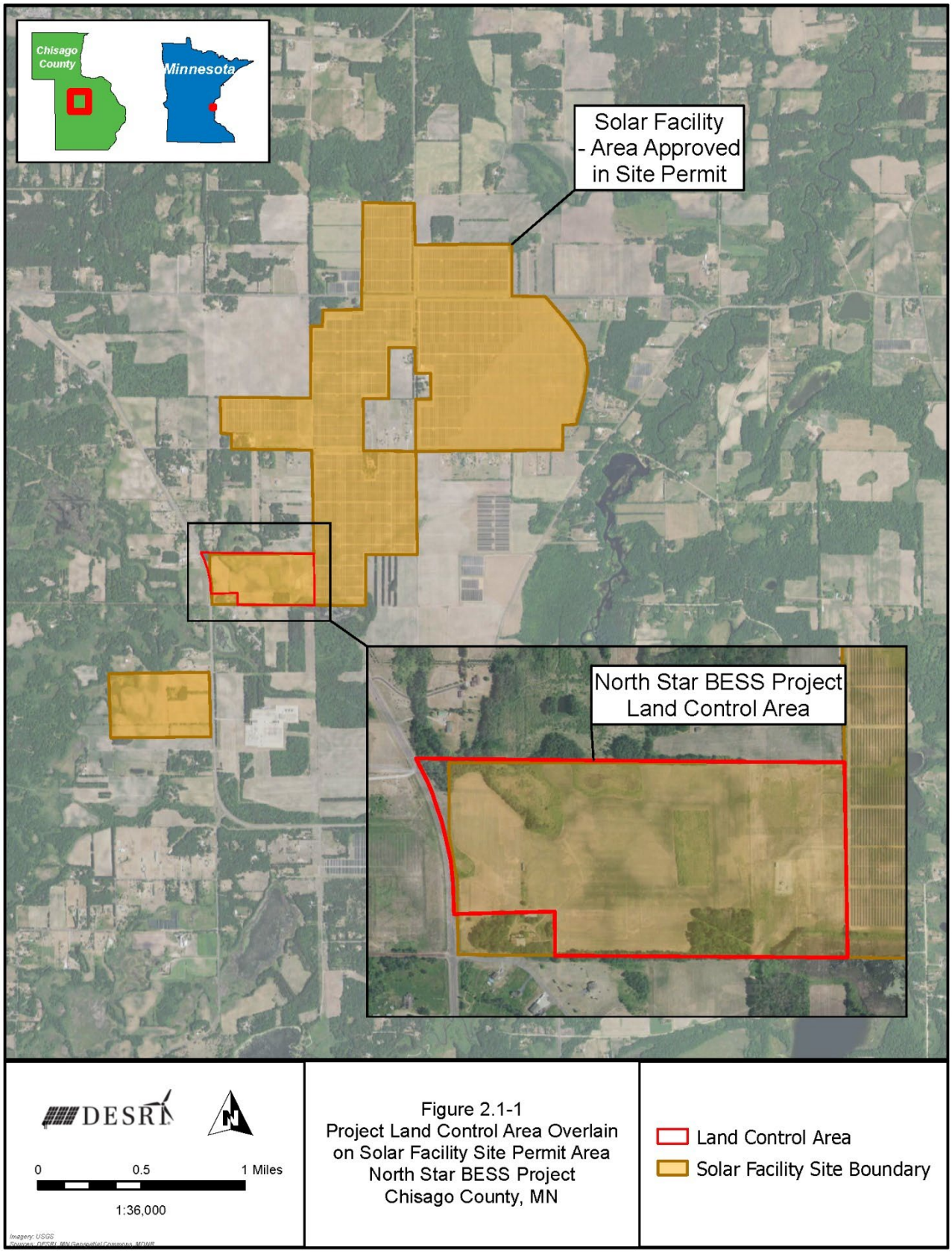

Figure 2.1-1
Project Land Control Area Overlain on Solar Facility Site Permit Area
North Star BESS Project
Chisago County, MN

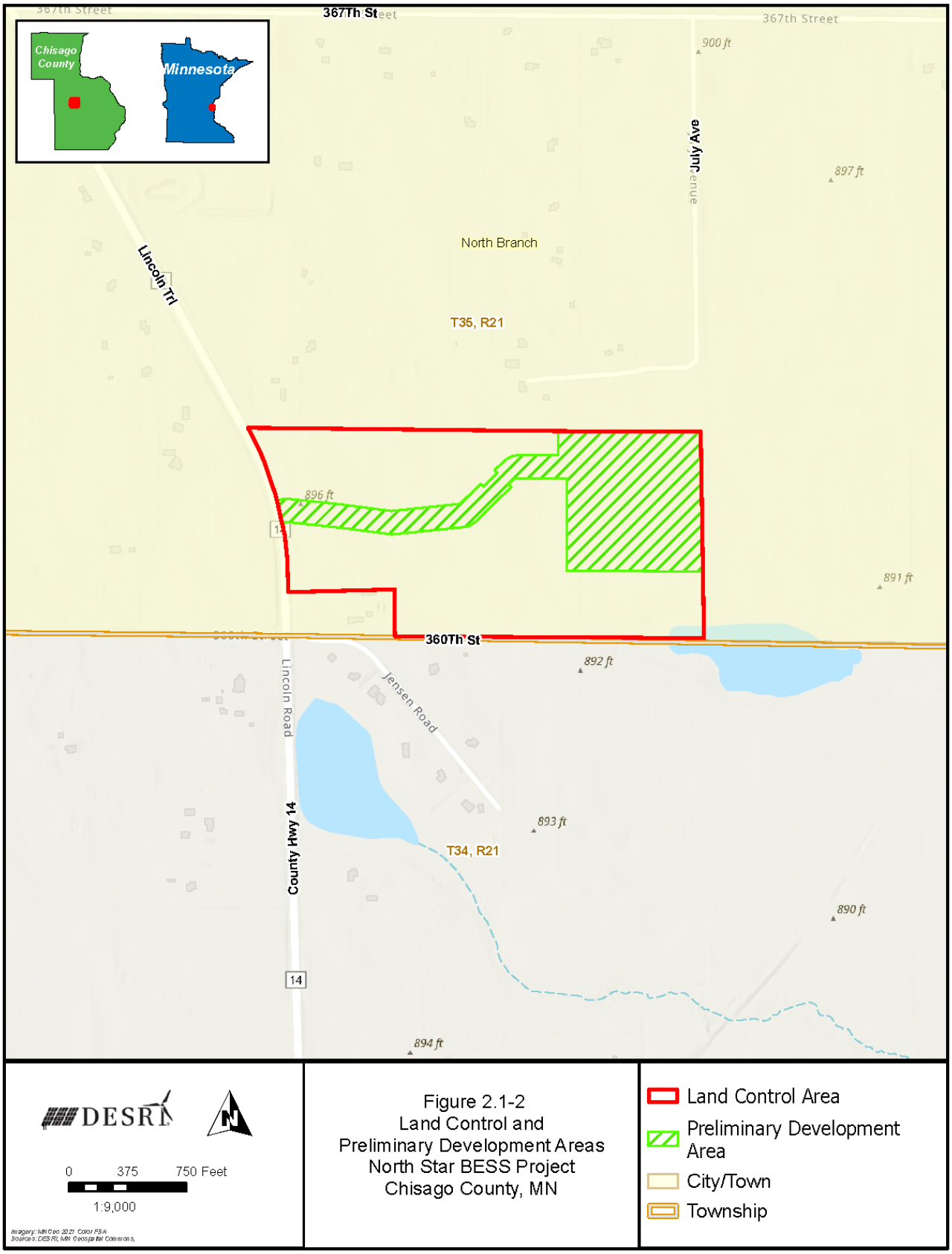

Figure 2.1-2
Land Control and
Preliminary Development Areas
North Star BESS Project
Chisago County, MN

2.2 INTERCONNECTION

The Project will be sited directly adjacent to the existing Solar Facility collector substation and the existing infrastructure that connects the Solar Facility to the Chisago County Substation. The Chisago County Substation, which is owned and operated by Xcel Energy, is the POI for the Solar Facility and will be the POI for the Project. Existing Infrastructure will be used to connect the Project to the POI, via the existing Solar Facility collector substation. Specifically, the Project will connect to the Solar Facility collector substation via buried 34.5 kilovolt collection lines that are capable of bi-directional flow, which will allow the BESS units to collect power from and release power back to the POI. No new gen-tie line is required for the Project.

The Project is currently undergoing a Midcontinent Independent System Operator surplus interconnection study, the results of which are anticipated in the first quarter of 2025. A Surplus Large Generator Interconnection Agreement will be executed specific to the Project following conclusion of the study and prior to construction.

2.3 SIZE AND CAPACITY

The Project will be able to store at least 320 MWh of electricity at a given time, with a maximum injection (i.e., nameplate) capacity of 80 MW into the electric transmission grid via the POI.

The Preliminary Development Area, which encompasses all temporary workspaces needed to install the Project equipment and access roads, would cover about 26.6 acres. The area required to host Project facilities during operation of the Project is anticipated to be less than 10.0 acres; these 10 acres are within the Preliminary Development Area.

2.4 COST ANALYSIS

The total estimated costs for the Project are about $172 million. A breakdown of estimated costs is provided in Table 2.4-1. The estimates provided are based on historical estimates from similar DESRI BESS projects and are expected to reflect actual costs within approximately 20 percent. Actual costs may vary for the Project as they are dependent on a variety of factors including construction labor, equipment and materials, electrical and communication systems, taxes/tariffs, and final design considerations.

TABLE 2.4-1
Estimated Project Costs

Category	Costs ($)
Project Engineering, Procurement, Construction	$120,000,000
Project Development and State Permitting	$1,500,000
Operations	$45,000,000
Decommissioning	$5,650,949
TOTAL	**$172,150,949**

Operating costs are estimated at approximately $1,500,000 per year and include labor, materials, tooling, taxes, and lease payments. The primary operational costs are related to inspections and maintenance.

2.5 FUTURE EXPANSION

North Star Storage intends to share interconnection rights via a Surplus Large Generator Interconnection Agreement between the existing Solar Facility and the Project, thus creating an 80 MW Surplus Interconnection agreement for the Project. At this time, North Star Storage has no intention of expanding the Project beyond the 80 MW planned for the Project.

3.0 PROJECT AREA SELECTION AND CONSTRAINTS ANALYSIS

North Star Storage designed the Project to take advantage of the available interconnection capacity associated with the existing Solar Facility, and better leverage renewable energy resources across Minnesota's transmission system. As such, Project siting focused on suitable areas that would allow efficient interconnection with the POI by way of the Solar Facility collector substation. Map 5 in the Maps appendix shows the potential development constraints surrounding the Land Control Area.

Adding BESS to the existing Solar Facility collector substation provides an expedited path to bringing new energy capacity to the transmission system. Pairing storage with solar allows for energy to be stored during low demand and high solar production periods and releasing the energy during periods where solar production may be lower. This allows for the interconnection rights associated with the Solar Facility to be more efficiently utilized. The Project's Surplus Large Generator Interconnection Agreement will result in the interconnection to Xcel Energy's system at a low cost and without significant upgrades to the existing transmission system. The Project was placed as close to the Solar Facility's existing collector substation as possible to minimize line losses when charging and discharging the BESS. As it is utilizing the same transmission rights as the Solar Facility, siting as near to the Solar Facility collector substation is necessary due to the shared infrastructure. This has the added benefit of reducing environmental impacts associated with longer collection line systems if placed further from the collector substation.

The Land Control Area was chosen based on proximity to the Solar Facility and its POI, minimal environmental or civil constraints, supportive landowners, and limited competition with other potential BESS projects.

3.1 PROHIBITED AND EXCLUSION SITES

Minnesota Rules 7850.4400 subp. 1 prohibits energy storage systems from being sited in several prohibited areas, including national parks; national historic sites and landmarks; national historic districts; national wildlife refuges; national monuments; national wild, scenic, and recreational riverways; state wild, scenic, and recreational rivers and their land use districts; state parks; nature conservancy preserves; state scientific and natural areas; and state and national wilderness areas (see Map 5). The Project is not located within any prohibited areas as discussed further in Section 6.0.

Additionally, Minnesota Rules 7850.4400 subp. 3 prohibits siting of energy storage systems in several exclusion areas unless there is no feasible and prudent alternative. Exclusion areas include state registered historic sites, state historic districts, state Wildlife Management Areas (WMAs), county parks, metropolitan parks, designated state and federal recreational trails, designated trout streams, and state water trails (as identified in Minn. Stat. § 85.32). The Project is not located within any exclusion areas. An analysis of the Project in relation to avoidance and exclusion areas or other sensitive environmental areas is provided below in Section 6.0.

3.2 FACTORS DRIVING CHOICE OF REGION

The region of Minnesota in which the Project is located was selected after searching for locations that were suitable for an energy storage facility to further state and national goals of supplying reliable energy to the grid. Factors considered included renewable energy projects in the region, environmental constraints, land availability, interconnection access, and costs.

As mentioned in Section 3.0, existing transmission interconnection availability was the primary factor in determining the Project's location. The Project will be able to interconnect to the transmission system using the existing collector substation from the Solar Facility, which means that the transmission-related construction efforts will be limited to expanding the Solar Facility's collector substation to allow for the Project to connect to the grid. Leveraging existing interconnection rights and infrastructure reduces overall project costs and reduces development timelines while improving energy capacity at the POI. Utilizing an existing asset, the Solar Facility, allowed North Star Storage to utilize existing infrastructure that created an ideal candidate for developing a BESS facility using a Surplus Large Generator Interconnection Agreement.

The Project requires sufficient acreage to host facilities that are conducive to development with respect to the energy resources, topography, interconnection, and environmental constraints. The Project will be located on land that is not expected to limit or constrain the development of a BESS and related infrastructure. The land is adjacent to existing energy infrastructure, is flat, will allow for interconnection at a low cost, and will avoid environmentally sensitive lands such as wetlands. These factors are described below and are specific to the Project.

3.3 MITIGATION AND OFFSETTING BENEFITS

In addition to the minimization measures described throughout this Application, the Project includes mitigation measures for public health and safety, agricultural land, and soils. These mitigation measures are described further in Section 6.0.

3.4 ALTERNATIVE SITES CONSIDERED BUT REJECTED

In accordance with Minn. Stat. § 216E.04, energy storage systems qualify for the Alternative Review Process as described in Minn. R. Chapter 7850.2800 to 7850.3900. Under the Alternative Review Process, pursuant to Minn. R. Chapter 7850.3100, North Star Storage is not required to analyze alternative sites for the Project. North Star Storage selected the Land Control Area based on proximity to the Solar Facility and the associated POI, willing landowner participation, minimal environmental impacts, and available capacity on the electrical grid for interconnecting the Project. Since North Star Storage's implementation of the Project is dependent on using Surplus Large Generator Interconnection Agreement rights at the existing Solar Facility, no alternative sites were considered.

4.0 ENGINEERING AND OPERATIONAL DESIGN

The primary components of a Project include battery storage enclosures, inverters, transformers, Emergency Management System, Battery Management System, underground electrical collection and communication lines, and interconnection to an existing electrical substation. A detailed description of each of these components is provided below.

The Project will be designed and engineered in accordance with the applicable requirements of the National Electric Safety Code, National Fire Protection Association Standards, Institute of Electrical and Electronics Engineers Standards, and the Minnesota state electrical code.

4.1 DESIGN

4.1.1 BESS

The proposed Project civil site plan is provided in Appendix C. The site plan is preliminary and utilizes a conservative engineering approach which relies on proven methodologies and familiar technologies. The following describes the BESS design in more detail. A representative photograph of a BESS facility is provided as Figure 4.1-1.

Figure 4.1-1 Representative Photograph of a BESS Facility

Lithium-ion batteries are the most common type of batteries used in utility-scale BESS. Lithium -ion batteries are a type of rechargeable battery where lithium ions move from negative

to positive electrodes and back when recharging. A variety of chemistries fall under the "lithium-ion" term, each with varying performance, cost, and safety characteristics. Lithium-ion batteries have a typical lifespan of thousands of cycles and 20+ years and will experience degradation of capacity and efficiency over that time. The lithium-ion battery technology DESRI is proposing to use for the Project is Lithium Iron Phosphate (LFP) and will be designed for the 30-year life of the BESS, but will require periodic augmentation to make up for the capacity lost to degradation.

LFP is the most stable chemistry of lithium-ion battery available on the market today and is considered the industry-leading technology for BESS applications. LFP does not contain heavy metals, allowing for easier and safer sourcing of materials and responsible deployment. It is also the safest lithium-ion chemistry on the market; it is incredibly stable in terms of thermal management and overall operational efficiency.

LFP battery systems are modular energy storage systems, and each module contains multiple smaller battery cells approximately the size of a car battery. The module typically contains 48-72 cells and is about 30 inches wide, 10 inches tall, and 60-72 inches long. Modules are placed in anchored racks within separate enclosures. Independent heating and cooling systems are included in each enclosure to maintain the temperature within the enclosure within operational parameters.

North Star Storage is considering multiple battery manufacturers, and as such, seeks to permit a range of options to preserve design flexibility. The BESS design described herein represents a typical BESS design, but details of components may vary depending on the technology selected during final engineering of the Project. Each BESS module will be contained in an enclosure measuring up to approximately 30 feet in length, 6 feet in width, and 10 feet in height. The enclosures will have a Battery Management System for automated monitoring and managing of the batteries to ensure design performance, as well as for providing control for the charging/discharging of the batteries along with temperature monitoring and control of the individual battery cell temperature with an integrated cooling system.

Batteries operate with direct current (DC) electricity that must be converted to alternating current (AC) electricity via inverters to ensure the electricity is compatible with the existing electrical grid. Depending on the final battery technology and battery enclosure design, the inverters may be included within the enclosure or outside on skids adjacent to enclosures. In addition, up to 30 medium voltage transformers will be installed for the Project. Each medium voltage transformer will be approximately 10 feet in length, 10 feet in width, and 8 feet in height. From the transformers, buried 34.5 kilovolt electrical cables will transfer power to and from the existing Solar Facility collector substation.

The Project will be run by on-site Energy Management Systems that will control the charging and discharging of the batteries. The BESS will also be monitored 24 hours a day, 7 days a week by a Battery Management System, as mentioned above. The Battery Management System provides extensive monitoring of the battery's temperature, voltage, amperage, and safety systems. The Battery Management System will ensure that the Project is operating within normal parameters and will immediately halt operation should it detect anomalous operation. Additional details about North Star Storage's approach to ensuring safe operation of the Project, including coordination with local first responders, is provided in Section 5.1.2.

Over the life of the Project, the batteries will lose some of their capacity. To maintain the facility's rated and contractually obligated capacity, the BESS will undergo augmentation either through the addition of battery modules within the existing enclosures or the addition of supplemental

battery enclosures. The augmentation schedule to maintain overall Project functionality will be determined during the design process after final equipment selection and will be based on the projected degradation schedule of the selected batteries. North Star Storage has designed the facility to accommodate future augmentation units within the fenced area. Specific installation timing will vary based on capacity monitoring during operations. North Star Storage has included the planned augmentation units in the design of the Project as displayed in Site Plan. Accordingly, the initial construction of the BESS will not include all battery enclosures displayed in the Site Plan, with augmentation units added during the life of the Project. However, initial site civil and electrical preparation will prepare the locations where augmentation will occur, and no expansion of the Project's fenced perimeter will be required. North Star Storage respectfully requests the Site Permit expressly allow the addition of augmentation units, as depicted in the final site plan, without a need for a Site Permit Amendment or minor alteration approval from the MPUC.

4.1.2 ELECTRICAL COLLECTION SYSTEM

The BESS will collect power from the existing Solar Facility collector substation via underground cabling that will be buried in a trench or ploughed into place to a depth of at least four feet. If the trench method is used for installation, the trench would be up to two feet wide. The depth to cables may be deeper when crossing under existing utilities or other features that require avoidance. The electrical collection technology used will be decided based on geotechnical analysis, constructability, and the availability of materials. The final engineering design and procurement may impact the method used for installation of the electrical collection system.

4.1.3 TRANSMISSION SYSTEM

The Project will use the existing Solar Facility collector substation to interconnect to the Chisago County Substation via the existing 115 kilovolt overhead gen-tie line of approximately 0.6 mile.

4.1.4 SOLAR FACILITY COLLECTOR SUBSTATION MODIFICATIONS

The Solar Facility collector substation will be expanded about 85 feet to the north to interconnect the BESS. The area required for expansion totals approximately 0.2 acre within the fence line of the BESS and is included in the Preliminary Development Area.

The substation expansion will likely include high-voltage electrical pole structures, breakers, three phase step-up/step-down bi-directional transformers, metering and related equipment, lightning protection, telecommunications equipment, and Supervisory Control and Data Acquisition (SCADA) equipment.

4.1.5 OTHER ASSOCIATED FACILITIES

4.1.5.1 Access Roads

North Star Storage is contemplating two options for the permanent access road to the site. One or both access roads may be utilized dependent on EPC contractor needs as well as long term O&M needs for the Project:

- Western Access Road: This access road option would approach the site from Lincoln Trail which is west of the Project site. It would be approximately 0.4 mile (2,112 feet) long by 25 feet wide.

- Eastern Access Road: This access road option would approach the site from an existing internal access road within the Solar Facility. During operation of the Project, personnel would travel through the Solar Facility beginning at an existing entrance to the Solar Facility from 367th Street, travel south toward the site, then turn right onto the eastern access road, which would be approximately 295 feet long by 25 feet wide.

Access roads will be wider during construction (approximately 150 feet wide) to provide adequate space for construction vehicles and heavy equipment. For the western access road, this 150-foot-wide corridor would be offset or necked down for short stretches to avoid impacts to wetland areas within the Land Control Area.

After construction is complete, the access road to the site would be reduced to approximately 25 feet wide and maintained for operation of the Project. Both access road options are included in the Preliminary Development Area described throughout this Application and reviewed for environmental effects in Section 6.0.

Interior access roads within the Project will consist of graveled areas between and around the BESS enclosures that are wide enough to allow standard vehicles to travel between the enclosures (approximately 10 feet wide). They are likely to be indiscernible from the larger gravel pad surrounding the BESS enclosures.

4.1.5.2 Security and Safety Features

The Project will be enclosed by permanent security fencing. Fencing will be secured to posts which will be directly embedded in the soil or set in concrete foundations as required for structural integrity. North Star Storage proposes to install a minimum six-foot-high chain-link fence, topped with one foot of barbed wire for security and safety purposes (seven feet total height) to comply with the National Electric Safety Code. Security fencing will be designed to prevent the public from gaining access to electrical equipment which could cause injury.

The Project will also have security lighting at the entrance gates that will be down-lit and blue light will be minimized. The typical pole height will be ten feet and lighting will be manually operated by switch as well as motion activated if an intrusion is detected.

4.1.5.3 On-site Maintenance and Parking Areas

An on-site maintenance area will be established within the fenced Project. Maintenance personnel will use the gravel pad of the BESS area for parking while performing maintenance activities during operations. If required, a small O&M building will be included onsite to for storage of parts and general maintenance. A bathroom (likely septic system) may also be included to facilitate onsite O&M workers. The access roads and fence line of the Project are shown on the Site Plans for the Project provided in Appendix C. On-site maintenance and parking areas will remain within the fence line of the Project.

4.1.5.4 Stormwater Basin

To meet National Pollutant Discharge Elimination System (NPDES) standards, North Star Storage proposes to construct a stormwater basin to manage stormwater collection and filtration on-site. Preliminary design proposes a 1.6-acre stormwater basin within the northeast portion of Preliminary Development Area, calculated based on the increased impervious surface area from installation of the BESS and associated gravel pad. The proposed stormwater basin will be

planted with perennial vegetation. North Star Storage will develop a project-specific Stormwater Pollution Prevention Plan (SWPPP) and will comply with all protocols of this plan during construction and operation of the Project.

4.1.5.5 Temporary Facilities

North Star Storage proposes to use 14.1-acres of temporary construction workspace during construction, which includes a one-acre laydown yard within the Preliminary Development Area, (see Map 4 in the Maps appendix). The laydown yard will be located just north of the area where the BESS units will be installed and will be used for equipment storage, temporary job trailers, and temporary parking for construction personnel. The laydown yard will be used for the duration of construction (approximately 9 to 12 months), after which the area will be restored to pre-construction conditions to the extent practicable in accordance with the Solar Facility's Vegetation Management Plan.

Existing road intersections may require temporary widening to accommodate large construction equipment and deliveries during construction. North Star Storage will coordinate with local road authorities regarding any necessary road intersection improvements.

4.2 PROJECT LAYOUT AND SETBACK ANALYSIS

The Project facilities have been sited to avoid or minimize impacts on human settlement, environmental and cultural resources, and existing infrastructure. As described in Section 1.4, the Project is considered an energy storage system as defined by Minn. Stat. § 216E.01, subd. 3a. To date, the MPUC has not issued a Site Permit for a stand-alone energy storage system and no precedent has been established at the state level relating to setbacks for these facilities. However, pursuant to Minn. Stat. § 216E.10, subd. 1, site permits issued by the MPUC are the only approval needed.

The City of North Branch City Code was reviewed to identify setback requirements that could be applied to the Project (North Branch, no date [n.d.]). Review of the City of North Branch Zoning Map (North Branch, 2024a) indicates the Project is sited in the Rural Residential district.

The City of North Branch does not have zoning requirements specific to energy storage systems. The closest development type to the Project would be a solar energy generation facility. The City of North Branch does have a zoning ordinance for Solar Energy Systems that provides zoning requirements for solar energy generation facilities that are not otherwise permitted at the state level. In the Solar Energy Systems ordinance, it states that all equipment and structures shall conform to the setback requirements of the underlying zoning district. Setback requirements in the Rural Residential district that may be applicable to the Project are provided in Table 4.2-1.

TABLE 4.2-1
Setback Requirements

Feature	City of North Branch Setbacks (feet)	Project Facilities (feet) [a]
Ditch easement	45	Not applicable – No ditches identified adjacent to the Land Control Area
Wetland natural buffer	20	BESS – 65 feet Western Access Road – 20 feet Eastern Access Road – 540 feet
Front Yard – Interior lot, at lot line or right-of-way	40	1,865 feet
Side Yard – Interior lot	10	114 feet
Rear Yard – Interior lot	30	291 feet

[a] Measurements were taken from the fence line of the BESS unless otherwise noted.

As shown in Table 4.2-1, the Project has been sited to meet or exceed setback requirements in the City of North Branch Rural Residential district.

4.3 ESTIMATED FACILITY ACREAGES

Construction of the Project will require a Preliminary Development Area of approximately 24.5 acres, within which the existing 0.5 acre Solar Facility collector substation will remain and an additional approximately 9.8 acres will be required to host BESS components for the life of the Project (estimated to be 30 years). Areas outside of the BESS fenced gravel pad area, permanent access roads, and stormwater basin would be restored after construction is complete and existing land uses would be allowed to resume. The Preliminary Development Area is depicted on Map 4 and in the Site Plan provided in Appendix C.

TABLE 4.3-1
Summary of New Temporary and Permanent Impacts in the Preliminary Development Area

Facility [a]	Description of Footprint	Perm. (acres)	Temp. (acres)
Fenced Gravel Pad Area	Fenced gravel pad area that doesn't include the BESS units	4.8	--
BESS Enclosures	Two 100-foot by 480-foot areas where BESS enclosures will be installed	0.7	--
Stormwater Basin	Footprint of basin/swale	1.6	--
Laydown Area	Footprint of laydown area	--	1.0
Temporary Construction Workspace	Footprint outside of gravel pad area, stormwater basin, temporary construction workspace for access roads, and the project substation	--	6.7
East Access Road	Approximately 150-foot-wide temporary workspace of which approximately 25-foot-wide will be permanent	2.5	0.8
West Access Road			5.6
Solar Facility collector substation Expansion	Area of expansion	0.2	--
	TOTAL	**9.8**	**14.1**

[a] The existing 0.5-acre substation is already developed and therefore is not included in the acreages above.
Note: A double dash indicates that no impacts are anticipated for this feature. The total acres may be off by up to 0.1 acre due to rounding.

5.0 CONSTRUCTION, RESTORATION, OPERATIONS AND MAINTENANCE, AND DECOMMISSIONING

Successful completion of the Project requires a comprehensive approach that spans multiple phases. The construction phase is divided into three key sub-phases: pre-construction, construction, and post-construction.

5.1 PRE-CONSTRUCTION

5.1.1 MANAGEMENT AND PERSONNEL

North Star Storage will solicit bids for an EPC contractor to construct the Project and will prioritize EPC contractor bids that utilize local, union construction personnel to the greatest extent feasible. The EPC contractor will be required to work with local labor unions, local subcontractors, and other vendors to create a construction staffing model that prioritizes local hiring and economic benefits, while ensuring the Project is safely built on time and on budget.

An on-site construction manager will be responsible for scheduling and coordinating construction activities including EPC contractors. Additional on-site personnel will include laborers, craftspeople, supervisory personnel, civil and construction trades, and administrative and support staff. The on-site construction workforce for the Project is anticipated to range from 30 to 60 personnel. The construction workforce will likely commute to the site each day from local communities and report to the designated construction maintenance areas prior to the beginning of each workday.

General skilled labor is expected to be available in Chisago County and Minnesota to serve the Project's basic infrastructure and site development needs; however, specialized labor will be required for certain aspects of construction. The relatively short duration of construction often precludes special training of local or regional labor, and it may be necessary to hire specialized labor from other areas of Minnesota or neighboring states.

5.1.2 COORDINATION WITH LOCAL FIRST RESPONDERS

North Star Storage is committed to early coordination with local first responders. Before construction begins, project-, location-, and technology-specific Hazard Mitigation Analyses will be shared with local first responders. The Hazard Mitigation Analyses will include detailed information about the BESS technology and any potential emissions that can be expected if a failure occurs on-site. Using the Hazard Mitigation Analyses as a guide, North Star Storage will develop an Emergency Response Plan. Typical components of an Emergency Response Plan include:

- Contact information (including emergency response coordinator)
- Preparation and planning (including alarm response)
- Hazard / safety precautions
- Emergency procedures
- Firefighting
- Emergency shutdown
- Maintenance (including alarm inspection)

North Star Storage will review the Emergency Response Plan with local first responders to ensure that emergency personnel responding to any incident understand and follow the agreed upon Emergency Response Plan.

Once gates are installed on the BESS facilities, a lock box will be installed on the front gate to allow fire department access to the site in the event of an emergency. The Project will be outfitted with fire-suppression equipment to meet or exceed applicable local and state fire safety codes and standards. Only minimal water is required in an emergency and North Star Storage will coordinate the Emergency Response Plan to have adequate supplies, which may include a water tank near the entrance to the site, if required.

Fire-protection measures for the Project will include prevention and isolation methods and materials. All methods will meet National Fire Protection Association 68 or 69 and National Fire Protection Association 855. This may include smoke/fire detection sensors; ground fault detectors and alarms; and/or systems for automatic shutdown of all cooling fans and opening of electrical contacts in the BESS system. These methods will depend on the battery technology selected for the Project. In addition, North Star Storage will use batteries that are Underwriters Laboratories 9540A Certified and include Battery Management Systems that have built-in fail safes designed specifically to prevent thermal runaway and fire spread both within and outside of the BESS enclosures.

5.1.3 GEOTECHNICAL STUDY

Geotechnical and pull testing studies will be performed to determine the topsoil and subsoil types, and the mechanical properties of the soils within the Preliminary Development Area. These variables will be used to engineer the BESS foundation system. Typically, the foundation is a steel pile, which is driven into the ground with a hydraulically powered high-frequency hammer mounted on a tracked carrier. The piles are installed at pre-defined locations throughout the array area to an embedment depth of 8 feet to 14 feet below grade, depending on soil properties and other factors.

5.2 CONSTRUCTION

Construction activities for the Project will include transport and delivery of equipment and materials, site preparation, equipment installation, and site restoration. Each of these activities is generally described below. Construction of the Project is estimated to take approximately 9 to 12 months and construction activities will occur Monday through Friday, between 7:00 a.m. and 6:00 p.m. Some weekend work may be necessary during the construction period to maintain schedule due to time sensitive construction installation or circumstances such as weather delays. Substation retrofit activities may have to occur at night to prevent disruption of the Solar Facility's operations, but these construction efforts are expected to be minimal in nature and of a short duration.

5.2.1 Transport and Delivery

Construction equipment like delivery trucks and semis, cranes, forklifts, and watering trucks will commonly be used throughout this phase.

Construction personnel and heavy vehicles delivering equipment and materials will access the sites using either the west or east access road, depending on final design of the Project. During peak construction, construction personnel are estimated to account for a maximum of 60

vehicles/day (roundtrip) and deliveries of equipment and materials are estimated to account for a maximum of 8 daily roundtrips, for a total of up to 68 daily roundtrips utilizing local public roads during the 9-to-12-month construction period.

Peak traffic numbers will occur over a 6-month period, with the numbers tapering up and down before and after the peak. The access road will be constructed to accommodate use by overweight vehicles delivering equipment and materials to the site.

5.2.2 Site Preparation

After all necessary permits are obtained, site preparation work will begin. North Star Storage will request utility locates from Gopher One Call prior to any ground disturbance. A NPDES General Construction Stormwater Permit application to discharge stormwater from construction facilities will be acquired from the Minnesota Pollution Control Agency (MPCA) before construction activities commence. Best management practices (BMPs) will be used during construction and operation of the Project to protect topsoil and adjacent resources and to minimize soil erosion, whether the erosion is caused by water or wind. Practices may include containment of excavated material, protection of exposed soil, stabilization of restored material, and treating stockpiles to control fugitive dust. A SWPPP will be developed for the Project prior to construction that will include BMPs such as silt fencing (or other sediment or erosion control devices), revegetation plans, and management of exposed soils to prevent erosion. North Star Storage will submit the SWPPP to MPCA for review and approval prior to construction and obtaining coverage under the General Construction Stormwater Permit. Additionally, North Star Storage intends to implement the protocols for site restoration and vegetation management outlined in the Solar Facility's Vegetation Management Plan that was developed for the Solar Facility (refer to Section 5.3.2). If water appropriation is determined to be necessary during construction, North Star Storage will obtain approval from the Minnesota Department of Natural Resources (MNDNR).

Initial site preparation will involve grubbing and grading to create level workspaces for installation of the facilities and safe operation of construction equipment. The access road will be developed by stripping and segregating topsoil material from the area that will be used during construction. Subsoil will be compacted as specified by the civil and geotechnical engineer in the geotechnical study. After subsoils are compacted, approximately 4 to 12 inches of gravel will be installed level with the existing grade to facilitate drainage and minimize ponding. Gravel will be installed with or without geo-fabric or alternatively, cement stabilization, depending on the soil type and the recommendations of the geotechnical study. During grading, North Star Storage intends to export soils excavated from one area and import fill for other areas. As the site is relatively flat, import and export of soil materials from grading is anticipated to be minimal. For any minor differences in cut or fill related to the site, soils will be imported or exported as necessary to accommodate final grading contours. Topsoil removed from the access road will be removed to suitable locations near the site of removal and spread across existing topsoil for storage. Storage locations will be identified using Global Positioning System boundary and depth and recorded on site maps to facilitate final reclamation after decommissioning.

In general, most grading in the Preliminary Development Area will occur within the proposed fenceline area where aboveground equipment will be installed. Trenching will also be required for placement of underground electrical collection and communication lines within the fenceline of the BESS. The proposed stormwater basin will be excavated adjacent to the fenceline of the BESS. Examples of construction equipment used during this phase include backhoes, compactors, bulldozers, dump trucks, skid steer loaders, motor graders, and watering trucks.

5.2.3 Installation of Project Facilities

Following site preparation activities, the facilities will generally be installed as follows:

- establishing the stormwater basin;
- installing BESS units and underground electrical collection and communication lines;
- installing inverters (if not within BESS units) and transformers;
- expanding the Solar Facility collector substation; and
- installing the remaining associated facilities.

In general, most grading in the Preliminary Development Area will occur within the proposed fenceline area where aboveground equipment will be installed. Trenching will also be required for placement of underground electrical collection and communication lines within the fenceline of the BESS. The proposed stormwater basin will be excavated adjacent to the fenceline of the BESS.

When establishing the stormwater basin, construction equipment like excavators, bulldozers, backhoes, dump trucks, graders, and compactors will likely be used. The construction equipment expected to be needed to install the other Project facilities, includes augers/drills, concrete mixers and pumps, trenchers, cranes, cable pullers and spoolers, scissor lifts and boom trucks, and high reach bucket trucks.

5.2.3.1 BESS Facility

After grading and trenching are complete, BESS unit foundations, enclosures, and equipment vaults will be installed. The BESS units will have a grounding grid installed and will be covered with an average of approximately 3 feet of aggregate surfacing for safe operation. Foundations for the BESS units will be concrete, pier, or other foundation type as deemed appropriate based on the results of the geotechnical study.

As the preassembled BESS units are offloaded onto foundations, the electrical collection and communication systems, inverters, and transformers will also be installed. The inverters and transformers will be installed on skids adjacent to the BESS units. Aggregate fill will be placed between and around the BESS equipment and adequate lighting will be installed around the BESS site for worker safety during operation.

All equipment will be checked and commissioned prior to the Project being placed into service.

5.2.3.2 Solar Facility Collector Substation Modifications

The Project will interconnect with the existing Solar Facility collector substation via buried 34.5 kilovolt collection lines capable of bi-directional flow of electricity. Expansion of the existing substation will occur simultaneously with construction of the Project. The expanded area will also have a grounding grid installed and will be covered with an average of approximately 3 feet of aggregate material for safe operation.

Construction work to expand the Solar Facility collector substation will include installation of substructures and electrical equipment. Aboveground and underground conduits from this equipment will run to a control enclosure that will house the protection, control, and automation relay panels. A substation service transformer will be installed for primary AC power requirements. Batteries and battery chargers will be installed inside the enclosure for auxiliary power to the

switchyard's control system. Adequate lighting will be installed around the substation for worker safety during construction and operation.

One of two methods will be used to install the substation foundations. Option 1 would be to use a small rubber tire backhoe to dig out major foundations prior to pouring the concrete slabs. Option 2 would use an auger/drill type machine for minor foundations.

After the foundations are installed, collector substation equipment will be delivered to the site and installed on the prepared foundations. Secondary containment areas for the transformer will be constructed as required by the Spill Prevention Control and Countermeasures Plan (SPCC Plan) that will be prepared for the Project, and final grading will occur around the collector substation site. Finally, electrical wires will be strung, perimeter fencing will be installed, and aggregate will be placed within the fenced area of the collector substation site.

5.3 POST-CONSTRUCTION AND RESTORATION PROCEDURES

5.3.1 Inspections and Commissioning

Equipment inspections will be conducted prior to commercial operation of the Project and in compliance with applicable Site Permit conditions.

This includes inspecting the battery units, power conversion systems, electrical collection system, and communication/control systems for any visible damage, proper installation, and functionality. Electrical testing is performed to verify voltage, current, insulation resistance, and efficiency, while control systems are tested for integration with grid management and remote monitoring. Commissioning involves initial energization, system integration with the grid, and validating performance under real-world conditions, including power quality and safety checks.

5.3.2 Site Restoration

Following construction, temporary workspaces within the Preliminary Development Area where aggregate has not been installed will revert back to existing land uses or be revegetated with perennial vegetation for soil stabilization and erosion control purposes.

The goal for restoration of areas within the North Star PV-owned parcel will be to reestablish vegetation consistent with how this area is maintained by the North Star PV. North Star Storage will follow the revegetation guidelines outlined in the Solar Facility's Vegetation Management Plan that was filed on eDockets in April 2016 (North Star Solar PV LLC, 2016). These guidelines include, but are not limited to, preparing the soil and seeding with a seed mix that is compatible with the vegetation that is currently maintained within the parcel. Vegetation maintenance (e.g., haying, mowing) and noxious weed management will continue as outlined in the Solar Facility's Vegetation Management Plan. Restoration within the privately owned parcel to the west will focus on restoring temporary workspaces along the western access road to agricultural use.

To minimize the potential for wind erosion, North Star Storage will stabilize all exposed soil areas, including stockpiles, as soon as practicable when construction activity has permanently or temporarily ceased on any portion of the site and will not resume for a period exceeding 14 calendar days. Stabilization will be completed no later than 14 calendar days after the construction activity has ceased. Stabilization and erosion prevention practices will be installed in accordance with the Project SWPPP. In addition to revegetation of temporarily disturbed areas, permanent

erosion control measures will be installed to address long-term stormwater requirements. Refer to Section 4.1.5.4 for additional information on the proposed stormwater basin.

With the exception of the permanent access roads that will be maintained for access to the Project during operation, temporary workspace along the access roads will be decompacted and restored to pre-construction contours and characteristics to the extent practicable.

Based on discussions with landowners, North Star Storage is not aware of any drain tile within the Land Control Area. If damage occurs to drain tile or private ditches as a result of construction activities or operation of the Project, North Star Storage will repair any damages.

5.4 OPERATION AND MAINTENANCE PROCEDURES

5.4.1 General Operation and Maintenance Procedures

Periodic maintenance and inspection of the Project and associated facilities will occur intermittently during the operation phase of the Project, currently estimated to be 30 years. Typical maintenance activities will follow basic monthly inspections, preventative quarterly inspections, and an in-depth annual maintenance program. Up to two full-time, locally based personnel will be on staff during operation of the Project. On average, two vehicle trips to the site per month are anticipated during operations.

Approved technicians will service the BESS units and associated equipment once per month. A performance audit and inspection to assess the quality of equipment will be conducted annually. If any equipment needs to be replaced before the Project's end-of-life, North Star Storage will reuse, recycle, or dispose of equipment in accordance with applicable regulations and best management practices. Ethylene glycol, refrigerant, and lubricating oils will be kept in the O&M storage containers on site; note that all BESS equipment will come pre shipped with 136 gallons of an ethylene glycol-based coolant. Small amounts of this coolant may be kept on hand in storage for maintenance purposes. No operational water is anticipated to be required.

Vegetation outside the BESS fence line and graveled area will be managed for the operational life of the Project. Mechanical vegetation control such as mowing, trimming, and pruning will be the primary means for vegetation management. Mowing frequency is anticipated to be two to three times per year and will be continuously monitored to avoid excessive growth. Herbicides may be utilized for vegetation control; however, an effort will be made to minimize use and only apply bio-degradable, U.S. Environmental Protection Agency (EPA) registered, organic solutions that are non-toxic to wildlife and used in a manner that fully complies with all applicable laws and regulations.

Table 5.4.1-1 provides a list of O&M tasks for the Project, along the anticipated frequency of each task. The frequency of O&M tasks may vary based on facility demands and performance.

TABLE 5.4.1-1
Operations and Maintenance Tasks and Frequency

Project Component	Task	Anticipated Frequency
BESS Units	System Visual Inspection	Monthly
	Filter Inspection	Quarterly
	Battery Condition Check	Quarterly
	Cooling System Check	Monthly
Electric Boards	Case Visual Check	Monthly

TABLE 5.4.1-1
Operations and Maintenance Tasks and Frequency

Project Component	Task	Anticipated Frequency
	Fuses Check	Quarterly
	Surge Arresters Check	Annually
	Torque Check	Annually
	DC Voltage and Current Check	Quarterly
	Grounding Check	Semi-Annually
Inverters	Case Visual Inspection	Monthly
	Air Intake and Filters Inspection	Quarterly
	DC Voltage and Current Check	Quarterly
	Data Logger Memory Download	Quarterly
	Fuses Check	Quarterly
	Ground Check	Annually
	Torque Check	Annually
Support Structures	Visual Check	Monthly
Transformers	Visual Check	Monthly

Additional periodic maintenance of the facilities will include access road maintenance, snow removal, vegetation maintenance, fence and gate inspection, and lighting system checks, as needed.

5.4.2 Performance Monitoring

As described in Section 4.1.1, the Project will include an Energy Management System and a Battery Management System that will be used to monitor facility performance and identify any equipment that is not functioning properly so that any necessary repairs can be made quickly and efficiently. Performance monitoring will be utilized 24 hours per day, 7 days per week with remote technicians monitoring operations at all times.

5.5 DECOMMISSIONING

At the end of the Project's useful life, North Star Storage will either apply to the MPUC for an extension of the Site Permit (i.e., re-permit the Project) or will decommission the Project and remove the facilities. The objective for decommissioning a project is to restore the site to a condition that will allow preconstruction land uses to resume. A copy of the Draft Decommissioning Plan for the Project is provided in Appendix D.

At the end of commercial operations, North Star Storage will be responsible for removing all BESS components and associated facilities or applying for an extension of the Site Permit to allow repowering and continued operation of the Project. Should North Star Storage decide to continue operation, a decision will be made as to whether the Project will continue to operate with the existing equipment or if the facility will be upgraded with newer technologies.

Decommissioning of the Project would include removing the BESS units and foundations, inverters, transformers, underground cables and lines, equipment pads and foundations, and fencing. Standard decommissioning practices will be used, including dismantling and repurposing, salvaging/recycling, or disposing of the Project equipment and restoring the site as near as practicable to preconstruction conditions.

North Star Storage will provide written notice to the MPUC, landowners, and local units of government prior to the start of decommissioning activities. These parties will again be notified once decommissioning activities have been completed.

5.5.1 Anticipated Timeline

Decommissioning is estimated to take approximately the same number of months as installation of the Project (i.e., 9 to 12 months).

5.5.2 Financial Resource Plan

North Star Storage will be responsible for all costs to decommission the Project and associated facilities. Decommissioning of the Project is expected to cost approximately $5.6 million with an estimated scrap/salvage value of $16.3 million.

North Star Storage anticipates establishing a financial assurance in the form of an escrow account or surety bond or other financial surety equal to the costs necessary to ensure proper decommissioning, less the estimated scrap/salvage value, with City of North Branch listed as the beneficiary. Consistent with Minnesota Department of Commerce (DOC) Energy Environmental Review and Analysis recommendations, North Star Storage anticipates posting a bond no earlier than the 10th anniversary of the Project's commercial operation date.

North Star Storage will update the Decommissioning Plan every five years, beginning in year 10 of operation, or any time there is a change in ownership or permit amendment. Each revised plan will reflect advancements in construction techniques, reclamation equipment, and decommissioning standards. The amount of the financial assurance will be adjusted accordingly to offset any increases or decreases in decommissioning costs and salvage values determined during each plan reassessment. At that time, North Star Storage will create an appropriate financial surety for decommissioning purposes. North Star Storage will abide by the applicable Site Permit condition(s) and ensure the Project is decommissioned in accordance with the Site Permit. Additional information on financial resource plans and assurances can be found in the Draft Decommissioning Plan in Appendix D.

5.5.3 Removal and Disposal of Project Components

Decommissioning will involve removal of all equipment associated with the Project and returning the area to pre-development conditions. Decommissioning will include consideration of local environmental factors to minimize effects such as erosion during the removal process, and the recycling of materials demolished or removed from the site to the extent feasible. The activities that may occur as part of decommissioning are summarized below:

- Decommissioning will commence once the Project has been fully de-energized and isolated from all external electrical connections.
- Consistent with the measures described for construction and operation of the Project, BMPs will be implemented and maintained throughout the decommissioning phase as needed to avoid and minimize potential impacts to the surrounding environment, particularly those related to soil erosion and stormwater management.
- Once the site has been adequately prepared for decommissioning, the following equipment will be removed: BESS units, inverters, and step-up transformers, electrical wiring and connections, communication equipment, and fencing. All above-grade

foundations will be removed to a level of no less than four feet below the ground surface unless requested to be maintained by the landowner.

- The access road will be used for decommissioning activities. After decommissioning activities are complete, removal of access road will be discussed with the landowner and will:
    - be left intact through mutual agreement with the landowner unless otherwise restricted by federal, state, or local regulations; or
    - be removed by excavating aggregate and loading it into dump trucks using suitable excavation equipment and shipped from the site to be reused, sold, or disposed of appropriately at North Star Storage's sole discretion, consistent with applicable regulations and industry standards. If the west access road is selected for the Project, any ditch crossing connecting the access road to Lincoln Trail will be removed unless otherwise negotiated with the county.
- Equipment and materials will be salvaged or recycled to the extent feasible and in coordination with licensed subcontractors, local waste haulers, and/or other facilities that recycle construction/demolition waste; the remaining materials will be disposed of by the contractor at authorized sites, in accordance with applicable laws. Reuse or recycling of materials will be prioritized over disposal. Batteries will most likely be shipped to recycling facilities. All waste requiring special disposal (e.g., transformers) will be handled according to regulations that are in effect at the time of disposal.

During decommissioning, North Star Storage will adhere to federal, state, and local requirements, including obtaining and adhering to applicable permits and authorizations.

5.5.4 Restoration/Reclamation of Facility

Following removal of equipment, site restoration will be conducted such that the physical conditions of the area are returned to substantially the same condition that existed prior to development. These activities will include removal of gravel and other aggregate material, localized grading and disking to match surrounding elevations, replacement of topsoil from on-site stockpiles, and revegetation of disturbed areas in non-agricultural areas with an appropriate hydroseed mix. As described in Section 5.3.2, North Star Storage will follow the revegetation guidelines outlined in the Solar Facility's Vegetation Management Plan that was filed on eDockets in April 2026 (North Star Solar PV LLC, 2016).

5.5.5 Post-restoration Monitoring

Decommissioning of the Project will comply with applicable regulations including the NPDES Permit, SPCC Plan, and SWPPP, if grading activities are necessary and exceed applicable permit thresholds. Decommissioning may include post-restoration monitoring as required by the NPDES Permit and SWPPP among other applicable requirements. In addition, North Star Storage will assign a Field Representative to monitor and coordinate decommissioning activities; this Field Representative will stay in contact with the landowner and conduct on-site check-ins until the NPDES Permit is closed.

6.0 ENVIRONMENTAL INFORMATION

The description of the existing environment throughout Section 6.0 is centered around the approximately 77.6-acre Land Control Area as identified on Map 1 of this Application. The portion of the Land Control Area that would be used to construct and operate the BESS units and supporting facilities is referred to as the Preliminary Development Area. A detailed description of the Preliminary Development Area is provided in Section 2.1, and a breakdown of temporary and permanent impacts is provided in Table 4.3-1 in Section 4.3.

North Star Storage analyzed potential impacts on human and environmental resources for the Project using impact assessment areas (IAAs) or study areas. The IAA or study area for each resource is the geographic area within which the Project may exert some influence. These impact assessment areas vary by resource and are summarized in Table 6.0-1.

The following IAAs will be used:

- **Preliminary Development Area**. The Preliminary Development Area includes the temporary construction workspace and the permanent facility footprint that would be required for the preliminary design of the Project as described in Section 2.1. This is used as the IAA for displacement, geology and groundwater resources, soils, surface waters (including stormwater, floodplains, and wetlands), and vegetation.
- **One mile**. A distance of one mile from the Land Control Area is used as the IAA for analyzing potential impacts to aesthetics, recreation, archaeological and historic resources, wildlife and their habitats, and rare and unique natural resources.
- **3,200 Feet from the Preliminary Development Area**: A distance of 3,200 feet from the Preliminary Development Area is used as the IAA for analyzing potential impacts related to noise.
- **Study Area**. Defined generally as the townships and counties where the Project is located, the Study Area is used as the IAA for analyzing potential impacts to cultural values, environmental justice, public health and safety, public services and infrastructure, land use and zoning compatibility, socioeconomics, land-based economies, air quality, climate change and greenhouse gas emissions. These are resources for which impacts may extend throughout communities surrounding the Project.

TABLE 6.0-1
Impact Assessment Areas

Impact Assessment Area	Specific Resource/Potential Impact to Resource
Preliminary Development Area	Displacement, Geology and Groundwater Resources, Soils, Surface Waters (Including Stormwater, Floodplains, and Wetlands), and Vegetation
One Mile Buffers	Aesthetics, Recreation, Archaeological and Historic Resources, Wildlife and Their Habitats, and Rare and Unique Natural Resources
3,200-foot Buffers	Noise
Study Area	Cultural Values, Environmental Justice, Public Health and Safety, Public Services and Infrastructure, Land Use and Zoning Compatibility, Socioeconomics, Land-Based Economies, Air Quality, Climate Change and Greenhouse Gas Emissions

6.1 ENVIRONMENTAL SETTING

The MNDNR and the U.S. Forest Service have developed an Ecological Classification System for ecological mapping and landscape classification in Minnesota that is used to identify, describe, and map progressively smaller areas of land with increasingly uniform ecological features (MNDNR, 2024a). Through the Ecological Classification System, the State of Minnesota is split into Ecological Provinces, Sections, and Subsections. The Project is located within the Eastern Broadleaf Forest Province (222), and more specifically, the Minnesota and NE Iowa Morainal Section (222M) and the Anoka Sand Plain Ecological Subsection (222Mc).

The topography in the Anoka Sand Plain Ecological Subsection ranges from level to gently rolling, and the area is characterized by a flat, sandy lake plain and terraces along the Mississippi River (MNDNR, 2024b). Terraces are associated with historic levels of the Mississippi River. Terraces are also associated with major tributaries of the Mississippi. The major landform is a broad sandy lake plain, which contains small dunes, kettle lakes, and tunnel valleys. Here, most rivers and streams are tributaries of the Mississippi. Some rivers flow east to the St. Croix River, which eventually flows into the Mississippi. Pre-settlement vegetation was dominated by oak barrens and openings, including bur oak, northern pin oak, jack pine, and brushland. Smaller areas contained upland prairie and floodplain forest. Agricultural production is currently the predominant land use, though urban development is expanding into the ecological subsection. This is representative of the area surrounding the Project; to the north, west and south of the Project area are agricultural fields interspersed with smaller areas of forest. The 100 MW Solar Facility owned and operated by North Star PV is located immediately to the east.

6.2 HUMAN SETTLEMENT

The description of existing human settlement resources is centered around the approximately 77.6-acre Land Control Area as identified on Map 1 in the Maps appendix of this Application. The portion of the Land Control Area that would be used to construct and operate the BESS units and supporting facilities is referred to as the Preliminary Development Area; the Preliminary Development Area is discussed further in each resources' Impacts and Mitigation section, as this is the area where construction and operation impacts would occur.

Potential impacts on human settlement resources for the Project were also assessed using IAAs or study areas. The IAA or study area for each resource is the geographic area within which the Project may exert some influence. These IAAs vary by resource and are summarized in Table 6.0-1.

Generally, both construction and operation of BESS facilities have the potential to impact human settlements. Public health and safety issues may occur during construction or operation related to injuries from falls, equipment use, and electrocution. The potential also exists for BESS facilities to displace homes or businesses, introduce new noise sources, affect the aesthetics and socioeconomics of the surrounding area, be incompatible with local land use and zoning, and impact the availability or use of public services (e.g., transportation). North Star Storage reviewed publicly available data to assess the potential for the Project to affect human settlements; detailed descriptions of this analysis are provided throughout Section 6.2.

The Project is in a rural area within the southeast corner of the City of North Branch. The center of the City of North Branch is about 4.0 miles northwest of the Project along County Highway 14/Lincoln Trail. U.S. Interstate 35 is about 3.8 miles to the east. The nearest metropolitan area is St. Paul, the center of which is about 37.0 miles south of the Project.

Multiple rural residential and agricultural properties are present along County Highway 14/Lincoln Trail in the vicinity of the Project. Areas of fields, woods, and open spaces separate the Project Land Control Area from the residences in this location. Immediately to the south of the access road to the BESS is a farmstead consisting of buildings, but no residence. In between the farmstead and the Project are agricultural fields and a forested shelter belt. The areas north and west of the Project consist of actively cultivated fields and rural farmsteads located near County Highway 14/Lincoln Trail. The Solar Facility is sited in an area immediately to the east. The Project is sited on a flat, upland area that is conducive to BESS development.

6.2.1 Aesthetics

The landscape within one mile of the Project consists of gently rolling agricultural fields intersected by wooded areas and rural residential/agricultural properties to the north, west, and south, and the Solar Facility immediately to the east. The 100 MW Solar Facility is a significant component of the aesthetic setting in the area, as it is one of the largest operating solar energy facilities in the Midwest, covering 1,000 acres with more than 440,000 panels (Community Energy, 2024; Star Tribune, 2024). No designated scenic byways or public lands managed for their scenic value are located within or within one mile of the Project.

There are 22 residences located within 0.25 mile of the Project and 44 residences located within 0.5 mile of the Project. Of the 44 residences within 0.5 mile, 27 are located to the north and northwest of the Project and the remaining 17 are located to the south, southwest, and west. Other than the Solar Facility, there are no other industrial facilities located within 0.5 mile of the Project. Businesses to the south and southwest of the Project include Benjamin Franklin Plumbing and Vicki's Pet Care. Given the proximity of the Project to County Highway 14/Lincoln Trail (approximately 0.4 mile east of the road), the Project will be partially visible from the roadway. It would also be visible from certain vantage points on rural residential properties nearby. There are no established points of observation, such as rest areas, that would be impacted by the presence of the Project.

6.2.1.1 Impacts and Mitigation

Construction and operation of the Project would represent a new vertical and horizontal element that would be visible to residences and passersby using public roadways. Each BESS module will be contained in an enclosure measuring up to approximately 30 feet in length, 6 feet in width, and 10 feet in height, which is smaller than a residential home. The BESS modules would not contribute to a vertical presence that disrupts local aesthetics. In addition, the Project is consistent with the aesthetics presented by the Solar Facility, which dominates the landscape in this area and has structures of similar height. As such, visual impacts associated with the Project would be moderate but not unlike other nearby developments.

6.2.2 Cultural Values

Cultural values include those perceived community attitudes or beliefs that provide a framework for community unity. The cultural values of Chisago County today are intertwined with its diverse and layered history, which includes the Native American cultures that first inhabited the region, the influences of European settlers, and the rise of farming and recreational tourism.

Before European settlement, Native American cultures in the region were classified into four traditions: Paleoindian, Archaic, Woodland, and Plains Village and Mississippian/Oneota. Europeans arrived by 1680, with the fur trade and sawmills shaping early industries (Westwood,

2014a and Westwood 2014b). Swedish settlers arrived in the mid-1800s, followed by farming from 1850-1890, and the area became a recreational destination. Chisago County was established in 1851, named after the Chippewa word for "Fair and Lovely Lakes" (Ki-Chi-Saga) (Chisago County, n.d.).

Agriculture has been a cornerstone of Chisago County since its establishment. The county has a strong history of farming, especially dairy, grain, and livestock farming, which is evidenced through its agricultural fairs and 4-H programs. The county is also known for its outdoor recreational activities. Lakes provide opportunities for fishing, boating, and winter sports, such as ice fishing. Residents and visitors alike value the abundance of parks and trails available for hiking, biking, and snowmobiling.

Chisago County residents often come together for local events, fairs, and festivals. Cultural representation in community events is tied less to racial or ethnic heritage and more to geographic features, seasonal events, national holidays, and municipal events within the county as well as within the City of North Branch and nearby Chisago City, which is located 6.8 miles to the south of the Project. The City of North Branch holds multiple community events throughout the city each year, including the annual Fall Harvest Festival in September of each year in Central Park (North Branch Chamber of Commerce, 2024). Each June, the MS 150, a 150-mile bike ride from Duluth to White Bear Lake travels through the City of North Branch, where a rest stop occurs (Bike MS, 2024). Chisago City holds the Ki-Chi-Saga Days Celebration each August over multiple days, including a craft and food event, concerts, parade, and fireworks (Chisago City, 2024). Other communities in the county hold their own similar events at various points throughout the year.

Chisago County is home to several historical organizations dedicated to preserving and sharing the area's heritage. The Chisago County Historical Society is the primary organization for county-wide historical preservation, offering exhibits and resources on Chisago County's history (Chisago County Historical Society, 2024). The Chisago County Historical Society also has an associated Rush City Museum which focuses on the history of the northern part of Chisago County, with exhibits and events for the public. Amador Township's Heritage Center focuses on the history of Amador Township, featuring artifacts and exhibits related to the area's development (Amador Township, 2007). The Taylors Falls Public Library houses historical collections and offers resources related to the history of Taylors Falls and the surrounding area (Taylors Falls, n.d.). The Gammelgården Museum of Scandia is dedicated to Swedish immigrant heritage, featuring historic buildings and cultural exhibits (Gammelgården Museum of Scandia, 2025).

6.2.2.1 Impacts and Mitigation

The Project would not impact public participation in the regional community cultural events noted above, because it is in a rural area which is removed from the locations where regional community events would occur within the county. At this distance, no impacts on public participation in regional community cultural events are anticipated and no mitigation measures are proposed.

6.2.3 Displacement

No residences or businesses are present within the Land Control Area. There are four residences located within 400 feet of the Land Control Area. Two are located approximately 200 to 300 feet to the north, one is located 210 feet to the south, and another is located 360 feet to the southwest. An additional 10 residences are located within 400 to 800 feet of the Land Control Area, and an additional 38 are located within 800 to 3,200 feet of the Land Control Area (see Map 6). The nearest commercial and industrial facility to the Project is the adjacent Solar Facility.

6.2.3.1 Impacts and Mitigation

No residences or businesses are present within the Land Control Area. As such, development of the Project within the Preliminary Development Area would not result in displacement and no mitigation measures are proposed.

6.2.4 Environmental Justice

Environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in decisions related to the development, implementation, and enforcement of environmental laws, regulations, and policies (MPCA, 2024a). The MPCA developed the Understanding Environmental Justice in Minnesota online screening tool to assist with identifying areas of concern for environmental justice (MPCA, 2024a). The online tool uses demographic and economic data from the U.S. Census Bureau at the census tract level to identify environmental justice communities.

Minn. Statute § 216B.1691, Subd. 1(e) defines an environmental justice area in Minnesota as an area in Minnesota that, based on the most recent data published by the U.S. Census Bureau, meets one or more of the following criteria:

(1) 40 percent or more of the area's total population is nonwhite;

(2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level[4],

(3) 40 percent or more of residents over the age of five have limited English proficiency; or

(4) the area is located within Indian country, as defined in United State Code, title 18, section 1151.

Data used in the MPCA's online tool is from the U.S. Census Bureau's 2018-2022 American Community Survey 5-year estimates (MPCA, 2024a). The Project is within Census Tract 27025110302 in Chisago County. Table 6.2.4-1 presents the data from the MPCA's online tool for Census Tract 27025110302 in Chisago County.

TABLE 6.2.4-1
Environmental Justice Review of the Project Study Area[1]

County/Census Tract	Minn. Statutes § 216B.1691, Subd. 1(e) Criteria			
	Percent Non-white Population	Percent of Households with Income Equal to or Below 200 Percent of Poverty Level	Percent of Residents with Limited English Proficiency	Within Indian Country?
Chisago County				
Census Tract 27025110302	8.2	17.0	0.9	No
Source: MPCA, 2024				

[4] The US Census Bureau determines the federal poverty level each year based on household size and age of family members.

The Project is not located within tribal/Indian country in Chisago Country as defined in United State Code, title 18, section 1151. Furthermore, review of the MPCA's online tool indicates that Census Tract 27109001800 is not considered an area of environmental justice based on consideration of the factors outlined in Minn. Stat. § 216B.1691, subd. 1(e) (MPCA, 2024a).

6.2.4.1 Impacts and Mitigation

No areas of environmental justice concern are present within the Project Study Area based on review of the MPCA's Understanding Environmental Justice in Minnesota online screening tool. Because the Project would not impact areas of environmental justice concern, no mitigation measures specific to these communities are proposed.

6.2.5 Public Health and Safety

The Project is in the City of North Branch which according to the U.S. Census Bureau, has a population density of 303 people per square mile (U.S. Census Bureau, 2023). If emergency personnel were needed for the Project, multiple agencies would likely respond, depending on the situation. These include the City of North Branch Police Department, Chisago County Sheriff's Office, the City of North Branch Volunteer Fire Department, Fairview Lakes Regional Medical Center, Cambridge Medical Center, Fairview Lakes North Branch Clinic, Alina Medical Center, and Lakes Region EMS, all of which are within approximately 3.5 to 16.5 miles from the Project.

There is one tower that is part of the Allied Radio Matrix for Emergency Response (ARMER) in Chisago County, which is located in Rush City, approximately 14 miles north of the Project (The RadioReference Wiki, 2020). These ARMER towers are a part of Minnesota's Statewide Communication Interoperability Plan, which serves as a primary communication tool for emergency responders. The ARMER radio system operates by line of sight, talking to other ARMER towers. Multiple towers are needed for the system to operate effectively, to produce a solid area of coverage. The system can be interrupted if there is interference from tall objects, within the line-of-sight, typically at or near the top of a tower over 150 feet tall. There are no ARMER towers within one mile of the Project.

North Star Storage reviewed the EPA's "MyEnvironment" database and map to locate federally listed sites with potential documented environmental impacts (EPA, 2024a). The nearest hazardous waste site designated under the Resource Conservation and Recovery Act is located 1.7 miles south of the Project.

North Star Storage also reviewed the MPCA's "What's in My Neighborhood" website to identify properties with past or ongoing contamination investigations, facilities holding environmental permits or registrations, those penalized for violations by the MPCA, projects under environmental review, emergency management activities, and pollution prevention initiatives (MPCA, 2025). Two sites noted as holding environmental permits are located approximately 0.5 mile from the Project. No other sites were identified within or within one mile of the Project's Land Control Area.

6.2.5.1 Impacts and Mitigation

Construction and operation of the Project is not anticipated to affect the security and safety of the local populace. Before construction begins, a location and technology-specific Hazard Mitigation Analysis will be shared with local first responders. This analysis will include detailed information about the BESS technology and any potential emissions that can be expected if a failure occurs on-site. Using the Hazard Mitigation Analysis as a reference, the Project will provide local first

responders an Emergency Response Plan and will review the Emergency Response Plan with local first responders to ensure respondents to any incident understand and follow the agreed upon Emergency Response Plan. A typical Emergency Response Plan includes the following typical components:

- Contact Info (including emergency response coordinator)
- Preparation and Planning (including alarm response)
- Hazard / Safety Precautions
- Emergency Procedures
- Firefighting
- Emergency Shutdown
- Maintenance (including alarm inspection)

North Star Storage is committed to using Tier 1 battery energy storage products which are preferentially differentiated from other products based on the experience, financial wherewithal, and product quality. The Project will be designed and operated in accordance with the National Fire Protection Association 855 Standard on the Installation of Energy Storage Systems as well as other applicable industry codes and standards. National Fire Protection Association 855 is considered the gold-standard for BESS fire safety and includes requirements for the design, construction, installation, commissioning, operation, maintenance, and decommissioning of stationary energy storage systems.

An SPCC Plan that meets EPA requirements and details proper storage, cleanup, and disposal of oil will be in place prior to construction and operational phases of the Project. All material handling will be done by trained personnel following established procedures and transformers and other oil-filled equipment will comply with EPA containment standards.

Additionally, installation of the Project facilities will comply with standard construction practices. Established industry safety procedures will be followed during and after construction of the Project; these include clear signage during all construction activities and fencing the Project to prevent public access. North Star Storage will ensure that workers receive the necessary training to effectively carry out construction and operation activities while minimizing associated risks.

Given the distance between the nearest ARMER tower in Rush City (i.e., within 14 miles), and the fact that the Project facilities are proposed to be well below the typical height of a tower and line-of-sight near the top of these towers (i.e., greater than 150 feet above ground), the Project is not anticipated to impact the ARMER communication system. North Star Storage anticipates the tallest BESS facility to be approximately up to12 feet above ground. As such, no mitigation measures specific to ARMER towers are proposed.

6.2.5.2 Electromagnetic Field

The term electromagnetic field (EMF) refers to electric and magnetic fields that are present around any electrical device. Electric fields arise from the voltage or electrical charges and magnetic fields arise from the flow of electricity or current that travels along transmission lines, power collection lines, substation transformers, house wiring, and electrical appliances. The intensity of the electric field is related to the voltage of the line and the intensity of the magnetic field is related to the current flow through the conductors. EMF can occur indoors and outdoors.

The general consensus is that electric fields pose no health risk to humans (Ministry of Health, New Zealand, 2013). The U.S. National Cancer Institute (2019) states there is no consistent evidence connecting non-ionizing EMF to cancer. Similarly, the Minnesota State Interagency Working Group on EMF Issues (2002) concluded that the existing evidence does not establish a cause-and-effect relationship between EMF and adverse health effects. Additionally, in 2010 the Commission considered the available evidence on EMF exposures to date and concluded "there is no demonstrated impact on human health and safety that is not adequately addressed by the existing State standards for exposure."[5]

In a battery storage system, EMF sources primarily include the following sources:

- Electrical feeder lines which are used to connect the battery storage system to the grid or other facilities. The flow of electricity through these lines generates electric and magnetic fields.

- Inverters which convert DC power stored in batteries to AC power, generating EMF during operation.

- Transformers in the system which help adjust voltage levels for efficient power distribution, contributing to EMF generation.

- The electronics managing battery charging, discharging, and overall system monitoring may also generate EMF.

As discussed in Section 2.2, the Project site is adjacent to the existing Solar Facility, which is owned and operated by North Star PV. The Project will be sited directly adjacent to the existing Solar Facility collector substation and will connect to the substation via underground 34.5 kilovolt collection lines. As such, the largest sources of EMF in the area surrounding the Project will be from existing electrical collection lines and the transformers installed in the portion of the Solar Facility collector substation that will be expanded to interconnect the BESS. EMF from electrical collection lines and transformers dissipates rapidly with distance from the source (National Institute of Environmental Health Sciences [NIEHS], 2002). Generally speaking, higher voltage electrical lines produce higher levels of EMF at the source before dissipating with distance. The internationally accepted guideline for the general public exposed to electric fields is 4.2 kilovolt per meter and 833 milliGauss (mG) for magnetic fields (NIEHS, 2002).

Impacts and Mitigation

EMF levels were not modeled for the buried electrical collection lines or the transformers. However, several studies have documented EMF exposure of various high voltage transmission lines. The NIEHS provides typical EMF levels for power transmission lines (NIEHS, 2002). A Canadian study of collection lines at a wind facility measured EMF of the project's 27.5 kilovolt collection lines, slightly lower voltage than the electrical collection lines proposed for the Project. This study found magnetic fields associated with buried electrical collection lines to be within background levels at 1 meter above ground and up to 16.5 mG directly beneath overhead 27.5 kilovolt lines (McCallum et al., 2014). As demonstrated here, electric and magnetic fields will be well below the international guidelines of 4.2 kilovolt per meter and 833 mG, respectively.

[5] OAH Docket Number 7-2500-20283-2, ALJ Findings of Fact, Conclusions and Recommendations at Finding 216 (April 22, 2010 and amended April 30, 2010)

Additionally, since the transformers are enclosed in a grounded metal case (shielded), they typically do not emit much EMF.

Stray voltage is an unintended transfer of electricity between two grounded objects and is typically caused by improperly grounded electrical equipment in buildings or by a faulty utility connection. All electrical components in the Project, including inverters and transformers, will be grounded in accordance with National Electric Safety Code. Soil resistivity measurements will be taken on site as part of the Project's geotechnical analysis, and that data will be used to help design grounding systems. Additionally, collection and communication lines will be installed below ground to connect the BESS units to the Solar Facility's collector substation. For these reasons, the potential for stray voltage to occur as a result of the Project will be negligible. Should a fault occur during operation of the Project, it would be quickly identified by monitoring systems and corrected.

The nearest residence is 540 feet from the BESS units (see Map 6). At this distance, any electric and magnetic fields generated by the Project facilities would have dissipated to background levels before reaching this residence. As such, impacts are anticipated to be negligible, and no mitigation measures specific to EMF are proposed.

6.2.6 Noise

Noise is measured in decibels using a logarithmic scale. Since human hearing is more sensitive to some frequencies than others, the A-weighted decibel scale (dBA) adjusts for this by assigning more weight to frequencies that humans hear best, while reducing the weight of frequencies that humans are less sensitive to, like very high and very low frequencies. In agricultural and rural environments, common sources of noise include farm equipment such as tractors and combines, traffic on roadways, bird calls, insects, and the sound of wind moving through vegetation. According to the American National Standards Institute and Acoustical Society of America 12.9-2013/Part 3 (2013), typical noise levels in rural residential areas are 40 dBA during the day and 34 dBA at night.

The background noise near the Project primarily comes from farming equipment and operations, wind, and passenger vehicles. Table 6.2.6-1 compares decibels emitted from typical noise sources.

TABLE 6.2.6-1
Common Noise Sources

Sound Pressure Level (dBA)	Common Noise Source
110	Rock Band at 5 meters
110	Jet flyover at 300 meters
95	Gas lawnmower at 1 meter
85	Food blender at 1 meter
80	Shouting at 1 meter
70	Vacuum cleaner at 1 meter
65	Normal speech at 1 meter
55	Large business office
50	Quiet urban daytime
40	Quiet urban nighttime
29	Bedroom at night
20	Quiet rural nighttime
12	Threshold of hearing

TABLE 6.2.6-1
Common Noise Sources

Sound Pressure Level (dBA)	Common Noise Source
Source: MPCA, 2015	

Minnesota Statute Section 116.07, subd. 2 empowers the MPCA to adopt noise standards. The agency sets these standards in Minnesota Rule Chapter 7030, requiring A-weighted noise measurements. The standards distinguish between daytime (7:00 a.m. to 10:00 p.m.) and nighttime (10:00 p.m. to 7:00 a.m.) hours. They define maximum allowable noise volumes that cannot exceed specified levels for more than 10 percent (L_{10}) and 50 percent (L_{50}) of any hour. Household units fall under Noise Area Classification 1. Table 6.2.6-2 details the MPCA state noise standards.

TABLE 6.2.6-2
MPCA State Noise Standards - Hourly A-Weighted Decibels

	Daytime (7:00 a.m. – 10:00 p.m.)		Nighttime (10:00 p.m. – 10:00 a.m.)	
Noise Area Classification	L_{10}	L_{50}	L_{10}	L_{50}
1 – Residential	65	60	55	50
2 – Commercial	70	65	70	65
3 – Industrial	80	75	80	75
Source: Minn. R. Chapter 7030.0040				

The Noise Sensitive Areas (NSAs) nearest the Project primarily comprise residential homes. These NSAs fall under Noise Area Classification 1 limits in Table 6.2.6-2. The MPCA's "A Guide to Noise Control in Minnesota" (MPCA, 2015) explains noise propagation and attenuation. Sound naturally decreases in amplitude as it travels outward, spreading across an increasingly larger sphere or cylinder, which reduces energy per unit area. Specifically, doubling the distance from a point source reduces sound level by 6 dBA. When sound energy doubles—such as two 50 dBA sources instead of one—the sound level increases by approximately 3 dBA. The human ear typically detects sound changes of 3 dBA, with a 5 dBA change being clearly noticeable.

North Star Storage identified NSAs within 3,200 feet of the BESS units. BESS units are the most likely Project component to generate noise during operation of the Project. Additional noise sources attributable to the Project include auxiliary skids, medium voltage transformers within the BESS, the heating, ventilation, and air conditioning system associated with the O&M building, and modifications to the existing substation transformer. The proximity of NSAs to the BESS units is summarized in Table 6.2.6-3; no NSAs are within 400 feet of the BESS. The NSA locations are identified on Map 7.

TABLE 6.2.6-3
Noise Sensitive Area Distance Distribution

Distance From Site to Noise Sensitive Area (Feet)	Number of Noise Sensitive Areas
<400	0
400 -800	2
800-1,600	5
1,600 - 3,200	27

Construction vehicles and equipment will generate intermittent noise during project activities. The noise impacts will be temporary, with sound levels varying based on the day's specific construction tasks and the distance between noise sources and receptors. The U.S. Department of Transportation (USDOT) Federal Highway Administration (USDOT, 2017) provides a table (see Table 6.2.6-4) detailing typical sound pressure levels in dBA at 50 feet for various construction equipment.

TABLE 6.2.6-4
Typical Sound Levels from Construction Equipment

Equipment	Max Sound Pressure Level 50 feet (dBA)
Backhoe	80
Compactor	82
Concrete Mixer	85
Dozer	85
Generator	81
Grader	85
Loader	85
Pile Driver (Impact)	101
Truck	88
Source: U.S. Department of Transportation Federal Highway Administration, 2017	

6.2.6.1 Impacts and Mitigation

Construction vehicles and equipment will generate noise during construction of the Project. Noise levels will fluctuate based on daily construction activities and will likely reach adjacent NSAs (see Table 6.2.6-3 for NSA distances). North Star Storage proposes to conduct most construction work during daylight hours from 7:00 a.m. to 6:00 p.m.

Noise associated with construction activities is expected to be short-term and will vary depending on the phase of construction in progress at any one time. Construction activities will be performed with standard heavy construction equipment. Construction equipment noise levels will typically be less than 85 dBA at 50 feet when equipment is operating. People at nearby residences and buildings may be able to hear construction noise, but the overall impact will be short term and primarily limited to daytime hours. As presented in the Noise Assessment (see Appendix E), the total calculated sound level due to construction at the nearest residence, approximately 593 feet from the BESS, is estimated to be 63.5 dBA, of which the potential increase due to the Project is 18.5 dBA. Nighttime work at the substation may be necessary to minimize interference with the Solar Facility’s ongoing operations. However, these activities are anticipated to generate minimal noise disturbance and be temporary in nature.

During operation, the Project's primary noise sources will include inverters, the BESS unit cooling systems, and the modifications to the existing substation transformer. Although the Project includes modifications to the substation transformer, any noise increases to the transformer due to the Project will be minor compared to the operation of the BESS, as illustrated in Appendix E. Nonetheless, the substation transformer has been included in the noise analysis in order to conservatively estimate overall noise due to the operation of the Project. Table 6.2.6-5 summarizes the anticipated distances to reach the most stringent MPCA noise standard for nighttime sound (50 dBA) and provides dBA measurements at 50 feet for noise level calculations for representative equipment. Final equipment choices will be made prior to construction.

Additional details are provided in the Noise Assessment prepared for the Project, which is available in Appendix E.

TABLE 6.2.6-5
Anticipated Operational Noise Levels for the Project

Type	Equipment Model	Distance to 50 dBA (feet)	dBA at 50 feet
BESS Unit	LG DC Link Battery [a]	104	56.6
Auxiliary Skid	Unknown	12	37.3
Medium Voltage Transformer	Unknown	113	57.3
Operations and Maintenance Building heating, ventilation, and air conditioning	Unknown	107	56.8
Substation Transformer (existing)	Unknown	312	66.2

[a] Noise estimates from the manufacturer are preliminary and conservative; therefore, the estimated distance to a dBA of 50 and dBA at 50 feet represent the worst-case scenario.

According to conservative noise calculations outlined in Appendix E, the Project has the potential to exceed the MPCA noise standard of 50 dBA at five NSAs. However, these calculations were conducted using the most conservative sound estimates for the Project components in order to create a worst-case scenario. In practice, it is likely that the Project will generate much less operational noise. Once the final Project design is established, noise attributable to the operation of the Project will be re-evaluated to determine whether noise mitigation is required. If this evaluation determines that operational noise levels exceed the MPCA noise standard of 50 dBA at NSAs, North Star Storage will implement targeted noise reduction strategies to minimize acoustic impacts, as necessary. Common noise mitigation strategies could include installing acoustic enclosures around equipment, using sound-absorbing wall panels, adapting the BESS' cooling system firmware to avoid noise violations. or strategically placing components away from property boundaries.

6.2.7 Public Services and Infrastructure

Public services are commodities provided by the government to its citizens, those services are used to benefit public health and safety. These services consist of transportation, emergency services, utilities, etc. This section addresses the potential for the Project to affect public services and associated infrastructure.

6.2.7.1 Transportation

Interstate 35, which has an annual daily traffic volume of over 30,000 vehicles per day, is located approximately 3.8 miles to the west of the Land Control Area. The nearest state highway to the Land Control Area is State Highway MN-95, which is 2.5 miles north. Other roads that surround the Land Control Area are local county or township roads. North Star Storage is contemplating options for the access road to the BESS. Access to the Project would be from County Highway 14, also known as Lincoln Road, or from the Solar Facility to the east of the Project (see Section 4.1.5.1). Annual Average Daily Traffic (AADT) counts based on Minnesota Department of Transportation's (MnDOT's) Traffic Mapping Application are provided in Table 6.2.7-1 (MnDOT, 2024a).

TABLE 6.2.7-1
Annual Average Daily Traffic in the Study Area

Roadway	Year	AADT Traffic Volume
Lincoln Road (west)	2022	3,332
Kost Trail (east)	2023	1,080
375th Street (north)	2022	489
Forest Blvd N (west)	2023	5,428
Lent Trail (south)	2023	2,168
Interstate 35 (west)	2023	32,873
MN-95 (north)	2022	3,412
Source: MnDOT, 2024a		

No railroads are located within the Land Control Area. The St. Croix Valley Railroad is the nearest railroad to the Land Control Area and is located approximately 3.4 miles northwest of the Land Control Area (MnDOT, 2024b).

The nearest Federal Aviation Administration (FAA)-registered airport to the Project is the Al's Due North Airport located approximately 3.5 miles northwest of the Land Control Area. This is a private use airport that operates one turf runway. Rush City Regional Airport and Forest Lake Airport are the closest public airports, which are approximately 16.5 miles to the north and 16 miles to the south, respectively. Rush City Regional Airport and Forest Lake Airport each operate one asphalt runway (AirNav, 2024).

6.2.7.2 Emergency Services

As discussed in Section 6.2.5, if emergency personnel were needed for the Project, multiple agencies would likely respond, depending on the situation. The City of North Branch Police Department, Chisago County Sheriff's Office, City of North Branch Volunteer Fire Department, Fairview Lakes Regional Medical Center, Cambridge Medical Center, Fairview Lakes North Branch Clinic, Alina Medical Center, and Lakes Region EMS, all of which are within approximately 3.5 to 16.5 miles from the Land Control Area.

6.2.7.3 Local Utilities

Chisago county is supplied water from groundwater wells, primarily extracted from sand and gravel aquifers and bedrock aquifers (Barry, 2014a). The City of North Branch stores water in three water towers that can store up to 1,000,000 gallons, while rural residents use private wells. Sewage in the City of North Branch is serviced by a mechanical wastewater treatment facility, while rural residents utilize septic systems (North Branch, 2024b). No wells or septic fields are present within the Land Control Area based review of Minnesota Department of Health (MDH) records (MDH, 2024a).

Approximately six telephone service providers and eleven broadband providers operate in Chisago County (Minnesota DOC, 2024; Minnesota Department of Employment and Economic Development [MN DEED], 2023a and 2023b). Electric service in the Project Study Area is supplied by East Central Energy and Xcel Energy (MPUC, n.d.).

6.2.7.4 Regional Utilities

The National Pipeline Mapping System was searched to assess whether pipelines are present within or adjacent to the Land Control Area. National Pipeline Mapping System pipeline data consists of gas transmission pipelines and hazardous liquid pipelines jurisdictional to the Pipeline and Hazardous Materials Safety Administration. There is one gas transmission pipeline that intersects the Project's west access road and generally runs from southeast to northwest through the Land Control Area. One hazardous liquid pipeline is mapped approximately 4.8 miles west of the Land Control Area and generally runs north to south (USDOT, 2024).

Two existing transmission lines bisect the eastern portion of the Land Control Area. An existing Xcel Energy 500/230 kilovolt double-circuited transmission line runs north-south through the Land Control Area as it travels towards the Chisago County Substation, which is about 0.5 mile south of the Land Control Area. The Chisago County Substation is the POI for the Solar Facility and the Project. In addition. The gen-tie line for the Solar Facility exits the Solar Facility collector substation on the south side and travels south towards the Chisago County Substation. Six additional existing transmission lines are mapped within one mile of the Land Control Area with voltages ranging from 115kV to 500kV. One of these transmission lines interconnects to the Chisago County Substation from the north, four interconnect to the Chisago County Substation from the south, and one transmission line runs from north to west adjacent to, but not interconnected to, the Chisago County Substation (U.S. Energy Information Administration, 2023).

6.2.7.5 Public Communications

Landline telephone service in the Project Study Area is provided to farmsteads, rural residences and businesses by Qwest Corporation, Citizens Telecom Co, and Frontier Citizens Com (Minnesota DOC, 2024). Cellular services in the Study Area are provided by many carriers including T-Mobile, Verizon Wireless, and AT&T Mobility. Midcontinent Communications provides cable services. Other services that are operating in Olmsted County, including fixed wireless, satellite, DSL, and fiber, include Centurylink, Consolidated Communications, Frontier, Genesis Wireless, HughesnNet, Martek Wireless, Stalwart Wireless, Starlink, Viasat, Inc, and Windstream (MN DEED, 2023a).

Based on data from the MN DEED, the majority of rural City of North Branch, nearest to the Project, is identified as either an Unserved Area (no wireline broadband of at least 25 megabytes per second (mbps) download and 3 mbps upload) or an Underserved Area (less than or equal to 25 mbps/3 mbps – Less than 100 Mbps/20Mbps). However, a majority of the City of North Branch is identified as a Served Area (wireline broadband of at least 100 Mbps/20 Mbps) (MN DEED, 2023b).

6.2.7.6 Emergency Communications

As discussed in Section 6.2.5, there is one ARMER tower in Chisago County. This ARMER tower is a part of Minnesota's Statewide Communication Interoperability Plan, which serves as a primary communication tool for emergency responders. The ARMER radio system operates by line of sight, talking to other ARMER towers. Multiple towers are needed for the system to operate effectively, to produce a solid area of coverage. The system can be interrupted if there is interference from tall objects, within the line-of-sight, typically at or near the top of a tower over 150 feet tall. There are no ARMER towers within one mile of the Project; the nearest ARMER

tower is located in Rush City which is approximately 14 miles east of the Land Control Area (The RadioReference Wiki, 2020).

6.2.7.7 Impacts and Mitigation Measures

Transportation

Access to the Project will be from County Highway 14/Lincoln Trail and 367th Street and July Avenue as shown on Map 8. During the construction phase, temporary traffic impacts are anticipated on some public roads within the Study Area, particularly those roads that are closest to the Land Control Area, from additional traffic and slow-moving construction vehicles. No changes or improvements to existing roadways in the Study Area are anticipated.

Traffic during construction is estimated to be approximately 10 pickup trucks, cars, and/or other types of employee vehicles onsite for the majority of construction. It is estimated that approximately 8 semi-trucks per day will be used for delivery of facility components. Semi-truck delivery will vary per day depending on time of construction and delivery timeline of equipment. Overweight or oversized loads are unlikely. If they are required, North Star Storage will obtain the appropriate approvals prior to construction. For purposes of comparison, the functional capacity of a two-lane paved rural highway is in excess of 5,000 vehicles per day, AADT. Since the area roadways have AADTs that are well below capacity, this increased traffic may be perceptible to area residents, but the slight increase in volume is not expected to affect traffic function. Slow-moving construction vehicles may also cause delays on smaller roads, similar to the impact of farm equipment during planting or harvest. However, these delays should be minimal for the relatively short construction delivery period.

After construction is complete, traffic impacts during the operations phase of the Project will be negligible. A small maintenance crew driving through the area in pickup trucks on a regular basis will monitor and maintain the facilities as needed, but traffic function will not be impacted as a result.

North Star Storage used the FAA Notice Criteria Tool to determine the need for filing 7460-1 Notice of Proposed Construction forms (see Appendix B). The results indicated the Project does not exceed the Notice Criteria. As such, Project facilities will not exceed obstruction standards and would not be a hazard to air navigation. No mitigation measures are anticipated or proposed for air traffic.

Emergency Services

Construction and operation of the Project will have minimal impacts on the security and safety of the local populace. Before construction begins, a location and technology-specific Hazard Mitigation Analysis will be shared with local first responders. This analysis will include detailed information about the BESS technology and any potential emissions that can be expected if a failure occurs on-site. Using the Hazard Mitigation Analysis as a reference, North Star Storage will provide local first responders an Emergency Response Plan and subsequent review of the same to ensure respondents to any incident understand and follow the agreed upon Emergency Response Plan.

Local Utilities

North Star Storage will coordinate with Gopher State One Call before and during construction to fully understand infrastructure locations and safety concerns and to avoid possible structural conflicts. North Star Storage will also conduct an American Land Title Association survey to identify the locations of underground utilities. Final design will minimize and avoid impacts to underground utilities; if conflicts are unavoidable North Star Storage will coordinate with the utility to develop an approach to reroute or otherwise protect the utility. Underground utilities will be marked prior to construction start.

Regional Utilities

As described in Section 2.2, the Project will be sited directly adjacent to the existing Solar Facility collector substation, and will connect to the POI, the Chisago County Substation, utilizing the existing gen-tie line for the Solar Facility. Underground 34.5 kilovolt medium voltage collection lines will tie the Project to the Solar Facility collector substation, and, as a result, no high new high voltage transmission line or gen-tie line are required for the Project. North Star Storage will coordinate with the owners of the existing transmission lines that bisect the Land Control and Preliminary Development Areas to avoid impacting these facilities.

Public Communications

North Star Storage does not anticipate any impacts to existing utilities, such as public communications. If cell tower signal or broadband interference is identified during or after construction of the Project, North Star Storage will address the interference on a case-by-case basis. North Star Storage does not propose mitigative measures at this time, as no impacts are anticipated.

Emergency Communications

As discussed in Section 6.2.5, the nearest ARMER tower to the Project is over 14 miles to the north in Rush City. The Project will not impact this communication system as Project facilities are proposed well below the typical height of a tower and line-of-sight near the top of these towers (i.e., greater than 150 feet above ground). North Star Storage anticipates the tallest BESS facilities to be approximately up to 12 feet above ground, respectively. As such, no mitigation is proposed.

6.2.8 Land Use and Zoning

6.2.8.1 Land Use

North Star Storage reviewed information available from the U.S. Geological Survey (USGS) National Land Cover Database (NLCD) to characterize the existing land uses and cover within the Land Control Area (Dewitz and USGS, 2021). The Project is in the City of North Branch and the primary land use in the Land Control Area is agricultural, as shown in Table 6.2.8-1 and on Map 9.

TABLE 6.2.8-1
Land Use Within the Land Control Area

Land Use Type [a]	Land Control Area (acres / percent)
Agricultural Land	68.3 / 88.1
Deciduous Forest	2.6 / 3.3
Developed Land	2.6 / 3.3
Emergent Herbaceous Wetlands	4.0 / 5.2
Woody Wetlands	0.1 / 0.2
TOTAL	**77.6 / 100%**

[a] According to NLCD, the existing 0.5-acre Project Substation is agricultural land. The acreages in this table were adjusted to reflect this existing developed land use.

Source: Dewitz and USGS, 2021

Note: The total acres may be off by up to 0.1 acre due to rounding.

Agricultural land within the Land Control Area is predominantly used for row crop agricultural production. Developed land in the Land Control Area is primarily associated with existing public roadways and the existing Solar Facility collector substation; the NLCD data shows the categorizes the existing substation as agricultural land, but this area was manually recategorized as developed land as part of this analysis. Emergent herbaceous and woody wetland areas are present in the northwest and southeast portions of the Land Control Area; a more detailed discussion of wetlands in the Land Control Area is presented in Section 6.5.5. A small area of forested land is located in the southeast portion of the Land Control Area.

6.2.8.2 Zoning

Energy storage systems are subject to Minnesota's Power Plant Siting Act (Minn. Stat. § 216E). As such, and pursuant to Minn. Stat. § 216E.10, subd. 1, site permits issued by the MPUC, "shall be the sole site or route approval required to be obtained by the utility. Such permit shall supersede and preempt all zoning, building or land use rules, regulations or ordinances promulgated by regional, county, local and special purpose government. Therefore, North Star Storage is not required to apply to county zoning authorities for additional building or land use permits or approvals for the Project. However, zoning information is discussed here to provide information on how the Project may impact existing land uses and future development in the City of North Branch.

Review of the City of North Branch Zoning Map (North Branch, 2024a) indicates the Project is sited in the Rural Residential district. Zoning information is shown on Map 6. The City's zoning code does not specifically address BESS systems.

However, the Solar Energy Systems Ordinance defines a solar energy system as a system that collects and stores energy. The Solar Energy Systems Ordinance details the zoning requirements for solar energy generation facilities that are not otherwise permitted at the state level and notes that solar energy systems are a permitted use in the Rural Residential district. A BESS is not included in the definition of a Solar Energy System, but it was included here to note how the City views renewable energy systems.

6.2.8.3 Impacts and Mitigation Measures

A breakdown of the NLCD land use/cover types within the Preliminary Development Area is presented in Table 6.2.8-2. As shown in Table 6.2.8-2, approximately 97.3 percent (23.8 acres)

of the Preliminary Development Area consists of agricultural land and the remaining 2.7 percent (0.7 acre) consists of developed land.

TABLE 6.2.8-2
NLCD Land Use/Cover Within the Preliminary Development Area

Land Use/Cover Type	Total in Preliminary Development Area (acres / percent) [a]	Existing Project Substation Impervious Surfaces (acres)	Conversion to Impervious Surfaces (acres) [b]	Conversion to Perennial Vegetation (acres) [c]	Restored to Previous Use (acres) [d]
Agricultural Land	23.8 / 97.3	--	8.2	1.6	14.0
Developed	0.7 / 2.7	0.5	<0.1	--	0.1
TOTAL	**24.5 / 100**	**0.5**	**8.2**	**1.6**	**14.1**

[a] According to NLCD, the existing 0.5-acre Project Substation is agricultural land. The acreages in this table were adjusted to reflect this existing developed land use

[b] Includes the fenced gravel pad area, BESS enclosures, Solar Facility collector substation expansion area, and access roads

[c] Includes the stormwater basin

[d] Includes temporary construction workspaces laydown area

Note: A double dash indicates this land use/cover type would not be impacted. The total acres may be off by up to 0.1 acre due to rounding.

Source: Dewitz and USGS, 2021

Of the 24.5 acres included in the Preliminary Development Area, about 8.2 acres would be converted to impervious surfaces (e.g., gravel or asphalt) to host the BESS units and expand the Solar Facility collector substation. This includes all BESS components within the gravel pad/fenceline including the Solar Facility collector substation expansion and both proposed access roads. Should only one of the two proposed access roads be constructed, the total amount of impervious surfaces would be reduced. The proposed 1.6-acre stormwater basin will be planted with perennial vegetation per the Solar Facility's Vegetation Management Plan. The remaining 14.1 acres of the Preliminary Development Area used as temporary workspace during construction would be restored after construction is complete and existing land uses would be allowed to resume.

As discussed in Section 5.3.2, North Star Storage will follow the revegetation guidelines outlined in the Solar Facility's Vegetation Management Plan that was filed with eDockets in April 2016 (North Star Solar PV LLC, 2016). These guidelines include, but are not limited to, preparing the soil and seeding with a seed mix compatible with the vegetation that is currently maintained within the parcel. Vegetation maintenance (e.g., haying, mowing) and noxious weed management will continue as outlined in the Solar Facility's Vegetation Management Plan. Restoration within the privately owned parcel to the west will focus on restoring temporary workspaces along the western access road to agricultural use.

Converting portions of the Preliminary Development Area for operation of the Project would effectively convert agricultural land to industrial use for the life of the Project (anticipated to be 30 years). As discussed in Section 6.3.1.1, the conversion of up to 8.2 acres of agricultural land to industrial use is not anticipated to have a significant impact on the availability of agricultural land within Chisago County as this acreage constitutes 0.01 percent of the total agricultural land in Chisago County (81,038 acres) (U.S. Department of Agriculture [USDA], 2022).

The Project will be similar in nature to other development in the area surrounding the Preliminary Development Area, in particular the adjacent Solar Facility and Solar Facility collector substation. As noted above, the City of North Branch City Code definition of Solar Energy Systems, which appears to include energy storage, states that solar farms are a permitted use in the Rural Residential district (North Branch, n.d.). North Star Storage has designed the Project to be consistent with the stated setback distances in the Rural Residential district (refer to Table 4.2-1 in Section 4.2). The City of North Branch Solar Energy Systems Ordinance requires landscaping to reasonably mitigate visual impacts to adjacent residences. The significant setbacks from public right-of-way and adjacent residences suggests the Project will not have significant visual impacts on adjacent residences or people travelling on public roads. Moreover, neither the Solar Facility collector substation nor the adjacent portions of the Solar Facility have landscaped screening. Accordingly, no visual screening is proposed for the Project.

6.2.9 Recreation

North Star Storage reviewed publicly available geographic information system (GIS) data from USGS, U.S. Fish and Wildlife Service (USFWS), and MNDNR to identify public recreation areas within and within one mile of the Land Control Area. No federal, state, or local public recreation areas were identified within the Land Control Area.

Generally, visitors travel through the area for sightseeing and recreational opportunities along the St. Croix River, including the St. Croix National Scenic Riverway, Wild River State Park, Interstate State Park, and Wild Mountain Ski Area, all located 10 miles or more east of the Project. These locations offer opportunities for outdoor recreation such as skiing, hiking, and camping.

The entrance and parking lot to the MNDNR's Janet Johnson Memorial WMA is located approximately 0.6 mile north of the Land Control Area on the west side of County Highway 14/Lincoln Trail (see Map 10). The WMA is approximately 787 acres in size and is largely undeveloped except for the public access point. The property consists of a variety of habitats and is primarily managed for migratory waterfowl, deer, and turkey habitat. It provides outdoor recreation and hunting opportunities (Trust for Public Land, 2024). There is a No Shooting or Hunting Area along the east boundary of this WMA along Lincoln Trail. The parking lot is equipped with signage and maps (MNDNR, 2024c).

A snowmobile trail managed by the City of North Branch Sno Drifters is located 0.5 mile to 1.0 mile to the north, east, and southeast of the Land Control Area along County Highway 14/Lincoln Trail, 367th Street, Keystone Avenue, and County Highway 11/Kost Trail (see Map 10) (Minnesota Geospatial Commons, 2024a).

6.2.9.1 Impacts and Mitigation

The Project would not impact public recreation areas. Both the Janet Johnson Memorial WMA and the snowmobile trails managed by the City of North Branch Sno Drifters are separated from the Preliminary Development Area by agricultural land, forested land, and public roadways. Temporary increases in noise and dust during the period of active construction are unlikely to be noticeable to users of these public recreation areas given the distance from the Preliminary Development Area and the forested and residential areas. As such, no mitigation measures specific to public use and enjoyment of recreation areas are proposed.

6.2.10 Socioeconomics

Information from the U.S. Census Bureau's Quick Facts and the 2022 American Community Survey 5-year Estimates Data Profiles was reviewed to characterize the socioeconomic environment in the Project Study Area (U.S. Census Bureau, 2023; U.S. Census Bureau, 2022). Demographic information is provided for the City of North Branch and Chisago County, and for the State of Minnesota for comparison. Demographic information for the Study Area is provided in Tables 6.2.10-1 and 6.2.10-2.

TABLE 6.2.10-1
Population and Economic Characteristics within the Study Area

Demographic	Minnesota	Chisago County	City of North Branch
2020 Census Population [a]	5,706,804	56,619	10,787
July 1, 2023 Population Estimates [a]	5,737,915	58,535	11,791
Percent Change 2010 – 2023 [a]	0.5%	3.4%	9.3%
Per Capita Income (U.S. Dollars) [a]	$44,947	$41,814	$44,360
Unemployment Rate (%) [b]	4.0	3.7	2.6%
Persons in Poverty (%) [a]	9.3%	5.4%	7.2%
Top Three Industries [b,c]	E, M, R	E, M, C	E, M, P

[a] U.S. Census Bureau QuickFacts, 2023
[b] U.S. Census Bureau, 2022
[c] Industries are defined under the 2012 North American Industry Classification System and abbreviated as follows: C = Construction; E = Educational, Health and Social Services; M = Manufacturing; P = Professional, scientific, and managements, and administrative and water management services, R = Retail Trade.

As shown in Table 6.2.10-1, population levels in Chisago County and Minnesota increased slightly from 2010 to 2023. In comparison, the population of City of North Branch increased at a higher rate than the state and county. The per capita income in Chisago County is lower than the state average whereas the per capita income in City of North Branch is closer to the state average. Unemployment rates at the state and county levels are similar, while the unemployment rate in the City of North Branch is lower than the state and county averages. The percent of persons in poverty in City of North Branch and at the state level are similar, while the percentage of persons in poverty in Chisago County is slightly lower. Of the top three industries in each category, the top two are:

- educational services, health care and social assistance; and
- manufacturing.

The third most common industry varies between the state, county, and local levels, as follows:

- retail trade is the third most comment industry for the State of Minnesota;
- construction is the third most common industry in Chisago County; and
- professional, scientific, and managements, and administrative and water management services is the third most common industry in the City of North Branch.

Most of the population in the Study Area self-identify as White Alone, Not Hispanic or Latino, making up about 90.8 percent of the county and 92.1 percent of City of North Branch, which

exceeds the state level, where 76.9 percent of the population identifies as White Alone, Not Hispanic or Latino.

TABLE 6.2.10-2
Race and Ethnicity of the Population in the Study Area

Race or Ethnicity	Minnesota	Chisago County	City of North Branch
White Alone, Not Hispanic or Latino (%)	76.9	90.8	92.1
Black or African American Alone (%)	7.9	1.6	0.5
American Indian or Alaska Native Alone (%)	1.4	0.9	0.0
Asian Alone (%)	5.5	2.3	2.0
Native Hawaiian/ Pacific Islander Alone (%)	0.1	N/A	0.0
Two or More Races (%)	2.9	1.7	3.3
Hispanic or Latino (%)	6.5	3.1	2.3
Total Minority (%) [a]	23.1	9.2	7.9

[a] Total minority percentage equals the total population minus the population of White Alone, Not Hispanic or Latino.
Note: N/A = Not Available
Source: U.S. Census Bureau, 2023

6.2.10.1 Impacts and Mitigation

The Project is designed to be socioeconomically beneficial to the landowners, local governments, and communities. Landowner compensation is established by voluntary leases or purchase agreements between the landowners and North Star Storage for lease or purchase of the land.

Construction of the Project would provide temporary increases to the revenue of the area through increased demand for lodging, food services, fuel, transportation, and general supplies. The Project will also create new local job opportunities for various trade professionals that live and work in the area and it is typical to advertise locally to fill required construction positions. Opportunity exists for sub-contracting to local contractors for gravel, fill, and civil work. Additional personal income will also be generated by circulation and recirculation of dollars paid out by the Project as business expenditures and state and local taxes.

North Star Storage will solicit bids for an EPC contractor to construct the Project and will prioritize EPC contractor bids that utilize local, union construction personnel to the greatest extent feasible. The EPC contractor will be required to work with local labor unions, local subcontractors, and other vendors whenever possible to create a construction staffing model that prioritizes local hiring and economic benefits, while ensuring the Project is safely built on time and on budget. North Star Storage met with union representatives as part of pre-application stakeholder outreach; summaries of discussions with union representatives are provided in Section 7.5.

General skilled labor is expected to be available in Chisago County or Minnesota to serve the Project's basic infrastructure and site development needs. Specialized labor will be required for certain aspects of the Project. It may be necessary to import specialized labor from other areas of Minnesota or neighboring states because the relatively short construction duration often precludes special training of local or regional labor.

The on-site construction workforce for the Project is anticipated to range from 30 to 60 personnel. The construction workforce will likely commute to the Project site each day from local communities. The O&M of the facility will require two long-term personnel. North Star Storage

anticipates that sufficient temporary lodging and permanent housing will be available within Chisago County to accommodate construction laborers and long-term personnel.

In general, the socioeconomic impacts associated with the Project will be a net positive. North Star Storage will pay wages and purchase goods and services from local businesses and landowners during the Project's construction and operation. While the Project will not generate tax revenue through a production tax, the Project is estimated to provide property tax payments to City of North Branch and Chisago County of approximately $25,000 over the 30-year life of the Project. In addition, lease payments paid to the landowner of the western parcel will offset potential financial losses associated with removing a portion of their land from agricultural production.

In general, the socioeconomic impacts associated with the Project will be positive; therefore, no mitigative measures are proposed.

6.3 LAND-BASED ECONOMIES

The description of existing land-based economy resources is centered around the approximately 77.6-acre Land Control Area as identified on Map 1 in the Maps appendix of this Application. The portion of the Land Control Area that would be used to construct and operate the BESS units and supporting facilities is referred to as the Preliminary Development Area; the Preliminary Development Area is discussed further in each resources' Impacts and Mitigation section, as this is the area where construction and operation impacts would occur.

Potential impacts on land-based economy resources for the Project were also assessed using IAAs or study areas. Defined generally as the townships and counties where the Project is located, the Study Area is used as the IAA for analyzing potential impacts to land-based economies. These are resources for which impacts may extend throughout communities surrounding the Project.

6.3.1 Agricultural

According to the USDA's 2022 Census of Agriculture, of the 265,536 acres that comprise Chisago County, 81,038 acres (30.5 percent) are actively cultivated farmland. A total of 740 individual farms are located in Chisago County, with the average farm size at 110 acres. The top crops (in acres) cultivated in Chisago County include soybeans for beans, corn for grain, and forage crops (hay). Cattle and calves top the list of livestock inventory in Chisago County, followed by commercially viable egg-producing chickens (USDA, 2022).

The market value of agricultural production in Chisago County in 2022 was approximately $55 million. Crop sales accounted for approximately 81 percent of the total value of agricultural production, while livestock, poultry, and their products accounted for the remaining 19 percent (USDA, 2022).

The Project will not impact any soil classified as prime farmland. As shown in Table 6.5.4-1 in Section 6.5.4, about 25.6 acres (33.0 percent) of soil within the Land Control Area are classified as farmland of statewide importance. Approximately 7.3 acres of soil classified as farmland of statewide importance will be temporarily impacted. Approximately 2.6 acres of farmland of statewide importance would be required to host Project facilities.

The Conservation Reserve Enhancement Program (CREP) is an offshoot of the Conservation Reserve Program (CRP), which is a land conservation program established by the USDA and

administered by the Farm Service Agency that pays farmers a yearly rental fee for agreeing to take environmentally sensitive land out of agricultural production in an effort to improve environmental health and quality (USDA, n.d.). Minnesota implemented the CREP to target state-identified, high-priority conservation issues by offering payments to farmers and agricultural landowners to retire environmentally sensitive land using the Reinvest in Minnesota Reserve Program (Minnesota Board of Water and Soil Resources, 2019). Enrollment in the CRP and CREP is voluntary and participation in the program comes with certain restrictions on the types of development allowed on parcels enrolled in the program, if such development is inconsistent with the conservation goals of the program. No CREP, CRP, or Reinvest in Minnesota easements are within or adjacent to the Land Control Area.

North Star Storage has confirmed with landowners that no drain tile is present in the Land Control Area. There are also no areas used for animal husbandry, specialty farms, organic farms, or other conservation lands within the Land Control Area.

6.3.1.1 Impacts and Mitigation

As presented in Section 6.2.8 and Table 6.2.8-2, construction of the Project will temporarily impact 23.8 acres of agricultural land and permanently impact up to 8.2 acres of agricultural land within the Preliminary Development Area. Project development will not result in a significant impact to agricultural production in the Study Area, as this acreage constitutes 0.01 percent of the land currently used for agricultural production in Chisago County (81,038 acres) (USDA, 2022). Agricultural production would continue in the surrounding areas during construction and operation of the Project. The revenue lost from removing land from agricultural production will be offset by the lease with the landowners. Areas disturbed during construction will also be repaired and restored to pre-construction contours and characteristics to the extent practicable. Agricultural production would be allowed to continue in the area outside the Land Control Area during construction and operation of the Project.

No drain tile has been identified in the Land Control or Preliminary Development Areas; therefore, no impacts on existing drain tile are anticipated from construction and operation of the Project. However, if damage to drain tile or private ditches were to occur as a result of construction activities or operation of the Project, North Star Storage will repair any damages.

No areas used for animal husbandry are located within the Land Control Area; therefore, no impacts to livestock are anticipated and no mitigation measures specific to animal husbandry operations are proposed.

6.3.2 Forestry

There are no commercial forestry operations in the Land Control Area; therefore, no forestry resources will be affected by the Project. Treed areas are located along the perimeter of the Land Control Area. Additionally, one forested area is located south of the Preliminary Development Area.

6.3.2.1 Impacts and Mitigation

No commercial forestry operations are present in or adjacent to the Preliminary Development Area. As such, no mitigative measures are proposed.

6.3.3 Tourism

The Project will be constructed within the City of North Branch, but on the far southeastern edge, outside of the main city facilities and features. As described in Section 6.2.2, primary tourism activities in the Study Area for the Project are associated with local community festivals and similar events. In addition, as discussed in Section 6.2.9, residents and visitors come to Chisago County for outdoor-focused recreation such as sightseeing, hiking, snowmobiling, and hunting. As described in Section 6.2.9, no areas used for outdoor-focused recreation are present within the Land Control Area.

6.3.3.1 Impacts and Mitigation

No road closures are anticipated to be necessary during active construction. Community festivals and other events would not be affected by construction or operation of the Project. Outdoor recreation opportunities such as the Janet Johnson Memorial WMA and local snowmobile trails are far enough away from the Preliminary Development Area that no impacts are anticipated (see Map 10). Because no impacts on tourism are anticipated from construction or operation of the Project, no mitigative measures are proposed.

6.3.4 Mining

Based on review of MnDOT's Aggregate Source Information System and the County Pit Map for Chisago County, there are no gravel pits in the Land Control Area (MnDOT, 2023; MnDOT, 2002). In the Aggregate Source Information System data and on the Chisago County Pit Map, gravel pits are located 1.5 to 2 miles north and northeast of the Land Control Area, respectively.

6.3.4.1 Impacts and Mitigation

No mining operations are located within or adjacent to the Land Control and Preliminary Development Areas. As such, no impacts on mining operations are anticipated and no mitigative measures are proposed.

North Star Storage will make efforts to source aggregate locally where feasible, potentially creating a significant economic impact to the community during construction.

6.4 ARCHAEOLOGICAL AND HISTORIC RESOURCES

Potential impacts on archaeological and historical resources for the Project were assessed using IAAs. A distance of one mile from the Land Control Area is used as the IAA for analyzing potential impacts to archaeological and historic resources.

As noted in Section 2.1, the Land Control Area falls entirely within the portion of Section 36 that was reviewed as part of the Site Permit proceedings for the Solar Facility. As such, all land required for construction and operation of the Project was previously reviewed for the presence of archaeological and historic resources in 2014.

In 2014, Westwood conducted a background literature review and field inventory to identify archaeological and historic resources in the Solar Facility project area, and to identify previously recorded cultural resource investigations and previously recorded archaeological sites within one mile of the Solar Facility (Westwood, 2014a; Westwood 2014b). The literature review indicated the Solar Facility had a moderate potential for cultural resources due to its proximity to the Sunrise

River and its tributaries. As a result of the findings, a Phase 1 Archaeological Investigation was conducted for the approximate 1,397-acre Solar Facility, which is inclusive of the boundaries of the Land Control Area for the Project.

The fieldwork for the Phase 1 Archaeological Investigation was conducted in October 2014. 10,000 Lakes Archaeology, Inc. assisted Westwood with the survey. Phase I field inventory for the Solar Facility did not identify archaeological or historic resources within the area currently proposed for the Land Control Area. However, two sites (21CH134 and 21CH135) were identified in 2014 that are immediately adjacent to the current Land Control Area.

Site Number 21CH134 is an historic farm site occupying approximately 5.3 acres; this site is directly adjacent to the southwest corner of the Land Control Area. Multiple outbuildings are present, several of which were being used for farming purposes in 2014; review of aerial imagery shows that these outbuildings are still present. Based on the results of the survey, the site was recommended as potentially eligible for the National Register of Historic Places (NRHP), and avoidance was recommended in the Phase I field inventory report.

Site Number 21CH135 is an historic farm site occupying approximately 6.1 acres; this site was directly adjacent to the northeastern corner of the Land Control Area in an area that is now occupied by the Solar Facility. From April to May 2015, a preliminary archaeological evaluation was conducted for Site Number 21CH135. Based upon the evaluation, Site Number 21CH135 was recommended as not eligible for NRHP listing due to a lack of archaeological integrity, and an inability to answer significant historic research questions. As such, Site Number 21CH135 was destroyed during construction of the Solar Facility.

Reports summarizing the Phase I field inventory and the preliminary testing at Site Numbers 21CH134 and 21CH135 were submitted to Minnesota State Historic Preservation Office (SHPO) for review and comment. The SHPO agreed with the findings and recommendations in the reports in letters dated February 26, 2015 and October 1, 2015; copies of the SHPO letters are included in Appendix B.

North Star Storage sent an introductory email and summary of the 2014 survey results, which included the entire Project Land Control Area, to the SHPO on November 25, 2024 (see Appendix B). On December 4, 2024, the SHPO agreed that the 2014 survey was adequate and that additional archaeological surveys are not required for the Project (see Appendix B).

6.4.1 Impacts and Mitigation

Based upon review of past literature research, on-site archaeological evaluations, and SHPO coordination, no archaeological sites, cemeteries, or historic structures are identified within the Land Control Area. Site Number 21CH134 would not be affected by the Project as it is approximately 400 feet south of the Preliminary Development Area. Site Number 21CH35 was razed during the development of the Solar Facility. As such, the Project will not affect historic properties eligible for or listed in the NRHP; and therefore, mitigation is not required.

Prior to the start of construction of the Project, North Star Storage will develop an Unanticipated Discoveries Plan that will outline steps to be taken if previously undocumented cultural resources or human remains are encountered during construction.

6.5 NATURAL ENVIRONMENT

The description of existing natural environment resources is centered around the approximately 77.6-acre Land Control Area as identified on Map 1. The portion of the Land Control Area that would be used to construct and operate the BESS units and supporting facilities is referred to as the Preliminary Development Area; the Preliminary Development Area is discussed further in each resources' Impacts and Mitigation section, as this is the area where construction and operation impacts would occur.

Potential impacts on natural environment resources for the Project were also assessed using IAAs or study areas. The IAA or study area for each resource is the geographic area within which the Project may exert some influence. These IAAs vary by resource and are summarized in Table 6.0-1.

6.5.1 Air Quality

The Clean Air Act requires the EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, referred to as "criteria pollutants" to protect health, the environment, and property. The six criteria pollutants are ground-level ozone (O_3), particulate matter (PM_{10}/$PM_{2.5}$), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), and lead (Pb) (EPA, 2024b). Minnesota is currently complying with all the NAAQS (MPCA, 2023).

In Minnesota, air quality is tracked using air quality monitoring stations across the state. The MPCA uses data from these monitors to calculate the Air Quality Index (AQI), on an hourly basis, for O_3, PM2.5, SO_2, NO_2, and CO (MDH, 2024b). The pollutant with the highest AQI value for a particular hour sets the overall AQI for that hour. The AQI is used to categorize the air quality of a region as one of five levels of quality: good, moderate, unhealthy for sensitive groups, unhealthy, or very unhealthy (MPCA, 2024b).

The Project is located nearest to the North Metro AQI Region, which has air quality monitors in Blaine, East Bethel, Marine on St Croix, and St. Michael, Minnesota. These stations monitor O_3 and $PM_{2.5}$. The five most recent annual AQI Days in each category for the North Metro AQI Region are provided in Table 6.5.1-1 (MPCA, 2024b).

TABLE 6.5.1-1
Days in Each Air Quality Index Category (North Metro, MN)

Year	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy
2023	176	160	19	4	0
2022	262	102	0	0	0
2021	230	127	6	2	0
2020	274	91	1	0	0
2019	269	95	1	0	0

Source: MPCA, 2024c

Air quality has been considered good or moderate for the majority of the past five reported years in the North Metro. Since 2019, the largest number of days classified as moderate occurred in 2023. There were 27 days throughout 2019, 2020, 2021, and 2023 where air quality was considered unhealthy for sensitive groups. Most of these days were between May and July and were likely a result of wildfire smoke. Two days were classified as unhealthy in 2021, which were the results of wildfires in Canada. Four days were classified as unhealthy in 2023, two of which

were also due to Canadian wildfires, while two were due to the formation of ground-level ozone (Huttner, 2023). No days have been classified as very unhealthy.

6.5.1.1 Impacts and Mitigation

Construction Emissions

Impacts on air quality from construction and operation of the Project would be minimal and primarily limited to the construction period. Minor temporary effects on air quality are expected during construction of the Project, gen-tie line, and access road(s) as a result of exhaust emissions from construction equipment, related traffic, and from fugitive dust that becomes airborne during dry periods of construction activity. During construction, the amount of dust generated would be a function of construction activity, soil type, soil moisture content, wind speed, precipitation, vehicle traffic, vehicle types, and road surface characteristics. Dust emissions are expected to be higher during dry periods and in areas where fine-textured soils are subject to surface activity.

The amount of air emissions during construction will be influenced by weather conditions and the type of construction activity. Air emissions during construction would primarily consist of emissions from construction equipment and would include volatile organic compounds, carbon dioxide, nitrogen oxides, and particulate matter; dust generated from earthmoving activities would also contribute to particulate matter emissions. Adverse effects on the surrounding environment are expected to be negligible because of the temporary nature of the emission and dust-producing construction phases. Table 6.5.1-2 shows the amount of criteria pollutant emissions resulting from construction of the Project. Detailed construction emission calculations are included in Appendix F.

TABLE 6.5.1-2
Construction Related Criteria Pollutant Emissions, in tons

Construction Activity	CO	NO_X	VOC	PM_{10}	$PM_{2.5}$	SO_2
Off-Road Engines	1.79	8.75	0.48	11.53	0.29	4.13e-03
Unpaved Roads	-	-	-	0.45	0.05	-
Earthmoving	-	-	-	10.79	1.14	-
TOTAL	**1.79**	**8.75**	**0.48**	**11.53**	**1.47**	**4.13e-03**

Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions if wind erosion becomes an issue. If dust levels become problematic due to construction related activities, North Star Storage will apply construction-related practices to control fugitive dust. These practices include the application of water or other commercially available dust control agents on unpaved roads, reducing vehicle speeds on unpaved roads, covering open-bodied haul trucks, containment of excavated materials, protection of exposed soil, soil stabilization, rand treating stockpiles to control fugitive dust. A SWPPP will be developed prior to construction that will include BMPs to minimize the potential for fugitive dust.

Additionally, since agricultural operations within the Preliminary Development Area will no longer occur during construction and operation of the facility, reduced particulate emission, dust, and farm equipment exhaust would occur and further improve air quality at and in the vicinity of the Project.

Operation Emissions

Energy storage systems, such as BESS, produce almost no emissions during operation except for those related to O&M vehicle traffic.

6.5.2 Climate Change and Greenhouse Gas Emissions

The Next Generation Energy Act of 2007 set statutory goals to reduce greenhouse gas emissions in Minnesota by 80 percent between 2005 and 2050. As of 2020 Minnesota is on track to meet this goal and has experienced a 23 percent reduction in greenhouse gas (GHG) emissions across all energy sectors (MPCA, 2024c). The Climate Change Subcabinet is responsible for identifying policies and strategies to meet or exceed the statutory goals set in the Next Generation Energy Act as well as to increase climate resiliency across the state (State of Minnesota, 2019).

6.5.2.1 Impacts of Climate Change on the Project

The Minnesota Department of Natural Resources publishes historical climate data from the years 1895 to 2024. This data shows that the average temperature of Chisago County, Minnesota has been increasing at a rate of 0.23°F per decade to reach an annual average temperature of 46.37°F in 2024. Over the 30-year lifespan of the Project, the annual average temperature could increase by 0.69°F. The annual precipitation has increased at a rate of 0.30 inches per decade to 26.17 inches in 2024. Over the lifespan of the Project, precipitation could increase an additional 0.90 inches per year (MNDNR, 2024d). Additionally, the frequency and intensity of heavy rainfall is increasing across the state, there have been sixteen mega-rain events recorded over the last 50 years, 11 of which have occurred since 2000. Mega-rain events are defined as rainfall events of more than 6 inches over 1,000 square miles in 24 hours or less (MNDNR, 2024d). Over the next 30 years, Chisago County is predicted to have major risk of flooding, with 3,218 properties in Chisago County that have a risk of flooding (First Street, 2024). Chisago County experienced a period of extreme drought in 2006 and 2009, currently, the county is ranked as abnormally dry drought (U.S. Drought Monitor, 2024).

The Project has been designed with consideration of the potential climate changes during the lifetime of the Project, including increased heavy rainfalls, stronger wind gusts, and increased temperatures. The stormwater basin has been designed to accommodate projected precipitation levels in 30 years. The Project's stormwater management system has been designed using NOAA Atlas-14, a modeling tool that provides precipitation frequency estimates for many of the Midwestern states, including Minnesota. The model takes into consideration the historical frequency of heavy rainfall events from NOAA's precipitation frequency data server. Refer to Section 4.1.5.4 for additional details on the stormwater basin design. The structures have been designed to meet current national, local, and state safety codes and standards, including National Fire Protection Association standards, which are designed to prevent fire hazards and are discussed further in Sections 5.1.2 and 6.2.5.1.

6.5.2.2 Impact of the Project on Climate Change

Construction of the Project will result in short-term increases in GHGs from the combustion of fossil fuels utilized in construction equipment and vehicles. North Star Storage prepared an estimate for the construction and operation of the Project. The estimate is based on the type of equipment used, duration of the project and the estimated fuel consumption to determine the total amount of gas and diesel fuel used during construction of the Project. Although Energy Storage systems, such as BESS, produce almost no GHGs during operations, potential annual emissions

from sources including on-site vehicle traffic and staff commuter traffic, have also been estimated. Table 6.5.2-1 shows the amount of GHG emission resulting from construction of the Project. Detailed construction emission calculations are included in Appendix F.

TABLE 6.5.2-1
Construction Related Greenhouse Gas Emissions, in tons

Construction Activity	CO_2	CH_4	N_2O	CO_2e
Off-Road Engine Emissions	388.77	0.02	0.00	390.04
Commuters and Delivery Vehicles	838.87	0.00	0.00	838.87
TOTAL	1,227.63	0.02	0.00	1,228.91

Note: CO_2 = carbon dioxide; CH_4 = methane; 1 short ton CH_4 = 28 short tons CO_2e; N_2O = nitrous oxide; 1 short ton N_2O = 265 short tons CO_2e; CO_2e = carbon dioxide equivalent

Source: EPA Emission Factors Hub: https://www.epa.gov/system/files/documents/2024-02/ghg-emission-factors-hub-2024.pdf

North Star Storage conducted a preliminary lifecycle GHG emissions assessment for the Project. The lifecycle assessment calculated the amount of GHG emissions that would be generated from construction, operation, and decommissioning of the Project. The Project is designed to store extra electricity from the grid when electricity production is higher than electricity demand, and to discharge electricity when demand is higher than production. The lifecycle GHG assessment calculated GHG emissions that would be otherwise produced to meet electricity demand without the Project. Note that the lifecycle assessment assumed a 20-year lifecycle for the Project; the actual Project lifecycle is expected to be 30 years.

The lifecycle assessment determined that construction, operation, and decommissioning of the Project would produce approximately 1.1 million metric tonnes of CO_2e over a 20-year lifetime. During that same time period, operation of the Project would displace approximately 1.2 million metric tonnes of CO_2e from discharging. This is a reduction of approximately 100,000 metric tonnes of CO_2e over the first 20 years of the Project's lifetime. Additional GHG emissions would be displaced for each additional year the Project operates after the 20th year of operation. This lifecycle assessment assumes a base case scenario of Xcel Energy's electricity source mix in Minnesota as of 2023. As the amount of electricity generated by coal- and natural gas-fired power plants in the State decreases and is replaced by more renewable sources, the Project will displace additional GHG emissions beyond this base case scenario. Overall, the Project is expected to produce a net-positive affect on climate change; therefore, mitigative measures are not proposed.

6.5.3 Geology and Groundwater Resources

6.5.3.1 Geology

The Project is located in the Anoka Sand Plain subsection of the Minnesota and Northeast Iowa Morainal Section as classified as by the MNDNR and U.S. Forest Service Ecological Classification System. The Anoka Sand Plain subsection consists of flat, sandy lake plain and terraces along the Mississippi River. Topography is level to gently rolling with a series of sandy terraces associated with historic levels of the Mississippi River. Surface glacial deposits are usually less than 200 feet thick, and the subsection is underlain by Cambrian and Ordovician dolomite, sandstone, and shale (see Map 11) (MNDNR, 2024b).

According to the Minnesota Geological Survey Chisago County Plate 3-Surficial Geology map, the surficial geology of the Land Control Area and surrounding area consists of Quaternary age very fine to medium grained sand with scattered lenses of silt (Setterholm, 2010). Gravelly sand may occur locally near the surface, especially near areas of glacial or fluvial sediment deposits. The surface was pitted during the drainage of glacial Lake Anoka. Wind erosion has continued to rework the surface. The Bedrock geology of the Land Control Area and surrounding area consists of Cambrian age sedimentary deposits of the Eau Claire Formation (Setterholm, 2010). The formation consists of feldspathic sandstone, siltstone, and shale. Brachiopod fossils are common. Depth to bedrock in the Land Control Area ranges from approximately 150 and 250 feet below ground surface (Setterholm, 2010).

6.5.3.1.1 Geology Impacts and Mitigation

Impacts to geology resources from construction and operation of the Project are not anticipated and mitigation is not expected to be necessary.

Due to the thickness of surficial materials, excavation or blasting of bedrock is extremely unlikely. Concrete foundations may be required for the Project components. Geotechnical soil testing will determine final installation process. Similarly, the exterior agricultural fence may require concrete foundations in some locations. If concrete is needed, it will be locally sourced; an on-site concrete batch plant will not be required for the Project.

6.5.3.2 Groundwater

Minnesota Department of Agriculture's Groundwater Protection Rule (2024) minimizes potential sources of nitrate pollution to the state's groundwater and protects our drinking water. The rule restricts the application of nitrogen fertilizer in the fall and on frozen soils in areas vulnerable to contamination, and it outlines steps to reduce the severity of the problem in areas where nitrate in public water supply wells is already elevated. The Land Control Area is located within a vulnerable groundwater area that restricts the application of nitrogen fertilizer in the fall and on frozen soils.

The Land Control Area is located in MNDNR Groundwater Province 1, which is characterized by buried sand aquifers and relatively extensive surficial sand plains, part of a thick layer of sediment deposited by glaciers overlying the bedrock. Province 1 is underlain by sedimentary bedrock with good aquifer properties (MNDNR, 2021). The Bedrock of the Land Control Area, the Eau Claire Formation, rests atop the Mt. Simon aquifer (Barry, 2014b). This aquifer has moderate permeability and is approximately 200 feet below ground surface within the Land Control Area. Groundwater typically flows to the east towards the Sunrise River in this area.

A previous geotechnical investigation contained two boring locations (B-9 and B-10) within the Land Control Area (Kleinfelder, 2014). The boring log for B-9, which was located in the western portion of the Land Control Area, indicates that the initial groundwater level was 7.5 feet below ground surface and the final groundwater level at the end of drilling was 14 feet below ground surface. The drill terminated 21 feet below ground surface. The boring log for B-10, which was located in the eastern portion of the Land Control Area, indicates that the initial groundwater elevation was 5 feet below ground surface and the final was 8 feet below ground surface. This exploration was also terminated 21 feet below ground surface. The change in initial to finding groundwater levels may be due to a perched groundwater table. The geotechnical report concluded that the soils found in the greater initial study area "should provide adequate support for shallow foundations such as footings, pads, slabs, and mat foundations" (Kleinfelder, 2014).

North Star Storage also reviewed publicly available GIS data to identify EPA-designated sole source aquifers, Drinking Water Supply Management Areas and MDH Wellhead Protection Areas. Sole source aquifers, Drinking Water Supply Management Areas, and Wellhead Protection Areas were not identified in the Land Control Area (EPA, 2024c; EPA, 2024d; MNDNR, 2019; MDH, 2019).

The MDH Minnesota Well Index (MDH 2024a; Minnesota Geological Survey and MDH, 2023) is a database that provides basic information about wells and borings, such as location, depth, geology, construction, and static water level. According to the Minnesota Well Index, there are no wells within the Land Control Area and 31 within 0.5 mile of the Land Control Area (see Table 6.5.3.1 and Map 11). The closest documented well is a domestic well located approximately 160 feet to the northwest of the northwest portion of the Land Control Area (see Map 11).

TABLE 6.5.3-1
MDH Well Index within 0.5 mile of the Land Control Area

Unique Well ID	Well Name	Well Elevation	Well Depth	Well Use
00154307	Splittstoser, Lyle	899	120	Domestic
00401015	Pleau, Leon	901	138	Domestic
00415204	Benson, Elton	903	138	Domestic
00416399	Perrault, Adrian	896	93	Domestic
00465957	Lessman, Joe	897	186	Domestic
00473681	Perrault, Roger	894	115	Domestic
00507427	Egerstrom, Rick	903	107	Domestic
00576999	Mueller, Mike & Barb	901	133	Domestic
00577026	Benson, Dwight	902	120	Domestic
00609617	Benson, Dave & Michelle	899	143	Domestic
00620447	Perrault, Steve	896	94	Domestic
00625128	Koecher, Keith	896	165	Domestic
00641840	Koecher, Mark	895	147	Domestic
00670294	Benson, Steve	898	160	Domestic
00672809	Franklin, Dave	903	142	Irrigation
00674234	Fletcher, Kurt	900	116	Domestic
00674711	White, Lawrence	899	140	Domestic
00681834	Gaiovik, Jim	896	160	Domestic
00702270	Johnson	896	137	Domestic
00704552	Olson, Garth	897	150	Domestic
00709812	Aker, Brad	895	192	Domestic
00716418	JBS Carpentry	901	175	Domestic
00720533	Schultz, Dave	898	156	Domestic
00728280	Johnson Construction	901	140	Domestic
00733477	Sherco Construction	894	200	Domestic
00744019	TDB LLC	889	164	Domestic
00747202	Pickard, Cody	900	180	Domestic
00761193	Graphic Homes, Inc.	889	230	Domestic
00791489	Oman, Steve	900	183	Domestic
00791744	Sherco Construction	893	220	Domestic
00814415	Bob Linder Coast	895.7	182	Domestic

North Star Storage also reviewed publicly available GIS data to identify EPA-designated sole source aquifers, Drinking Water Supply Management Areas and MDH Wellhead Protection Areas. Sole source aquifers, Drinking Water Supply Management Areas, and Wellhead Protection Areas were not identified in the Land Control Area (EPA, 2024c; EPA, 2024d; MNDNR, 2019; MDH, 2019).

6.5.3.2.1 Groundwater Impacts and Mitigation

Impacts to groundwater resources from construction and operation of the Project are not anticipated.

Project facilities are not likely to affect the use of existing water wells because there are no wells within the Land Control or Preliminary Development Areas, thereby minimizing the risk of impacts on private wells in the area. The closest documented domestic well is approximately 675 feet north of the northwest portion of the Preliminary Development Area. Construction of the Project facilities is not likely to require subsurface blasting; therefore, disturbances to groundwater flow from newly fractured bedrock are not anticipated.

Impacts on groundwater resources, including aquifers, are not anticipated as water supply needs will be quite limited. It is probable that O&M water requirements will be satisfied with a single existing domestic-sized water well sited within North Star Solar Facility. As described in Section 6.5.1 and 6.5.4, North Star Storage may apply water on unpaved roads and/or highly erodible soils for dust abatement and erosion control during construction.

Any dewatering required during construction will be discharged to the surrounding surface, thereby allowing it to infiltrate back into the ground to minimize potential impacts. If dewatering is necessary, the Project will obtain a Water Appropriation Permit from MNDNR.

Based on the small amount of impervious surface area that will be created by the Project components (see Sections 4.1 and 4.3), the Project will likely have minimal impacts on regional groundwater recharge. Concrete foundations may be required for the Project components. Geotechnical soil testing will determine final installation process. Similarly, the exterior agricultural fence may require concrete foundations in some locations. If concrete is needed, it will be locally sourced; an on-site concrete batch plant will not be required for the Project.

As described in Section 4.1.5.4, North Star Storage proposes to construct a stormwater basin to manage stormwater collection and filtration on-site. In accordance with the General Construction Stormwater Permit, the stormwater basin will be constructed to prevent adverse impacts to groundwater resources. North Star Storage will submit the basin design and SWPPP to MPCA for review and approval prior to construction and obtaining coverage under the General Construction Stormwater Permit.

6.5.4 Soils

The description of the existing environment in this section is centered around the approximately 77.6-acre Land Control Area as identified on Map 1. The portion of the Land Control Area that would be used to construct and operate the BESS units and supporting facilities is referred to as the Preliminary Development Area; the Preliminary Development Area is discussed further in Section 6.5.4.1 Impacts and Mitigation, as this is the area where construction and operation impacts would occur.

Soil characteristics within the Land Control Area were assessed using the Soil Survey Geographic database (SSURGO) (Soil Survey Staff, 2024). Table 6.5.4-1 lists the soil types located within the Land Control Area; soil map units are depicted on Map 12 and farmland classifications are depicted on Map 13. Additional information about soils characteristics is presented in the Impacts and Mitigation Measures section below.

TABLE 6.5.4-1
Summary of Soils Within the Land Control Area

Map Unit Symbol	Map Unit Name	Farmland Classification	Hydric Rating (Relative % Hydric) [a]	Land Control Area (acres)
161	Isanti loamy fine sand	Not prime farmland	Predominantly hydric (93%)	3.2
162	Lino loamy fine sand	Farmland of statewide importance	Predominantly nonhydric (3%)	25.6
158B	Zimmerman fine sand, 1 to 6 percent slopes	Not prime farmland	Predominantly nonhydric (2%)	19.0
328B	Sartell fine sand, 1 to 6 percent slopes	Not prime farmland	Predominantly nonhydric (8%)	19.3
676B	Kost loamy fine sand, 1 to 6 percent slopes	Not prime farmland	Predominantly nonhydric (8%)	8.6
W	Water	Not prime farmland	Nonhydric	1.8
			TOTAL [a]	**77.6**

[a] The Hydric Rating is based on the composition of hydric components of a soil unit. The five classes are Hydric (100% hydric components), Predominantly Hydric (66%–99% hydric components), Partially Hydric (33%–65% hydric components), Predominantly Nonhydric (1%–32% hydric components), and Nonhydric (less than 1% hydric components).

Note: The total acres may be off by up to 0.1 acre due to rounding.

Source: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: http://websoilsurvey.sc.egov.usda.gov/. Accessed November 2024.

6.5.4.1 Impacts and Mitigation

Impacts to soils will occur during construction and operation of the Project within the Preliminary Development Area. Table 6.5.4-2 provides a breakdown of the anticipated temporary and permanent impacts to soils within the Preliminary Development Area. Temporary impacts will primarily be due to grading of the BESS facilities, expanded Solar Facility collector substation area, access roads, and the stormwater basin. Additionally, soil compaction may result from construction vehicles driving over wet soils, which could reduce pore space within the soil, increase runoff potential and cause rutting. During operation of the Project, ongoing soil compaction could occur from continued use of access roads.

TABLE 6.5.4-2
Selected Soil Characteristics Within the Preliminary Development Area

Soil Characteristic	Temporary Impacts (acres / percent)		Permanent Impacts (acres / percent [a])	
Preliminary Development Area	24.0		9.8	
Prime Farmland [b]	--	0.0%	--	0.0%
Farmland of Statewide Importance [c]	7.3	30.7 %	2.6	10.8%
Water Erodible [d]	--	0.0%	--	0.0%
Wind Erodible [e]	24.0	100.0%	9.8	100.0%

TABLE 6.5.4-2
Selected Soil Characteristics Within the Preliminary Development Area

Soil Characteristic	Temporary Impacts (acres / percent)		Permanent Impacts (acres / percent [a])	
Hydric [f]	--	0.0%	--	0.0%
Compaction Prone [g]	--	0.0%	--	0.0%
Stony/Rocky [h]	--	0.0%	--	0.0%

Source: Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Web Soil Survey. Available online at the following link: http://websoilsurvey.sc.egov.usda.gov/. Accessed November 2024.

Notes: A double dash indicates that no impacts are anticipated for this feature. The total acres may be off by up to 0.1 acre due to rounding.

The existing 0.5-acre substation is already developed and therefore is not included in the acreages above.

[a] Percentages for permanent impacts are shown in relation to the total temporary Project impacts.

[b] Includes prime farmland, and prime farmland if limiting factor is mitigated, as designated by the Natural Resource Conservation Service (NRCS).

[c] Includes soils that are classified as farmland of statewide importance.

[d] Includes soils with a slope >15% or soils with a K value of >0.35 and slopes greater >5%.

[e] Soils with a wind erodibility group classification of 1 or 2.

[f] Includes soils that are classified as hydric by SSURGO.

[g] Soils with somewhat poor to very poor drainage classes and surface textures of sandy clay loam or finer.

[h] Soils with one or more horizons with cobbley, stony, bouldery, channery, flaggy, very gravelly, or extremely gravelly in their textural class and/or contain greater than 5 percent by weight of rocks larger than 3 inches.

The Project will not impact any soil classified as prime farmland. Approximately 7.3 acres of soil classified as farmland of statewide importance will be temporarily impacted; 2.6 acres of farmland of statewide importance would be permanently impacted.

All soils in the Preliminary Development Area are prone to wind erosion. The Project will protect soils from wind erosion by use of dust suppression techniques (e.g., applying water or dust suppressants, installing erosion control mats) during construction and establishing vegetative cover on disturbed soils as soon as practicable following construction. As discussed in Section 5.3.2, soil stabilization will be completed no later than 14 calendar days after the construction activity has ceased. Additional construction-related practices that will be used to control fugitive dust are further described in Section 6.5.1.1.

Overall, soils in the Preliminary Development Area are not prone to compaction and, given that up to 8.2 acres would be converted to impervious surfaces (e.g. gravel or asphalt) for the life of the Project, ongoing risk of soil compaction and rutting is likely to be minimal. Additionally, the Project is expected to reduce the potential for erosion by water by establishing perennial vegetation outside the fenceline of the Project. There are no hydric or stony/rocky soils within the Preliminary Development Area.

6.5.5 Surface Waters

The Project is located within the Lower St. Croix Watershed (HUC8: 07030005) (MNDNR, 2024e). This watershed is approximately 915 square miles and there are 60 municipalities and townships located completely or partially within the boundaries of the watershed.

6.5.5.1 Lakes, Rivers, Streams, Ditches, and Wetlands

Review of the MNDNR Hydrography Dataset does not identify streams within the Land Control Area (MNDNR, 2024e). The MNDNR update to USFWS National Wetland Inventory identifies three wetland areas within Land Control Area, none which intersect the Preliminary Development Area (Minnesota Geospatial Commons, 2024b).

An on-site wetland and waterway delineation for the Solar Facility was conducted in September 2014[6] to identify and characterize wetlands and waterways per U.S. Army Corps of Engineers (USACE) methodology (Wetlands Delineation Manual (Environmental Laboratory, 1987) and the Regional Supplement to the USACE Wetland Delineation Manual: Northcentral and Northeast Region (USACE, 2010). The delineation area included the current Land Control Area. The wetland and waterway delineation identified five wetlands totaling 11.4 acres within the Land Control Area in Section 36, none which intersect the Preliminary Development Area (see Map 14). Approximately 7.5 acres are classified as palustrine emergent wetland (PEM) and the remaining 3.9 acres are classified as a PEM, palustrine scrub shrub (PSS), and palustrine forested (PFO) wetland complex. (Cowardin et al. 1979).

North Star Storage is consulting with the USACE and Chisago County Soil and Water Conservation District (the Local Government Unit assigned responsibility under the Wetland Conservation Act) to confirm wetlands will be avoided and that additional field work and permitting is not required. North Star Storage will install silt fencing or other sediment control devices in accordance with the SWPPP around wetlands during construction to avoid inadvertent impacts.

6.5.5.2 Minnesota Public Waters

The MNDNR Public Waters Basin and Watercourse Delineations dataset does not identify MNDNR Public Waters Inventory watercourses or basins within the Land Control Area. The closest Public Waters Inventory watercourse (unnamed stream) is located approximately 1,200 feet to the south of the Land Control Area (see Map 14) (MNDNR, 2024f).

6.5.5.3 Water Quality

There are no impaired waters within the Land Control Area (MNDNR, 2024g). The nearest impaired water is located approximately 7,500 feet from the eastern edge of the Land Control Area.

6.5.5.4 Floodplains

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Panel 27025C0260D does not identify FEMA floodplains within the Land Control Area (FEMA, 2023).

6.5.5.5 Impacts and Mitigation

The Project has been designed to avoid or minimize all impacts to surface waters to the extent practicable. The Project components are not sited within surface waters and all wetlands are avoided in the Preliminary Development Area. A SWPPP will be developed for the Project prior to construction that will include BMPs such as silt fencing (or other sediment or erosion control

[6] Compliance Filing Appendix A-9 Part 3 of 8 (February 11, 2015). E-docket ID Number 20152-107276-03. Available online at: https://www.edockets.state.mn.us/documents/%7BB1D38B69-9681-4BD3-B423-15024D23AD39%7D/download?contentSequence=0&rowIndex=231.

devices), revegetation plans, and management of exposed soils to prevent sediment from entering into adjacent surface waters. As described in Section 4.1.5.4, a stormwater basin will be constructed to help control runoff during rain events. The SWPPP will be submitted to the MPCA for review and approval prior to construction and obtaining coverage under the General Construction Stormwater Permit. North Star Storage is consulting with the USACE and Chisago County Soil and Water Conservation District (the Local Government Unit assigned with jurisdiction under the Wetland Conservation Act) to confirm that additional permitting is not required.

6.5.6 Vegetation

As discussed in Section 6.1, the Project is within the Eastern Broadleaf Forest Province comprised of the Minnesota and Northeast Iowa Morainal Section and Anoka Sand Plain Subsection (MNDNR, 2024h, MNDNR, 2024i, MNDNR, 2024b). The Eastern Broadleaf Forest Province is located in the central and southeastern parts of Minnesota and serves as a transition between semi-arid portions of the state that were historically prairie and semi-humid mixed conifer-deciduous forests to the northeast (MNDNR, 2024h).

The Minnesota and Northeast Iowa Morainal Section is a long band of deciduous forest, woodland, and prairie that stretches nearly 350 miles from Polk County in northwestern Minnesota to the Iowa border. The Anoka Sand Plain Subsection consists of a flat, sandy lake plain and terraces along the Mississippi River. Topography is level to gently rolling. (MNDNR, 2024i; MNDNR, 2024b).

Prior to settlement, sandy flat areas in the Minnesota and Northeast Iowa Morainal Section were dominated by prairie, savanna, and oak and aspen woodlands, particularly in the Anoka Sand Plain and sandy terraces along the major rivers. Characteristic trees included bur oak and northern pin oak, with jack pine along the northern edge of the subsection. Brushland were found in large areas of the sandplain with narrow bands of upland prairie and as did areas of floodplain forest (MNDNR, 2024i; MNDNR, 2024b).

Based on field observations from the wetland delineations in 2014 conducted for the Solar Facility (Westwood, 2014c) and review of aerial imagery, the majority of the Land Control Area is dominated by cultivated agriculture consisting of corn (*Zea mays*). Other vegetation species observed in the corn fields included timothy (*Phleum pratense*), Kentucky bluegrass (*Poa pratensis*), and red clover (*Trifolium pratense*).

Based on the USGS NLCD landcover data, as presented in Table 6.2.8-1 in Section 6.2.8, the Land Control Area is comprised predominantly agricultural land (approximately 68.3 acres/88.1 percent). As described in Section 6.5.5, based upon past wetland delineations, wetland coverage is 11.4 acres and consists of emergent, scrub shrub and forested wetland types. Developed land within the Land Control Area (approximately 2.6 acres) includes public roadways and the existing 0.5-acre Solar Facility collector substation, which is within the Preliminary Development Area. Deciduous forest in the Land Control Area consists of a wooded fence row along the northern and southern margins of the Land Control Area and a woodlot in the southeastern portion of the Land Control Area. The dominant wetland vegetation consists of narrow leaf cattail, reed canary grass, speckled alder, quaking aspen, sensitive fern, and/or yellow nut sedge.

6.5.6.1 Impacts and Mitigation

The majority of the Preliminary Development Area consists of agricultural land representing approximately 97.3 percent of the total acreage. However, review of recent aerial imagery

indicates that only the western portion of the Preliminary Development Area, including the western access road, overlaps actively cultivated agricultural land. With the exception of the existing Solar Facility collector substation, the eastern portion of the Preliminary Development Area, which is located on the parcel owned by North Star PV, appears to be fallow and maintained in an herbaceous state.

Up to 8.2 acres of the Preliminary Development Area, as presented in Table 6.2.8-2 in Section 6.2.8, will be converted to impervious surfaces for operation of the Project and approximately 14.1 acres will be temporarily impacted (temporary workspaces and the laydown area). Temporary workspaces will be restored to pre-construction conditions after construction is complete. The wooded fence row and woodlot are adjacent to the northern and southern limits of the Preliminary Development Area; however, no tree clearing is anticipated to be necessary to construct the Project.

As discussed in Section 5.3.2, North Star Storage will implement the procedures in the Project SWPPP and BMPs to control erosion, prevent sedimentation, and promote soil stabilization in disturbed areas. The planting of perennial vegetation and restoration activities will help prevent erosion and sedimentation and promote soil stabilization long term.

6.5.7 Wildlife and Their Habitats

6.5.7.1 Common Wildlife

Identification of habitat available to wildlife species within the Land Control Area is based upon review of the Wetland Delineation Report for the North Star Solar Project (Westwood, 2014c), as well as review of aerial imagery. A field-based habitat assessment was not necessary due to the lack of suitable habitat within the Project. The Land Control Area is primarily dominated by cultivated agriculture characterized by corn production. Other types of landcover present to a lesser degree include wetlands, fallow field habitat, a wooded fence row and a woodlot.

As discussed in Section 6.5.5, there are approximately 7.5 acres of PEM wetlands and 3.9 acres of PEM/PSS/PFO wetland complex present along the northern and southeastern boundary and central portion of the Land Control Area. The wooded fence row is comprised of deciduous species and is present in the southern portion of the Land Control Area and a small woodlot (approximately 2.9 acres in size) occurs on the southeast portion of the Land Control Area. The forested woodlot is bisected by a utility corridor, resulting in an area that has been cleared of trees within that corridor. The woodlot is small and fragmented and thus, forest interior habitat is not available to species preferring unaltered, large tracts of forest. Forest edge habitat is available to wildlife and occurs along the agricultural / wooded areas and persistent cover habitat is present along the wetland / agricultural areas.

This mosaic of agricultural areas with adjacent forest and wetland habitats are likely to be utilized by the following common wildlife species: white-tailed deer (*Odocoileus virginianus*), common raccoon (*Procyon lotor*), coyote (*Canis latrans*), red fox (*Vulpes vulpes*), American crow (*Corvus brachyrhynchos*), meadow vole (*Microtus pennsylvanicus*), deer mouse (*Peromyscus maniculatus*), eastern bluebird (*Sialia sialis*), mourning dove (*Zenaida macroura*), ring-necked pheasant (*Phasianus colchicus*), American toad (*Anaxyrus americanus*), and common garter snake (*Thamnophis sirtalis*). Additionally, other species that may use the wetland habitats include red-winged black-bird (*Agelaius phoeniceus*) and common yellowthroat (*Geothlypis trichas*). The red-tailed hawk (*Buteo jamaicensis*) may utilize the forest for roosting and nesting and the agricultural fields for hunting. Additionally, some pollinator species (bees, butterflies, and moths)

may be present within the Land Control Area especially utilizing the wetland plants such as speckled alder and sandbar willow.

Expansive habitat complexes of consisting of wetlands, forestland, riparian habitat, and agricultural land are situated west and northwest of the Land Control Area and are part of the Janet Johnson Memorial WMA, which consists of approximately 800 acres (see Map 10). Additionally, an extensive wetland complex habitat and MNDNR Site of Biodiversity Significance ranked moderate is located southwest of the Land Control Area and is contiguous with the Janet Johnson Memorial WMA (see Map 15). These habitats contribute to greater biodiversity and provide higher-quality cover, food and reproductive value for wildlife than the agricultural-dominated matrix of the Land Control Area.

6.5.7.2 Avian Species

The Project is located within the Mississippi Flyway, a crucial migration route for millions of birds that migrate annually between nesting habitat and wintering habitat in North, Central and South America. Migratory birds are protected under the Migratory Bird Treaty Act (MBTA) (16 U.S. Code 703-711) which prohibits the taking of any migratory bird and their nests, eggs, or products. Additionally, Bald and Golden Eagles are also protected under the Bald and Golden Eagle Protection Act (BGEPA) (16 U.S. Code 668-668d) which prohibits disturbance that may lead to biologically significant impacts.

Although the MBTA and BGEPA provide protection for all migratory birds, the USFWS has also developed lists of Birds of Conservation Concern (BCC), which includes MBTA species and some non-MBTA protected species, to foster proactive conservation actions by federal and state agencies and private parties by focusing first on species of concern (USFWS, 2021). In addition, the U.S. North American Bird Conservation Initiative (NABCI) has developed Bird Conservation Regions (BCRs) to “facilitate domestic and international cooperation in bird conservation” (NABCI, 2022); each BCR has a list of birds present or possibly present within the region that are considered BCC.

The Project is also located within the Prairie Hardwood Transition Bird Conservation Region (BCR 23), (NABCI, 2021). The USFWS’s Information for Planning and Consultation (IPaC) tool identified nine species considered BCC within BCR 23 that are most likely to be present in the Land Control Area, as shown in Table 6.5.7-1.

TABLE 6.5.7-1
Birds of Conservation Concern that are Most Likely Present in the Land Control Area

BCR	Listed Birds	
	Common Name [a]	**Scientific Name**
23 (Prairie Hardwood Transition)	Black Tern	*Chlidonias niger*
	Canada Warbler	*Cardellina canadensis*
	Chimney Swift	*Chaetura pelagica*
	Eastern Whip-poor-will	*Antrostomus vociferus*
	Golden-winged Warbler	*Vermivora chrysoptera*
	Grasshopper Sparrow	*Ammodramus savannarum*
	Lesser Yellowlegs (nb)	*Tringa flavipes*
	Red-headed Woodpecker	*Melanerpes erythrocephalus*
	Wood Thrush	*Hylocichla mustelina*

[a] (nb) non-breeding in this BCR. The listed birds are a subset of birds within BCR 23 that are most likely present in the Land Control Area according to USFWS's IPaC review. Although the birds are known to the Project vicinity, suitable breeding habitat is not present (see Section 6.5.7.3).

Source: Listed birds are derived from the USFWS's IPaC tool receipt generated 1/06/2025 (see Appendix B).

Bald Eagles are assumed to be present within the Project vicinity. The USFWS has established Waterfowl Production Areas to protect habitat determined essential to the breeding, resting, and nesting habitat for countless avian and other wildlife species (USFWS, 2024a). The Project is not located within or near any Waterfowl Production Areas.

The National Audubon Society has established Important Bird Areas. Important Bird Areas are discrete sites that provide essential habitat for one or more bird species and include habitat for breeding, wintering, and/or migrating birds (National Audubon Society, 2024). The Project is not located within an Important Bird Areas. The closest Important Bird Areas is the Carlos Avery, approximately 1.4 miles to the south of the Land Control Area.

6.5.7.3 Impacts and Mitigation

Common Wildlife

The Project is designed to avoid areas with the potential for quality habitat by avoiding forests and wetland habitat that may affect wildlife species requiring specialized habitat conditions. The higher-quality habitats associated with the Janet Johnson Memorial WMA and Sites of Biodiversity Significance located to the west, northwest, and southwest of the Project are avoided. Habitats affected within the Preliminary Development Area are primarily agricultural land and fallow field habitat. Impacts to wildlife species using this type of habitat are expected to be minor as most of the species utilizing the Preliminary Development Area are mobile and easily adaptable if displaced to similar adjacent and available habitat. Additionally, wildlife species using the agricultural habitat are accustomed to regular manipulation of habitat conditions as a result of agricultural activities. Most of the wildlife species that utilize habitat within the Preliminary Development Area will likely avoid the area during construction in favor of adjacent habitats with fewer anthropogenic activities. During operation of the Project, impacts are expected to be minimal as wildlife will become accustomed to operational activities similar to the agricultural practices and Solar Facility maintenance activities that already occur adjacent to the Preliminary Development Area. Less mobile species may be more prone to impacts; however, impacts resulting from the construction and operation of the Project are not expected to differ from current impacts of annual farming activities or Solar Facility O&M. Mitigation is not proposed due to

minimal impact upon wildlife using land primarily manipulated for agriculture practices and adjacent similar habitat of higher value is available for displaced species.

Avian Species

Bald eagles are not expected to be impacted by the Project. The bald eagle may be present within the Study Area; however, based on a desktop review, the trees needed for roosting and nesting by bald eagles are absent from the Preliminary Development Area. If it is determined that bald eagles are nesting in the Project vicinity, then North Star Storage will work with USFWS to implement recommendations in accordance with the BGEPA .

Migratory BCC will not be affected by the Project as habitat is avoided or likely not present based upon a review of aerial imagery; an on-site habitat assessment was not deemed to be necessary given the absence of suitable roosting and nesting trees within the Land Control and Preliminary Development Areas. For example, migratory species such as the wood thrush will not be affected as suitable habitat (i.e. large unfragmented forest) is lacking within the Preliminary Development Area. The Canada warbler, which prefers mature mixed hardwoods of extensive forest and streamside thickets, is not present within the Preliminary Development Area. Other migratory bird species that may use forest-forest edge habitat (eastern whip poor will) will not be affected as forest habitat is avoided by the Preliminary Development Area. The lack of trees within the Preliminary Development Area reduces the suitability for redheaded woodpeckers and chimney swifts. The absence of prairie and grassland habitat within the Preliminary Development Area reduces the suitability for grasshopper sparrow. Species dependent upon wetlands and large freshwater marshes (i.e. lesser yellow legs, golden-winged warbler) will not be directly affected as wetland habitats are expected to be avoided.

The Project has been designed to avoid adverse impacts to quality habitat to the greatest extent possible. The Project will utilize BMPs to stabilize, protect, and mitigate potential impacts upon adjacent habitat minimizing impacts upon species. These BMPs will be implemented during construction, post-construction, and operational phases of the Project. Lighting will be designed in accordance with MNDNR's Commercial Solar Siting Guidance to reduce emitted blue light, which can be harmful to birds (MNDNR, 2016). Additionally, downward lighting will be implemented to reduce light pollution and avoid impacts upon avian species. No additional species-specific mitigation is proposed as potential impacts to wildlife, including avian species, are expected to be minimal.

6.5.8 Rare and Unique Natural Resources

6.5.8.1 Federally Listed Species

The USFWS's IPaC tool was reviewed for a list of federally endangered, threatened, proposed, and candidate species and designated critical habitat that may occur within the Land Control Area (USFWS, 2024b). The Official Species List, originally obtained on November 4, 2024, was updated on January 6, 2025, and both are included in Appendix B.

Table 6.5.8-1 shows the species that may occur within the Land Control Area according to the IPaC review.

TABLE 6.5.8-1
Federally Listed, Proposed, and Candidate Species Potentially Present in the Land Control Area

Scientific Name	Common Name	Federal Status
Canis lupus	Gray Wolf	Threatened
Grus americana	Whooping Crane	Experimental population, Non-essential
Simpsonaias ambigua	Salamander Mussel	Proposed Endangered
Danaus Plexippus	Monarch butterfly	Proposed Threatened

The Land Control Area does not overlap with any federally designated or proposed critical habitat.

Gray Wolf

The gray wolf can thrive in a wide range of habitats which reflects their adaptability as a species. The gray wolf successfully uses alpine, forest, grassland, shrubland, and woodland habitats across their range. In Minnesota, they largely inhabit forested regions where there is plenty of prey as well as plenty of cover (USFWS, 2024c; AZ Animals, 2024). Wolves tend to select against areas with high human and agriculture densities (Van Den Bosch, M., 2022). The Minnesota gray wolf population is classified as threatened (USFWS, 2024c).

Ungulates (wild and domestic) are the typical prey of wolves, who prefer moose, elk, and white-tailed deer. However, wolves also readily scavenge especially if an available supply of larger animals is not available. Additionally, wolves will turn to animals such as beavers, rabbits and birds (USFWS, 2024c and AZ Animals, 2024). The average territory of wolf packs in Minnesota ranges from 50 to 60 square miles (MNDNR, 2020). Both male and female wolves disperse at equal rates and equal distances, sometimes greater than 600 miles (USFWS, 2024c).

There are approximately 2,650 to 2,700 wolves in Minnesota. The latest official figures show that there were 2,691 wolves in the state in 2022. Minnesota conducts a survey of the wolves in the state every four years, allowing the population to be monitored easily. Minnesota has a dedicated wolf plan that aims to maintain a stable population of wolves within the state.

The Land Control Area is within the known range of the gray wolf and a food source may be present in this area. However, the Land Control Area is not contiguous with larger forested regions where cover and food sources are also available. As a result, more suitable habitat for gray wolves is available elsewhere nearby, in areas less dominated by agriculture and human activity.

Whooping Crane

Whooping cranes near the Land Control Area are listed as an experimental population, non-essential, according to USFWS (USFWS, 2024b). The Whooping Cranes' north to south range included Canada and the United State to Mexico, and its east to west range included the Rocky Mountains to the East Coast (USFWS, 2024d). Whooping Cranes in Central Minnesota are part of the eastern population that winters at the Chassahowitzka National Wildlife Refuge in Florida and breeds in the Necedah National Wildlife Refuge in Wisconsin. The 2024 estimated population size is 69. Fifteen of the 69 individuals are wild-hatched, and the rest are captive-reared. There are about 60 whooping cranes in Wisconsin and three in Minnesota. The remaining birds' locations have not been confirmed at the time of the report (International Crane Foundation, 2024). The whooping crane breeds, migrates, winters and forages in a variety of habitats, including coastal marshes, and estuaries, inland marshes, lakes, open ponds, shallow bays, salt marsh and sand or tidal flats, upland swales, wet meadows and rivers, pastures and agricultural fields (USFWS, 2024d). Suitable habitat in an agricultural setting includes a matrix of shallow

wetlands, surrounding grasslands, pastures, and small grain crops like wheat (Minnesota Conservation Volunteer, 2016). Summer foods include large nymphal or larval forms of insects, frogs, rodents, small birds, minnows, and berries.

For the purposes of consultation, non-essential experimental populations on private land are treated as a proposed species and do not receive any protections under the Endangered Species Act (ESA); however federal agencies must not jeopardize their existence (USFWS, 2018).

Suitable foraging, resting, and breeding habitat for the whooping crane may be present within the Land Control Area but suitability may be affected by a landscape matrix dominated by agriculture rather than the wetland, riparian, forest and open land to the west of the Land Control Area.

Salamander Mussel

Salamander mussels are small, elliptical-shaped mussels, reaching only up to 2 inches in length. Suitable habitat includes rivers, streams, and even lakes with suitable amounts of flow. Salamander mussels shelter under slab rocks or within bedrock crevices to gain stability within swift currents. Like all mussels, the larval stage of young salamander mussels is spent developing within the gills of a host aquatic species. The host species for larva is the mudpuppy, a species of large salamander. Mudpuppies must be present during the salamander mussel breeding season in order for the mussels to propagate (USFWS, 2024e).

On August 22, 2023, the USFWS published a proposed rule listing the salamander mussel as federally endangered under the ESA (Federal Register, 2023). Proposed species are not protected under the ESA, and as such, a determination of effect is not applicable. However, federal agencies are required to confer with the USFWS on agency actions that may be likely to jeopardize a proposed species (USFWS, 2017).

The closest waterbody (originating at Olson Marsh) is situated south of the Land Control Area, according to the Wetland Delineation Report (Westwood, 2014c). The waterbody is greater than 1,330 feet from the Land Control Area. As such, suitable habitat for the salamander is not present within the Land Control Area.

Monarch Butterfly

The monarch butterfly has two sets of wings and a wingspan of three to four inches (seven to ten centimeters). Their wings are a deep orange with black borders and veins, and white spots along the edges. The butterfly's body is black with white markings (National Wildlife Federation, 2024).

Whether monarchs are present in a given area within their range depends on the time of year. They are one of the few migratory insects, traveling great distances between summer breeding habitat and winter habitat where they spend several months inactive. In the summer they range as far north as southern Canada. In the fall the eastern population migrates to the cool, high mountains of central Mexico and the western population migrates to coastal California, where they spend the entire winter (National Wildlife Federation, 2024).

Field, roadside areas open areas, wet areas, or urban gardens all serve as habitat for the monarch butterfly. However, milkweed and flowering plants are needed for monarch habitat. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they can only lay eggs on milkweed plants (USFWS, 2024f).

On December 12, 2024, the USFWS published a proposed rule to the federal register to list the monarch as threatened with a 4(d) rule (Federal Register, 2024). Public comment on the proposed listing is being accepted by USFWS until March 12,2025. A final rule is expected to be published to the federal register in 12 months (excluding an extension), and the listing made effective 30-60 days later (i.e., January or February 2026).

Although common milkweed was not documented during other biological studies as occurring in the Land Control Area, common milkweed grows in a variety of habitats such as agricultural field edge habitat, roadside edges, and old field habitat which are present within the Land Control Area. Based on the desktop review, suitable habitat containing common milkweed for the monarch butterfly may be present within the Land Control Area.

6.5.8.2 State-listed Species

The MNDNR's Natural Heritage Information System (NHIS) was reviewed for documented occurrences of state-listed species within one mile of the Project. The MNDNR maintains the NHIS database through their Natural Heritage Program and Nongame Game Research Program; the NHIS is the most complete source of data on Minnesota's threatened and endangered species, as well as ecologically significant areas, native plant communities, and other rare natural features. The NHIS information provided here is based on a query of licensed NHIS data (license # LA170-2024). In addition, a Natural Heritage Review Request to the MNDNR was submitted via the MNDNR's Minnesota Conservation Explorer (MCE) online tool on November 4, 2024. An update was submitted through MCE on December 11, 2024, to provide additional information related to lighting and stormwater management to assist in the evaluation of effects upon species of concern, specifically the Blanding's Turtle. MNDNR provided a Natural Heritage Review response (MCE-2024-00911) related to the Blanding's Turtle on December 31, 2024. The review is valid for one year. Copies of agency correspondence are provided in Appendix B. Documented occurrences of state-listed species within one mile of the Land Control Area are shown in Table 6.5.8-2 (MNDNR, 2024j).

TABLE 6.5.8-2
State Listed Species Potentially Present Within One Mile of the Land Control Area

Scientific Name	Common Name	State Status
Emydoidea blandingii	Blanding's Turtle	Threatened
Rotala ramosior	Toothcup	Threatened

Blanding's Turtle

Wetland complexes and adjacent sandy uplands are necessary to support viable populations of Blanding's turtles; however, preference is for calm, shallow waters, including ponds and wetlands associated with rivers and streams with rich aquatic vegetation. In Minnesota, this species uses a wide variety of wetland types and riverine habitats. In central Minnesota, shrub wetlands are utilized throughout the summer and also serve as over-wintering sites. Blanding's turtles emerge from overwintering sites in late March to early April. Small, temporary wetlands are frequently used by Blanding's turtles in spring and early summer, when these habitats provide basking sites and mating opportunities. Nesting can occur up to a mile from the wetland in sparsely vegetated uplands or agricultural fields with well-drained, sandy soils (MNDNR, 2024k).

Suitable habitat may be present for the Blanding's turtle within the Land Control Area due to the presence of wetlands, including wetlands with adjacent mapped sandy soils, as well as the wetlands' connectivity with large wetlands beyond the Land Control Area.

Toothcup

The toothcup is a threatened plant species within Minnesota. Minnesota sits along the northern periphery of the toothcup's range with very few occurrences in the state. The species in known to inhabit only shallow wetlands in five east-central counties in the Anoka Sand Plain, St. Paul-Baldwin Plains and Moraines, Big Woods, and Mille Lacs Uplands ecological subsections. The populations of the toothcup in Minnesota typically occur on sandy shores or small shallow lakes set in a savanna landscape. More specifically, it can be expected to occur between the normal high-water line and low-water line. The toothcup is a small inconspicuous summer annual. It is insect-pollinated, though it is self-compatible and often self-pollinated (MNDNR, 2024l).

Suitable habitat for the toothcup is not present within the Land Control Area.

6.5.8.3 MNDNR High-value Areas

North Star Storage reviewed publicly available information to identify other MNDNR high value natural resources for potential presence within the Land Control Area and the area within a one-mile buffer, including:

- Minnesota Biological Survey sites of biodiversity significance, MNDNR Native Plant Communities (NPCs), and Native Prairie;
- calcareous fens;
- Minnesota Wildlife Action Plan Species and Wildlife Action Network (WAN); and
- large block and other important habitats.

Additionally, potential impacts to ecologically significant areas did not require further review from the MNDNR based on an automatic response through the Natural Heritage Program's MCE tool, dated December 11, 2024 (see Appendix B). In addition, the final Natural Heritage Review, dated December 11, 2024, did not provide requirements or recommendations to avoid impacts to ecologically sensitive areas. The high value unique natural features identified above are discussed below and shown on Map 15.

Native Plant Communities

Using aerial surveys and a desktop review, MNDNR's Minnesota Biological Survey evaluates Minnesota landscapes for rare plant and animal species, NPCs, and intact ecological communities. The most recent classification effort was in 2003; this "Version 2.0" is strongly based on plant species composition and was developed using extensive data from sample plots throughout the state from a variety of habitat types including wetlands, forests, prairies, and others.

A biodiversity significance rank is assigned to each site; these are then referred to as sites of biodiversity significance. Ranks are based on the landscape context (i.e., proximity of site to other intact sites or isolation within agricultural, urban, or other disturbed areas), presence/extent of native plant communities, and the presence of rare species populations. The ranking process allows for prioritization of sites for conservation and guides management and monitoring efforts. Sites are ranked as outstanding, high, moderate, and below.

Based on review of the MNDNR NPC data, there are no NPCs within the Land Control. An area of moderate biodiversity significance is not within the Land Control Area but is located approximately 811 feet west of the Land Control Area, west of Lincoln Trail. Moderate sites contain occurrences of rare species, moderately disturbed native plant communities, and/or landscapes that have strong potential for recovery of native plant communities and characteristic ecological processes.

Native Prairie

Native prairie means land that has never been plowed where native prairie vegetation originating from the site currently predominates or, if disturbed, is predominantly covered with native prairie vegetation that originated from the site. Unbroken pastureland used for livestock grazing can be considered native prairie if it has predominantly native vegetation originating from the site and conservation practices have maintained biological diversity (Minn. Stat. Section 84.02 subd. 5; MNDNR, 2024m). There is no MNDNR-mapped native prairie in the Land Control Area. Moreover, a review of historic aerial photographs indicates that the entire Preliminary Development Area is currently or has been subject to row crop agriculture. Accordingly, no native prairie will be impacted by the Project.

Calcareous Fens

Calcareous fens are rare wetlands dependent on a persistent source of calcium-rich groundwater. These areas support unique plant communities that are highly sensitive to changes in both groundwater quality and quantity (MNDNR, 2024n). Reductions in groundwater upwelling rates changes in surface water can damage fen condition and/or extent, in some cases irreparably. Based on review of MNDNR's data, there are no calcareous fens within 5 miles of the Land Control Area.

Minnesota Wildlife Action Plan and Wildlife Action Network

Minnesota's State Wildlife Action Plan (SWAP) (2015-2025) is a plan which aims to address the primary issues facing Minnesota's Species of Greatest Conservation Need (SGCN) including habitat loss, degradation, and fragmentation, biological factors such as low reproduction, poor dispersal ability, disease, or overexploitation, and the impacts of climate change (MNDNR, 2024o). SGCN are native species with rare, declining, or vulnerable populations. All state and federally listed species that occur in Minnesota are automatically listed as SCGN.

The SWAP defines actions that can be taken to prevent populations declining further and resulting in the need to list them under the state endangered species program or the federal ESA.

The WAN is a spatial dataset developed by the MNDNR to assist in developing and focusing conservation efforts for species identified in the SWAP (MNDNR, 2024p). The WAN is comprised of 10 GIS data layers that represent terrestrial and aquatic habitats across the state that support SGCN. These include lakes of biological significance, rivers and streams with high biological integrity, and high conservation value forests. Areas within Minnesota are ranked from low to high identifying habitats representing viable or persistent populations and "richness hotspots" of SGCN. The Land Control Area is within a medium ranked area for SGCN but not a richness hotspot for SGCN. The expansive landscape that contains the medium ranked SGCN area also includes the higher quality habitat of the Janet Johnson Memorial WMA and biodiversity area as well as the Land Control Area and other renewable energy areas. As a result, the Project is

situated within the altered area of the landscape and avoids the higher-quality habitat areas of habitat and species diversity.

Large Block Habitats

Large, contiguous blocks of habitat, such as forests or grasslands, can provide foraging, denning, and breeding habitats for species requiring greater separation from anthropogenic development. Large habitat blocks are considered areas greater than 100 acres (Ontario Extension Notes, 2000; Atwood et. al., 2017). These areas often include more complex ecological communities, which may lead to an increased diversity of species, and larger and more resilient species populations. Construction of the Project within large block habitats may increase habitat loss and fragmentation, which is counterproductive to area-sensitive species for feeding, breeding, and sheltering. No large block habitats of forest land or grassland are present in the Land Control Area.

6.5.8.4 Impacts and Mitigation Measures

Federally Listed Species

An Official Species List will be requested through IPaC again prior to the start of construction to ensure the species list remains current. If new federally listed species are identified through the updated reviews as potentially present in the Preliminary Development Area, avoidance and minimization measures will be developed to ensure Project activities will not result in unauthorized take of federally listed species.

Gray Wolf

Suitable habitat for the gray wolf is present within the Preliminary Development Area; however, due to the transient nature of the gray wolf, development/land use activity within the vicinity of the Project, and available adjacent habitat, it is unlikely that the gray wolf would persist within the Preliminary Development Area. As a result, impacts are not anticipated; and therefore, no mitigation is proposed.

Whooping Crane

Suitable habitat for the whooping crane may be present within the Preliminary Development Area (and larger Land Control Area) to support migration and breeding; however, it is anticipated that whooping cranes will use adjacent habitat during construction and operation of the Project; therefore, impacts are expected to be minimal, and mitigation is not proposed.

Salamander Mussel

Suitable habitat for the salamander mussel is not present within the Preliminary Development Area; therefore, impacts are not anticipated. North Star Storage will implement BMPs prior to, during and following construction to protect and maintain water quality of downgradient waters. No mitigation measures are proposed.

Monarch

Based upon review of aerial imagery, suitable habitat for monarchs may be present within the Preliminary Development Area due to the presence of old field habitat. If it is determined during

field investigations that suitable monarch habitat is confirmed then coordination with the USFWS will be conducted to evaluate potential project impacts to the species and develop appropriate avoidance and conservation measures.

State-listed Species

Blanding's Turtle

Suitable habitat for the Blanding's turtle may be present within the Preliminary Development Area. Actions and measures to avoid and minimize potential impacts upon the Blanding's turtle are discussed below.

During an early coordination meeting with MNDNR, MNDNR representatives expressed concern that potential suitable overwintering habitat for the Blanding's turtle may be created by the construction of the stormwater basin adjacent to the fenced Project. However, due to the presence of sandy soils, any collected stormwater is anticipated to infiltrate into the soil within 24-hours of a rainfall event. Therefore, extensive use or overwintering of Blanding's turtles in the stormwater basin is not anticipated. North Star Storage will maintain the stormwater basin periodically during Project operation; the maintenance schedule/plan is pending. North Star Storage will implement the Blanding's turtle construction BMPs if/when maintenance is necessary, in accordance with MNDNR's fact sheet for the Blanding's Turtle (MNDNR, 2008a).

MNDNR's Natural Heritage Review response indicated the Blanding's turtle may be impacted due to proposed project activities. A copy of the December 31, 2024 Natural Heritage Review response letter is provided in Appendix B. The following avoidance measures are required by MNDNR to avoid a take of a threatened or endangered species without a permit in accordance with Minnesota's Endangered Species Statute (Minn. Stat. § 84.0895) and associated Rules (Minn. R. Chapter 6212 Parts 6212.1800 to 6212.2300 and Chapter 6134). The following avoidance measures are required.

- Avoid wetland and aquatic impacts during hibernation season, between September 15 and April 15, if the area is suitable for hibernation.
- Install and maintain a temporary turtle proof barrier, such as a silt fence, to keep turtles out of soil stockpiles, gravel pads, and other areas of exposed soil/sand/sediment during nesting season, May 15 to July 15. The turtle proof barrier must be buried a minimum of 10 inches and removed once the project is complete.
- Limit erosion and sediment control to wildlife friendly erosion control (MNDNR, 2008b).
- Avoid hydro-mulch products that contain any materials with synthetic (plastic) fiber additives, as the fibers can re-suspend and flow into waterbodies.
- Check bare ground within construction areas for turtles before the use of heavy equipment or any ground disturbance.
- The Blanding's turtle flyer (MNDNR, 2008b) must be given to all contractors working in the area.
- Report any sightings using the Quick Species Observation Form (QUICK Species Observation Form).

- If turtles are in imminent danger, move them by hand out of harm's way; otherwise, they are to be left undisturbed. Directions on how to move turtles safely can be found at Helping Turtles Across the Road (MNDNR, 2024q).

- Additional Blanding's turtle avoidance measures may include, but are not limited to, recommendations from List 1 and List 2 of the Blanding's turtle fact sheet (MNDNR, 2008a).

North Star Storage is committed to implementing the above listed measures to avoid potential impacts on the Blanding's Turtle. North Star Storage notified MNDNR of the commitment to implement the avoidance measures on February 26, 2025. Copies of agency correspondence are provided in Appendix B. The Natural Heritage Review response will be included as part of state or local license or permit application packages for reference and for inclusion as restrictions or special conditions as appropriate.

Toothcup

Suitable habitat for the toothcup is not present within the Preliminary Development Area. As a result, impacts are not anticipated, and mitigation is not necessary.

MNDNR High-value Areas

Review of publicly available datasets did not identify MNDNR high value areas within the Preliminary Development Area, including Minnesota Biological Survey sites of biodiversity significance, NPCs; native prairie; calcareous fens; SWAP species or WAN areas; or large block habitats. MNDNR's review of the project through the MCE did not identify known high-value habitat / ecologically significant areas within the Land Control Area (see Appendix B). As such, impacts on MNDNR high value-ecologically significant areas, including species richness hotspots for SGCN, will not occur and be avoided and no mitigative measures are proposed.

6.6 UNAVOIDABLE IMPACTS

North Star Storage developed the Project to avoid impacts on environmental resources whenever possible. In some cases, impacts on environmental resources could not be entirely avoided, but could be minimized by implementation of mitigation measures. A detailed discussion of the environmental impacts of the proposed Project, as well as the mitigation measures that would be used to minimize impacts is presented in Sections 6.1 through 6.5 of this Application. Environmental impacts that would be minimized by the use of mitigation measures, but not entirely avoided are provided below. Most of these unavoidable impacts would occur during construction. Most unavoidable impacts would resolve with the completion of construction.

Unavoidable impacts related to the Project that would last only as long as the construction period include:

- noise emitted from vehicles and equipment during construction that will be audible to neighboring landowners;

- increased traffic on roads surrounding the Land Control Area;

- minor air quality impacts due to fugitive dust;

- potential for soil erosion; and

- disturbance to and displacement of some species of wildlife.

Unavoidable impacts related to the Project that would last as long as the life of the Project would include:

- changes to existing aesthetics of landscape (from agrarian to a BESS facility), which will be visible from local roadways and parcels; and

- changes in land use and vegetation from agricultural land to a BESS facility with impervious.

6.7 IRRETRIEVABLE COMMITMENT OF RESOURCES

An irretrievable commitment of resources refers to the use or consumption of resources in a way that is neither renewable nor recoverable for later use by future generations. The commitment of resources refers primarily to the use of nonrenewable resources such as fossil fuels, water, and other materials (e.g., aggregate minerals, steel/metals).

Construction of the Project would require the use of fossil fuels for electricity (portable generators) and for the operation of vehicles and equipment. Use of raw building materials for construction would be an irretrievable commitment of resources from which these materials are produced, excluding those materials that may be recycled at the end of the Project's life cycle. The use of water for dust abatement and erosion control during construction activities would also be irreversible. Further, commitment of labor and fiscal resources to develop and build the Project is considered irretrievable.

6.8 CUMULATIVE POTENTIAL IMPACTS

Cumulative impacts on the environment can occur if the impacts of one activity overlap either geographically or temporally with other activities, thereby resulting in cumulatively greater impacts on a particular area or important resource.

Review of MnDOT state highway projects within the Twin Cities – Metro District did not identify any proposed Project that would be adjacent to the Project. The nearest MnDOT project would be construction on Highway 95 in City of North Branch to improve safety including constructing a dedicated left turn lane at 392nd Street, reconstruct shoulders, resurface pavement, and update drainage (MnDOT, 2024c); construction is scheduled for 2025 which is not expected to overlap with 2026 Project construction. Chisago County is also leading a project to identify a long-term solution to improve safety and mobility along Highway 8 from Interstate 35 in Forest Lake to Karmel Avenue. The location of this project is about 5.5 miles south of the Project. This work is planned for 2025-2028, which would overlap with the anticipated period of construction for the Project. However, given the distance between the Project and the planned MnDOT project, no potential for cumulative impacts is anticipated.

Review of the Chisago County Public Works 2024-2028 Chisago County Transportation Improvement Plan identified a mill and overlay project along County Road 72 and County State Aid Highway (CSAH) 11, and a seal coat project along CSAH 18 (Chisago County, 2023). The closest of which (CSAH 11) is approximately 0.8 mile east of the Project. North Star Storage will

work with Chisago County to determine construction schedules and mitigate any concerns. As such, cumulative effects related to the Chisago County construction projects are not anticipated.

No other proposed projects that may overlap spatially or temporally with the Project have been identified through coordination with other state, county, or local government agencies. As such, no potential cumulative impacts are anticipated from construction or operation of the Project.

7.0 AGENCY AND STAKEHOLDER COORDINATION

North Star Storage conducted early coordination with federal, state, and local agencies and Tribal Nations in Fall 2024 for the Project. This section describes the early stakeholder engagement conducted by North Star Storage in support of this Application.

A project notification letter was sent out on November 18, 2024, to the agencies and Tribal Nations listed in Table 7.0-1. A summary of responses received as of the date of this Application filing follows the table. A representative letter and copies of responses received from agencies and Tribal Nations are provided in Appendix B.

TABLE 7.0-1
Summary of Agency Correspondence

Agency	Response/Meeting Date
FEDERAL	
U.S. Army Corps of Engineers	Response date: November 20, 2024
U.S. Fish and Wildlife Service	Response date: January 6, 2025
U.S. Department of Agriculture	No response to date.
U.S. Federal Aviation Administration	Filing is not required per Notice Criteria Tool.
TRIBAL NATIONS	
Bois Forte Band of Chippewa	No response to date.
Fond du Lac Band of Lake Superior Chippewa	No response to date.
Grand Portage Band of Ojibwe	No response to date.
Leech Lake Band of Ojibwe	December 11, 2024
Lower Sioux Indian Community	Response dates: November 20, 2024 and December 9, 2024
Mille Lacs Band of Ojibwe	No response to date.
Prairie Island Indian Community	No response to date.
Red Lake Nation	No response to date.
Shakopee Mdewakanton Sioux (Dakota) Community	Response dates: November 18, 2024 and November 25, 2024
Upper Sioux Community	No response to date.
White Earth Nation	No response to date.
STATE	
Minnesota Board of Water and Soil Resources	No response to date.
Minnesota Department of Agriculture	Meeting coordination; December 12, 2024
Minnesota Department of Commerce, Energy Environmental Review and Analysis	Meeting only; December 13, 2024
Minnesota Department of Health	No response to date.
Minnesota Department of Natural Resources, Energy Review Planner	Response date: November 18, 2024
Minnesota Department of Natural Resources Environmental Review – Regional Program	Meeting date: December 9, 2024 Response date: December 31, 2024
Minnesota Department of Transportation	Response date: November 21, 2024
Minnesota Indian Affairs Council	No response to date.
Minnesota Pollution Control Agency	No response to date.
Minnesota State Historic Preservation Office	Response dates: December 4, 2024 and January 31, 2025
Office of the State Archaeologist	No response to date.

TABLE 7.0-1
Summary of Agency Correspondence

Agency	Response/Meeting Date
LOCAL	
Chisago County Environmental Services Department	Response date: November 20, 2024 Meeting date: January 9, 2025
City of North Branch Planning and Zoning; Economic Development	Response date: November 25, 2024 Meeting date: January 9, 2025
OTHER STAKEHOLDERS	
International Union of Operating Engineers and the Carpenters' Union	Meeting on February 4, 2025
Laborers' International Union of North American	Meeting on February 18, 2025

7.1 FEDERAL AGENCIES

7.1.1 U.S. Army Corps of Engineers

The USACE provided a response on November 20, 2024, which summarizes USACE's jurisdiction and applicability of Section 301b and 404 under the Clean Water Act. The USACE also offered to set up a pre-application consultation meeting. North Star Storage responded indicating, based on preliminary design, the proposed Project is not anticipated to result in a discharge of dredged or fill material into Waters of the United States (see Section 6.5.5.5). If avoidance is determined not to be possible, North Star Storage will work with USACE to obtain coverage under either a Nationwide Permit or a Regional General Permit, as appropriate. A copy of this correspondence is provided in Appendix B.

7.1.2 U.S. Fish and Wildlife Service

North Star Storage obtained an official species list on November 4, 2024, by accessing the USFWS's IPaC online tool to determine federally listed species of concern within the Land Control Area and vicinity. The IPaC review was updated on January 6, 2025, to capture the status change for the monarch butterfly from candidate for listing to a listing of proposed threatened. The IPaC response receipts are contained in Appendix B. Federal threatened and endangered species are discussed in Section 6.5.8. The USFWS's Determination Keys identify if a proposed project action has the potential to adversely affect federally listed species or designated critical habitat and will be completed if appropriate once federal nexus has been determined regarding the project. The IPaC response also identified the potential for bald eagles and migratory bird species of concern within the Land Control Area and vicinity for compliance with the BGEPA and MBTA (see Section 6.5.7.2). Online reviews of USFWS databases identified the potential for federal public recreation areas (see Section 6.2.9) and waterfowl production areas (see Section 6.5.7.2).

7.1.3 Federal Aviation Administration

North Star Storage used the FAA Notice Criteria Tool to determine the need for filing 7460-1 Notice of Proposed Construction forms. The results indicated the Project does not exceed the Notice Criteria (see Appendix B).

7.2 TRIBAL NATIONS

7.2.1 Leech Lake Band of Ojibwe

The Leech Lake Band of Ojibwe responded on December 11, 2024, indicating the Project has been reviewed and the Leech Lake Band of Ojibwe does not have any recorded historic properties within this area. The Leech Lake Band of Ojibwe requested that should any human remains or suspected human remains be encountered, all work shall cease and the following personnel should be notified immediately: County Sheriff's Office, Office of the State Archaeologist, and the Leech Lake Band of Ojibwe, along with other interested parties.

7.2.2 Lower Sioux Indian Community

The Lower Sioux Indian Community responded on November 20, 2024, requesting that the Lower Sioux Tribal Historic Preservation Office remain an interested party throughout Project endeavors and asked that North Star Storage contact appropriate parties and agencies should any inadvertent discoveries concerning archaeological and/or cultural resources happen to occur to assure the matter is properly addressed. North Star Storage provided a copy of the 2014 Solar Facility Phase I archaeological survey that included the Project area as well as recent SHPO correspondence indicating the 2014 survey was adequate and that additional survey is not required for the BESS Project (see Section 7.3.4). The Lower Sioux Indian Community responded on December 9, 2024 indicating they will review the documents and cross reference with their internal databases to confirm the presence of cultural resources or cultural places. A copy of this correspondence is provided in Appendix B.

7.2.3 Shakopee Mdewakanton Sioux Community

As requested by the Shakopee Mdewakanton Sioux Community, North Star Storage provided a copy of the Solar Facility Phase I archaeological survey that included the Project area on November 25, 2024. The Shakopee Mdewakanton Sioux Community responded that as long as no significant archaeological or cultural sites are involved, they have no concerns, but to continue to keep them informed. A copy of this correspondence is provided in Appendix B

7.3 STATE AGENCIES

7.3.1 Minnesota Department of Natural Resources

North Star Storage initiated communications and requested early coordination with the MNDNR on November 18, 2024. DESRI and MNDNR met on December 9, 2024 to discuss the Project and the potential for impacts upon species of concern. At the request of MNDNR, an update was submitted through MCE on December 11, 2024 to provide additional project information related to lighting and stormwater management to assist in the evaluation of potential impacts upon species of concern, specifically the Blanding's Turtle. The consultation and review efforts regarding the Project are ongoing. Copies of agency correspondence are included in Appendix B.

North Star Storage initially submitted a request for a Natural Heritage Review through MNDNR's online MCE program on November 4, 2024. Prior to the response, the Blanding's turtle and the toothcup were identified as potentially occurring within the Land Control Area and vicinity based upon review of online data sources. Following the December 11, 2024 update request, the MNDNR provided a Natural Heritage Review response on December 31, 2024 and outlined

required avoidance measures to protect the Blanding's turtle (see Appendix B). MNDNR was notified North Star Storage has committed to the implementation of the avoidance measures to protect the Blanding's turtle. Copies of agency correspondence are included in Appendix B. The project is located within a medium ranked area for SGCN but not within a richness hotspot for SGCN. The application discusses topics such as wildlife and their habitats (see Section 6.5.7), state threatened and endangered species (see Section 6.5.8), wildlife management areas (see Section 6.2.9), and high value habitats such as sites of biodiversity significance, native plant communities, calcareous fens, SGCN areas, and large habitat blocks (see Section 6.5.8.3). Other ecological features addressed in coordination with federal agencies include federally listed species (see Section 6.5.8.1); and surface waters, including wetlands (see Section 6.5.5).

7.3.2 Minnesota Department of Transportation

MnDOT responded on November 21, 2024 indicating the proposed Project does directly impact MnDOT trunk highways or areas of interest and with the possible exception of Minnesota Oversize/Overweight permits that may be needed during project construction (see Section 6.2.7.7). MnDOT does not anticipate the need for coordination of any other utility accommodation, trunk highway access, or miscellaneous permits. A copy of this correspondence is provided in Appendix B

7.3.3 Minnesota Indian Affairs Council

On December 31, 2024, Isaac Weston from the Minnesota Indian Affairs Council contacted DESRI to ask whether any federal funding was associated with the Project or if the Project was being developed solely with private funding. DESRI respond to Mr. Weston's call on January 2, 2025 and confirmed that no federal funding will be used for Project development.

7.3.4 Minnesota State Historic Preservation Office

On November 25, 2024, North Star Storage informed the SHPO that a Phase I archaeological survey that included the Project area was conducted in October 2014. On December 4, 2024, the SHPO agreed that the 2014 survey was adequate and that additional survey is not required for the Project. On January 31, 2025, the SHPO confirmed that no significant archaeological sites will be affected by this project and that there are no properties listed in the National or State Registers of Historic Places, or within the Historic Sites Network, that will be affected by this project. A copy of this correspondence is provided in Appendix B.

7.4 LOCAL GOVERNMENT

7.4.1 Chisago County

Chisago County responded on November 20, 2024 introducing Nate Sondrol (City of North Branch Community Development Director) and requested additional project details as it becomes available. North Star Storage responded on November 25, 2024 requesting an in-person meeting in early to mid-January; an in-person meeting occurred on January 9, 2025. A copy of this correspondence is provided in Appendix B.

7.4.2 City of North Branch

The City of North Branch requested relevant MPUC docket information and timing of early coordination. On November 25, 2024, North Star Storage provided a response. A copy of this

correspondence is provided in Appendix B. Additionally, an in-person meeting occurred on January 9, 2025 to discuss the Project.

7.5 OTHER STAKEHOLDERS

7.5.1 International Union of Operating Engineers and Carpenter's Union

North Star Storage met with Charles Sutton, representative for the International Union of Operating Engineers (IUOE) and the Carpenters' Union on February 4, 2025 to introduce the Project, provide a general overview of the anticipated construction schedule, and answer any questions the unions may have about Project labor needs and hiring. At this meeting, North Star Storage explained that an Engineering, Procurement, and Construction contractor has not been selected for the Project. However, North Star Storage committed to facilitating an introduction between the Engineering, Procurement, and Construction contractor and IUOE and Carpenter's Union representatives sometime in summer 2025, after this contractor is selected. Mr. Sutton expressed the IUOE and Carpenter's Union support for the Project and noted they look forward to continuing the conversation about labor sourcing as Project development advances.

7.5.2 Laborers' International Union of North America

North Star Storage met with Kevin Pranis, representative for the Laborers' International Union of North American (LIUNA) on February 18, 2025 to introduce the Project, provide a general overview of the anticipated construction schedule, and answer any questions the union may have about Project labor needs and hiring. At this meeting, North Star Storage explained that an Engineering, Procurement, and Construction contractor has not been selected for the Project. However, North Star Storage committed to facilitating an introduction between the Engineering, Procurement, and Construction contractor and LIUNA representatives sometime in summer 2025, after this contractor is selected. Mr. Pranis expressed the LIUNA support for the Project and noted they look forward to continuing the conversation about labor sourcing as Project development advances.

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