

Environmental Assessment: North Star Battery Energy Storage Project

The Human and Environmental Impacts of Constructing and Operating the
100 MW North Star Energy Storage Project

October 2025

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

OAH Docket No. 5-2500-40938



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North Star Energy Storage, LLC (North Star Storage), an affiliate of DESRI Renewables, LLC and North Star Solar PV, LLC, proposes to construct and operate an energy storage project with a nominal power rating of up to 100 megawatts (MW) alternating current (AC) with approximately 400 megawatt-hours (MWh) of energy capacity on a site of approximately 77.9 acres in North Branch, Chisago County, Minnesota. North Star Storage must obtain a site permit from the Minnesota Public Utilities Commission before it can construct the proposed North Star Battery Energy Storage Project.

Sources

Much of the information used to prepare this environmental assessment comes from the site permit application. Additional sources include information from relevant federal and state environmental review documents for similar projects, surveys conducted by/on behalf of the applicants, and publicly available geospatial datasets.

Project Mailing List

To place your name on the project mailing list contact docketing.puc@state.mn.us or (651) 201-2246 and provide the docket number (25-123), your name, email address, and mailing address. Please indicate whether you would like to receive notices by email or U.S. mail.

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Acronyms and Abbreviations

Acronym/Abbreviation	Description
AC	alternating current
ALJ	administrative law judge
applicant	North Star Energy Storage, LLC
BESS	Battery Energy Storage System
BMP	best management practice
Commerce	Department of Commerce
Commission	Public Utilities Commission
CSAH	County State Aid Highway
CSW Permit	Construction Stormwater Permit
dBA	A-weighted sound level recorded in units of decibels
DC	direct current
DNR	Minnesota Department of Natural Resources
DSP	draft site permit
DWSMA	Drinking Water Supply Management Area
EA	environmental assessment
EMF	electromagnetic fields
ESA	Endangered Species Act
ESS	Energy Storage System
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
GPS	Global Positioning System
IPaC	Information for Planning and Consultation
IUOE	International Union of Operating Engineers
kV	kilovolt
LCA	Land Control Area
LFP	lithium iron phosphate battery technology
MBS	Minnesota Biological Survey
MDA	Minnesota Department of Agriculture
MDH	Minnesota Department of Health

Acronyms and Definitions

MW	megawatt
MWh	megawatt hour
mG	milligauss
MnDOT	Minnesota Department of Transportation
MPCA	Minnesota Pollution Control Agency
NAC	noise area classification
NLCD	National Land Cover Dataset
NMC	nickel manganese cobalt battery technology
NHIS	Natural Heritage Information System
North Star Storage	North Star Energy Storage, LLC
O&M	Operations and Maintenance
Project	North Star Battery Energy Storage Project
Project substation	North Star Solar Substation
PWI	DNR Public Waters Inventory
ROI	region of influence
ROW	right-of-way
SCADA	Supervisory Control and Data Acquisition
SHPO	State Historic Preservation Office
SPA	Site Permit Application
SPAA	Site Permit Application Amendment
SPCCP	Spill Prevention, Control and Countermeasures Plan
SSURGO	Soil Survey Geographic database
SWPPP	Stormwater Pollution Prevention Plan
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
VMP	Vegetation Management Plan
WCA	Wetland Conservation Act
WHPA	Wellhead Protection Area
WMA	DNR Wildlife Management Area

DEFINITIONS

Several terms used in this document have specific meaning in Minnesota law or regulation. Other terms are defined for clarity.

associated facilities: buildings, equipment, and other physical structures that are necessary to the operation of a large electric power generating plant or high voltage transmission line (Minnesota Rule 7850.1000, subpart 3).

Construction: any clearing of land, excavation, or other action that would adversely affect the natural environment of the site or route but does not include changes needed for temporary use of sites or routes for nonutility purposes, or uses in securing survey or geological data, including necessary borings to ascertain foundation conditions (Minnesota Statute 216E.01, subdivision 3).

distribution line: power lines that operate below 69 kilovolts.

easement : grant of one or more of the property rights by the property owner to and /or for the use by the public, a corporation, or another person or entity

energy storage system: equipment and associated facilities designed with a nameplate capacity of 10,000 kilowatts or more that is capable of storing generated electricity for a period of time and delivering the electricity for use after storage. (Minnesota Statute 216E.01, subdivision 3a).

land control area: the 77.9 acre area for which North Star Storage is assumed to have site control through a lease agreement. The term is used to bound a review area and should not be understood to imply the applicant has secured, or will definitely secure, the necessary land rights.

local vicinity: 1,600 feet from the land control area and collection line corridor.

Mitigation: to avoid, minimize, correct, or compensate for a potential impact.

power line: a distribution, transmission, or high voltage transmission line.

project area: one mile from the land control area.

transmission line: power lines that operate at 69 kilovolts and above.

1 Introduction

North Star Energy Storage, LLC (North Star Storage or Applicant), an affiliate of DESRI Renewables, LLC and North Star Solar PV, LLC, proposes to construct and operate a battery energy storage system (BESS) with a nominal power rating of up to 100 MW alternating current (AC) with approximately 400 megawatt-hours (MWh) of energy capacity on a site of approximately 77.9 acres in North Branch, Chisago County, Minnesota. As proposed, the facility will be connected to the electric grid through the existing Chisago County Substation, which is adjacent to the project and owned by Xcel Energy. The project is also adjacent to the North Star Solar project (Docket No. IP-6943/GS-15-33) which connects to the Chisago County Substation as well. North Star Storage anticipates that project construction will begin in early 2026 and that operation will commence in early 2027.

North Star Storage must obtain a site permit from the Minnesota Public Utilities Commission (Commission) before it can construct the proposed North Star Battery Energy Storage project (facility or project).

The applicant filed a site permit application (SPA) on February 28, 2025.¹ The application requested an up to 80 MW energy storage facility. The Commission found the application to be substantially complete on April 15, 2025.² On August 22, 2025, the applicant filed a site permit application amendment (SPAA) to request that the proposed BESS facility be altered to have a maximum storage capacity of 100 MW.³

Minnesota Public Utilities Commission Energy Infrastructure Permitting (EIP) staff has prepared this environmental assessment (EA) for the proposed project.⁴ The EA describes the project, highlights resources affected by the project, and discusses potential human and environmental impacts to these resources. It also discusses ways to mitigate potential impacts. These mitigation strategies can become enforceable conditions of the Commission's site permit.

An EA is not a decision-making document, but rather an information document. The EA is intended to facilitate informed decisions by state agencies, particularly with respect to the goals of the Minnesota Power Plant Siting Act to “minimize adverse human and environmental impacts while insuring continuing electric power system reliability and integrity and ensuring that electric energy needs are met and fulfilled in an orderly and timely fashion”.⁵

¹ North Star Storage, SPA, February 28, 2025, eDocket Nos. [20252-215915-01](#) (through -10).

² Commission, Order, April 15, 2025, eDocket No. [20254-217702-01](#).

³ North Star Storage, SPAA, August 22, 2025, eDocket No. [20258-222299-01](#).

⁴ On July 1, 2025, Department of Commerce (Commerce) Energy Environmental Review and Analysis (DOC EERA) unit staff moved to the Minnesota Public Utilities Commission Energy Infrastructure Permitting (PUC EIP) unit as directed by state law (Laws of Minn. 2024, ch.126, art. 7). While DOC EERA staff initiated environmental review of this proposal prior to July 1, 2025, the environmental review is now being completed by PUC EIP staff. For accuracy related to procedural history, references to previous filings and actions by Commerce and/or EERA will be identified as such, and “EIP” will be referenced throughout the remainder of this document.

⁵ Minnesota Statutes [216E.02](#), subd. 1.

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1.1 How is this document organized?

The EA addresses the matters identified in the scoping decision.

This EA is based on the applicant's site permit application and public scoping comments. It addresses the matters identified in the August 29, 2025, amended scoping decision (**Appendix B**).

- **Chapter 1** briefly describes the state of Minnesota's role; discusses how this EA is organized; and provides a summary of potential impacts and mitigation.
- **Chapter 2** describes the project—design, construction, operation, and decommissioning.
- **Chapter 3** summarizes the regulatory framework, including the site permit process, the environmental review process, other approvals that might be required for the project, and the criteria the Commission uses to make its decisions.
- **Chapter 4** describes the environmental setting; details potential human and environmental impacts from the project; and identifies measures to mitigate adverse impacts. It summarizes the cumulative potential effects of the project and other projects and lists unavoidable impacts and irreversible and irretrievable commitments of resources.

1.2 What does the applicant propose to construct?

North Star Storage proposes to construct a 100 MW BESS and associated facilities on a site of approximately 77.5 acres in North Branch in Chisago County, Minnesota.

North Star Storage proposes to construct and operate a BESS with a nominal power rating of up to 100 MW alternating current (AC) with approximately 400 MWh of energy capacity on a site of approximately 77.5 acres in North Branch, Chisago County, Minnesota. In addition to batteries, racking, and enclosures, the facility will also include inverters and transformers, electrical feeder lines, drainage basin, parking areas, and fencing surrounding the perimeter of the facility. Upon final design, there may be an operations and maintenance (O&M) building added to the project footprint. The project will utilize the existing North Star Solar substation to facilitate the connection to the Chisago County Substation. The North Star Solar substation will be expanded and modified to incorporate the BESS project.

North Star Storage indicates that the project will help meet the growing demand for renewable energy and will assist Minnesota in reaching its renewable energy objectives by allowing wind and solar resources to continue producing energy at times when they would otherwise be curtailed due to low demand.

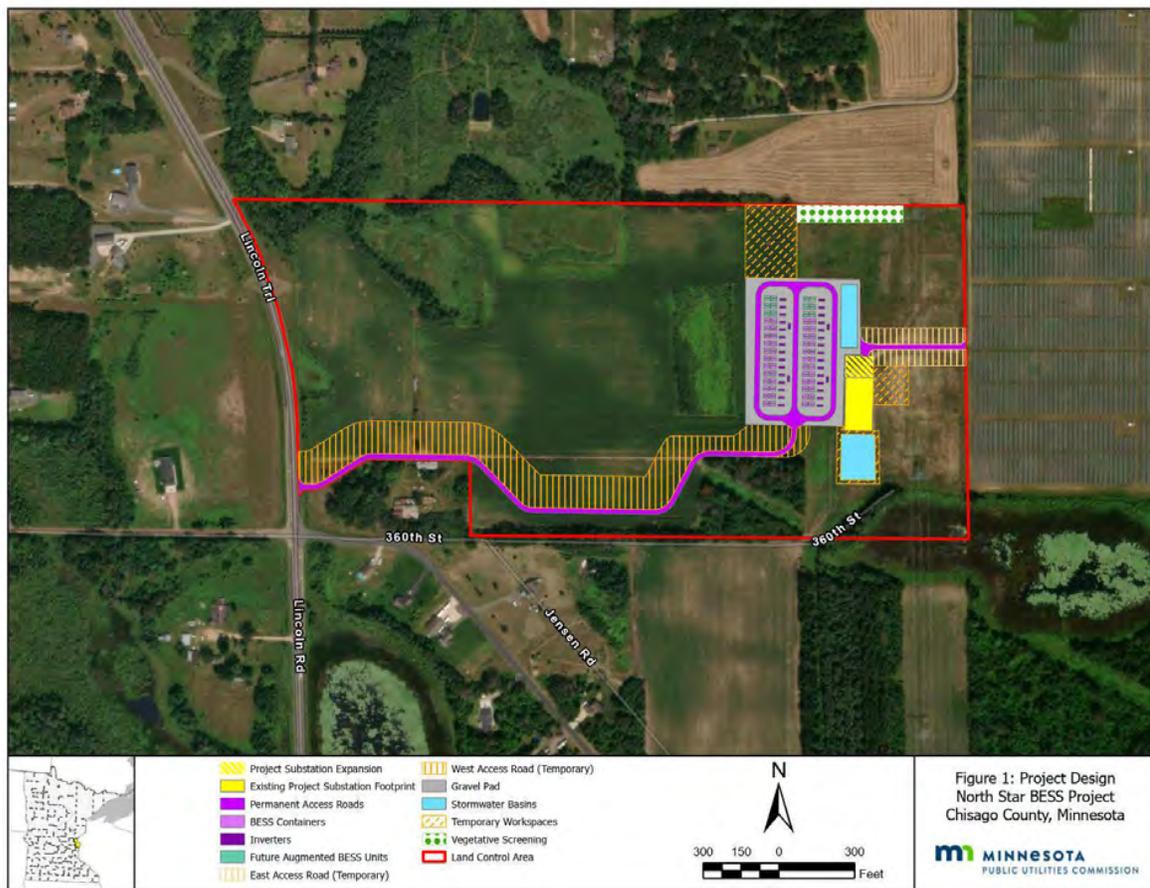
North Star Storage indicates that it is in negotiations with Xcel Energy for an offtake agreement for the energy storage capacity. North Star Storage has executed its offtake contract with Xcel, and hopes to obtain Commission approval for the offtake agreement in the first or second quarter of 2026.⁶

⁶ Email with Commission staff- Sept. 17, 2025

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The project has executed a Surplus Large Generator Interconnection Agreement (SLGIA) with MISO as of August 2025 for 80 MW. The project is currently undergoing follow-on studies with MISO to increase the project capacity to 100MW/400MWh at the point of interconnection (POI). If follow-on studies for the 100MW configuration identify no need for network upgrades, the project will move to amend the executed SLGIA with MISO to reflect the increased project size. This amendment is expected to be executed in the first or second quarter of 2026. Total project cost is expected to be approximately \$172 million, and annual operating costs are anticipated to be approximately \$1.5 million.⁷

Figure 1.2-1: Proposed North Star Storage Project



1.3 What is the state of Minnesota's role?

The applicant needs a site permit from the Commission to construct the project. EIP staff prepared this EA. An administrative law judge will oversee a public hearing.

To build the project, the applicant needs a site permit from the Commission. The project may also require additional approvals from other federal and state agencies and local governments, for

⁷ SPA, p. 14

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example, a driveway permit from Chisago County or a Construction Stormwater Permit from the Minnesota Pollution Control Agency (MPCA). A site permit supersedes local zoning, building, and land use rules.⁸ The Commission’s site permit decision must be guided, in part, by consideration of impacts to local zoning and land use in accordance with the legislative goal to “minimize human settlement and other land use conflicts”.⁹

North Star Storage filed an SPA to the Commission for the project on February 28, 2025.¹⁰ North Star Storage filed an SPAA on August 22, 2025.¹¹ The Commission must consider whether the record supports issuing a site permit, and what conditions should be placed on the site permit.

To ensure a fair and robust airing of the issues, the Minnesota Legislature set out a process for the Commission to follow when considering site permit applications.¹² In this instance, an EA was prepared, and a public hearing will be held. The goal of the EA is to describe potential human and environmental impacts of the project (*the facts*), whereas the intent of the public hearing is to allow interested persons the opportunity to advocate, question, and debate what the Commission should decide about the project (*what the facts mean*). The record developed during this process—including all public input—will be considered by the Commission when it makes its decisions on the applicant’s site permit application.

1.4 What is the public’s role?

Minnesota needs your help to make informed decisions.

During scoping, you told us your concerns about the project. At the public hearing, which comes next, you can tell us if you think we have provided the information that addresses your concerns in this EA. Your help in guiding the information provided in this document and participating in this process will help the Commission make informed decisions regarding the project.

1.5 What is an Environmental Assessment?

This document is an Environmental Assessment. The Commission will use the information in this document to inform their decisions about issuing a site permit for the project.

This EA contains an overview of affected resources and discusses potential human and environmental impacts and mitigation measures. EIP staff prepared this document as part of the environmental review process. Scoping is the first step in the process. It provides opportunities to provide comments on the content of this environmental assessment, suggest alternatives, and to mitigate potential impacts.

1.6 Where do I get more information?

⁸ Minnesota Statutes [216E.10](#), subd. 1.

⁹ Minnesota Statutes [216E.03](#), subd. 7.

¹⁰ North Star Storage, SPA, February 28, 2025, eDocket Nos. [20252-215915-01](#) (through -10).

¹¹ North Star Storage, SPAA, August 22, 2025, eDocket No. [20258-222299-01](#).

¹² See generally Minnesota Statute [216E](#).

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For additional information don't hesitate to contact Commission staff.

If you would like more information or if you have questions, please contact EIP staff: Sam Weaver, sam.weaver@state.mn.us, 651-539-1531 or Scott Ek, scott.ek@state.mn.us, 651-539-1070.

Information about the project, including the site permit application, notices, and public comments, can be found on eDockets: <https://www.edockets.state.mn.us/documents> by entering "25-123" in the Docket # field and selecting the search button. Information is also available on the Commission's webpage for the project: <https://puc.eip.mn.gov/web/project/16143>.

1.7 What permits are needed?

A site permit from the Commission is required. Federal, state, and local permits may also be necessary to construct the project.

The project requires a site permit from the Commission because it meets the statutory definition of an *energy storage system*, which is equipment and associated facilities designed with a nameplate capacity of 10 MW or more and is capable of storing generated electricity for a period of time and delivering the electricity for use after storage.¹³

Various federal, state, and local approvals will be required for activities related to the construction and operation of the project. These permits are referred to as "downstream permits" and must be obtained by the applicant prior to constructing the project.

1.8 What are the potential impacts of the project?

The project will impact human and environmental resources. Impacts will occur during construction and operation.

A potential impact is the anticipated change to an existing condition caused directly or indirectly by the project. Potential impacts can be positive or negative, short- or long-term, and can accumulate incrementally. Impacts vary in duration and size, by resource, and across locations. The impacts of constructing and operating a project can be mitigated by avoiding, minimizing, or compensating for the adverse effects and environmental impacts of a project.

The context of an impact—in combination with its anticipated on-the-ground effect and mitigation measures—is used to determine an impact intensity level, which can range from highly beneficial to highly harmful. Impacts are grouped: human settlement, human health and safety, land-based economies, archeological and historic resources, and natural resources.

Select resource topics received abbreviated study because they were deemed to be of minor importance to the Commission's site permit decision. Potential impacts are anticipated to be negligible for displacement, communication, forestry, and mining.

¹³ Minn. Stat. [216E.01](#), subd. 3a.

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1.8.1 Human Settlement

Large energy projects can impact human settlement. Impacts range from short-term, such as increased local expenditures during construction, to long-term, such as changes to viewsheds.

Aesthetics: The impact intensity level is expected to be minimal to moderate and long-term. Impacts are anticipated to be minimal for travelers along public roadways, while the facility will be more noticeable to nearby residences.

Cultural Values: The impact intensity level is anticipated to be minimal. The project is not anticipated to impact or alter the work and leisure pursuits of residents in such a way as to impact the underlying culture of the area. Differences between cultural values related to renewable energy and rural character have the potential to create tradeoffs that cannot be addressed in the site permit.

Land Use and Zoning: The impact intensity level is anticipated to be minimal. Land use impacts are anticipated to be long-term and localized. Although energy storage systems are not specifically addressed in local planning documents or zoning codes, the proposed facility is generally consistent with local land use ordinances and the Chisago County's Comprehensive Plan. Constructing the project will change land use at the site from agricultural to energy storage production for the expected 30 year life of the project. After the project's useful life, the land control area (LCA) could be restored to agricultural or other planned land uses by implementing appropriate restoration measures. Impacts can be minimized.

Noise: The impact intensity level during construction will range from negligible to significant depending on the activity, potential construction impacts are anticipated to be intermittent and short-term. Impacts are unavoidable but can be minimized. These localized impacts may affect nearby residences and might exceed state noise standards. Once operational, noise impacts are anticipated to range from negligible to significant at nearby residences. Noise impacts from operation of the facility can be minimized and mitigated.

Property Values. Impacts to property values within the local vicinity could occur; however, changes to a specific property's value are difficult to determine. Because of this uncertainty, impacts to specific properties in the project vicinity could be minimal to moderate and decrease with distance and over time.

Transportation and Public Services: Potential impacts to the electrical grid, roads and other utilities are anticipated to be short-term, intermittent, and localized during construction. Impacts to existing wells and septic systems are not expected to occur. Impacts to railroads are not expected to occur. Impacts to a pipeline can be mitigated. Overall, construction-related impacts are expected to be minimal, and are associated with possible traffic delays. During operation, negligible traffic increases would occur for maintenance. Impacts are unavoidable but can be minimized.

Socioeconomics: The impact intensity level is anticipated to be minimal and positive. Effects associated with construction will, overall, be short-term and minimal. Impacts from operation will be negligible. Significant positive effects may occur for individuals. Adverse impacts are not anticipated.

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Economic Justice: The project will not have disproportionately high and adverse human health or environmental effects on low-income, minority, or tribal populations

1.8.2 Human Health and Safety

Large energy projects have potential to impact human health and safety. Most concerns are related to the construction phase, although BESS facilities do create additional operational risks.

Electronic and Magnetic Fields (EMF): Impacts to human health from possible exposure to EMFs are not anticipated. Potential impacts will be long-term and localized. These unavoidable impacts will be of a small size. Impacts can be mitigated.

Public Safety and Emergency Services: Like any construction project, there are risks for injuries from falls, equipment and vehicle use, electrical accidents, etc. Public risks involve electrocution. Electrocution risks could also result from unauthorized entry into the fenced area.

The main safety hazard of a BESS is battery failure leading to thermal runaway which has the potential to spread to nearby batteries and containers, quickly presenting an emergency. Emergency response to fires or thermal runaway events at BESS facilities require specialized response. Potential impacts from construction are anticipated to be minimal. Potential impacts during normal operations are anticipated to be minimal, with the potential for significant impacts in the event of an emergency, such as a thermal runaway event. Impacts would be short- and long-term and can be minimized.

1.8.3 Land-based Economies

Large energy projects can impact land-based economies by limiting land use for other purposes.

Agriculture: Potential impacts to agricultural producers are anticipated to be minimal—lost farming revenues will be offset by easement agreements. A negligible loss of farmland in Chisago County would occur for the life of the project. Potential impacts are localized and unavoidable but can be minimized.

Tourism and Recreation: Because the site is not close to major recreational or tourism resources, potential impacts to recreational opportunities and tourism are anticipated to be negligible.

1.8.4 Archeological and Historic Resources

The impact intensity level is anticipated to be negligible to minimal. Impacts would be localized. Impacts can be mitigated through siting and an unanticipated discoveries plan.

1.8.5 Natural Resources

Large energy projects can impact the natural environment. Impacts are dependent upon many factors, such as how the project is designed, constructed, maintained, and decommissioned. Other factors, such as the environmental setting, influence potential impacts. Impacts vary significantly within and across projects.

Air Quality Potential impacts to air quality during construction would be intermittent, localized, short-term, and minimal. Impacts are associated with fugitive dust and exhaust. Impacts can be mitigated. Once operational, the BESS facility will not generate criteria pollutants or carbon dioxide.

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Negligible fugitive dust and exhaust emissions would occur as part of routine maintenance activities. Impacts are unavoidable and do not affect a unique resource. Impacts can be minimized.

Geology and Groundwater: Impacts to geology and domestic water supplies are not expected. Localized impacts to groundwater resources, should they occur, would be intermittent, but have the potential to occur over the long-term. Indirect impacts from surface waters might occur during construction. Impacts can be mitigated through use of Best Management Practices (BMPs) for stormwater management.

Soils: Impacts to soils will occur during construction and decommissioning of the project. The impact intensity level is expected to be minimal. Potential negative impacts will occur over both the short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur. Impacts can be mitigated through use of BMPs for stormwater management.

Surface Water: The impact intensity level is anticipated to be minimal. Direct impacts to surface waters are not expected. Indirect impacts to surface waters might occur. These impacts will be short-term, of a small size, and localized. Impact can be mitigated.

Wetlands: While wetlands are present in the LCA, no direct impacts to wetlands are anticipated from the project. With proper construction management practices, indirect impacts to on- and offsite wetlands can be mitigated.

Vegetation: The facility will convert row crop farmland to a mixture of impermeable surface and perennial vegetation for the life of the project. Potential impacts of the facility can be mitigated through amendment of an existing vegetation management plan (VMP) for the adjacent North Star Solar project.

Wildlife and Habitat: Long-term, minimal impacts to small mammals, insects, reptiles, etc. would occur. Impacts to large wildlife species, for example, deer, will be negligible. Significant negative impacts could occur to individuals during construction of the project. While most of the site will be covered by crushed rock, a portion of the land control area will provide native habitat for the life of the project. The project does not contribute to significant habitat loss or degradation or create new habitat edge effects. Potential impacts can be mitigated in part through design and BMPs. The impact intensity level is expected to be minimal.

Rare and Unique Resources: The impact intensity level is anticipated to be minimal, as the project avoids identified areas of species occurrence and preferred habitat. Potential impacts to the Blanding's turtle are possible, but can be mitigated.

1.9 What factors guide the Commission's decision?

Minnesota statute and rule identify the factors the Commission must consider when determining whether to issue a site permit.

After reviewing the project record—including public comments—the Commission will determine whether to issue a site permit and, if a site permit is issued, where the BESS facility will be located and what permit conditions are appropriate.

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Minnesota Statutes 216E.03 lists considerations that guide the study, evaluation, and designation of site permits. Minnesota Rule 7850.4100 lists the factors the Commission must consider when making a site permit decision.

- A. Effects on human settlement, including, but not limited to, displacement, noise, aesthetics, cultural values, recreation, and public services.
- B. Effects on public health and safety.
- C. Effects on land-based economies, including, but not limited to, agriculture, forestry, tourism, and mining.
- D. Effects on archaeological and historic resources.
- E. Effects on the natural environment, including effects on air and water quality resources and flora and fauna.
- F. Effects on rare and unique natural resources.
- G. Application of design options that maximize energy efficiencies, mitigate adverse environmental effects, and could accommodate expansion of transmission or generating capacity.
- H. Use or paralleling of existing rights-of-way, survey lines, natural division lines, and agricultural field boundaries.
- I. Use of existing large electric power generating plant sites.
- J. Use of existing transportation, pipeline, and electrical transmission systems or rights-of-way.
- K. Electrical system reliability.
- L. Costs of constructing, operating, and maintaining the facility which are dependent on design and route.
- M. Adverse human and natural environmental effects which cannot be avoided.
- N. Irreversible and irretrievable commitments of resources.

The Commission is also guided by the “state’s goals to conserve resources, minimize environmental impacts, minimize human settlement and other land use conflicts, and ensure the state’s electric energy security through efficient, cost-effective power supply and electric transmission infrastructure.”¹⁴

A draft site permit (DSP) for the Project is included in **Appendix C**.

1.10 Siting Factors – Analysis and Discussion

This analysis applies the siting factors to the project. Some factors are described in just a few words. Other factors are more descriptive and include a list of elements that, when grouped, make up the

¹⁴ Minnesota Statutes [216E.03](#), subd. 7(a).

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factor. Finally, certain factors are relatively succinct, but the scoping process identified elements to be analyzed in this EA. For example, the public health and safety factor includes an EMF element.

Factor M (unavoidable impacts) and **Factor N** (irreversible and irretrievable resource commitments) are discussed in [Section 4.8](#) and [Section 4.9](#), respectively, of this EA. **Factor G** (application of design options) and **Factor L** (costs dependent on design) do not apply as the design of the proposed project is the only design under consideration. **Factor H** (use or paralleling of existing lines) and **Factor J** (use of existing transmission systems or rights-of-way) do not apply as this is a proposed site and not a route.

Other factors are ranked as follows:

	Impacts are anticipated to be negligible to minimal and able to be mitigated or consistent with factor
	Impacts are anticipated to be minimal to moderate and able to be mitigated in part or less consistent with factor, but nonetheless consistent
	Impacts are anticipated to be moderate to significant and unable to be mitigated fully or consistent in part or not consistent with factor

Table 1.10-1: Application of Siting Factors

Factor A: Human Settlement		
Element	Construction	Operation
Aesthetics		
Displacement		
Cultural Values		
Electric Interference		
Floodplains		
Land Use and Zoning		
Noise		
Property Values		
Recreation		
Socioeconomics		
Factor A: Public Services		
Element	Construction	Operation
Airports		

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Roads	●	●
Utilities	●	●
Factor B: Public Safety		
Element	Construction	Operation
EMF	●	●
Emergency Services	○	○
Medical Devices	●	●
Public Safety	○	○
Stray Voltage	●	●
Worker Safety	●	●
Factor C: Land-based Economies		
Element	Construction	Operation
Agriculture	●	●
Forestry	●	●
Mining	●	●
Tourism	●	●
Factor D: Archaeological and Historic Resources		
Element	Construction	Operation
Archeological	●	●
Historic	●	●
Factor E: Natural Resources		
Element	Construction	Operation
Air Quality	●	●
Geology and Groundwater	●	●
Soils	○	○
Surface Water	●	●
Vegetation	●	●
Wetlands	●	●
Wildlife	○	●
Wildlife Habitat	●	●

Factor F: Rare and Unique Resources		
Element	Construction	Operation
Fauna	○	●
Flora	●	●

Factor I: Use of Existing Generating Plants		
Element	Construction	Operation
Existing Plants	●	●

Factor K: Electrical System Reliability		
Element	Construction	Operation
Reliability	●	●

1.10.1 Discussion

The following discussion highlights potential impacts to factor elements that are anticipated to be moderate to significant, and factors determined less consistent, consistent in part, or not consistent.

FACTOR A: HUMAN SETTLEMENT

Aesthetics Visual impacts are subjective. Thus, potential impacts are unique to the individual and can vary widely. Although there are no other BESS facilities nearby, the proposed BESS is similar in appearance to the adjacent solar facility. For those with high viewer sensitivity, for example, neighboring landowners, visual impacts are anticipated to be moderate to significant, while for those that travel through the project area, visual impacts are likely to be minimal, although noticeable.

Noise Noise impacts from construction of the facility will be temporary and intermittent and range from negligible to significant depending on the construction equipment used and the location of the listener. Once operational, noise impacts are anticipated to range from negligible to significant at nearby residences. Noise impacts can be mitigated.

FACTOR B: PUBLIC SAFETY

Public Safety and Emergency Services In addition to construction-related risks, BESS facilities have unique public safety risks related to operation. The main safety hazard for BESS facilities is battery failure leading to thermal runaway which has the potential to spread to nearby batteries and containers, quickly presenting an emergency. Emergency response to fires or thermal runaway events at BESS facilities require specialized response. Potential impacts from construction are anticipated to be minimal. Potential impacts during operation are anticipated to be minimal to significant. Employing best practices in facility design and operation, including identifying hazards and developing training for emergency responders can mitigate potential impacts.

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FACTOR I: POWER PLANTS

Because the BESS facility is proposed to be built adjacent to, and in conjunction with, a solar power generating plant the impacts of the project are consistent with this siting factor.

FACTOR K: ELECTRICAL SYSTEM RELIABILITY

Because the BESS facility is designed to improve electric reliability in conjunction with the solar power generating plant, the impacts of the project are consistent with this siting factor.

1.11 What's next?

A public hearing will be held near the proposed project; you can provide comments at the hearing. The Commission will then review the record and decide whether to grant a site permit

An administrative law judge (ALJ) from the Court of Administrative Hearings will hold a public hearing after the EA is complete and available. At the hearing you may ask questions and submit comments about the project. After the close of the comment period, the ALJ will provide a written report to the Commission summarizing public comments and including findings of fact, conclusions of law, and recommendations.

The Commission reviews all the information in the project record in determining whether to issue a site permit. Site permits define the location of the project and include conditions specifying mitigation measures. The Commission is expected to make a permit decision in early 2026.

2 Proposed Project

North Star Storage proposes to construct and operate a BESS with a nominal power rating of up to 100 MW AC with approximately 400 MWh of energy capacity on a site of approximately 77.9 acres in North Branch, Chisago County, Minnesota. The facility will be connected to the electric grid through an existing collector substation for the North Star Solar project, which connects via an existing 115 kV transmission line to the Chisago County Substation. This chapter describes the project design and how it would be constructed, operated, and decommissioned.

2.1 BESS Facility

2.1.1 How do BESS facilities work?

A BESS connects to the electric grid and transfers electric energy from the grid to store in batteries when demand is low and then transferred back to the grid during outages or when demand is high.

A BESS consists of a series of electrochemical devices (batteries) that charges by collecting energy from a source (the electric grid or a power plant) and discharges the energy at a later time when needed. Battery storage can enhance the flexibility of a power system and can help integrate renewable generation technologies like wind and solar into the grid by storing energy when demand is low and discharging the energy when demand is high.¹⁵

2.1.2 Where is the Project located?

The Project is in North Branch, Chisago County, Minnesota (Figure 1).

As shown in **Figure 1 (Appendix A)**, the facility is located on a site of approximately 77.9 acres in North Branch (Township 35N, Range 21W, Section 36) in Chisago County. The facility site is located within the municipal boundary of North Branch and is located southeast of the city proper, on the eastern side of Lincoln Trail, or County State Aid Highway (CSAH) 14.

North Star Storage selected the site based on the proximity to the North Star Solar Farm, minimal environmental constraints, and landowner interest. North Star Storage indicates that it will seek an easement agreement with the landowner for up to 30 years.

2.1.3 How is the facility designed?

In addition to battery energy storage enclosures, the facility will also include inverters and transformers, electrical feeder lines, a project substation, a stormwater drainage basin, an access road, storage and parking areas, and fencing surrounding the perimeter of the facility. North Star Storage may construct an O&M facility at the site depending on final design. The facility will be connected to the electric grid through an existing collector substation for the North Star Solar project, which connects via an existing 115 kV transmission line to the Chisago County Substation. North Star Storage indicates that the specific equipment will depend upon final design, which will be finalized before construction.

¹⁵ National Renewable Energy Laboratories, *Grid-Scale Battery Storage: Frequently Asked Questions*. September 2019, <https://www.nrel.gov/docs/fy19osti/74426.pdf>.

2.1.3.1 Batteries and BESS Enclosures

The BESS industry currently uses two main types of lithium-ion batteries:¹⁶

- **Nickel Manganese Cobalt (NMC):** Nickel is the primary source of energy in NMC batteries, but manganese and cobalt are required to stabilize and provide the desired power output. Because cobalt is expensive, these batteries typically use eight parts nickel to one part each of manganese and cobalt (8:1:1). NMC have a high energy density, which means that they can store energy in a smaller package, making them suitable for electric vehicles and consumer electronics such as smartphones and laptops.
- **Lithium Iron Phosphate (LFP):** LFP batteries are comprised of roughly equal parts of iron and phosphate. Relative to NMC technology, LFP batteries are more chemically stable and less prone to thermal runaway events and combustion, and the components of LFP batteries are cheaper and generally considered to be less toxic. LFP batteries are commonly used in energy storage facilities.

Battery storage technology is developing rapidly, and North Star Storage indicates that it anticipates using some type of LFP battery technology but will defer selection of the technology until closer to the anticipated start of construction in 2026.

The batteries are housed in enclosures (**Graphic 2**). Under the preliminary design, BESS enclosures will occupy approximately 0.7 acres of the approximately 7.3 acre fenced area of the site. Each BESS enclosure will connect to pad-mounted switchgear, transformer(s) to step-up and step-down voltage, and an electric distribution system via 34.5 kV underground cables. North Star Storage anticipates that the dimensions of the BESS enclosures are approximately 10 feet tall, 6 feet wide, and 30 feet long.

¹⁶ Mayfield Renewables, October 2023, *Comparing NMC and LFP Lithium-Ion Batteries for C&I Applications*, [https://www.mayfield.energy/technical-articles/comparing-nmc-and-lfp-lithium-ion-batteries-for-ci-applications/#:%7E:text=Nickel%20Manganese%20Cobalt%20\(NMC\)%20and%20Lithium%20Iron%20Phosphate%20\(LFP,long%2Dterm%20reliability%20are%20paramount\)](https://www.mayfield.energy/technical-articles/comparing-nmc-and-lfp-lithium-ion-batteries-for-ci-applications/#:%7E:text=Nickel%20Manganese%20Cobalt%20(NMC)%20and%20Lithium%20Iron%20Phosphate%20(LFP,long%2Dterm%20reliability%20are%20paramount)) (Accessed August 12, 2025).

Graphic 2.1.3.1-1: Representative BESS Enclosures¹⁷



2.1.3.2 Substation

Electricity will flow to and from the existing North Star Solar substation via underground collection cable system. The North Star Solar substation will be expanded approximately 80 feet to the north (project substation). At the project substation, transformers will step the voltage down from 115 kV to 34.5 kV and then back from 34.5 kV to 115 kV depending upon the flow of electricity. Pending final design, North Star Storage anticipates that the project substation 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.¹⁸

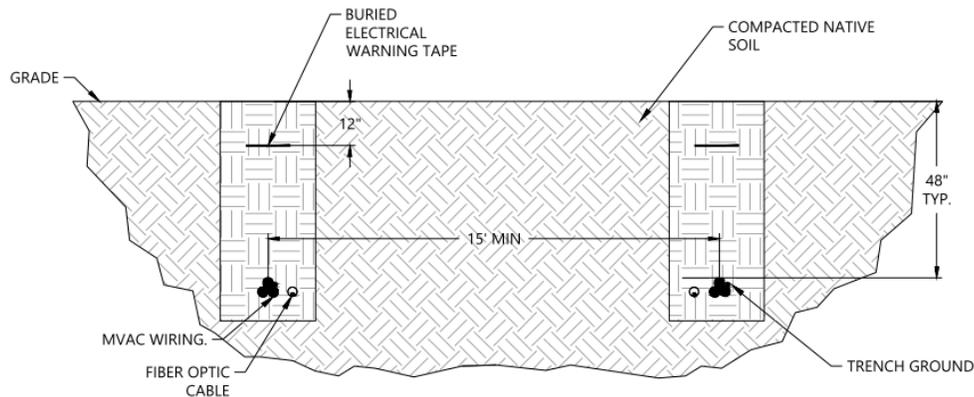
2.1.3.3 Power Conversion System

Electrical energy will flow between the project substation and the BESS enclosures through underground 34.5 kV AC feeder lines (**Graphic 2.1.3.3-1**). The power will pass through medium voltage transformers and inverters to the battery modules. The inverters convert AC to DC for storage in the battery modules and from DC to AC for delivery back to the grid.

¹⁷ SPA, p. 18, Figure4.1-1.

¹⁸ SPA, p. 20.

Graphic 2.1.3.3-1: Underground Cabling



2.1.3.4 Fencing

North Star Storage will install security fencing around the perimeter of the facility. Fencing will be secured to posts that will be directly embedded in the soil or set in concrete foundations as required for structural integrity. At the time of application, North Star Storage anticipates using six foot tall chain link fencing topped by one foot of barbed wire. The BESS facility will be accessed through locked gates on both the east and west access roads.

North Star Storage indicates that security lighting will be installed at the gates. The lighting will be down-lit and blue light will be minimized.

2.1.3.5 Access Roads and Drive Area

North Star Storage is contemplating two options for the permanent access road to the site. One or both access roads may be utilized depending on the 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. 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 North Star Solar Facility. During operation of the project, personnel would travel through the North Star Solar Facility beginning at an existing entrance from 367th Street, travel south toward the project, then turn right onto the eastern access road, which would be approximately 295 feet long by 25 feet wide.

During construction the access roads will be approximately 150 feet wide to accommodate construction vehicles and heavy equipment. Within the site, the surfaces between BESS enclosures

and the fence will be covered by gravel, allowing for access to the enclosures and substation. North Star Storage anticipates the internal spacing/drive lanes will be approximately 25 feet wide.¹⁹

2.1.3.6 Operations and Maintenance Building

North Star Storage indicates that it may construct an O&M building within the fenced site to provide a workspace for maintenance activities and to store parts, supplies, and equipment. If constructed, preliminary plans anticipate locating the O&M building along the eastern portion of the site.²⁰

2.1.4 How would the BESS facility be constructed?

North Star Storage anticipates that construction of the facility will begin in early 2026 with an in-service date of early 2027. This section summarizes construction activities. Unless otherwise noted, this summary has been adapted from Section 5 of the SPA, or the Vegetation Management Plan for the North Star Solar Facility, which the project will use as a guide for vegetation management.

Construction will begin after necessary permits are obtained and the interconnection process is finalized. North Star Storage anticipates that construction will begin in early 2026 to meet an in-service date of early 2027. The actual construction schedule is dependent upon permitting, final design, delivery of equipment, and workforce availability.

Construction is defined in Minn. Stat. 216E.01, subd. 3 as clearing of land, excavation, or other action that would adversely affect the natural environment of the site but does not include temporary disturbances needed for surveying or geotechnical investigation. North Star Storage's pre-construction activities include geotechnical investigation, coordination with local first responders, final project design, and component procurement (e.g., batteries, racking, inverters, BESS containers, transformers, etc.).

Initial site preparation includes grubbing and grading, stripping and segregating topsoil, and establishing the access roads and laydown areas. North Star Storage anticipates temporary work areas of approximately 9.48 acres on the site (Figure 1). Two stormwater basins, approximately 1 acre in total area, will also be constructed. The applicant anticipates minimal grading for the project, as the area is relatively flat.

Typical construction equipment will be used for the project – backhoes, compactors, bulldozers, dump trucks, skid steer loaders, motor graders, and watering trucks. Additional specialty equipment could include augers/drills, concrete mixers and pumps, trenchers, cranes, cable pullers and spoolers, scissor lifts and boom trucks, and high reach bucket trucks.

For several weeks of construction, there will be approximately 8 semi-trucks daily to deliver the project components such as batteries, enclosures, inverters, and transformer skids. Traffic will decrease once these components are delivered. Traffic volume during construction will

¹⁹ SPA, pp. 20-21.

²⁰ SPA, p. 21, and Appendix C of the SPA.

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predominantly come from worker travel to the construction site. Daily construction traffic would consist of about 60 light duty trucks and cars during the 9 - 12 months of construction.

The project will create approximately 30-60 temporary construction jobs, and up to two full-time jobs to operate and maintain the facility.²¹

ACCESS ROADS AND DRIVE AREAS

Unlike internal access roads in solar facilities, which have specifically designed road profiles, the entire fenced area containing the BESS equipment will be graveled to allow vehicles to move in lanes between BESS enclosures. Construction of the drive area will begin with scraping and removal of topsoil from the developed area. Topsoil removed from the developed area will be stockpiled in suitable locations. After the topsoil has been segregated, the contractor will compact the subgrade materials along the to the specified compaction requirements specified in the civil and geotechnical engineer plans. Following compaction of the drive lanes area, North Star Storage will install 4 to 12 inches of aggregate, which will then be compacted. The aggregate will be installed with geo-fabric or cement stabilization depending on the soil type and the recommendations of the geotechnical study.

POWER CONVERSION SYSTEM

The electrical collection system will be installed below-ground. Preliminary design anticipates that inverter and transformer skids will be placed adjacent to the BESS enclosures.

BESS ENCLOSURES

Once the BESS area has been prepared and underground cables and conduits are installed, workers will install foundations for the BESS containers. Foundations for the BESS units will be concrete, pier, or other foundation type as deemed appropriate based on the results of the geotechnical study. Preassembled BESS containers will be offloaded onto the foundations.

SUBSTATION

Construction work to expand the North Star Solar 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.

²¹ SPA- pp. 26 – 29.

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After the foundations are installed, collector substation equipment will be delivered to the site and installed on the prepared foundations. Electrical wires will be strung, perimeter fencing will be installed, and aggregate will be placed within the fenced area of the collector substation site.

RESTORATION

After construction, the developed area will be graded to natural contours (as possible) and soils will be decompacted. Most of the disturbed areas within the North Star Solar land will be reseeded with seed mixes in accordance with North Star Solar's VMP. The private-owned land that was disturbed, except the access road, will be reverted to agricultural use.

North Star Solar has a VMP outlining how the site will be revegetated, maintained, and monitored over the life of the project to ensure restoration goals and objectives are met²². North Star Storage has committed to following this VMP for the project as well. Section 5.5 of the DSP states that the applicant must file an amended VMP that creates an additional management area for the BESS site, and specifically addresses seed mixes and management strategies.

2.1.5 How would the facility be operated and maintained?

The service life of the project will be 30 years. Following restoration and construction closeout, control of the facility will transfer from the construction team to the operations staff. Up to two full time maintenance staff will perform regularly scheduled inspections of electrical equipment, maintain or repair equipment as needed, maintain vegetation at the site, and remove snow as needed (**Table 2.1.5.1-1**).

²² North Star Solar – Revised Vegetation Management Plan ([eDockets no. 20164-120014-03](#))

Table 2.1.5.1-1: Operations and Maintenance Tasks and Frequency²³

Device	Task	Preliminary Frequency
BESS	System visual check	Monthly
	Filter Inspection	Quarterly
	Battery condition check	Quarterly
	Cooling system check	Monthly
Electric Boards	Case visual check	Monthly
	Fuses check	Quarterly
	Surge arresters check	Annually
	Torque check	Annually
	DC voltage and current check	Quarterly
	Grounding check	Semi-Annually
Inverter	Case visual inspection	Monthly
	Air intake and filters inspections	Quarterly
	DC voltage and current check	Quarterly
	Datalogger memory download	Quarterly
	Fuses check	Quarterly
	Grounding check	Annually
	Torque check	Annually
Support Structures	Visual check	Monthly
Transformers	Visual Check	Monthly

2.1.5.1 Battery Augmentation

Along with the normal physical degradation of manmade structures as they age, the batteries used in the facility will lose the ability to store and deliver energy over time. This process, sometimes referred to as “derating” or “degradation,” results in diminished capacity and efficiency, shorter operational life, and a decline in performance over time. Battery degradation is caused by chemical wear and tear that occurs over multiple charging and discharging cycles, aging (regardless of how the battery is used), and environmental factors such as temperature fluctuation, humidity, and dust in the operating environment. The normal degradation can also be impacted by, temperature extremes, humidity, and other factors.²⁴

To maintain the facility’s capacity and accreditation, BESS facilities anticipate replacing degraded batteries with new batteries periodically over the course of the facility’s operating life. This periodic replacement is referred to as “augmentation.” Battery augmentation may involve either the addition of battery modules within the existing enclosures (Scenario 1) or the installation of new enclosures and new batteries (Scenario 2). North Star Storage indicates the type and frequency of augmentation will depend upon final design. The final design of the project has accommodated the

²³ SPA, Table 5.4.1-1.

²⁴ GridX. *What is Battery Degradation and How to Prevent It*. February 6, 2025, <https://www.gridx.ai/knowledge/what-is-battery-degradation-and-how-to-prevent-it> NREL, Grid-Scale Battery Storage: Frequently Asked Questions.

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use of future augmentation units and so the initial build of BESS enclosures will not match that of the project design (**Figure 1**). North Star Storage indicates the project site will be designed and constructed to accommodate future BESS augmentations.

2.1.6 What happens at the end of the facility’s useful life?

As the project progresses through its service life, the applicant may seek to repower the project. The applicant’s decision on whether to pursue repowering will consider the equipment performance, maintenance costs, extending the useful life of the project, or a desire to increase storage capacity with newer or more efficient batteries and other equipment. Any site permit issued by the Commission will specify the maximum capacity, so if North Star Storage wishes to increase the capacity, it must seek an amendment to the site permit. At the end of the project’s useful life, North Star Storage will either take the necessary steps to continue operation of the project (re-permitting and retrofitting) or will decommission the project.

Commission issued site permits require that the permittee be responsible for removing all project components and restore the site to pre-construction conditions at the end of a project’s useful life and that the permittee is responsible for all costs associated with decommissioning the project. North Star Storage provided a draft decommissioning plan as Appendix D of its SPA.

If the project is not repowered, North Star Storage will decommission the project and remove the project facilities. Decommissioning would include removal of the BESS enclosures (cabinets, batteries, racking, and other auxiliary equipment), foundations, transformers and pad-mounted inverters, fencing, underground cables and lines, gravel and crushed rock, and the access road should the landowner wish it removed. North Star Storage anticipates the decommissioning of the facility will take approximately 9 to 12 months to complete.

Commission permits require that permittees are responsible for all decommissioning costs. North Star Storage anticipates the total estimated cost to decommission the project is approximately \$5.6 million and estimated salvage/scrap value is approximately \$16.3 million, for a net decommissioning revenue of approximately \$10.7 million.

North Star Storage anticipates establishing either an escrow account or surety bond equal to the net costs with North Branch as a beneficiary of the financial assurance.

2.2 Project Schedule

If permitted, the project would begin commercial operation by the beginning of 2027. **Table 2.2-1** shows North Star Storage’s estimated development and construction milestones.

Table 2.2-1: Anticipated Project Schedule²⁵

Activity	Anticipated Timeframe
Interconnection Study Received	Q1 2025

²⁵ SPA, Table 1.3-1.

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Offtake Agreement Finalized	Q1 2025
Land Acquisition	Complete
Site Permit Issued	Q4 2025
Equipment and Contractor Acquisition	Q4 2025
Downstream Permits	Q4 2025
Construction	Q1 – Q4 2026
Testing and Commissioning	Q1 2027
Commercial Operation Date	Q1 2027

2.3 Project Costs

The total installed capital cost to construct the project to be approximately \$172 million (**Table 2.3-1**). Actual costs will depend on final material and labor costs.²⁶

The project's annual operations and maintenance costs would total approximately \$1.5 million. Maintenance costs include labor, materials, and lease payments.²⁷

²⁶ SPA, p. 14.

²⁷ SPA, p. 14.

Table 2.3-1: Estimated Project Costs

Project Component	Estimated Cost (\$ millions)
Project Engineering, Procurement, Construction	120
Project Development and State Permitting	1.5
Operations	45
Decommissioning	5.5
Total Project Cost	172

3 Regulatory Framework

Chapter 3 discusses the site permit approval required from the Commission. It describes the environmental review process and lists the factors the Commission considers when making its decision. This chapter also discusses required approvals from federal and state agencies and local units of government with permitting authority for actions related to the project. Lastly, it lists topics outside the scope of this EA.

3.1 What Commission approvals are required?

The project requires a site permit from the Commission before it can be constructed.

The project requires a site permit from the Commission because it meets the definition of an *energy storage system* which means electric equipment with a capacity of 10 MW or more that is capable of storing electricity for a period of time and delivering the electricity for use after storage.²⁸

3.2 What is environmental review?

Environmental review informs interested persons about potential impacts and possible mitigation measures associated with the project; environmental review informs Commission decisions.

Minnesota law requires that potential human and environmental impacts be analyzed before the Commission decides whether to grant a site permit. This analysis is called environmental review.

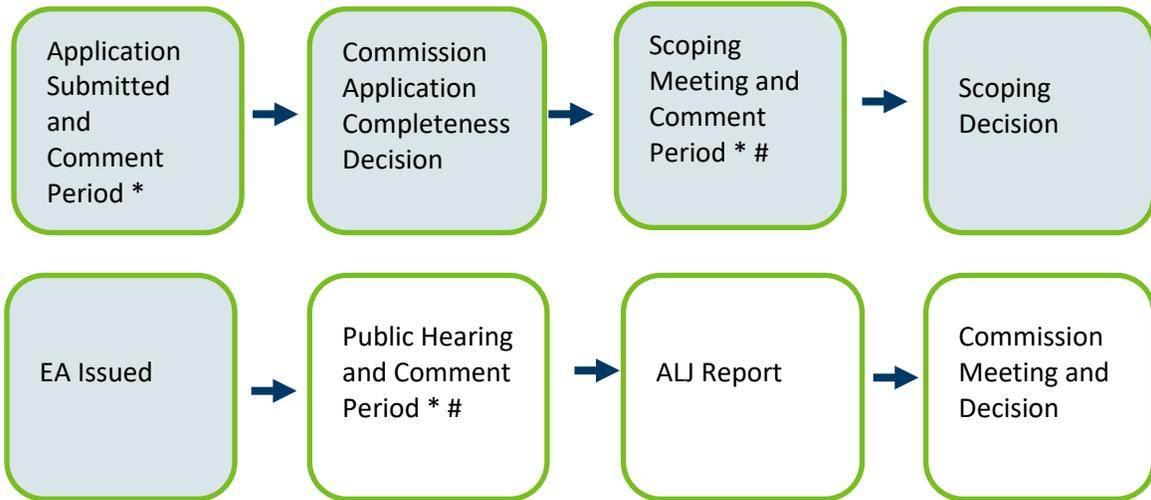
3.3 What does the review and permitting process look like?

The Commission accepted the site permit application as substantially complete on April 15, 2025. Public information and scoping meetings were held in Stacy, Minnesota on May 28, 2025, and online on May 29, 2025.

Graphic 3.3-1 outlines the environmental review and permitting process for this project.

²⁸ 2023 Minn. Stat., 216E.01, subd. 3a

Graphic 3.3-1: Permitting Process Summary²⁹



APPLICATION FILING AND ACCEPTANCE

North Star Storage provided the required written notice of its intent to file a site permit under the alternative process on February 13, 2025.³⁰ The applicant filed a site permit application (SPA) on February 28, 2025.³¹ The SPA requested an up to 80 MW energy storage facility. The Commission found the application to be substantially complete on April 15, 2025.³² The order also referred the matter to the Court of Administrative Hearings³³ for appointment of an ALJ to conduct a public hearing for the project. Commission staff provided a *Sample Site Permit for an Energy Storage System* on November 27, 2024.³⁴ On August 22, 2025, the applicant filed a SPAA requesting the energy storage facility to have a max storage of 100 MW.³⁵

²⁹ Read from left to right; shaded steps are complete; “*” means public comment opportunity and “#” means public meeting opportunity.

³⁰ North Star Storage, *Notice of Intent to Submit a Site Permit Application Under the Alternative Permitting Process*, February 13, 2025, eDocket No. [20252-215380-01](#).

³¹ North Star Storage, *SPA*, February 28, 2025, eDocket Nos. [20252-215915-01](#) (through -10).

³² Commission, *Order*, April 15, 2025, eDocket No. [20254-217702-01](#).

³³ Previously referred to as the Office of Administrative Hearings.

³⁴ Commission, *Sample Energy Storage System Site Permit*, November 27, 2024, eDockets No. [202411-212496-01](#).

³⁵ North Star Storage, *SPAA*, August 22, 2025, eDocket No. [20258-222299-01](#).

SCOPING PROCESS

Scoping is the first step in the environmental review process. It helps focus the EA on the most relevant information needed by the Commission to make informed decisions. Scoping comments have been compiled and are available to review or download.

Scoping includes a public meeting and comment period that provide opportunities for interested persons to help develop the scope (or contents) of the EA.³⁶ The purpose of the public information and scoping meetings is to provide information and answer questions about a proposed project and the permitting process. The meeting and associated comment period also provides an opportunity to gather input regarding potential impacts and mitigative measures that should be studied in the EA.

On May 14, 2025, the Commission issued a *Notice of Public Information and Environmental Assessment Scoping Meetings* and associated public comment period.³⁷ Commission staff held a public information and scoping meeting in Stacy, Minnesota on May 28, 2025, and an online meeting on May 29, 2025. The comment period closed on June 13, 2025. Twelve people attended the Stacy meeting, and six attendees provided public comments. There were no public comments at the online meeting.³⁸

In addition to the comments received at the public meeting in Stacy, written comments were received from the Minnesota Department of Natural Resources (DNR), the International Union of Operating Engineers (IUOE) Local 49, and members of the public.³⁹

The DNR provided comments on the proposed fencing, lighting impacts, dust control and erosion control methods, Blanding's turtle impact mitigation, and the vegetation management plan. The DNR recommended against use of barbed wire and requested that North Star Storage coordinate with the DNR before finalizing fence design. The DNR also recommended the use of downlit lighting that minimizes blue hues, backlight, and glare, avoidance of dust control methods containing chlorides, and the use of wildlife-friendly erosion control as mitigation measures to minimize impacts to wildlife and the environment.

The IUOE Local 49 expressed support for the project.

The private citizen, Dennis Anderson, an affected landowner, provided comments regarding a pipeline beneath the parcel which the project's western access road would cross.

SCOPING DECISION

³⁶ Minn. R. [7850.3700](#), subp. 2.

³⁷ Commission, *Notice of Public Information and Environmental Review Scoping Meeting*, May 14, 2025 eDocket No. [20255-218909-01](#).

³⁸ Oral Comments, Stacy, Minnesota, May 28, 2025 and virtual meeting, May 29, 2025, eDocket No. [20256-219969-01](#).

³⁹ Written Comments, eDocket No. [20256-219970-01](#).

The scoping decision identifies the issues studied in this EA.

After considering public comments and recommendations by staff, the Commission issued a scoping decision on July 17, 2025. The Commission then issued a revised scoping decision on August 29, 2025, in response to the applicant’s SPAA (**Appendix B**). The scoping decision identifies the issues to be evaluated in this EA.

3.4 Are other permits or approvals required?

Yes, other permits and approvals are required for the project.

A site permit from the Commission is the only state permit required for siting the project. However, various federal, state, and local approvals might be required for activities related to construction and operation of the project. These subsequent permits are referred to as “downstream” permits and must be obtained by the permittee prior to construction.⁴⁰ **Table 3.4-1** lists potential downstream permits that might be required, several of which are discussed below.

Table 3.4-1: Potential Downstream Permits

Unit of Government	Type of Application	Purpose	Anticipated for Project
Federal			
U.S. Environmental Protection Agency	Spill Prevention, Control and Countermeasures Plan (SPCCP)	Prevent oil spills and minimize impacts from any spills that do occur.	Possible
State			
Department of Natural Resources	License to Cross Public Lands and Waters	Prevent impacts associated with crossing public lands and waters	No
	State Threatened and Endangered Species Consultation	Consultation to mitigate impacts to state-listed species	Yes
	Water Appropriation Permit	Balances competing management objectives; may be required for construction dewatering	Possible
Minnesota Pollution Control Agency	Construction Stormwater Permit	Minimizes temporary and permanent impacts from stormwater	Yes
	Section 401 Clean Water Act – Water Quality Certification	Ensures project will comply with state water quality standards	No
State Historic Preservation Office	National Historic Preservation Act Section 106 Consultation	Ensures adequate consideration of impacts to significant cultural resources	Yes
Department of Agriculture	Agricultural Impact Mitigation Plan	Establishes measures for protection of agricultural resources	Yes

⁴⁰ DSP (Appendix C), Section 4.5.2 (stating the permittee “shall obtain all required permits for the project and comply with the conditions of those permits”).

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Unit of Government	Type of Application	Purpose	Anticipated for Project
Department of Labor and Industry	Electrical Inspection	Necessary to comply with electric code.	Yes
Department of Transportation	Utility Accommodation on Trunk Highway ROW Permit	Controls utilities being placed along or across highway rights-of-way (ROW)	No
	Oversize/Overweight Permit	Controls use of roads for oversize or overweight vehicles	No
Board of Water and Soil Resources	Wetland Conservation Act	Ensures conservation of wetlands	No
Local			
Chisago County	Right-of-Way/Utility Permit	Needed to construct or maintain electrical lines along or across county highway ROW	No
	Access Permit	Needed to move, widen, or create a new driveway access to county roads	Possible
	Wetland Conservation Act Permit	Ensures conservation of wetlands	No
	Moving Permit/ Oversize/Overweight Vehicle Permit	Needed to transport oversized and overweight loads on county roads	Yes

3.4.1 Federal

The U.S. Environmental Protection Agency requires certain facilities to develop, maintain, and implement a Spill Prevention, Control and Countermeasures Plan (SPCCP) to prevent oil spills and control any spills that do occur. An SPCCP may be required for power transformers within the project substation.

A permit is required from the United States Fish and Wildlife Service (USFWS) for the incidental taking⁴¹ of any threatened or endangered species. The project is not expected to impact federally listed threatened or endangered species, and no permit from the USFWS is anticipated to be necessary.

3.4.2 State

Potential impacts to state lands and waters, as well as fish and wildlife resources, are regulated by the DNR. Licenses are required to cross state lands or waters.⁴² Projects affecting the course, current, or cross-section of lakes, wetlands, and streams that are public waters may require a *Public*

⁴¹ [16 U.S. § 1532\(19\)](#) (defining “take” to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or attempt to engage in such conduct).

⁴² Minnesota Statutes [84.415](#).

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*Waters Work Permit.*⁴³ Not unlike the USFWS, DNR encourages project proposers to consult with the agency to determine if a project has the potential to impact state-listed threatened or endangered species. Additionally, consultation can lead to the identification of measures to mitigate potential impacts associated with the project.

Construction projects that disturb one or more acres of land require a general *National Pollutant Discharge Elimination System / State Disposal System Construction Stormwater Permit* (CSW Permit) from the MPCA. This permit is issued to “construction site owners and their operators to prevent stormwater pollution during and after construction.”⁴⁴ The CSW Permit requires use of best management practices; development of a Stormwater Pollution Prevention Plan; and adequate stormwater treatment capacity once the project is complete. Projects must be designed so that stormwater discharged after construction does not violate state water quality standards. Specifically, projects with net increases of one acre or more to impervious surface must be designed to treat water volumes of one-inch times the net increase in impervious surface.⁴⁵

A Clean Water Act Section 401 *Water Quality Certification* from MPCA might also be required. “Section 401 of the Clean Water Act requires any applicant for a federal license or permit to conduct an activity that may result in a discharge of a pollutant into waters of the United States to obtain a certification from the State in which the discharge originates that the discharge complies the applicable water quality standards.”⁴⁶ The certification becomes a condition of the federal permit.

Additionally, MPCA regulates generation, handling, and storage of hazardous wastes.

A permit from MnDOT is required for construction, placement, or maintenance of utility lines adjacent or across trunk highway rights-of-way. Coordination would be required to construct access roads or driveways from trunk highways. These permits are required to ensure that use of the right-of-way does not interfere with free and safe flow of traffic, among other reasons.⁴⁷

The State Historic Preservation Office (SHPO) is charged with preserving and protecting the state’s historic resources. SHPO consults with project proposers and state agencies to identify historic resources to avoid and minimize impacts to these resources.

The Minnesota Department of Agriculture (MDA) ensures the integrity of Minnesota’s food supply while protecting the health of its environment and the resources required for food production. MDA

⁴³ DNR (n.d.) *Requirements for Projects Involving Public Waters Work Permits*, http://www.dnr.state.mn.us/waters/watermgmt_section/pwpermits/requirements.html.

⁴⁴ MPCA. *Construction Stormwater*. (2022). <https://www.pca.state.mn.us/business-with-us/construction-stormwater>

⁴⁵ MPCA. *Minnesota Stormwater Manual*. (2022). <https://www.pca.state.mn.us/water/minnesotas-stormwater-manual>.

⁴⁶ MPCA. (n.d.) *Clean Water Act Section 401 Water Quality Certifications*, <https://www.pca.state.mn.us/water/clean-water-act-section-401-water-quality-certifications>.

⁴⁷ MnDOT. *Utility Accommodation on Highway Right of Way*: (2023). <https://www.dot.state.mn.us/policy/operations/oe002.html>

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assists in the development of agricultural impact mitigation plans that outline necessary steps to avoid and mitigate impacts to agricultural lands.

The Board of Water and Soil Resources oversees implementation of Minnesota's *Wetland Conservation Act* (WCA). The WCA is implemented by local units of government.

3.4.3 Local

Chisago County oversees local implementation of the WCA in the project area. The WCA requires that any person "proposing to impact a wetland to first, attempt to avoid the impact; second, attempt to minimize the impact; and finally, replace any impacted area with another wetland of at least equal function and value."⁴⁸

Commission site permits preempt local zoning, building, and land use rules, regulations, or ordinances promulgated by regional, county, local, and special purpose government; however, coordination with local governments may be required for the issues listed below.

- **Access/Driveway** Coordination may be required to construct access roads or driveways from county or township roads.
- **Overwidth Load** Coordination may be required to move over-width or heavy loads on county or township roads.
- **Road Crossing and Right-of-Way** Coordination may be required to cross or occupy county or township road rights-of-way.

3.5 Do electrical codes apply?

Yes, if constructed the project must meet electrical safety code requirements.

The project must meet requirements of the National Electrical Safety Code.⁴⁹ These standards are designed to safeguard human health "from hazards arising from the installation, operation, or maintenance of conductors and equipment in electric supply stations and overhead and underground electric supply lines".⁵⁰ They also ensure that facilities and all associated structures are built from materials that will withstand the operational stresses placed upon them over the expected lifespan of the equipment, provided operational maintenance is performed.

3.6 Are any issues outside the scope of this EA?

⁴⁸ Minnesota. Rule. [8420.0100](#), subp. 2.

⁴⁹ See Minnesota. Statute. [326B.35](#); Minn. R. [7826.0300](#), subp. 1 (requiring utilities to comply with the most recent edition of the National Electric Safety Code when constructing new facilities or reinvesting capital in existing facilities)

⁵⁰ IEEE Standards Association (n.d.) *2017 – National Electrical Safety Code Brochure*, retrieved from: https://standards.ieee.org/content/dam/ieee-standards/standards/web/documents/other/nesc_2017_brochure.pdf.

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Yes, the scoping decision identified several issues that will not be studied.

This EA does not address the following:

- The need for the project, including questions of size, type, timing, and alternative system configurations.
- Any impacts related to the manufacture of the elements of the project including batteries, battery storage units, concrete, fuel used for construction vehicles, etc.
- The manner in which landowners are compensated for the project.

4 Project Impacts and Mitigation

Chapter 4 describes the environmental setting, affected resources, and potential impacts from the project. It also discusses mitigation of potential impacts.

4.1 How are potential impacts measured?

Potential impacts are measured on a qualitative scale based on an expected impact intensity level; the impact intensity level takes mitigation into account.

A potential impact is the anticipated change to an existing condition caused either directly or indirectly by the construction and operation of a proposed project. Potential impacts can be positive or negative, short- or long-term, and, in certain circumstances, can accumulate incrementally. Impacts vary in duration and size, by resource, and across locations.

Direct impacts are caused by the proposed action and occur at the same time and place. An indirect impact is caused by the proposed action but is further removed in distance or occurs later in time. This EA considers direct and indirect impacts that are reasonably foreseeable, which means a reasonable person would anticipate or predict the impact. Cumulative potential effects are the result of the incremental impacts of the proposed action in addition to other projects in the environmentally relevant area.

4.1.1 Potential Impacts and Mitigation

The following terms and concepts are used to describe and analyze potential impacts:

- **Duration:** Impacts vary in length. Short-term impacts are generally associated with construction. Long-term impacts are associated with the operation and usually end with decommissioning and reclamation. Permanent impacts extend beyond the decommissioning stage.
- **Size:** Impacts vary in size. To the extent possible, potential impacts are described quantitatively, for example, the number of impacted acres or the percentage of affected individuals in a population.
- **Uniqueness:** Resources are different. Common resources occur frequently, while uncommon resources are not ordinarily encountered.
- **Location:** Impacts are location dependent. For example, common resources in one location might be uncommon in another.

The context of an impact—in combination with its anticipated on-the-ground effect—is used to determine an impact intensity level, which can range from beneficial to harmful. Impact intensity levels are described using a qualitative scale, which is explained below. These terms are not intended as value judgments, but rather a means to ensure common understanding among readers and to compare potential impacts between alternatives.

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- **Negligible** impacts do not alter an existing resource condition or function and are generally not noticeable to an average observer. These short-term impacts affect common resources.
- **Minimal** impacts do not considerably alter an existing resource condition or function. Minimal impacts might, for some resources and at some locations, be noticeable to an average observer. These impacts generally affect common resources over the short- or long-term.
- **Moderate** impacts alter an existing resource condition or function and are generally noticeable to the average observer. Impacts might be spread out over a large area making them difficult to observe but can be estimated by modeling. Moderate impacts might be long-term or permanent to common resources, but generally short- to long-term to uncommon resources.
- **Significant** impacts alter an existing resource condition or function to the extent that the resource is impaired or cannot function. Significant impacts are likely noticeable or predictable to the average observer. Impacts might be spread out over a large area making them difficult to observe but can be estimated by modeling. Significant impacts can be of any duration and affect common or uncommon resources.

Also discussed are opportunities to avoid, minimize, or compensate for potential impacts. Collectively, these actions are referred to as mitigation.

- To **avoid** an impact means to eliminate it altogether, for example, by not undertaking parts or all of a project, or relocating the project.
- To **minimize** an impact means to limit its intensity, for example, by reducing project size or moving a portion of the project.
- To **correct** an impact means to repair, rehabilitate, or restore the affected resource.
- To **compensate** for an impact means replacing it or providing a substitute resource elsewhere, or by fixing it by repairing, rehabilitating, or restoring the affected resource. Compensating an impact can be used when an impact cannot be avoided or further minimized.

Some impacts can be avoided or minimized; some might be unavoidable but can be minimized; others might be unavoidable and unable to be minimized, but compensation can be applied. The level at which an impact can be mitigated might change the impact intensity level.

4.1.2 Regions of Influence

Potential impacts to human and environmental resources are analyzed within specific geographic areas called regions of influence (“ROI”). This EA uses the following ROIs:

- LCA (Land leased by North Star Storage to construct and operate the project)
- Local vicinity (1,600 feet from the boundary of the LCA)
- Project area (one mile from the boundary of the LCA)

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- Region (Chisago County)

Impacts to resources may extend beyond these distances but are expected to diminish quickly. ROIs vary between resources. **Table 4.1.2-1** summarizes the ROIs used in this EA.

Table 4.1.2-1: Regions of Influence for Human and Environmental Resources

Resource Type	Resource Element	Region of Influence
Human Settlement	Displacement, Electrical Interference, Land Use and Zoning	Land control area
	Noise, Property Values	Local vicinity
	Aesthetics, Cultural Values, Recreation	Project area
	Socioeconomics	Region
Public Services	Airports, Roads, Emergency Services, Public Utilities	Project area
Public Health and Safety	Electric and Magnetic Fields, Implantable Medical Devices, Stray Voltage, Worker and Public Safety	Land control area
Land-based Economies	Agriculture, Forestry, Mining	Site control area
	Tourism	Project area
Archaeological and Historic Resources		Project area
Natural Environment	Geology and Groundwater, Soils, Vegetation, Water Resources, Wetlands, Wildlife (except birds), Wildlife Habitat	Land control area
	Wildlife (birds), Rare and Unique Resources	Local vicinity
	Air Quality	Region

4.2 Project Setting

The project is in a rural area along the eastern side of CSAH 14 (Lincoln Trail), and adjacent to the southwestern portion of North Star Solar, in the boundary of North Branch in Chisago County.

The proposed facility is located on an agricultural site within the boundary of North Branch in Chisago County, Minnesota (**Figure 1**). Topography of the area is level to gently rolling. There are no lakes or streams within the site, the nearest surface water bodies are unnamed ponds and lakes, located within the local vicinity of the site.

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The project is in the Anoka Sand Plain subsection (222Mc) of the Eastern Broadleaf Forest Province.⁵¹ Prior to European settlement vegetation in the project area was primarily oak barrens and openings, with characteristic trees being bur oak and northern pin oak. Species associated with oak openings and barrens are still present, however large areas of these species are uncommon. The site is located southeast of the city of North Branch.

Land use within the site is dominated by agriculture; approximately 88 percent of the 77.9 acre site is currently used for cultivated agriculture. Land use in the project area is predominantly agricultural and rural residential with scattered, and increasing, commercial and industrial land uses such as North Star Solar, which is adjacent to the eastern side of the site, and North Star Solar's substation, which is within the site. CSAH 14 and CSAH 11 (Kost Trail) are the major transportation corridors in the project area. Built features common to the area include residences and buildings, paved and gravel roads, and electric power infrastructure including substations, transmission lines, and distribution lines.

4.3 Human Settlement

Large energy projects can impact human settlement. Impacts might be short-term, such as increased local expenditures during construction, or long-term, such as changes to a viewshed.

4.3.1 Aesthetics

The ROI for aesthetics is the project area. The project will introduce new manmade structures into the existing landscape. Portions of the project may be visible from local roads, CSAH 14, and nearby residences. For most people who pass through the project area on US Highway 14 or local roads the impact intensity level is expected to be minimal. For individuals with greater viewer sensitivity, such as people who live in the project vicinity, the impact intensity level is anticipated to be moderate. Impacts will be short- and long-term and localized. Potential impacts are unavoidable but can be mitigated in part.

Aesthetics refers to the visual quality of an area as perceived by the viewer and forms the impression a viewer has of an area. Aesthetics are subjective, meaning their relative value depends upon the perception and philosophical or psychological responses unique to individuals. Impacts to aesthetics are equally subjective and depend upon the sensitivity and exposure of an individual. How an individual values aesthetics, as well as perceived impacts to a viewshed, can vary greatly.

A viewshed includes the natural landscape and built features visible from a specific location. Natural landscapes can include wetlands, surface waters, distinctive landforms, and vegetation patterns. Buildings, roads, bridges, and power lines are examples of built features.

Viewer exposure refers to variables associated with observing a viewshed, and can include the number of viewers, frequency and duration of views, and view location. For example, a high

⁵¹ DNR (n.d.) *Ecological Classification System: Ecological Land Classification Hierarchy*, retrieved from: <https://www.dnr.state.mn.us/ecs/index.html>

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exposure viewshed would be observed frequently by large numbers of people. These variables, as well as other factors such as viewing angle or time of day, affect the aesthetic impact.

The existing landscape in the project area is rural and agricultural consisting of gently rolling terrain, row crops, and rural residences. The built environment in the project area includes the city of North Branch, roads, and electric and infrastructure including the North Star Solar facility adjacent to the project and the North Star Solar substation within the project site, as well as transmission and distribution lines. Residences and farmstead are scattered throughout the project area. There are no residences or businesses within the site; however, there are 23 residences within the project vicinity (1,600 feet). The nearest home to the facility is located approximately 200 feet north of the site boundary (Figure 2).

POTENTIAL IMPACTS

The visible elements of the facility will consist of new BESS enclosures, a fenced area of approximately 5.5 acres, a project substation expansion, a new 6-foot chain link fence topped by barbed wire surrounding the facility, new stormwater ponds, and potentially a new O&M building.

The project will convert approximately 28 acres from agricultural use into a BESS facility. Although the change will be noticeable, it is similar in appearance, and is significantly smaller than, the existing North Star Solar facility.

For residents outside the project vicinity and for others with low viewer sensitivity, such as travelers along CSAH 14, aesthetic impacts are anticipated to be minimal. For these viewers, BESS enclosures would be relatively difficult to see due to the rolling topography and existing vegetation along the highway, and the substation and transmission structures would be indiscernible from those of the solar facility to the east. Residents in the project vicinity and areas residents traveling local roads are likely to be more sensitive to aesthetic impacts, but the topography of the site and existing screening around nearby residences will tend to screen the project. The aesthetic impacts are likely to be higher for the closest residences to the north and southwest of the project.

Exterior security lighting will be installed at the project substation. Switch and motion activated lights will be located at the entrance gates.⁵² Impacts to light-sensitive land uses are not anticipated given the rural project location and the minimal required lighting for operations.

MITIGATION

Minimizing aesthetic impacts from energy storage facilities is primarily accomplished by locating the facilities so that they are not immediately adjacent to homes, ensuring that damage to natural landscapes during construction is minimized, and shielding the facilities from view by terrain or vegetation. The applicant has indicated in the SPAA that they intend to develop a landscaping plan along the northern property line to the north of the project.⁵³ Impacts from facility lighting can be

⁵² SPA, p. 21.

⁵³ SPAA, p. 3.

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minimized by using shielded and downward facing light fixtures and using lights that minimizes blue hue.

Section 4.3.8 of the DSP (**Appendix C**) requires the permittee to consider landowner input with respect to visual impacts and to use care to preserve the natural landscape.

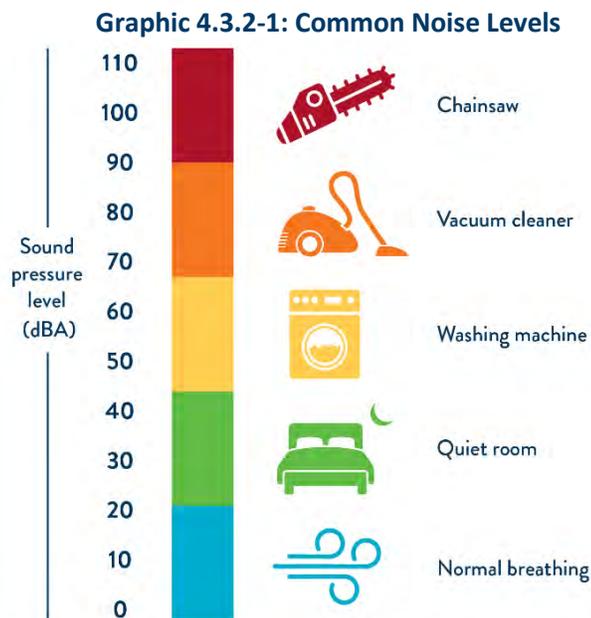
Section 5.1 of the DSP is a special condition requiring the permittee to minimize lighting impacts by using shielded and downward facing light fixtures and using lights that minimizes blue hue.

Section 5.2 of the DSP is a special condition requiring the permittee to develop a visual screening plan for the affected landowners.

4.3.2 Noise

The ROI for noise is the local vicinity. The impact intensity level during construction will range from negligible to significant depending on the activity, potential construction impacts are anticipated to be intermittent and short-term. Impacts are unavoidable but can be minimized. These localized impacts may affect nearby residences and might exceed state noise standards. Once operational, noise impacts are anticipated to range from negligible to significant at nearby residences. Noise impacts from operation of the facility can be mitigated.

Noise can be defined as any undesired sound. It is measured in units of decibels on a logarithmic scale. The A-weighted scale (“dBA”) is used to duplicate the sensitivity of the human ear.⁵⁴ A three dBA change in sound is barely detectable to average human hearing, whereas a five dBA change is clearly noticeable. A 10 dBA change is perceived as a sound doubling in loudness. Noise perception is dependent on a number of factors, including wind speed, wind direction, humidity, and natural and built features between the noise source and the receptor. **Graphic 4.3.2-1** provides



⁵⁴ MPCA. *A Guide to Noise Control in Minnesota*. (2015). <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>.

decibel levels for common indoor and outdoor activities.⁵⁵

In Minnesota, noise standards are based on *noise area classifications* (NAC) corresponding to the location of the listener, referred to as a receptor. NACs are assigned to areas based on the type of land use activity occurring at that location. Household units, designated camping and picnicking areas, resorts and group camps are assigned to NAC 1; recreational activities (except designated camping and picnicking areas) and parks are assigned to NAC 2; agricultural and related activities are assigned to NAC 3. A complete list is available at Minnesota Rule 7030.0050.

Noise standards are expressed as a range of permissible dBA over a one-hour period. L₁₀ may be exceeded 10 percent of the time, or six minutes per hour, while L₅₀ may be exceeded 50 percent of the time, or 30 minutes per hour. Standards vary between daytime and nighttime hours. There is no limit to the maximum loudness of a noise. **Table 4.3.2-1** provides current Minnesota noise standards.

Table 4.3.2-1: Noise Area Classifications (dBA)

Noise Area Classification	Daytime (7:00 a.m. to 10:00 p.m.)		Nighttime (10:00 p.m. to 7:00 a.m.)	
	L ₁₀	L ₅₀	L ₁₀	L ₅₀
1	65	60	55	50
2	70	65	70	65
3	80	75	80	75

The MPCA noise standards are public health standards. That is, they protect people from noise generated by all sources at a specific time and place. The total sum of noise at a specific time and location cannot exceed the standards. The MPCA evaluates whether a specific noise source is in violation by determining if the source causes or significantly contributes to a violation of the standards.

POTENTIAL IMPACTS

The primary noise receptors are the local residences. Although there are no residences within the site, there are 23 residences within the local vicinity (in this case, the closest residence is approximately 200 feet from the site boundary) and an additional 11 residences located between 1,600 and 3,200 feet of the site boundary.⁵⁶ The proposed project is in a rural, agriculturally dominated area and is CSAH 14. Residences are in NAC 1. Noise receptors could also include individuals working outside in the project vicinity. Potential noise impacts from the project are associated with construction noise and operational noise.

⁵⁵ Federal Aviation Administration (February 9, 2018) *Fundamentals of Noise and Sound*, retrieved from: https://www.faa.gov/regulations_policies/policy_guidance/noise/basics/.

⁵⁶ SPA, Appendix E (GIS analysis used for updated layout).

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Construction: Noise from construction will be temporary in duration, limited to daytime hours and potentially moderate to significant depending in location. North Star Storage indicates its intent to limit construction noise to daytime hours to the extent practicable. Construction noise will vary depending upon the phase of construction and the equipment being used. Sound levels from grading equipment are not dissimilar from the typical tractors and larger trucks used in agricultural communities during harvest. Pile driving of the piers for BESS enclosures will also contribute to construction noise. The noise from construction activities would dissipate with distance and be audible at varying decibels, depending on the locations of the equipment and receptor.

Thus, this construction noise could exceed state noise standards at select times and locations. Exceedances would be short-term and confined to daytime hours. Even without an exceedance, noise impacts will occur.

Operation: The primary noise sources during facility operation are BESS containers, substation transformer(s), heating ventilation and air conditioning (HVAC) equipment, and auxiliary transformers.⁵⁷ Unlike solar facilities, which do not operate during the night, BESS facilities can be expected to operate 24 hours a day, resulting in noise levels may vary throughout the day and night. Noise levels were modeled for the facility using manufacturers' information for the substation transformer, 30 auxiliary transformers, and an HVAC unit at the O&M facility. Because North Star Storage has not selected the BESS equipment, the applicant used "typical" BESS units with integrated inverters and batteries for 120 BESS containers.

The noise report indicates that additional noise analysis may be required if the final equipment selected differs from the modeling assumptions. New analysis may also be required if battery augmentation requires new BESS enclosures or new battery equipment. The modeling estimates facility-only nighttime noise between 42.9 and 60.4 dBA and a total noise of between 47.0 and 60.5 dBA at the modeled residences.⁵⁸ Although the modeled results exceed state noise standards, the applicant indicates this is a "worst-case scenario" and the noise will likely be less. They also indicate that they intend to implement noise mitigation strategies, including equipment silencers, landscaping interventions, constructing noise barriers, equipment modifications, operational adjustments, or using a combination of methods.⁵⁹ Noise from routine maintenance activities is anticipated to be negligible to minimal. Noise from the electrical collection system is not expected to be perceptible.

4.3.2.1 MITIGATION

Sound control devices on vehicles and equipment (e.g., mufflers), conducting construction activities during daylight hours, and running vehicles and equipment only when necessary are common ways to mitigate noise impacts during construction. North Star Storage indicates it will mitigate

⁵⁷ SPA, p. 43.

⁵⁸ SPA, Appendix E, pp. 6-7.

⁵⁹ SPA, Appendix E, p. 7.

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construction noise impacts by limited construction to daytime hours to the extent practicable, and proposed noise barriers enclosing the BESS in its amended application.⁶⁰

North Star Storage has indicated that it will implement noise mitigations upon final design of the project. Additional mitigation measures to minimize noise during operation include selecting individual BESS units with lower noise levels, installing equipment silencers on BESS enclosures, installation of noise barriers (such as fences or berms), and operational limits.

The DSP includes permit conditions to minimize and mitigate noise impacts.

- Section 4.3.7 is a standard condition that requires the permittee to comply with noise standards established under Minnesota noise standards as defined under Minnesota Rule, part 7030.010 to 7030.0080, and to limit construction and maintenance activities to daytime hours to the extent practicable.
- Section 5.3 is a special condition that requires the permittee to file a pre-construction noise modeling and impact assessment summarizing results from noise propagation modeling using the selected equipment and final layout prior to construction of the facility. This condition also requires the permittee to file an updated noise impact assessment prior to modifying the permitted facility.
- Section 5.4 is a special condition that requires the permittee to file a proposed methodology for conduct of a post-construction noise study prior to construction of the project and to file the noise study within 18 months of operation. This section also clarifies that the project must be operated to comply with MPCA noise standards at all times and that the Permittee may be required to modify design or operation of the facility to comply with MPCA noise standards.

4.3.3 Cultural Values

The ROI for cultural values is the project area. The impact intensity is expected to be minimal and long-term. Development of the project may change the character of the area, potentially changing residents' sense of place. There are tradeoffs for rural communities between renewable energy projects and retaining the rural character of an area. Construction and operation of the project is not anticipated to impact or alter the work and leisure pursuits of residents in the project area in such a way as to impact the underlying culture of the area.

Cultural values can be defined as shared community beliefs or attitudes that define what is collectively important to the group. These values provide a framework for individuals and community thought and action. Infrastructure projects believed inconsistent with these values can deteriorate community character. Those found consistent with these values can strengthen it. Projects often invoke varying reactions and can, at times, weaken community unity.

Individual and community-based renewable energy is becoming more valued across the nation. Utility scale renewable projects—generally located far from load centers in rural areas—are also

⁶⁰ SPAA, p. 4.

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valued, but, at times, opposed by residents. The highly visible, industrial look and feel of these projects can erode the rural feeling that is part of a residents' sense of place.

Cultural values can be informed by ethnic heritage. Residents of in the project area derive primarily from European ancestry. Cultural values are also informed by work and leisure pursuits, for example, farming and snowmobiling, as well as land use, such as agricultural cropland. Community events in the project area are usually tied to geographic features, seasonal/municipal events, and national holidays.

The North Branch Comprehensive Plan strives to maintain the well-balanced and wide range of places to live, work, shop and play.⁶¹

POTENTIAL IMPACTS

Construction and operation of the project is not anticipated to impact or alter the work life and leisure pursuits of residents or visitors in the project area or affect land use in such a way as to impact the underlying culture or community unity of the area.

At the same time, the development of the project may change the character of the area, at least where it is visible. In addition, the project represents a shift in energy infrastructure by introducing storage facilities to the landscape. The value residents put on the character of the landscape within which they live is subjective, meaning its relative value depends upon the perception and philosophical or psychological responses unique to individuals. Because of this, construction of the project might—for some residents—change their perception of the area's character thus potentially eroding their sense of place. This tension between infrastructure projects and rural character creates real tradeoffs.

Because of the relatively small size of the project and distance from businesses and recreational resource, impacts to cultural resources from the project are anticipated to be minimal.

MITIGATION

There are no conditions included in the DSP that directly address mitigation for impacts to cultural values. No mitigation is proposed.

4.3.4 Land Use and Zoning

The ROI for land use and zoning is the land control area. The impact intensity level is anticipated to be minimal. Land use impacts are anticipated to be long-term and localized. Although energy storage systems are not specifically addressed in local planning documents or zoning codes, the proposed facility is generally consistent with local land use ordinances and the North Branch Comprehensive Plan. Constructing the project will change land use at the site from agricultural to energy storage production for the expected 30 year life of the project. After the project's useful

⁶¹ North Branch, North Branch Comprehensive Plan. (2018)
<https://cms4files1.revize.com/northbranch/2018%20North%20Branch%20Comp%20Plan.pdf>.

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life, the land control area could be restored to agricultural or other planned land uses by implementing appropriate restoration measures. Impacts can be minimized.

Land use is the characterization of land based on what can be built on it and how the land is used. Zoning is a regulatory tool used by local governments (cities, counties, and some townships) to guide specific land uses within specific geographic areas. Land cover documents how much of a region is covered by forests, wetlands, impervious surfaces, agriculture, and other land and water types, including wetlands. Construction of the BESS will alter current and future land use and land cover in the LCA.

The United States Geological Survey (USGS) National Land Cover Dataset (NLCD) provides “spatial reference and descriptive data for characteristics of the land surface” nationwide.⁶² According to the NLCD, the current dominant land use at the site is agricultural (**Figure 3**). Approximately 88.1 percent of the site is covered in cultivates crops while the remainder is industrial, grasslands, and wetlands.

A site permit from the Commission supersedes local zoning, building, or land use rules.⁶³ Though zoning and land use rules are superseded, the Commission’s site permit decision must be guided, in part, by consideration of impacts to local zoning and land use in accordance with the legislative goal to “minimize human settlement and other land use conflicts.”⁶⁴

The site is located in the North Branch Rural Residential zone. Chapter 3 of the North Branch Comprehensive Plan states:

“Rural Residential makes up 9,961 acres or 43% of the total acreage in the City of North Branch. This land use is largely characterized by single family residences set on larger lot sizes to accommodate onsite sewage treatment systems. Some of these areas are located within the city’s designated Urban Service Area and no new development is allowed within this zoning district without connecting to municipal services. Areas located outside of the Urban Service Area must meet a minimum buildable acre standard so as to ensure that there is sufficient land area with the appropriate soil separation to support both a primary and a future secondary on-site sewage treatment system.”⁶⁵

POTENTIAL IMPACTS

North Branch does not have land use regulations that specifically address BESS facilities. North Star Storage is sited partially within the jurisdiction of North Branch. The proposed facility appears to be consistent with the types of industrial uses that have already been built in the same area.

⁶² U.S. Geological Survey. *The National Land Cover Database*. (February 2012), retrieved from: <http://pubs.usgs.gov/fs/2012/3020/fs2012-3020.pdf>.

⁶³ Minn. Stat. 216I.19, subd. 1, Minnesota Statutes [216E.10](#), subd. 1.

⁶⁴ Minn. Stat. 216I.05, subd. 11((a)(2); Minnesota Statutes [216E.03](#), subd. 7.

⁶⁵ North Branch, North Branch Comprehensive Plan. (2018) <https://cms4files1.revize.com/northbranch/2018%20North%20Branch%20Comp%20Plan.pdf>.

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MITIGATION

The project would convert approximately 28 acres of cultivated cropland to a BESS. The DSP has several permit conditions related to the preservation and restoration of agricultural land:

- Section 4.3.22 requires the permittee to avoid damage to drain tile and to repair or replace drain tile if damaged over the project's life.
- Section 5.5 is a special condition that requires the applicant to amend the existing North Star Solar VMP to include the North Star Storage project as its own management area. The purpose of this amended VMP is to prevent soil erosion and invest in soil health by establishing a plan to protect soil resources by ensuring perennial cover.
- Section 9.2 requires removal of all project-related infrastructure and restore the site to restore and reclaim the site to pre-project conditions to the extent feasible. The applicant's draft decommissioning plan is found in Appendix D of the site permit application.

4.3.5 Property Values

The ROI for property values is the local vicinity. Impacts to property values within the local vicinity could occur; however, changes to a specific property's value are difficult to determine. Because of this uncertainty, impacts to specific properties in the project vicinity could be minimal to moderate and decrease with distance and over time.

Impacts to property values can be measured in three ways: sale price, sales volume, and marketing time. These measures are influenced by a complex interaction of factors. Many of these factors are parcel specific, and can include condition, size, acreage, improvements, and neighborhood characteristics; the proximity to schools, parks, and other amenities; and the presence of existing infrastructure, for example, highways or transmission lines. In addition to property-specific factors, local and national market trends, as well as interest rates, can affect all three measures. The presence of an energy storage facility becomes one of many interacting factors that could affect a specific property's value.

Because each landowner has a unique relationship and sense of value associated with their property a landowner's assessment of potential impacts to their property's value is often a deeply personal comparison of the property "before" and "after" a proposed project is constructed. The landowner's judgments, however, do not necessarily influence the market value of a property. Professional property appraisers assess a property's value by looking at the property "after" a project is constructed. Moreover, potential market participants are likely to see the property independent of the changes brought about by a project; therefore, they do not take the "before" and "after" into account the same way a current landowner might. Staff acknowledges this section does not and cannot consider or address the fear and anxiety felt by landowners when facing the potential for negative impacts to their property's value.⁶⁶

⁶⁶Department of Commerce (2022) *Rights-of-way and Easements for Energy Facility Construction and Operation*, retrieved from: <https://apps.commerce.state.mn.us/eera/web/project-file/12227>.

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POTENTIAL IMPACTS

Electrical generating facilities can impact property values. Often, negative effects result from impacts that extend beyond the project location. Examples include emissions, noise, and visual impacts. Unlike fossil-fueled electric generating facilities, the project would not generate emissions. Potential impacts from operational noise are possible. Aesthetic impacts will occur, but because the project is relatively low in height – as compared to a wind turbine or a smokestack – impacts would be localized.

Commission staff was unable to locate peer reviewed literature that addressed potential impacts to property values from stand-alone BESS.

Impacts to the value of specific properties within the project vicinity are difficult to determine but could occur. Considerations such as setbacks, benefits to the community, economic impact, noise, and screening could have an unpredictable range of influence over property value. The project is screened to some extent from nearby residences by the topography and existing windbreaks around homes.

To the extent that negative impacts do occur they are expected to decrease with distance from the project. Aesthetic and noise impacts that might affect property values would be limited to residences and parcels in the project vicinity where the facility may be visible and where noise impacts from operation may occur.

MITIGATION

Impacts to property values can be mitigated by reducing aesthetic impacts and encumbrances to future land use. Impacts can also be mitigated through individual agreements with neighboring landowners. Such agreements are not within the scope of this EA.

4.3.6 Transportation and Public Services

The ROI for transportation and public services is the project area. Potential impacts to the electrical grid, roads and other utilities are anticipated to be short-term, intermittent, and localized during construction. The project may install a well and septic system but impacts to existing wells and septic systems are not expected to occur. Impacts to railroads are not expected to occur. The western access road will cross a pipeline orthogonally. Overall, construction-related impacts are expected to be minimal, and are associated with possible traffic delays. During operation, negligible traffic increases would occur for maintenance. Impacts are unavoidable but can be minimized.

Public services are services provided by a governmental entity or by a regulated private entity to provide for public health, safety, and welfare.

Water and Wastewater: The city of North Branch has sewer and water service, but the LCA is not serviced by city water supply or sanitary sewer, and many residents in the project area have private wells for domestic water needs and private septic systems of drain fields for domestic wastewater.

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The applicant has not identified any existing wells or septic fields in its search of Minnesota Department of Health (MDH) within the LCA.⁶⁷

Electric Utilities: The primary electric providers in North Branch are Xcel Energy and East Central Energy.⁶⁸ Seven total transmission are located within the local vicinity, including the connection transmission line from the North Star Solar substation within the project area. Two of these lines, including the transmission line from North Star Solar substation, intersect the LCA.⁶⁹

Pipelines: Minnesota Energy Resources and Excel Energy provide natural gas service in city of North Branch. There is a hazardous liquid pipeline located approximately 4.8 miles west of the site. There is one gas transmission pipeline that intersects the area of land control from the southeast to the northwest.

Railroads: There are no railroads within the project area. The nearest railroad track is the St. Croix Valley Railroad located 3.4 miles northwest of the project.⁷⁰

Roads: The major roadway accessing the project area is CSAH 14, located just west of the site. Other roads in the project vicinity are city roads.

Airports: 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 LCA. 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.⁷¹

POTENTIAL IMPACTS

Large energy projects can impact public services, such as buried utilities or roads. These impacts are usually temporary, for example, road congestion associated with material deliveries. Impacts can be long-term if they change the area in a way that precludes or limits public services.

Water and Wastewater: If an O&M facility is constructed, North Store may install a well for drinking water or onsite-septic system for sanitary services.⁷²

⁶⁷ SPA, p. 45.

⁶⁸ City of North Branch, Other Utilities, https://www.ci.north-branch.mn.us/residents/utilities/other_utilities/index.php

⁶⁹ SPA, p. 46.

⁷⁰ SPA, p. 45.

⁷¹ SPA, p. 45.

⁷² SPA, p. 21.

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Railroads: No impacts to railroads are anticipated. The project will avoid railroad property and railroad ROW.⁷³

Roads: During construction workers and trucks delivering construction material and equipment will use the existing county and city road system to access the project. Traffic during construction is estimated to be approximately 10 pickup trucks, cars, and/or other types of employee vehicles onsite during construction. Truck traffic to the site will vary by construction phase. North Star Storage anticipates up to 8 semi-trucks per day will be used for delivery of facility components. Construction traffic will be perceptible to area residents, but because the average daily traffic on the area is well below design capacity, this increased traffic 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. North Star Storage states that overweight or oversized loads are “unlikely,” but will obtain appropriate approvals for these loads prior to construction.⁷⁴

No impacts to roads are anticipated during the operation; negligible traffic increases would occur for maintenance.

Electric Utilities: No long-term impacts to utilities will occur because of the project. The Project will not impact existing transmission lines.

Air Safety: The FAA’s Notice Criteria tool was used to determine if further aeronautical study or FAA filing is needed. The Notice Criteria tool indicates that the project does not exceed notice criteria.

MITIGATION

Water and Wastewater: A well construction permit from the MDH would be required if a well is installed at an O&M facility.

Utilities: Section 4.3.5 of the DSP is a standard permit condition that requires the permittee to minimize disruptions to public utilities.

The location of underground utilities can be identified using the Gopher State One Call system during engineering surveys and marking the underground utility locations prior to construction. If a utility is identified, the project component or the utility itself might need to be relocated if it cannot be successfully crossed. Relocation, as well as any necessary crossing, would need to be coordinated with the affected utility.

Railroads: As no impacts to existing railroads are anticipated, no mitigation is proposed.

⁷³ SPA, p. 45.

⁷⁴ SPA, p. 47.

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Roads: New driveways or changes to existing driveways from county roads will require permits from the county.

Section 4.3.19 of the DSP requires permittees to inform road authorities of roads that will be used during construction and acquire necessary permits and approvals for oversize and overweight loads. Permitted fencing and vegetative screening cannot interfere with road maintenance activities, and the least number of access roads shall be constructed.

In addition to permit requirements for driveway access and the conditions of the DSP, the following practices can mitigate potential impacts:

- Pilot vehicles can accompany movement of heavy equipment.
- Deliveries can be timed to avoid traffic congestion and dangerous situations on the roadway.
- Traffic control barriers and warning devices can be used as necessary.
- Photographs can be taken prior to construction to identify pre-existing conditions. Permittees would be required to repair any damaged roads to preconstruction conditions.

4.3.7 Socioeconomics

The ROI for socioeconomics is the region. The impact intensity level is anticipated to be minimal and positive. Effects associated with construction will, overall, be short-term and minimal. Significant positive effects may occur for individuals. Impacts from operation will be long-term and negligible. Adverse impacts are not anticipated.

The project is in an area that is growing slower than the state of Minnesota as a whole. Between 2010 and 2020, the population in Chisago County grew by nearly 5.1 percent, compared to 7.6 percent for Minnesota as a whole. The population of North Branch has increased by 6.5 percent over the same time.

While the median household incomes in Chisago County are higher than in Minnesota, the household incomes in North Branch are similar to Minnesota. Both the percentage of minorities and those below poverty level are lower in North Branch and Chisago County than in Minnesota. (**Table 4.3.7-1**).

In 2023 the sectors with the largest employment in Chisago County were educational services, health care, and social assistance sector (23.5 percent), manufacturing (15.1 percent), construction (12 percent), and retail trade (10.7 percent).⁷⁵ Chisago County is part of the Minnesota Department of Employment and Economic Development Region 7E, which is the East Central Economic Development Region. Region 7E has consistently had higher unemployment rates than the state,

⁷⁵ US Census, [https://data.census.gov/profile/Chisago County, Minnesota?g=050XX00US27025](https://data.census.gov/profile/Chisago%20County,%20Minnesota?g=050XX00US27025).

typically hovering around 1.5% above the state rate.⁷⁶ In 2024, Chisago County had a slightly higher unemployment rate (3.2 percent) than the state average (2.8 percent). The county also had a lower labor force participation rate (67.3 percent) than Minnesota as a whole (68.5 percent).⁷⁷

Table 4.3.7-1: Population Characteristics

Area	Total Population				Population Characteristics***		
	2010 Census*	2020 Census*	% Change 2010 - 2020	2024 Estimate **	% Minority‡	Median Household Income (\$)	% Below Poverty Level
Minnesota	5,303,925	5,706,494	7.6	5,842,388	24.1	87,117	9.3
Chisago County	53,887	56,621	5.1	59,105	8.3	98,260	5.9
North Branch	10,125	10,787	6.5	12,159	8.3	90,383	6.8

* U.S. Census Bureau, <https://data.census.gov/>

** 2025, Minnesota State Demographic Center, Population Data, Our Estimates, <https://mn.gov/admin/demography/data-by-topic/population-data/our-estimates/>

*** 2024 American Community Survey 5-year estimates for Minnesota and Chisago County, 2023 American Community Survey 5-year estimates for North Branch

‡ Minority population includes all persons who do not self-identify as white alone.

POTENTIAL IMPACTS

Potential impacts associated with construction will be positive, but minimal and short-term. Significant positive effects might occur for individuals. Impacts from operation will be long-term, positive, and minimal. The project will not disrupt local communities or businesses and does not disproportionately impact low-income or minority populations (see discussion of environmental justice in **Section 4.3.8**). Adverse impacts are not anticipated.

The applicant anticipates the project will create approximately 30-60 jobs during the construction phase, and two long-term personnel during the operations phase. Indirect economic benefits will occur from additional local spending on lodging, goods and services and local sales tax.⁷⁸

Construction of the project is likely to result in increased expenditures for lodging, food and fuel, transportation, and general supplies at local businesses during construction. The applicant indicates

⁷⁶ Minnesota Department of Economic Employment and Development (DEED). *Economic Development Region 7E: East Central, 2024 Regional Profile*. (2024), https://mn.gov/deed/assets/2024_EDR-7E_RP_tcm1045-133246.pdf.

⁷⁷ DEED, County Profile: Chisago County. (2024), https://mn.gov/deed/assets/052725_chisago_tcm1045-407410.pdf.

⁷⁸ SPA, p. 53.

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it will work with its main construction contractor to develop a workforce and hiring plan that provides opportunities for the local workforce.

Property taxes are calculated on the land underlying the facility. The land is currently taxed as agricultural (class 2A). Following construction of the facility, the land classification will likely change to commercial/industrial (class 3a) (commercial/industrial/public utility) which is taxed at a higher rate than land used primarily for homestead or agriculture. North Star Storage anticipates that the project will have property tax payments which, summed over the life of the project, will amount to \$25,000 to North Branch over the 30 year life of the project.⁷⁹ Unlike solar and wind facilities that pay a production tax based on energy generated, North Star Storage will not pay a production tax because the facility does not generate power, it stores power.

Adverse impacts associated with the loss of agricultural land and agricultural production will be mitigated through lease payments to landowners.

MITIGATION

Section 8.5 of the DSP requires quarterly reports concerning efforts to hire Minnesota workers.

Section 8.6 of the DSP requires the permittee, as well as its construction contractors and subcontractors, to pay no less than the prevailing wage rate.

As socioeconomic impacts are anticipated to be positive in the short term and insignificant over the long term operation of the project, no additional mitigation is proposed.

4.3.8 Environmental Justice

The ROI for environmental justice analysis is the region. The project will not have disproportionately high and adverse human health or environmental effects on low-income, minority, or tribal populations.

Minnesota defines an environmental justice area as meeting one or more of the following criteria:⁸⁰

- (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;
- (3) 40 percent or more of the area's 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](#).

Environmental justice (EJ) means the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income in the development, implementation, and

⁷⁹ SPA, p. 54.

⁸⁰ Minn. Stat. 216B.1691, subd. 1(e)

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enforcement of environmental laws, regulations, and policies.”⁸¹ The purpose of considering impact to environmental justice communities is to ensure that all people benefit from equitable levels of environmental protection and have the same opportunities to participate in decisions that might affect their environment or health.

POTENTIAL IMPACTS

Utility infrastructure can adversely impact low-income, minority or tribal populations. To identify potential environmental justice concerns in the project area, staff used the MPCA’s EJ Mapping Tool to identify EJ populations.⁸² The project is not located within an identified EJ area according to the MPCA EJ Mapping Tool.

Figure 4 shows the project within the U.S. census tract used to evaluate EJ criteria and **Table 4.3.8-1** provides EJ parameter data within the U.S. census tract.

Table 4.3.8-1: Low-Income and Minority Population Characteristics

Project Census Tract	% Population Below 200% Poverty Level	% Nonwhite Population [‡]	% Population with Limited English
Census Tract 1103.02	16.4	6.0	0.7

Source: U.S. Census Bureau, 2022 and 2023 American Community Survey 5-year Estimate

[‡] Minority population includes all persons who do not self-identify as white alone.

MITIGATION

The project area is not within a census tract which Minnesota deems an environmental justice area; therefore, disproportionate and adverse impacts to these populations are not expected, and mitigation is not proposed.

4.4 Human Health and Safety

Construction and operation of a BESS facility has the potential to impact human health and safety.

4.4.1 Electric and Magnetic Fields

The ROI for EMF is the site. Impacts to human health from possible exposure to EMFs are not anticipated.

EMFs are invisible forces that result from the presence of electricity. They occur naturally and are caused by weather or the geomagnetic field. They are also caused by all electrical devices and found

⁸¹ MPCA, Environmental Justice Website, <https://www.pca.state.mn.us/about-mPCA/environmental-justice>.

⁸² MPCA, Understanding Environmental Justice in Minnesota, <https://experience.arcgis.com/experience/bff19459422443d0816b632be0c25228/page/Page/?views=EJ-areas>

wherever people use electricity. EMFs are characterized and distinguished by their frequency, that is, the rate at which the field changes direction each second. Electrical lines in the United States have a frequency of 60 cycles per second or 60 hertz, which is extremely low frequency EMF (“ELF-EMF”). The strength of an electric field decreases rapidly as it travels from the conductor and is easily shielded or weakened by most objects and materials.

Voltage on a conductor creates an electric field that surrounds and extends from the wire. Using water moving through a pipe as an analogy, voltage is equivalent to the pressure of the water moving through the pipe. The strength of the electric field is measured in kilovolts per meter (kV/m). Electric fields decrease rapidly as they travel from the conductor and are easily shielded or weakened by most objects and materials.

Current moving through a conductor creates a magnetic field that surrounds and extends from the wire. Using the same analogy, current is equivalent to the amount of water moving through the pipe. The strength of a magnetic field is measured in milliGauss (mG). Like electric fields, the strength of a magnetic field decreases rapidly as the distance from the source increases; however, unlike electric fields, magnetic fields are not easily shielded or weakened.

Table 4.4.1-1 provides examples of electric and magnetic fields associated with common household items. “The strongest electric fields that are ordinarily encountered in the environment exist beneath high voltage transmission lines. In contrast, the strongest magnetic fields are normally found very close to motors and other electrical appliances, as well as in specialized equipment such as magnetic resonance scanners used for medical imaging.”⁸³

Table 4.4.1-1: Electric and Magnetic Field Strength of Common Household Objects

Electric Field*		Magnetic Field**			
Appliance	kV/m	Appliance	mG		
	1 foot		1 inch	1 foot	3 feet
Stereo	0.18	Circular saw	2,100 to 10,000	9 to 210	0.2 to 10
Iron	0.12	Drill	4,000 to 8,000	22 to 31	0.8 to 2
Refrigerator	0.12	Microwave	750 to 2,000	40 to 80	3 to 8
Mixer	0.10	Blender	200 to 1,200	5.2 to 17	0.3 to 1.1
Toaster	0.08	Toaster	70 to 150	0.6 to 7	< 0.1 to 0.11
Hair Dryer	0.08	Hair dryer	60 to 200	< 0.1 to 1.5	< 0.1
Television	0.06	Television	25 to 500	0.4 to 20	< 0.1 to 1.5
Vacuum	0.05	Coffee maker	15 to 250	0.9 to 1.2	< 0.1

⁸³ World Health Organization. *Radiation: Electromagnetic Fields, What are typical exposure levels at home and in the environment?* (2016). <https://www.who.int/news-room/questions-and-answers/item/radiation-electromagnetic-fields>

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- * German Federal Office for Radiation Safety
- ** Long Island Power Institute

Health Studies In the late-1970s, epidemiological studies indicated a weak association between childhood leukemia and ELF-EMF levels. “Epidemiologists observe and compare groups of people who have had or have not had certain diseases and exposures to see if the risk of disease is different between the exposed and unexposed groups but does not control the exposure and cannot experimentally control all the factors that might affect the risk of disease.”⁸⁴

Ever since, researchers have examined possible links between ELF-EMF exposure and health effects through epidemiological, animal, clinical, and cellular studies. To date, “no mechanism by which ELF-EMFs or radiofrequency radiation could cause cancer has been identified. Unlike high-energy (ionizing) radiation, EMFs in the non-ionizing part of the electromagnetic spectrum cannot damage DNA or cells directly,” that is, the ELF-EMF that is emitted from HVTLs does not have the energy to ionize molecules or to heat them.⁸⁵ Nevertheless, they are fields of energy and thus have the potential to produce effects.

“The few studies that have been conducted on adults show no evidence of a link between EMF exposure and adult cancers, such as leukemia, brain cancer, and breast cancer.”⁸⁶

“Overall there is no evidence that exposure to ELF magnetic fields alone causes tumors. The evidence that ELF magnetic field exposure can enhance tumor development in combination with carcinogens is inadequate.”⁸⁷

“A number of scientific panels convened by national and international health agencies and the U.S. Congress have reviewed the research carried out to date. Most concluded that there is insufficient evidence to prove an association between EMF and health effects; however, many of them also concluded that there is insufficient evidence to prove that EMF exposure is safe.”⁸⁸

⁸⁴ National Institute of Environmental Health Sciences. *EMF: Electric and Magnetic Fields Associated with the Use of Electric Power*. (2002). https://www.niehs.nih.gov/health/materials/electric_and_magnetic_fields_associated_with_the_use_of_electric_power_questions_and_answers_english_508.pdf

⁸⁵ National Cancer Institute. *Magnetic Field Exposure and Cancer*. (2022). <http://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/magnetic-fields-fact-sheet> .

⁸⁶ National Institute of Environmental Health Sciences. *Electric and Magnetic Fields*, (2024). <http://www.niehs.nih.gov/health/topics/agents/emf/index.cfm>.

⁸⁷ World Health Organization. *Extremely Low Frequency Fields*. (2007). <http://www.who.int/peh-emf/publications/Comple DEC 2007.pdf?ua=1>, page 10.

⁸⁸ State of Minnesota, State Interagency Working Group on EMF Issues (2002) *A White Paper on Electric and Magnetic Field (EMF) Policy and Mitigation Options*, <https://apps.commerce.state.mn.us/eera/web/project-file?legacyPath=/opt/documents/EMF%20White%20Paper%20-%20MN%20Workgroup%20Sep%202002.pdf>: page 1.

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The Minnesota State Interagency Working Group on EMF Issues, comprised of staff from state agencies, boards, and Commission, was tasked to study issues related to EMF. In 2002, the group published *A White Paper on Electric and Magnetic Field Policy and Mitigation Options*, and concluded the following:

Some epidemiological results do show a weak but consistent association between childhood leukemia and increasing exposure to EMF.... However, epidemiological studies alone are considered insufficient for concluding that a cause and effect relationship exists, and the association must be supported by data from laboratory studies. Existing laboratory studies have not substantiated this relationship..., nor have scientists been able to understand the biological mechanism of how EMF could cause adverse effects. In addition, epidemiological studies of various other diseases, in both children and adults, have failed to show any consistent pattern of harm from EMF.

The Department of Health concludes that the current body of evidence is insufficient to establish a cause and effect relationship between EMF and adverse health effects. However, as with many other environmental health issues, the possibility of a health risk cannot be dismissed.

Regulations and Guidelines Currently, there are no federal regulations regarding allowable ELF-EMF produced by power lines in the United States; however, state governments have developed state-specific regulations. For example, Florida limits electric fields to 2.0 kV/m and magnetic fields to 150 mG at the edge of the ROW for 161 kV transmission lines.⁸⁹ Additionally, international organizations have adopted standards for exposure to electric and magnetic fields (**Table 4.4.1-2**)

Table 4.4.1-2: International Electric and Magnetic Field Guidelines

Organization	Electric Field (kV/m)		Magnetic Field (mG)	
	Public	Occupational	Public	Occupational
Institute of Electrical and Electronics Engineers	5.0	20.0	9,040	27,100
International Commission on Non-Ionizing Radiation Protection	4.2	8.3	2,000	4,200
American Conference of Industrial Hygienists	—	25.0	—	10,000/1,000 ^a
National Radiological Protection Board	4.2	—	830	4,200

^a For persons with cardiac pacemakers or other medical electronic devices

POTENTIAL IMPACTS

Potential impacts are anticipated to be negligible and are not expected to negatively affect human health. Impacts will be long-term and localized but can be minimized. The primary sources of EMF from the generating facility will be from the buried electrical collection lines and the transformers installed at each inverter. Because the electrical components, such as the transformers, will be

⁸⁹ Florida Department of State. *Rule 62-814.450 Electric and Magnetic Field Standards*. (2008). <https://www.flrules.org/gateway/ruleNo.asp?id=62-814.450>.

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enclosed in a grounded metal case and distant from residences EMF levels are anticipated to be minimal.⁹⁰

4.4.1.1 MITIGATION

No health impacts from EMF are anticipated. EMF diminishes with distance from a conductor or inverter. The nearest home is approximately 540 feet from the BESS units. At this distance both electric and magnetic fields will dissipate to background levels. No additional mitigation is proposed.

4.4.2 Public Safety and Emergency Services

The ROI for public and work safety is the land control area. Like any construction project, there are risks for injuries from falls, equipment and vehicle use, electrical accidents, etc. Public risks involve electrocution. Electrocution risks could also result from unauthorized entry into the fenced area. The main safety hazard of a BESS is battery failure leading to thermal runaway which has the potential to spread to nearby batteries and containers, quickly presenting an emergency. Emergency response to fires or thermal runaway events at BESS facilities require specialized response. Potential impacts from construction are anticipated to be minimal. Potential impacts during normal operation are anticipated to be minimal, with the potential for significant impacts in the case of an emergency event, such as a thermal runaway event. Impacts would be short- and long-term and can be minimized.

Like any construction project, there are risks. These include potential injury from falls, equipment and vehicle use, electrical accidents, etc. Construction might disturb existing environmental hazards on-site, for example, contaminated soils. In addition to the typical operational risks associated with an electric facility (falls, electrical accidents, etc.) battery storage facilities include a heightened risk of thermal runaway events and fires. During operation there are occupational risks similar to those associated with construction. Public risks would result from unauthorized entry into the facility.

Emergency services in the project area are provided by local law enforcement and emergency response agencies located in nearby communities. Law enforcement in the project area is provided by the Chisago County Sheriff, and the police departments of North Branch. Fire service is provided by the North Branch Volunteer Fire Department. Ambulance response is provided by the Lakes Region EMS. The nearest hospitals to the project are Fairview Lakes Regional Medical Center and Cambridge Medical Center, both within 17 miles from the project.⁹¹

POTENTIAL IMPACTS

The inflow of temporary construction personnel could increase demand for emergency and public health services. On the job injuries of construction workers requiring assistance due to slips, trips or falls, equipment use, or electrocution can create a demand for emergency, public health, or safety services that would not exist if the project were not to be built. Although no road closures are

⁹⁰ SPA, p. 41.

⁹¹ SPA, p. 38.

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anticipated during construction, any temporary closures could impede police, fire, and other rescue vehicles access to the site of an emergency.

As with other industrial facilities, there is the potential for falls, fire or other industrial accidents once operational. The main safety hazard of a BESS is battery failure leading to thermal runaway which has the potential to spread to nearby batteries and containers, quickly presenting an emergency. The movement of electrons and lithium ions within the battery cell produces electricity as well as heat. Lithium-ion batteries are designed to allow heat to dissipate from the cell to maintain a controlled reaction. Thermal runaway is a phenomenon when a battery cell generates heat at a greater rate than the heat can dissipate from the cell, resulting in a cascading chemical reaction which produces additional heat.

Thermal runaway events can result in extremely high temperatures, smoke, fire, and potentially ejection of gas, shrapnel, and particulates.⁹² Although BESS are a relatively new technology, there is a growing body of research that informs industry standards to minimize the potential for these types of incidents and mitigate potential safety concerns in the event of such incidents.

As discussed in **Section 2.1.3**, There are two major types of lithium ion battery technology used in BESS facilities. The chemistry of NMC batteries allows them to charge and discharge at higher rates (referred to as “energy density”) than LMC batteries. The ability to charge and discharge at high rates made them a popular choice in early BESS projects. However, compared to LFP batteries, the NMC batteries have a lower thermal runaway temperature, creating increased risks and requiring enhanced monitoring. In comparison, LFP batteries have a higher thermal runaway temperature, making them more stable and less prone to fire. As a result of the relative thermal stability compared to NMC technology as well as decreased costs as the LFP technology matured, the energy storage industry has recently pivoted to LFP technology.

Emergency response to fires or thermal runaway events at BESS facilities require specialized response. Fires at BESS facilities present unique challenges to firefighters. Unlike other utilities or industrial sites, BESS facilities do not have a single point of disconnect and, although separate parts of the system can be disconnected, the batteries will remain energized.⁹³ Because of the gases that accumulate within containers during a thermal runaway event or fire, first responders should not approach or enter the containers. Because of the difficulty in extinguishing fires, the risk that some batteries will remain energized, and the potential exposure to toxic gas, the industry recommends that first responders monitor the event and allow fires to burn themselves out as the energy is depleted from the batteries.

⁹² UL Research Institutes (2021). *What is Thermal Runaway*, <https://ul.org/research/electrochemical-safety/getting-started-electrochemical-safety/what-thermal-runaway>

⁹³ American Clean Power, *Energy Storage Emergency Response Plan Template*, https://cleanpower.org/wp-content/uploads/gateway/2022/11/ACP_Energy_Storage_Emergency_Response_Plan_Template.pdf, pp.14-17

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MITIGATION

The project will be designed and constructed in compliance with applicable electric codes. Electrical inspections will ensure proper installation of all components, and the project will undergo routine inspection. Electrical work will be completed by trained technicians.

Construction is bound by federal and state Occupational Safety and Health Administration (OSHA) requirements for worker safety, and must comply with local, state, and federal regulations regarding installation of the facilities and qualifications of workers. Established industry safety procedures will be followed during and after construction of the project. Crews will be trained and briefed on safety issues, reducing the risk of injury. The project will be fenced to prevent unauthorized access.

Construction crews must comply with local, state, and federal regulations when installing the BESS components and associated facilities. This includes standard construction-related health and safety practices. This generally includes safety orientation and training, as well as daily/weekly safety meetings.

In addition to the use of the more stable LFP technology, North Star Storage's facility design uses modular containers that are tested by the manufacturer to ensure fire resistance. Modern BESS containers include explosion prevention systems to remove flammable gases during a thermal runaway event and relieve pressure to limit gas levels within the containers from reaching levels that can be flammable or explosive. The containers are spaced to minimize the potential for fire to spread to other containers. The BESS equipment is monitored remotely, tracking cell voltage and temperature to identify and isolate potential issues before they occur. The facility will also install fire detection systems at the containers to recognize incidents and disconnect and isolate failed equipment.

The National Fire Protection Association issued updated *NFPA 855 Standard for the Installation of Stationary Energy Storage Systems* in 2023. The standard includes requirement for fire detection and suppression, explosion control, exhaust ventilation, gas detection, and thermal runaway.⁹⁴

NFPA standards require BESS facilities to prepare a hazard mitigation analysis (HMA) detailing the results of the equipment testing and the risks associated with the technology prior to installation of the BESS.

Public safety is addressed in several sections of the DSP:

- Section 4.3.27 requires the permittee to take several public safety measures, including landowner educational materials, appropriate signs and gates, etc.
- Section 8.11 of the DSP is a standard condition that requires permittees file an *Emergency Response Plan* with the Commission and local first responders prior to operation. As

⁹⁴ National Fire Protection Association, NFPA 85: Standard for the Installation of Stationary Energy Storage Systems, <https://www.nfpa.org/product/nfpa-855-standard/p0855code#2023-edition-details> The standard is available for purchase, the website highlights details of the updated edition.

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discussed above, the fire hazards associated with BESS facilities require additional training for first responders. Emergency response plans for BESS facilities require project-specific details on emergency response to incidents at the BESS. This includes BESS-specific training. The American Clean Power Association has developed an Emergency Response Plan template for BESS Facilities.⁹⁵

- Section 8.12 requires disclosure of extraordinary events, such as fires, etc.
- Section 9.1 requires a decommissioning plan prior to construction and updated every five years. Periodic updates of the plan will address the developing information on end-of-life issues related to batteries.

4.5 Land-based Economies

BESS facilities can impact land-based economies by precluding or limiting land use for other purposes. Impacts to agriculture, tourism and recreation are discussed in this section. Impacts to forestry and mining are not anticipated, and those resources are discussed in [Section 4.10](#).

4.5.1 Agriculture

The ROI for agriculture is the site. Potential impacts to agricultural producers are anticipated to be minimal. A loss of approximately 8.2 acres farmland in Chisago County would occur for the life of the project. Potential impacts are localized and unavoidable but can be minimized.

Agricultural use dominates the area of land control, with approximately 88.1 percent of the area used for cultivated row crops.

In 2022, there were approximately 81,038 acres of farmland in Chisago County, comprising approximately 30.5 percent of all land in the county. This represents a decrease of approximately 30 percent in total agricultural acreage since 2017. By acreage, the largest crops are corn and soybeans. Dairy cows and cattle are the largest livestock category.⁹⁶

Prime farmland is defined by Federal regulation at 7 C.F.R.657.5(a)(1) “is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses.” The site contains approximately 25.6 acres classified as farmland of statewide importance while the remaining 52.3 acres is listed as not prime farmland.⁹⁷

⁹⁵ American Clean Power Association, Energy Storage Emergency Response Plan Template

⁹⁶ United States Department of Agriculture, 2022 Census of Agriculture, County Profile: Chisago County, Minnesota,
https://www.nass.usda.gov/Publications/AgCensus/2022/Online_Resources/County_Profiles/Minnesota/cp27025.pdf.

⁹⁷ U.S. Department of Agriculture, Web Soil Survey,
<https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.

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Only approximately 7.3 acres of farmland of statewide importance will be temporarily impacted while approximately 2.6 acres will be permanently impacted.⁹⁸

POTENTIAL IMPACTS

The impact intensity level is expected to be minimal and very localized. The intensity of the impact is likely to be subjective. For example, conversion of farmland to energy uses can be viewed as a conversion from one type of industrial use to another. Conversely, the conversion of farmland to energy uses can be viewed as a negative impact to agricultural production.

The project will result in up to 8.2 acres of farmland being removed from agricultural production for the life of the project. Although this change in land use would take productive farmland out of production for the life of the project, the removal of 8.2 acres relative to 81,038 acres of farmland in the county is insignificant. The applicant indicates that the land could be returned to agricultural uses after the project is decommissioned and the site is restored.⁹⁹

Construction of the project has the potential to damage agricultural soils through compaction or erosion if BMPs are not implemented to minimize damage.

MITIGATION

Several sections of the DSP address agricultural mitigation and soil-related impacts:

- Section 4.3.9 requires protection and segregation of topsoil.
- Section 4.3.10 requires measures to minimize soil compaction.
- Section 4.3.11 requires the permittee to implement erosion prevention and sediment control practices recommended by the MPCA and to obtain a CSW Permit.
- Section 4.3.17 requires the permittee to develop an Invasive Species Management Plan to prevent introduction and spread of invasive species during construction of the project.
- Section 4.3.18 requires the permittee to take reasonable precautions against the spread of noxious weeds.
- Section 4.3.26 requires the permittee to fairly restore or compensate landowners for damages to crops, fences, drain tile, etc. during construction.
- Section 5.5 is a special condition that requires the permittee to amend the existing VMP for Nort Star Solar that defines how the LCA will be revegetated and monitored over the life of the project. Appropriate seeding rates and timing of revegetation will stabilize soils and improve overall soil health.

⁹⁸ SPA, p. 54.

⁹⁹ SPA, p. 55.

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Reduced or lost farming revenues may be offset by lease agreements, which are outside the scope of this document.

4.5.2 Tourism and Recreation

The ROI for recreation is the local vicinity and the ROI for tourism is the project area. Because the site is not close to major recreational or tourism resources, potential impacts to recreational opportunities and tourism are anticipated to be negligible.

In 2023 the leisure and hospitality industry in Chisago County accounted for about \$100 million in gross sales and employed an estimated 1,783 people.¹⁰⁰ The project is within North Branch city limits but is on the southeastern edge of the city limits. Tourism destinations in the Project Area are related to outdoor recreational activities and local festivals and events.¹⁰¹

Impacts to recreation can be direct or indirect. Direct impacts are impacts that directly impede the use of a recreational resource, for example, closing of a trail to facilitate project construction. Indirect impacts reduce the enjoyment of a recreational resources but do not prevent use, for example, aesthetic impacts visible from a scenic overlook.

There are no Scientific and Natural Areas or state parks within the project area. There is one wildlife management area located approximately half a mile northwest of the LCA. Although there are a number of parks in and near North Branch, there are none within the project area. There is a snowmobile trail (Route Number 106 & 107) that circumvents the LCA approximately 0.5 to 1 mile, northwest to southeast.

POTENTIAL IMPACTS

Construction and operation of the project are not anticipated to impact recreation or tourism in the Project Area.

MITIGATION

Because no impacts are anticipated, no mitigation is proposed.

4.6 Archeological, Cultural, and Historic Resources

The ROI for archeological and historic resources is the project area. The impact intensity level is anticipated to be negligible to minimal. Impacts would be localized. Impacts can be mitigated through siting.

Archeological resources are locations where objects or other evidence of archaeological interest exist, and can include aboriginal mounds and earthworks, ancient burial grounds, prehistoric ruins,

¹⁰⁰ Explore Minnesota (n.d.) *2023 Leisure & Hospitality Industry Data*, retrieved from: https://mn.gov/tourism-industry/assets/2023%20MN%20L%26H%20Data_tcm1135-665060.pdf

¹⁰¹ SPA, p. 51.

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or historical remains.¹⁰² Historic resources are sites, buildings, structures, or other antiquities of state or national significance.¹⁰³

Construction and operation of the project has the potential to impact resources that have importance to American Indian Tribes with ties to the region. Siting of large energy facilities in a manner that respects historic and cultural ties to the land requires coordination with tribes.

POTENTIAL IMPACTS

North Star Storage reports contacting the eleven Minnesota Tribal Nations' Tribal Historic Preservation Officers and the Minnesota Indian Affairs Council for additional information or comment on the project.¹⁰⁴

In 2014, a Phase 1 Archaeological Investigation was conducted within the LCA by Westwood, with assistance from 10,000 Lakes Archaeology, for the North Star Solar project. While no archaeological or historic sites were identified in the LCA, two sites were identified adjacent to the project. One is a historic farm site adjacent to the project to the southwest, the other was a historic farm site adjacent to the project to the northeast.

The historic farm site to the southwest is approximately 400 feet from the LCA. North Star Storage indicates this site will not be affected by the project.¹⁰⁵

In 2015 the historic farm site to the northeast was deemed not eligible for National Register of Historic Places. It has since been destroyed in the building of North Star Solar. North Star Storage sent the 2014 results to SHPO in 2024 and SHPO agreed that the 2014 survey was adequate for this project and additional archaeological surveys are not required.

MITIGATION

Prudent siting to avoid impacts to archaeological and historic resources is the preferred mitigation. The DSP contains several permit conditions intended to minimize impacts to archaeological and cultural resources:

- Section 4.3.20 is a standard permit condition that requires the permittee to avoid impacts to archaeological and historic resources where possible and to mitigate impacts where avoidance is not possible. If previously unidentified archaeological sites are found during construction, the permit requires the permittee to stop construction and contact SHPO to

¹⁰² Minnesota Statutes, Section. [138.31](#), subd. 14.

¹⁰³ Minnesota. Statutes, Section [138.51](#).

¹⁰⁴ SPA, p. 83, Table 7.0-1.

¹⁰⁵ SPA, p. 57.

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determine how best to proceed. Ground disturbing activity will stop, and local law enforcement will be notified should human remains be discovered.

- Section 5.6 requires the permittee to prepare an Unanticipated Discoveries Plan outlining steps to be taken if previously unrecorded cultural resources or human remains are encountered during construction.

4.7 Natural Resources

The facility's impacts on natural resources are dependent upon many factors, such as how the project is designed, constructed, maintained, and decommissioned. Other factors, for example, the environmental setting, influence potential impacts. Impacts can and do vary significantly both within, and across, projects.

4.7.1 Air Quality

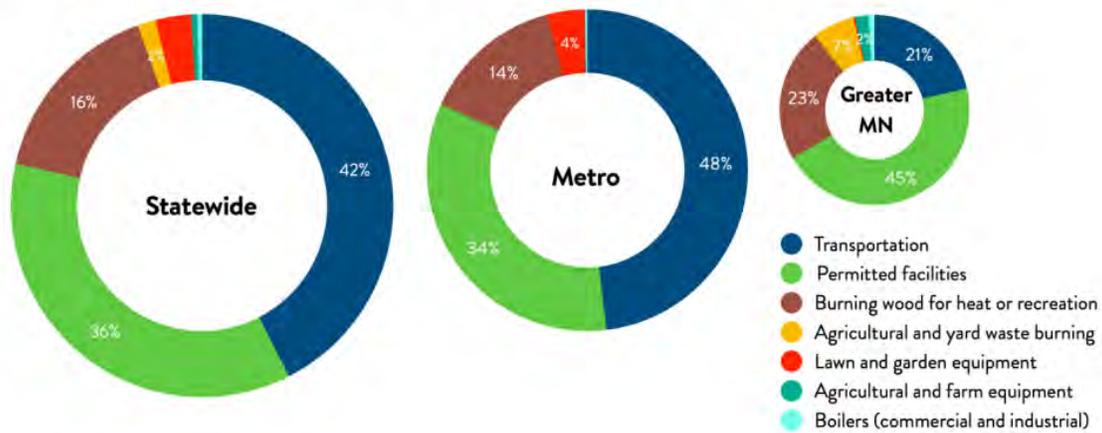
The ROI for air quality is the region. Potential impacts to air quality during construction would be intermittent, localized, short-term, and minimal. Impacts are associated with fugitive dust and exhaust. Impacts can be mitigated. Once operational, the BESS facility will not generate criteria pollutants or carbon dioxide. Negligible fugitive dust and exhaust emissions would occur as part of routine maintenance activities. Impacts are unavoidable and do not affect a unique resource. Impacts can be minimized.

Air quality is a measure of how pollution-free the ambient air is and how healthy it is for humans, other animals, and plants. Emissions of air pollutants will occur during construction and operation of new infrastructure for the project. Overall air quality in Minnesota has improved over the last 20 years, but current levels of air pollution still contribute to health impacts. As illustrated in **Graphic 4.7.1-1**, today, most of our air pollution that can lead to health effects are transportation, permitted facilities, and wood burning for heat or recreation. Transportation has a much greater contribution to air pollution in the metro area than in greater Minnesota ¹⁰⁶

¹⁰⁶ MPCA 2025. *The Air We Breathe: The State of Minnesota's Air Quality, January 2025 Report to the Legislature*, <https://www.pca.state.mn.us/sites/default/files/Iraq-1sy25.pdf>

Graphic 4.7.1-1: Air Pollution Sources by Type¹⁰⁷

Air pollution risk sources in Minnesota



The project is located in the North Metro Air Quality Index Region, which incorporates data from monitoring stations in Blaine, East Bethel, Marine on St. Croix, and St. Michael, Minnesota. Between 2019 and 2023, air quality in the north metro region has been considered “good” between 176 and 274 days of the year and moderate between 91 and 160 days. There were 27 days throughout 2019, 2020, 2021, and 2023 where air quality was considered unhealthy for sensitive groups, with most of these conditions being the result of smoke from Canadian wildfires.¹⁰⁸ In the same time period, there were 6 days where air quality was considered unhealthy for all groups. Four of these days were due to wildfire smoke, and the other two were due to ground-level ozone formation.¹⁰⁹

4.7.1.1 POTENTIAL IMPACTS

Minimal intermittent air emissions are expected during construction of the project. Air emissions associated with construction are highly dependent upon weather conditions and the specific activity occurring. For example, traveling to a construction site on a dry gravel road will result in more fugitive dust than traveling the same road when wet. Once operational, the BESS will not generate criteria pollutants or carbon dioxide.

¹⁰⁷ The State of Minnesota’s Air Quality, January 2025 Report to the Legislature, <https://www.pca.state.mn.us/sites/default/files/lraq-1sy25.pdf>

¹⁰⁸ MPCA. 2025. *The Air We Breathe: The State of Minnesota’s Air Quality, January 2025 Report to the Legislature*, <https://www.pca.state.mn.us/sites/default/files/lraq-1sy25.pdf> pp. 12-13

¹⁰⁹ MPR News- <https://www.mprnews.org/story/2023/06/14/air-quality-reaches-very-unhealthy-category-in-minnesota>

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Motorized equipment will emit exhaust. This includes construction equipment and vehicles travelling to and from the project. Exhaust emissions, primarily from diesel equipment, would vary according to the phase of construction.

All projects that involve movement of soil, or exposure of erodible surfaces, generate some type of fugitive dust emissions. The project will generate fugitive dust from travel on unpaved roads, grading, and excavation.

4.7.1.2 MITIGATION

Exhaust emissions can be minimized by keeping vehicles and equipment in good working order and not running equipment unless necessary.

Applicable BMPs will be used during construction and operation of the Project to minimize dust emissions if wind erosion becomes an issue. These practices include the application of water or other 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, and 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.

Several sections of the DSP indirectly mitigate impacts to air quality, including sections related to soils, vegetation removal, restoration, and pollution and hazardous wastes.

4.7.2 Geology and Groundwater

The ROI for geology and groundwater is the land control area. Impacts to domestic water supplies are not expected. Impacts to geology are not anticipated. Localized impacts to groundwater resources, should they occur, would be intermittent, but have the potential to occur over the long-term. Indirect impacts from surface waters might occur during construction. Impacts can be mitigated through use of BMPs for stormwater management.

Groundwater in Minnesota is largely a function of local geologic conditions that determine the type and properties of aquifers. Minnesota is divided into six groundwater provinces based on bedrock and glacial geology. According to the Minnesota Geological Survey's Chisago County Geology map, the surficial geology consists of Quaternary age very fine to medium grained sand with scattered lenses of silt.¹¹⁰ 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. Bedrock geology consists of Cambrian age sedimentary deposits of the Eau Claire Formation. The formation consists of feldspathic sandstone, siltstone, and shale. Depth to bedrock ranges from approximately 150 to 250 feet below ground surface.

The project is located in DNR 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. The bedrock rests atop the Mt. Simon aquifer. This aquifer has

¹¹⁰ Geologic Atlas of Chicago County, Minnesota. Stterholm, Dale (2010).
<https://conservancy.umn.edu/items/fad31768-59e4-46e2-94ab-347040435d0f>

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moderate permeability and is approximately 200 feet below ground surface. Groundwater typically flows to the east towards the Sunrise River in the project area.

The MDH maintains the Minnesota Well Index, which provides basic information (e.g., location, depth, geology, construction, and static water level) for wells and borings drilled in Minnesota.¹¹¹ The index did not identify any wells within the LCA. 30 active wells were identified within 0.5-mile of the LCA (**Figure 5**). Active wells in the project area vary in depth from 93 to 230 feet.

Under the Safe Drinking Water Act, each state is required to develop and implement a Wellhead Protection Program to identify the land and recharge areas contributing to public supply wells and prevent the contamination of drinking water supplies. Public and non-public community water supply source-water protection in Minnesota is administered by the MDH. A wellhead protection area (WHPA) encompasses the area around a drinking water well where contaminants could enter and pollute the well. The project is located outside of any WHPA. The closest WHPA is the North Branch WHPA located 2.6 miles northeast of the LCA (**Figure 5**).¹¹²

A Drinking Water Supply Management Area (DWSMA) is a clearly defined geographic area around a WHPA outlined by clear boundaries like roads. The DWSMA is managed by a wellhead protection plan, typically by the city. The MDH assigned vulnerability ratings to each DWSMA based on factors including geologic sensitivity, well construction, maintenance and use. The project is located outside of any DWSMA, and the nearest DWSMA is the North Branch DWSMA, which is 2.6 miles northeast of the LCA (**Figure 5**). The North Branch DWSMA is classified as low vulnerability.

4.7.2.1 POTENTIAL IMPACTS

Potential impacts to geology and groundwater can occur directly or indirectly. Impacts to geological resources are likely to be minimal, due to the depth to bedrock (150 feet) relative to anticipated depth of any project impacts (8 feet to 14 feet below grade) and the absence of karst features.

Impacts on groundwater resources, including wells and aquifers, are not anticipated as water supply needs will be limited, and there are no existing wells in the LCA. O&M water requirements will be satisfied with a single existing domestic-sized water well sited within the existing solar facility. Direct impacts to groundwater associated with construction (e.g. structure foundations that could penetrate shallow water tables or heavy groundwater usage) are not anticipated.¹¹³

Indirect impacts could occur through spills or leaks of petroleum fluids or other contaminants that contaminate surface waters which could ultimately contaminate groundwater. The disturbance of

¹¹¹ MDH (2024.) *Minnesota Well Index*
<https://www.health.state.mn.us/communities/environment/water/mwi/index.html> .

¹¹² MDH. 2024. Source Water Protection Web Map Viewer,
<https://www.health.state.mn.us/communities/environment/water/swp/mapviewer.html> , map viewer available at
<https://mdh.maps.arcgis.com/apps/View/index.html?appid=8b0db73d3c95452fb45231900e977be4>)

¹¹³ SPA, p. 90

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soil and vegetative cover could affect water quality in groundwater resources. Once constructed, the impervious surface area, excluding the existing project substation footprint, will be approximately 6.8 acres.

4.7.2.2 MITIGATION

Stormwater management is important to ensure that BESS components maintain their integrity and that rainwater and surface runoff drain away from the project components in a way that does not adversely affect existing drainage systems, roads, or nearby properties. Appropriate permanent stormwater management measures, including minimizing the area of impervious surfaces at the site to reduce the volume and velocity of the stormwater runoff and the establishment of multiple stormwater ponds, will address drainage from the newly established impervious areas.

Because the project will disturb more than one acre, North Star Storage must obtain a Construction Stormwater Permit (CSW Permit) from the MPCA. The CSW Permit will identify BMPs for erosion prevention and sediment control. As part of the CSW Permit, North Star Storage will also develop a SWPPP that describes construction activity, temporary and permanent erosion and sediment controls, BMPs, permanent stormwater management that will be implemented during construction and through the life of the project. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion and detail stormwater management methods during construction and operation of the facility.

North Star Storage proposes to construct two stormwater basins to manage stormwater collection and filtration on-site. In accordance with the CSW Permit, the stormwater basins will be constructed to prevent adverse impacts to groundwater resources.

While a 2014 geotechnical survey determined that the project area's soils would provide adequate support for shallow foundations, further geotechnical studies will be performed to confirm the topsoil and subsoil types, and the mechanical properties of the soils. These variables will be used to engineer the foundations for the BESS containers, substation, and transformers.

Section 4.3.11 of the DSP requires the permittee to obtain a CSW Permit and implement the BMPs for erosion prevention and sediment control. Impacts to groundwater can also be minimized by mitigating impacts to and soils and surface waters as discussed in Sections 4.7.3 and 4.7.4.

Any new wells require notification to MDH and would be constructed by a well borer licensed by MDH. If any previously unmapped wells are discovered, North Star Storage will cap and abandon the well in place in accordance with MDH requirements.

Any dewatering required during construction will be discharged to the surrounding upland vegetation, thereby allowing it to infiltrate back into the ground to minimize potential impacts. If

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construction requires dewatering of more than 10,000 gallons per day or 1,000,000 gallons per year, a Water Appropriations Permit from DNR will be required.¹¹⁴

4.7.3 Soils

The ROI for the soils is the land control area. Impacts to soils will occur during construction and decommissioning of the project. The impact intensity level is expected to be minimal. Potential negative impacts will occur over both the short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur.

Soil characteristics within the LCA were assessed using the Soil Survey Geographic database (SSURGO).¹¹⁵ **Table 4.7.3-1** lists the soil types located within the LCA; soil map units and farmland classifications are depicted in **Figure 6**.

Table 4.7.3-1: Soil Types in Facility Land Control Area

Map Unit Symbol	Map Unit Name	Farmland Classification	Soil Hydric Rating	Acres in Land Control Area	Percent of Land Control Area
158B	Zimmerman fine sand, 1 to 6 percent slopes	Not prime farmland	2	19.3	24.8
161	Isanti loamy fine sand	Not prime farmland	93	3.2	4.1
162	Lino loamy fine sand	Farmland of statewide importance	3	25.6	32.9
328B	Sartell fine sand, 1 to 6 percent slopes	Not prime farmland	8	19.3	24.8
676B	Kost loamy fine sand, 1 to 6 percent slopes	Not prime farmland	8	8.6	11.1
W	Water	Not prime farmland	0	1.8	2.3

POTENTIAL IMPACTS

The impact intensity level is expected to be low to moderate. Primary impacts to soils include compaction from construction equipment, soil profile mixing during grading and pole auguring, rutting from tire traffic, and soil erosion. Impacts to soils are likely to be greatest with the below-ground electrical collection system. Potential impacts will be positive and negative, and short- and long-term. Isolated moderate to significant negative impacts associated with high rainfall events could occur.

¹¹⁵ Soil Survey Staff, Natural Resources Conservation Service, United States Department of Agriculture. Soil Survey Geographic (SSURGO) Database for Chisago County, Minnesota. Available online. Accessed 09/09/2025.

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Construction of the facility will disturb approximately 17.8 acres within the LCA. As with any ground disturbance, there is potential for soil compaction and erosion. Heavy rainfall events during construction or prior to establishment of permanent vegetation, increase the risk that significant sedimentation and erosion could occur.

Soil cover and management at the facility will change from cultivated cropland to a mixture of impervious and pervious surfaces. The access roads and the area within and surrounding the fenced area (approximately 6.8 acres in total) will be covered with crushed rock, while the remainder of the site will be a mixture of native groundcover plantings and an area that would continue to be used for agriculture. Soil health will likely improve for the portion of the site that is revegetated with native perennial vegetation for the operating life of the project.

MITIGATION

Several sections of the DSP address soil-related impacts

- Section 4.3.9 requires protection and segregation of topsoil.
- Section 4.3.11 requires the permittee to obtain a MPCA CSW Permit and implement the BMPs within for erosion prevention and sediment control.
- Section 5.5 is a special condition that requires the applicant to amend the existing North Star Solar VMP to include the North Star Storage project as its own management area. The purpose of this amended VMP is to prevent soil erosion and invest in soil health by establishing a plan to protect soil resources by ensuring perennial cover.

4.7.4 Surface Water Resources

The ROI for surface water resources is the land control area. The impact intensity level is anticipated to be minimal. Direct impacts to surface waters are not expected. Indirect impacts to surface waters might occur. These impacts will be short-term, of a small size, and localized. Impacts can be mitigated.

BESS projects have the potential to impact surface water resources and floodplains. These projects could directly impact water resources and floodplains if these features cannot be avoided through project design. Projects also have the potential to adversely impact surface waters through construction activities which move, remove, or otherwise handle vegetative cover and soils. Changes in vegetative cover and soils can change runoff and water flow patterns.

The Project is located within the Lower St. Croix Watershed (HUC8A: 07030005).¹¹⁶ This watershed is approximately 915 square miles and there are 60 municipalities and townships located completely or partially within the boundaries of the watershed.

¹¹⁶ DNR, *Mapping Watersheds in Minnesota*, <https://www.dnr.state.mn.us/watersheds/index.html>

4.7.4.1 Lakes and Ponds

No lakes or ponds were identified within the LCA based on USFWS National Wetland Inventory (NWI) data (**Figure 7**).¹¹⁷ There is, however, one pond present to the southeast of this project, and this pond is connected to a wetland complex that enters the southeast corner of the LCA.

4.7.4.2 Rivers and Streams

No rivers or streams are present within the LCA based on DNR Hydrography data¹¹⁸ and NWI data (**Figure 7**). The on-site wetland delineation conducted in June 2025 supported the absence of streams.

4.7.4.3 Public Waters

There are no waterbodies or watercourses listed on the DNR Public Waters Inventory (PWI) in the LCA (**Figure 7**).¹¹⁹ The nearest Public Waters Inventory (PWI) body of water is Olson Marsh, located approximately 600 feet southwest of the LCA, which also has an unnamed PWI watercourse running through it.

4.7.4.4 Impaired Waters

Under Section 303(d) of the Clean Water Act, states are required to assess all waters of the state to determine if they meet water quality standards, list waters that do not meet standards and update the list biannually and conduct total maximum daily load studies to set pollutant-reduction goals needed to restore waters to the extent that they meet water quality standards for designated uses. The list, known as the 303(d) list, is based on violations of water quality standards. The MPCA has jurisdiction over determining 303(d) waters in the State of Minnesota. There are no waters listed by the MPCA as impaired waters within the LCA. The Sunrise River and the North Branch of the Sunrise River are the closest impaired waters to the LCA at 1.3 and 1.8 miles from the LCA, respectively.¹²⁰

4.7.4.5 Wetlands

Wetlands are areas with hydric (wetland) soils, hydrophilic (water-loving) vegetation, and wetland hydrology (inundated or saturated during much of the growing season). Wetlands vary widely due to differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors.¹²¹ Wetlands are important to the health of waterways and communities that are downstream. Wetlands can be one source of hydrology in downstream watercourses and water bodies, detain floodwaters, recharge groundwater supplies, remove pollution, and provide fish and wildlife habitat. Wetland health also has economic impacts because of their key role in fishing,

¹¹⁷ U. S. Fish and Wildlife Service. *National Wetlands Inventory*, <https://www.fws.gov/program/national-wetlands-inventory>. U.S. Department of the Interior, Fish and Wildlife Service, Washington, D.C

¹¹⁸ DNR, *DNR Hydrography Dataset*, <https://gisdata.mn.gov/dataset/water-dnr-hydrography>

¹¹⁹ DNR, *Public Waters (PW) Basin and Watercourse Delineations*, <https://gisdata.mn.gov/dataset/water-mn-public-waters>

¹²⁰ MPCA, *Impaired Waters Viewer*, (2014), <https://gisdata.mn.gov/dataset/impaired-waters-viewer>.

¹²¹ USEPA, *What is a Wetland*, (2024), <https://www.epa.gov/wetlands/what-wetland>.

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hunting, agriculture, and recreation. The proposed project could temporarily or permanently impact wetlands if these features cannot be avoided through project design.

North Star Storage assessed the potential for wetlands within the LCA through a formal wetland delineation in July of 2025. In addition to the on-site delineation, this section also incorporates wetlands data from publicly available sources, including the NWI and Minnesota Hydrology datasets.

A total of 10 wetlands were identified in the LCA during the on-site wetland delineation (**Figure 7**). Wetlands were further identified to determine type and acreage using NWI data (**Table 4.7.4.5-1**).

Table 4.7.4.5-1: Delineated Wetlands in the Land Control Area

Wetland ID	Wetland type	Acres
Wetland 1	Emergent	0.752732
Wetland 2	Forested / Emergent	7.162315
Wetland 3	Emergent	3.45778
Wetland 4	Emergent	0.904285
Wetland 5	Emergent	0.48123
Wetland 6	Emergent	0.141999
Wetland 7	Forested / Emergent	1.588503

The two forested wetlands identified by the delineation align with wetlands identified by both NWI and DNR Hydrography datasets, and are likely regulated by the WCA and will require coordination with the responsible Local Government Unit (Chisago County). Five emergent wetlands were identified by the delineation that were not included in NWI data. These five wetlands are likely non-jurisdictional, meaning they are not regulated by the WCA or Section 404 of the CWA.

4.7.4.6 Floodplains

Floodplains are flat, or nearly flat, land adjacent to a river or stream that experiences occasional or periodic flooding. It includes the floodway, which consists of the stream channel and adjacent areas that carry flood flows, and the flood fringe, which includes areas covered by the flood, but which do not experience a strong current. Floodplains prevent flood damage by detaining debris, sediment, water, and ice. The Federal Emergency Management Agency (FEMA) delineates floodplains and determines flood risks in areas susceptible to flooding. The base flood that FEMA uses, known as the 100-year flood, has a one percent chance of occurring during each year.

At the state level, the DNR oversees the administration of the state floodplain management program by promoting and ensuring sound land use development in floodplain areas in order to promote the health and safety of the public, minimize loss of life, and reduce economic losses caused by flood damages. The DNR also oversees the national flood insurance program for the state of Minnesota. Floodplains are also regulated at the local level.

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According to the FEMA website, the project area is mapped as Zone X, which is an area of minimal flood hazard.¹²²

4.7.4.7 Potential Impacts

The project is designed to avoid direct impacts to surface waters by avoiding placement of project components such as access roads, BESS modules, inverters, or temporary workspaces in surface waters.

Construction of the project creates a potential for indirect impacts if sediment or fugitive dust created by excavation, grading, vegetation removal, and construction traffic reaching nearby surface waters.

Overall, the project is expected to have minimal impacts on water quality.

4.7.4.8 Mitigation

Standard construction management practices, including, but not limited to containment of excavated soils, protection of exposed soils, stabilization of restored soils, and controlling fugitive dust, would minimize the potential for eroded soils to reach surface waters.

Best management practices to minimize the impact on surface waters will be utilized as a part of the SWPPP, including but not limited to sediment control, revegetation plans, and management of exposed soils to prevent sediment from entering waterbodies.

The DSP has two standard conditions that address potential impacts to surface waters:

- Section 4.3.11 of both DSPs require the permittee to “implement erosion prevention and sediment control practices recommended by the [MPCA]” and to “obtain a [CSW Permit].” A CSW Permit requires both temporary and permanent stormwater controls. This section also requires implementation of erosion and sediment control measures, contours graded to provide for proper drainage, and all disturbed areas be returned to pre-construction conditions. North Star Storage will also develop a SWPPP that complies with MPCA rules and guidelines. The SWPPP describes construction activity, temporary and permanent erosion and sediment controls, BMPs, permanent stormwater management that will be implemented during construction and through the life of the project. Implementation of the protocols outlined in the SWPPP will minimize the potential for soil erosion during construction.
- Section 4.3.16 of the DSP requires that “site restoration and management” practices enhance “soil water retention and reduces storm water runoff and erosion”.

4.7.5 Vegetation

The ROI for vegetation is the land control area. The facility will convert row crop farmland to a mixture of impermeable surface and perennial vegetation for the life of the project. Potential

¹²² FEMA, *FEMA Flood Map Service Center*, <https://msc.fema.gov/portal/home>.

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impacts of the facility can be mitigated through amendment of the existing VMP for North Star Solar.

The Project is within the Eastern Broadleaf Forest Province comprised of the Minnesota and Northeast Iowa Morainal Section and Anoka Sand Plain Subsection.¹²³ 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.¹²⁴

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. Brushlands were found in large areas of the sandplain with narrow bands of upland prairie and as did areas of floodplain forest.

Based on the USGS NLCD (**Figure 3**), the LCA is composed of predominantly agricultural land (78.1 percent). Deciduous forest in the LCA consists of a wooded fence row along the northern and southern margins of the LCA and a woodlot in the southeastern portion of the LCA, both of which are part of wetland complexes. The dominant wetland vegetation consists of narrow leaf cattail, reed canary grass, speckled alder, quaking aspen, sensitive fern, and/or yellow nut sedge.

POTENTIAL IMPACTS

Approximately 17.8 acres (including both facility components and a re-vegetated area outside the fence line) will be converted from cropland for the life of the facility. Removal of vegetative cover exposes soils and could result in soil erosion. Temporary or permanent removal of vegetation also has the potential to affect wildlife habitat.

Construction activities could introduce or spread invasive species and noxious weeds and the early phases of site restoration and seeding of native species can result in populations of non-native and invasive species on site.

MITIGATION

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.

Several sections of the DSP address impacts to vegetation:

- Section 4.3.15 requires the permittee to minimize the number of trees removed.

¹²³ DNR- Ecological Classification System- <https://www.dnr.state.mn.us/ecs/222Mc/index.html>

¹²⁴ DNR- Ecological Classification System- <https://www.dnr.state.mn.us/ecs/222/index.html>

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- Section 4.3.17 requires the permittee to employ BMPs to avoid potential introduction and spread of invasive species and to file an Invasive Species Management Plan prior to construction.
- Section 4.3.18 requires the permittee to take all reasonable precautions to prevent the spread of noxious weeds during construction.
- Section 5.5 is a special condition that requires the applicant to amend the existing North Star Solar VMP to include the North Star Storage project as its own management area. The purpose of this amended VMP is to prevent soil erosion and invest in soil health by establishing a plan to protect soil resources by ensuring perennial cover.

4.7.6 Wildlife and Habitat

The ROI for non-avian wildlife and their habitats is the land control area, the ROI for birds is the local vicinity. Long-term, minimal impacts to small mammals, insects, snakes, etc. would occur. Impacts to large wildlife species, for example, deer, will be negligible. Significant negative impacts could occur to individuals during construction and operation of the project. While most of the site will be covered by crushed rock, a portion of the land control area will provide native habitat for the life of the project. The project does not contribute to significant habitat loss or degradation or create new habitat edge effects. Potential impacts can be mitigated in part through design and BMPs. The impact intensity level is expected to be minimal.

The project landscape is dominated by agriculture and developed areas (roads, railroads, homes, and farmsteads), but also contains multiple forested and emergent wetlands, both of which provide potential high quality habitats for wildlife.

Wildlife species associated with disturbed habitats and are accustomed to human activities (e.g., agricultural activities and road traffic) are those most likely to occur in the project area. Mammals, reptiles, amphibians, and insects are likely present, given the presence of herbaceous and forested wetlands. Common wildlife species found in agricultural wetland complexes likely include white-tailed deer, red fox, striped skunk, raccoon, coyote, American toad, garter snake, and a variety of insects including native bees, butterflies, and moths.

The Project is located within the Mississippi Flyway, which is a major north-south migration route, and within the North American Bird Conservation Initiative Prairie Hardwood Transition Bird Conservation Region.¹²⁵ There are no designated Waterfowl Production Areas within one mile of the site, and the nearest Important Bird Area designated by the National Audubon Society is the Carlos Avery Important Bird Area, approximately 1.4 miles south of the site.¹²⁶

¹²⁵ North American Bird Conservation Initiative - *Bird Conservation Regions Map*- <https://nabci-us.org/resources/bird-conservation-regions-map/>

¹²⁶ National Audubon Society- Important Bird Areas, https://gis.audubon.org/portal/apps/sites/?_gl=1*1a4h47v*_gcl_au*MTc5NjJlWzU4OC4xNzUyNzU1NjQw*_ga*MTk1MjU5NzY2My4xNzUyNzU1NjQw*_ga_X2XNL2MWTTCzE3NjAzMjk5ODcjbzZkZzAkDE3NjAzMjk5ODcckajYwJGwwJGgw#/nas-hub-site

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There is high quality wetland, forest, and riparian habitat in the Janet Johnson Memorial Wildlife Management Area (WMA), which consists of approximately 800 acres and is just northwest of the LCA (**Figure 8**). Additionally, an extensive wetland complex habitat and DNR Site of Biodiversity Significance is located southwest of the LCA and is contiguous with the Janet Johnson Memorial WMA (**Figure 8**). These habitats provide higher-quality cover, food and reproductive value for wildlife than the agricultural-dominated habitat matrix of the LCA.

POTENTIAL IMPACTS

The impact intensity level is expected to be minimal. Potential impacts will be short- and long-term and can be mitigated.

Non-Avian Wildlife Individuals will be displaced to adjacent habitats during construction. Because the LCA does not provide critical habitat, this should not impact life cycle functions for animals, such as nesting. Direct significant impacts to individuals might occur, that is, small species might be crushed or otherwise killed during construction. Population level impacts are not anticipated.

The project's fencing does create the potential for wildlife impacts. Although deer can jump fences, they can become tangled in both smooth and barbed-wire fences, especially if the wires are loose or installed too closely together.¹²⁷ Predators can use fences to corner and kill prey species.¹²⁸ Because of the project's relatively small footprint the overall impact is anticipated to be minimal.

Plastic erosion control netting is frequently used for erosion control during construction and landscape projects and can negatively impact wildlife populations. Wildlife entanglement and death from plastic netting and other plastic materials has been documented in birds, fish, mammals, and reptiles.¹²⁹

Birds: Bird injuries or mortality may occur due to lack of fencing visibility. Local avian species, particularly raptors, may be vulnerable to fence collisions.

Habitat: Within the Project Area, no direct impacts to quality habitat, including emergent wetlands and forested wetlands, are anticipated. The Janet Johnson Memorial WMA is located 0.3 miles northwest of the LCA, and a DNR Site of Biodiversity significance (Branch Wetlands) is located 0.15 miles west of the LCA, and no impacts to these areas are anticipated.

The dominant row crop habitat at the site is not crucial to wildlife populations, although the LCA may be used as a travel corridor or, occasionally, as a food source (for example, standing corn).

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- ¹²⁷ Colorado Division of Wildlife. *Fencing with Wildlife in Mind*. (2009). <https://cpw.state.co.us/Documents/LandWater/PrivateLandPrograms/FencingWithWildlifeInMind.pdf>, p. 3.
- ¹²⁸ Marcel Huijser, et al. *Construction Guidelines for Wildlife Fencing and Associated Escape and Lateral Access Control Measures*. (April 2015). http://onlinepubs.trb.org/onlinepubs/nchrp/docs/NCHRP25-25%2884%29_FR.pdf, page 27.
- ¹²⁹ DNR. *Wildlife-friendly Erosion Control*. (2013). <http://files.dnr.state.mn.us/eco/nongame/wildlife-friendly-erosion-control.pdf>.

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Following construction, outside of wetlands and permanent project infrastructure, the land will continue to be used for agricultural purposes. Overall, the project does not contribute to significant habitat loss or degradation or create new habitat edge effects.

MITIGATION

Several sections of the DSP specify measures that will minimize impacts to wildlife:

- Section 5.9 is a special condition that requires the permittee to coordinate with the DNR to ensure that the fence used in the project minimizes impacts to wildlife
- Section 5.10 is a special condition that requires use of wildlife-friendly erosion control.
- Section 8.13 requires permittees to report “any wildlife injuries and fatalities” to the Commission on a quarterly basis.

Other potential mitigation measures include:

- Checking open trenches and removing any wildlife caught in trenches before backfilling mitigates impacts.
- Once permanent vegetation is established, restricting mowing from April 15 to August 15 will improve the potential for ground nesting habitat.

4.7.7 Rare and Unique Resources

The ROI for rare and unique resources is the local vicinity. The impact intensity level is anticipated to be minimal, as the project avoids identified areas of species occurrence and preferred habitat. No additional mitigation measures are proposed. Impacts can be mitigated.

Construction and operation of large energy facilities may adversely impact rare and unique resources through the taking or displacement of individual plants or animals, invasive species introduction, and habitat loss. Conversely, for some types of projects, sites can be managed to provide habitat. For example, the introduction of native vegetation into a landscape otherwise dominated by cultivated row crops could create habitat for pollinators.

4.7.7.1 Potential Impacts

4.7.7.1.1 Federally-listed Species

The USFWS maintains the Information for Planning and Consultation (IPaC) system to determine whether federally protected species may occur within or adjacent to a given area. North Star Storage queried the IPaC system on January 6, 2025, to determine whether federally listed species may occur within or adjacent to the LCA. One threatened species, the gray wolf (*Canis lupus*) and one experimental population, non-essential species, the whooping crane (*Grus americana*) were listed as potentially occurring near the project. Additionally, a proposed endangered species, the salamander mussel (*Simpsonaias ambigua*), and a proposed threatened species, the monarch butterfly (*Danaus plexippus*), were listed as potentially occurring near the project. Each of these species is discussed in detail below.

4.7.7. Federally-listed species potentially occurring within or adjacent to the project

Common Name	Scientific Name	Listing Status
Gray Wolf	<i>Canis lupus</i>	Threatened
Whooping Crane	<i>Grus americana</i>	Experimental population, non-essential
Salamander Mussel	<i>Simpsonaias ambigua</i>	Proposed Endangered
Monarch Butterfly	<i>Danaus plexippus</i>	Proposed Threatened

Gray wolf (*Canis lupus*)

Gray wolves use a variety of habitats across their range. In Minnesota, they largely inhabit forested regions where there is plenty of prey as well as abundant cover.¹³⁰ Wolves tend to select against areas with high human and agriculture densities.¹³¹ Ungulates are the typical prey of wolves, who prefer moose, elk, and white-tailed deer.

The Minnesota gray wolf population is classified as threatened. 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.

The LCA is within the known range of the gray wolf and their preferred ungulate prey may be present in this area. However, the LCA 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 (*Grus americana*)

Whooping cranes are designated as a non-essential experimental population in Minnesota and consultation is not necessary for projects that occur outside a National Wildlife Refuge or a National Park. The project will have no effect on the whooping crane.

Salamander mussel (*Simpsonaias ambigua*)

The salamander mussel is typically found in swift-flowing rivers and streams with areas of shelter under rocks or in crevices.

On August 8, 2023, the USFWS issued a proposed rule to list the salamander mussel as an endangered species and designate critical habitat under the Endangered Species Act (ESA). While the species is proposed as endangered, proposed species do not receive the full protections of the ESA until the listing is finalized. The LCA contains no suitable habitat for the salamander mussel, and no impacts to this species are anticipated.

¹³⁰ USFWS- Gray Wolf, <https://www.fws.gov/species/gray-wolf-canis-lupus>

¹³¹ Van den Bosch, M., et al. "Identifying potential gray wolf habitat and connectivity in the eastern USA." *Biological Conservation* 273 (2022): 109708.

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Monarch Butterfly (*Danaus plexippus*)

The monarch butterfly can be found in a wide variety of habitats including prairies, grasslands, urban gardens, road ditches, and agricultural fields, provided a supply of nectaring plants are available for adult foraging and milkweed plants are present for laying eggs and as a food source for caterpillars.¹³²

On December 12, 2024, the USFWS issued a Species Status Assessment and a proposed rule to list the monarch butterfly as a threatened species and designate critical habitat under the ESA. While the species is proposed as threatened, proposed species do not receive the full protections of the ESA until the listing is finalized. A final rule will likely be published within 12 months of the proposed rule and protections would be effective within 30 to 60 days or around January 2026. If the listing status of the monarch butterfly changes, the Applicants must consult with USFWS regarding any potential impacts to this species.

Bald Eagles and Golden Eagles

In Minnesota, the bald eagle nesting season is generally January through early July. Bald eagles are primarily found near rivers, lakes, and other waterbodies.¹³³

Bald eagles are afforded additional protections under the Bald and Golden Eagle Protection Act, which is administered by the USFWS. Bald eagle incidental take permits and nest removal permits are voluntary permits, meaning a project proposer must make the determination to pursue a permit based on the respective risk of their project's potential to take a bald eagle.

Although there are forested areas along the northern and southern boundaries of the site, the location and the trees are not suitable nesting habitat for bald eagles. There are no bald eagle nests near the LCA. Since the project will not remove any trees or nests, impacts to the bald eagle are not anticipated.

4.7.7.1.2 State-listed Resources

The Minnesota DNR classifies rare plant or animal communities across the state. These include Scientific and Natural Areas, High Conservation Value Forest, Minnesota Biological Survey (MBS) Native Plant Communities, and MBS Sites of Biodiversity Significance.

The Division of Ecological and Water Resources within DNR manages the Natural Heritage Information System (NHIS). NHIS data includes records of observed federally endangered, threatened, or candidate plant species, and endangered or threatened animal species. The system also includes records of state endangered, threatened, or special concern species. The NHIS database

¹³² USFWS. Undated. FWS Focus: Monarch Butterfly (*Danaus plexippus*). Available online at: <https://www.fws.gov/species/monarch-butterfly-danaus-plexippus>. Accessed July 2025.

¹³³ DNR, *Bald Eagles in Summer*. <https://www.dnr.state.mn.us/birds/eagles/summer.html>

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provides a useful source of information, but not the sole source for identifying these resources, as some areas have not been extensively surveyed.

North Star Storage submitted the project to the MNDNR’s NHIS system for review of potential impacts to state-listed species within one mile of the Project and other important natural resources. The DNR identified Blanding’s turtle (*Emydoidea blandingii*) and toothcup (*Rotala ramosior*) as being potentially impacted by the project (Table 4.7.7.1.2-1).

Table 4.7.7.1.2-1: State-listed species potentially occurring within or adjacent to the project

Common Name	Scientific Name	Listing Status
Blanding’s turtle	<i>Emydoidea Blandingii</i>	Threatened
Toothcup	<i>Rotala ramosior</i>	Threatened

Blanding’s turtle (*Emydoidea blandingii*)

Blanding’s turtles are typically found in wetland complexes with adjacent sandy uplands. Blanding’s turtles prefer calm, shallow waters, including ponds and wetlands associated with rivers and streams with rich aquatic vegetation. Wetlands are used throughout the summer for foraging and also serve as over-wintering sites. 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.¹³⁴

Suitable habitat for the Blanding’s turtle is present within the LCA due to the presence of wetlands, including wetlands with adjacent mapped sandy soils, as well as the wetlands’ connectivity with large wetlands beyond the LCA.

Toothcup (*Rotala ramosior*)

The LCA is situated along the northern edge of the toothcup’s range with very few occurrences in the state. The species is found in 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. Toothcup populations typically occur on sandy shores or small shallow lakes set in a savanna landscape.¹³⁵

Suitable habitat for the toothcup is not present within the LCA. Therefore, no impacts to the toothcup are anticipated.

¹³⁴ DNR Rare Species Guide – Blanding’s Turtle (Accessed 10/1/2025)
<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ARAAD04010>

¹³⁵ DNR Rare Species Guide- Toothcup (Accessed 10/1/2025)
<https://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=PDLYT0B030>

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4.7.7.2 MITIGATION

Techniques for minimizing impacts to wildlife and vegetation also minimize impacts to rare species. Avoiding identified areas of species occurrence or preferred habitat is the preferred mitigation measure. Blanding's turtles require specific mitigation measures, due to their use of varied habitats and their high rates of dispersal and movement for breeding and foraging. Section 5.10 of the DSP describes the avoidance measures, as requested by the DNR, that the applicant must take to mitigate potential impacts to Blanding's turtles.

4.7.8 Climate Change

The project has the potential to support the shift of energy production in Minnesota and the upper Midwest toward carbon-free sources. Construction emissions will have a short-term negligible increase in greenhouse gases that contribute to climate change. The project's design incorporates design elements that minimize impacts from the increase in extreme weather events such as increase flooding, storms, and heat wave events that are expected to accompany a warming climate.

Climate change refers to any significant change in measures of climate lasting for an extended period. Greenhouse gases (GHG) are gaseous emissions that trap heat in the atmosphere and contribute to climate change. These emissions occur from natural processes and human activities. The most common GHGs emitted from human activities include carbon dioxide, methane, and nitrous oxide.

4.7.8.1 POTENTIAL IMPACTS

Construction activities will result in short-term increases in GHG emissions from the combustion of fossil fuels in construction equipment and vehicles.

Table 4.7.8.1-1 provides an estimate of GHG emissions for the construction 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. Energy Storage systems, such as BESS, produce almost no GHGs during operations. While there are potential annual emissions from sources including on-site vehicle traffic and staff commuter traffic, emissions during project operation will be minimal and are not presented in **Table 4.7.8.1-1**.

Table 4.7.8.1-1: Construction Related Greenhouse Gas Emissions, in tons

Construction Activity	CO ₂	CH ₄	N ₂ O	CO ₂ e
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: CO₂ = carbon dioxide; CH₄ = methane; 1 short ton CH₄ = 28 short tons CO₂e; N₂O = nitrous oxide; 1 short ton N₂O = 265 short tons CO₂e; CO₂e = carbon dioxide equivalent

A preliminary lifecycle GHG emissions assessment for the project was also conducted.¹³⁶ The lifecycle assessment calculated the amount of GHG emissions that would be generated from construction, operation, and decommissioning of the project. The lifecycle assessment determined that construction, operation, and decommissioning of the project would produce approximately 1.1 million metric tonnes of CO₂e over a 20-year lifetime. During that same time period, operation of the project would displace approximately 1.2 million metric tonnes of CO₂e from discharging. This is a reduction of approximately 100,000 metric tonnes of CO₂e 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.

A warming climate is expected to cause increased flooding, storms, and heat wave events. These events, especially an increased number and intensity of storms, could increase risks to the project. More extreme storms also mean more frequent heavy rainfall events. Climate and weather impacts are considered in the design of the facility and include impacts from extreme storms such as stormwater runoff, strong winds and hail. North Star Storage states that 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 basins have been designed to accommodate projected precipitation levels in 30 years.

MITIGATION

Mitigation to reduce emissions during construction is discussed in the Air Quality section of this EA. Strategies to reduce emissions include keeping vehicles in good working order, which will reduce the amount GHG emissions from diesel or gasoline.

Project developers can employ location, design, and construction strategies to mitigate impacts resulting from a warmer, wetter, and more energetic climate by:

- Avoiding sites with high probability for extreme weather events to the extent possible.
- Designing facility components to withstand snow loads as well as stronger storms and winds.
- Designing the project’s stormwater system to prevent flooding during heavy rainfall events.
- Designing the project’s electrical collection system to be resistant to flooding damage.

¹³⁶ DSP- Appendix F (eDockets No. [20252-215915-09](https://www.regulations.gov/document/20252-215915-09))

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The preliminary site plan includes two stormwater drainage basins to reduce stormwater runoff from the site. Final site design will ensure the site will meet state and county requirement for reducing runoff and treating stormwater. Final site design may employ swales and berms to prevent flooding and route water to stormwater basins.

4.8 Unavoidable Impacts

Resource impacts are unavoidable when an impact cannot be avoided even with mitigation strategies.

Potential impacts and the possible ways to mitigate against them were discussed earlier in this chapter. However, even with mitigation strategies, certain impacts cannot be avoided. Most adverse unavoidable impacts are associated with construction; therefore, they would be temporary.

Unavoidable adverse effects associated with construction of the project (in some instances a specific phase of construction) would last through construction and include:

- Fugitive dust.
- Noise disturbance to nearby residents and recreationalists.
- Visual disturbance to nearby residents and recreationalists.
- Soil compaction and erosion.
- Vegetative clearing.
- Disturbance and temporary displacement of wildlife, as well as direct impacts to wildlife inadvertently struck or crushed.
- Minor amounts of marginal habitat loss.
- Possible traffic delays.

Unavoidable adverse impacts associated with the operation would last as long as the life of the project, and include:

- Visual impacts of the project.
- Noise disturbance to nearby residents.
- Loss of land for agricultural purposes.
- Injury or death of birds and mammals from fencing.

4.9 Irretrievable or Irreversible Impacts

Resource commitments are irreversible when it is impossible or very difficult to redirect that resource to a different future use; an irretrievable commitment of resources means the resource is not recoverable for later use by future generations.

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Irreversible and irretrievable resource commitments are primarily related to project construction, including the use of water, aggregate, hydrocarbons, steel, concrete, wood, and other consumable resources. Some, like fossil fuel use, are irretrievable. Others, like water use, are irreversible. Still others might be recyclable in part, for example, the raw materials used to construct batteries and enclosures would be an irretrievable commitment of resources, excluding those materials that may be recycled at the end of useful life. The commitment of labor and fiscal resources to develop, construct, and operate the project is considered irretrievable.

4.10 Resource Topics Receiving Abbreviated Analysis

Resource topics that will have negligible impacts from the project and that do not impact the Commission's site permit decision receive less study and analysis.

Many environmental factors and associated impacts from a project are analyzed during the environmental review process. However, if impacts are negligible and will not impact the permit decision, those resource impacts receive less study and analysis. The following resource topics meet this threshold, which is based on information provided by the applicant, field visits, scoping comments, environmental analysis, and staff experience with similar projects.

4.10.1 Displacement

Displacement can occur when residences or other buildings are located within a proposed site or right-of-way. If the buildings would potentially interfere with the safe operation of a project, they are typically removed from the site or ROW and relocated. Displacements from large energy facilities are rare and are more likely to occur in heavily populated areas where avoiding all residences and businesses is not always feasible than in rural areas where there is more room to adjust site boundaries or ROWs to accommodate the proposed energy facility.

There are no residences, business, or structures such as barns or sheds located within the site, and none will be displaced by the project. No mitigation is proposed.

4.10.2 Communications

Electronic interference from the proposed project is not anticipated. The project area is served by several AM and FM radio stations and digital television channels. There are no radio, microwave, or television towers located within the site. Landline telephone service to the project area is provided by Citizens Communications Company, Frontier Communications and Qwest Corporation. Mobile service Cellular phone service in the service area is provided by national carriers.

Global Positioning System (GPS) Electronic interference associated with communications infrastructure is related to a phenomenon known as corona. Impacts are not expected, because anticipated electric fields are below levels expected to produce significant levels of corona.

Because the BESS facilities are relatively low (less than 20 feet), they are well below the line of site used in many communication system signals. Electronic interference associated with communications infrastructure and devices including agricultural navigation systems is related to a

Chapter 4 Project Impacts and Mitigation

phenomenon known as corona. Impacts are not expected, because anticipated electric fields are below levels expected to produce significant levels of corona.

Section 4.3.21 of the DSP requires the permittee to take whatever action is feasible to restore or provide equivalent reception should interference occur to “radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices” as a result of the project. Additional mitigation is not proposed.

4.10.3 Forestry

Active forestry operations, including commercial timber harvest, woodlots, or other forestry resources do not occur within the LCA. Impacts to forestry operations will not occur and no mitigation is proposed.

4.10.4 Mining

Construction of the project will require the use of sand and aggregate for backfill and access roads. The demand for sand and gravel will be temporary and is not expected to require new or expanded sand or aggregate operations.

There are no quarries or gravel pits within or adjacent to the site.¹³⁷ Through sale or lease of the land used for the facility, the current landowners choose energy production as the higher and greater economic use. Impacts to mining will not occur and no mitigation is proposed.

4.11 Cumulative Potential Effects

Cumulative potential effects result from the incremental effects of a project in addition to other projects in the environmentally relevant area.

Minnesota Rule 4410.0200, subpart 11a, defines “cumulative potential effects,” in part, as the “effect on the environment that results from the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects ... regardless of what person undertakes the other projects or what jurisdictions have authority over the project.”

The “environmentally relevant area” includes locations where the potential effects of the project coincide with the potential effects of other projects to impact the elements studied in this EA.

Consideration of cumulative potential effects is intended to aid decision-makers so that they do not make decisions about a specific project in a vacuum. Effects that may be minimal in the context of a single project may accumulate and become significant when all projects are considered.

¹³⁷ MDO, Aggregate Source Information System Map, 2023, https://www.dot.state.mn.us/materials/asis_GE.html (accessed March 6, 2025)

Chapter 4 Project Impacts and Mitigation

4.11.1 Analysis Background

The ROI for cumulative potential effects varies across elements and is consistent with the ROI identified in Potential Impacts and Mitigation throughout this document. Cumulative potential effects—where they coincide—increase or decrease the breadth of the impact to the resources and elements studied in Potential Impacts and Mitigation. This may or may not change the impact intensity level assigned to the resource or element.

Cumulative potential effects are impacts to the environment that results from “the incremental effects of a project in addition to other projects in the environmentally relevant area that might reasonably be expected to affect the same environmental resources, including future projects actually planned or for which a basis of expectation has been laid, regardless of what person undertakes the other projects or what jurisdictions have authority over the projects.”¹³⁸

The “environmentally relevant area” includes locations where the potential effects of the project coincide with the potential effects of other projects to impact the elements studied in this EA. Generally, this area includes the ROI for the different resource elements.

EIP staff explored publicly available planning resources for Chisago County, MnDOT, and the Environmental Quality Board to identify foreseeable projects. No reasonably foreseeable projects in the vicinity of the North Star Storage project were identified.

Where cumulative effects are anticipated, a written description is provided. Where cumulative potential effects are not anticipated no further analysis is provided. For the purposes of this EA, actions that have occurred in the past and their associated impacts are considered part of the existing environmental and were analyzed in this section.

4.11.2 Human Settlement

Cumulative potential effects on human settlements are anticipated to be minimal, since the project is adjacent to an existing solar facility and alters land use only in the LCA.

4.11.3 Public Health and Safety

Cumulative potential effects on public health and safety are anticipated to be minimal to moderate. Impacts on public health and safety as a result of the project are anticipated to be moderate to significant (**Section 4.4.2**). The addition of battery storage facilities introduces potential public safety hazards from thermal runaway events. Response to thermal runaway events and fires at BESS facilities requires specialized training. Employing best practices in facility design and operation, including identifying hazards and developing training for emergency responders can mitigate potential impacts.

¹³⁸ Minn. R. 4410.0200, subp. 11a

Chapter 4 Project Impacts and Mitigation

4.11.4 Land-based Economies

Cumulative potential effects on land-based economies are anticipated to be minimal. Additional energy infrastructure will result in conversion of agricultural land from production to power generation and storage, but the loss of agricultural land is anticipated to be minimal overall.

4.11.5 Archaeological and Historical Resources

Because no archaeological resources are identified, cumulative potential effects are expected to be minimal.

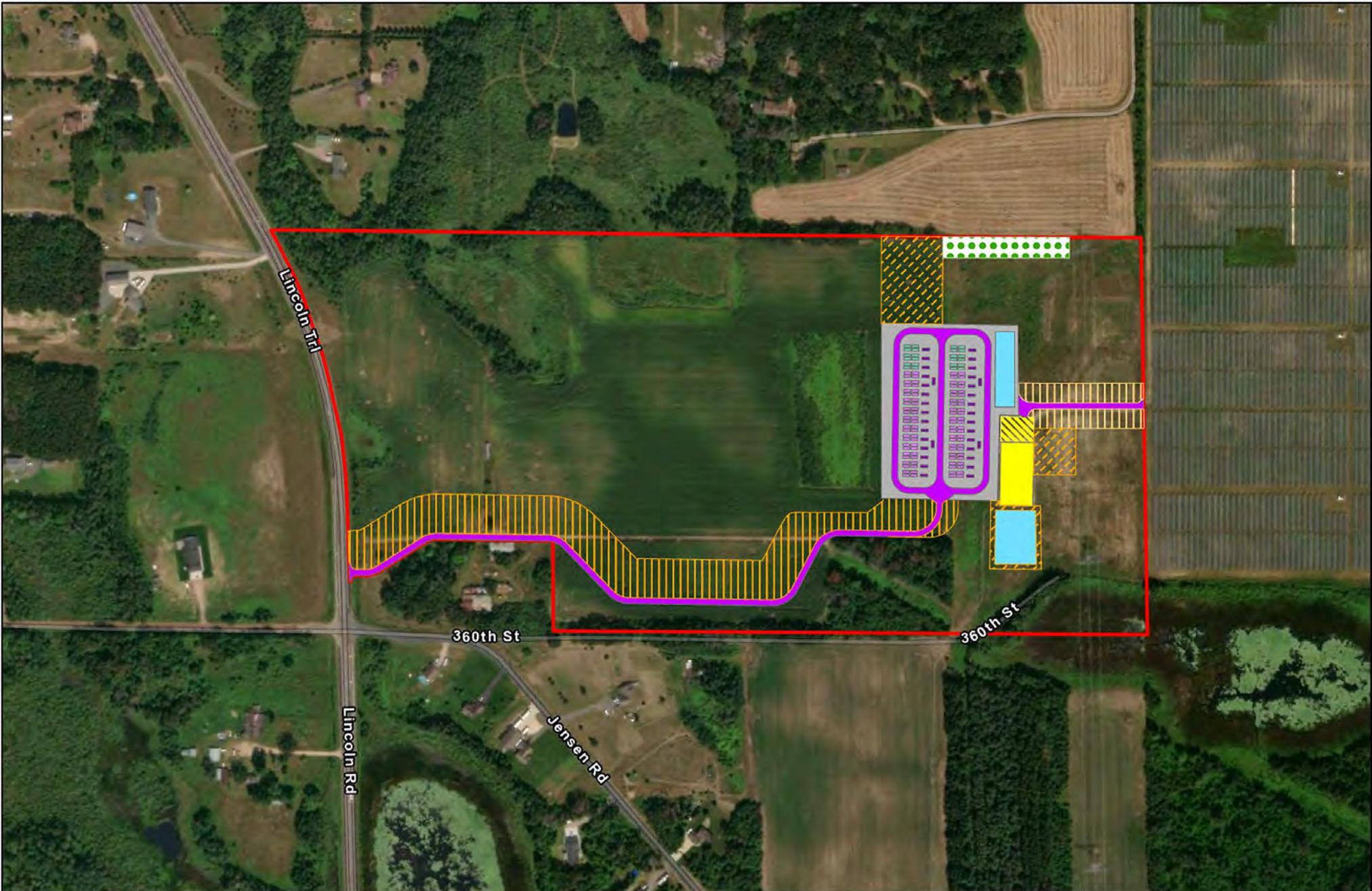
4.11.6 Natural Resources

Cumulative potential effects on the natural environment are anticipated to be minimal to moderate. Most of the foreseeable projects are in cultivated agricultural areas or along roadways resulting in minimal loss of high-quality habitat. Wildlife might be inadvertently harmed or killed during construction. The overall impact intensity level is expected to remain minimal.

4.11.7 Rare and Unique Resources

Cumulative potential effects on rare and unique natural resources are expected to be minimal since there are relatively few rare and unique species in the project area, and there are no direct impacts to high quality habitat

Appendix A: Maps



- | | | |
|---------------------------------------|------------------------------|----------------------|
| Project Substation Expansion | Future Augmented BESS Units | Temporary Workspaces |
| Existing Project Substation Footprint | East Access Road (Temporary) | Vegetative Screening |
| Permanent Access Roads | West Access Road (Temporary) | Land Control Area |
| BESS Containers | Gravel Pad | |
| Inverters | Stormwater Basins | |

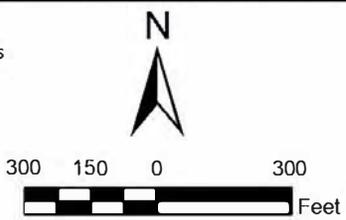
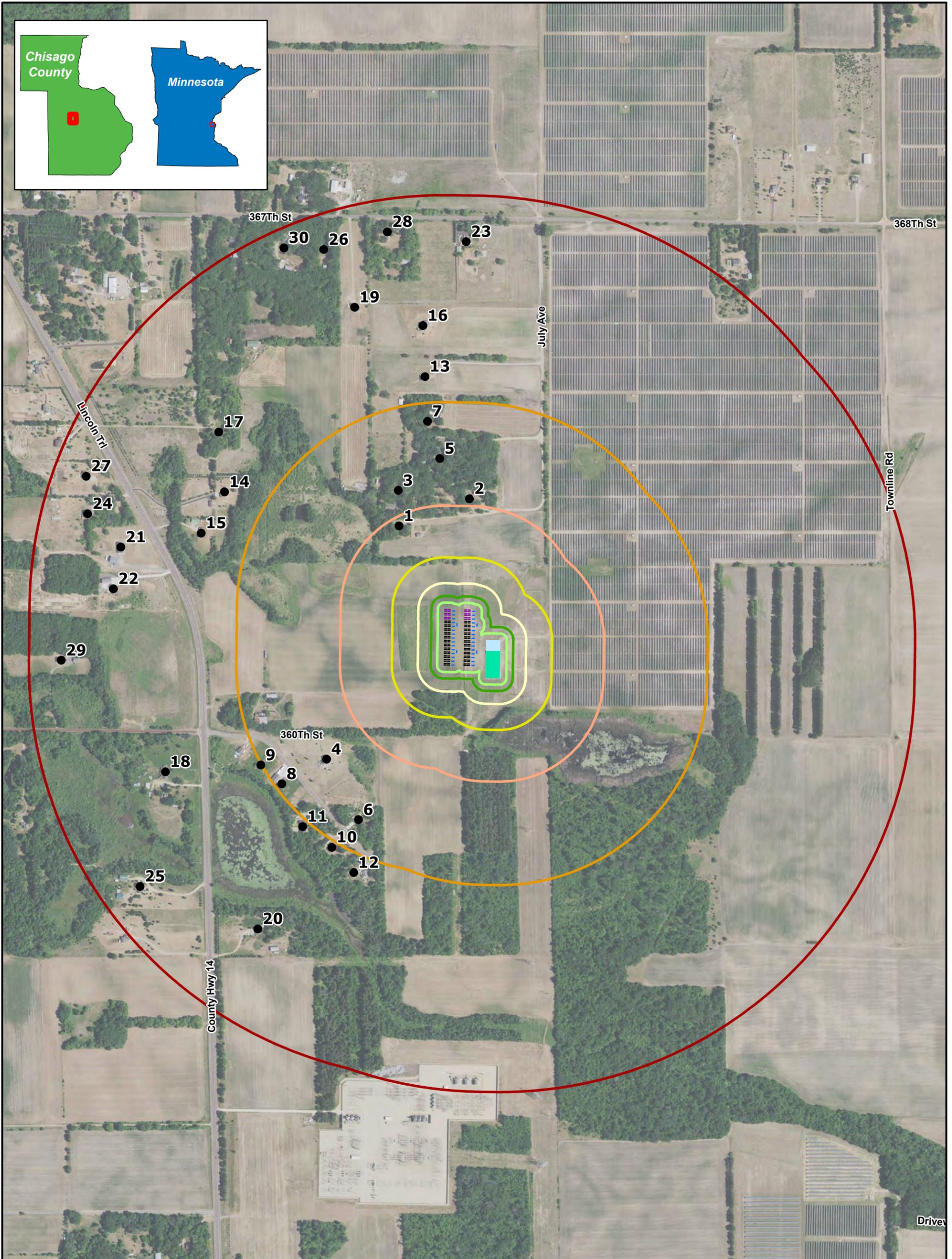


Figure 1: Project Design
North Star BESS Project
Chisago County, Minnesota

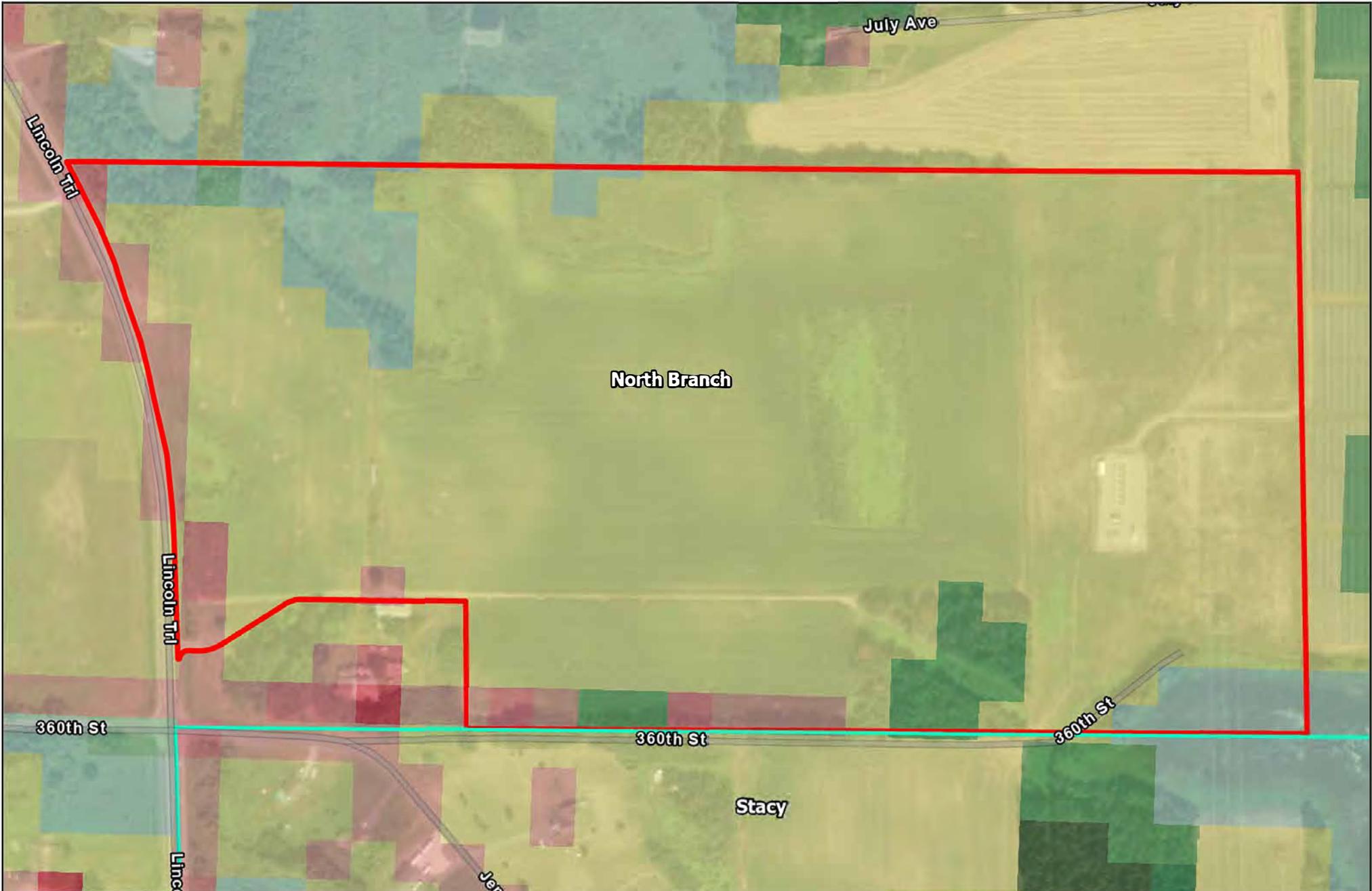


0 350 700 Feet

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Figure 2
Noise Sensitive Areas
North Star BESS Project
Chisago County, MN

- | | |
|---------------------------------------|-------------------|
| ● Residence | Noise Buffer (Ft) |
| ■ BESS Container | 50 |
| ■ BESS Container - | 100 |
| ■ Future Augmentation Unit | 200 |
| ■ Existing Substation | 400 |
| ■ Inverter | 800 |
| ■ Solar Facility Substation Expansion | 1600 |
| | 3200 |



- | | |
|------------------------------|------------------------------|
| City and Township Boundaries | Evergreen Forest |
| Land Control Area | Mixed Forest |
| Developed Open Space | Pasture/Hay |
| Developed Low Intensity | Cultivated Crops |
| Developed Medium Intensity | Woody Wetlands |
| Deciduous Forest | Emergent Herbaceous Wetlands |

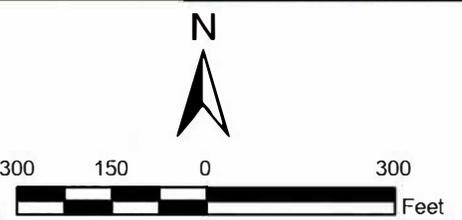
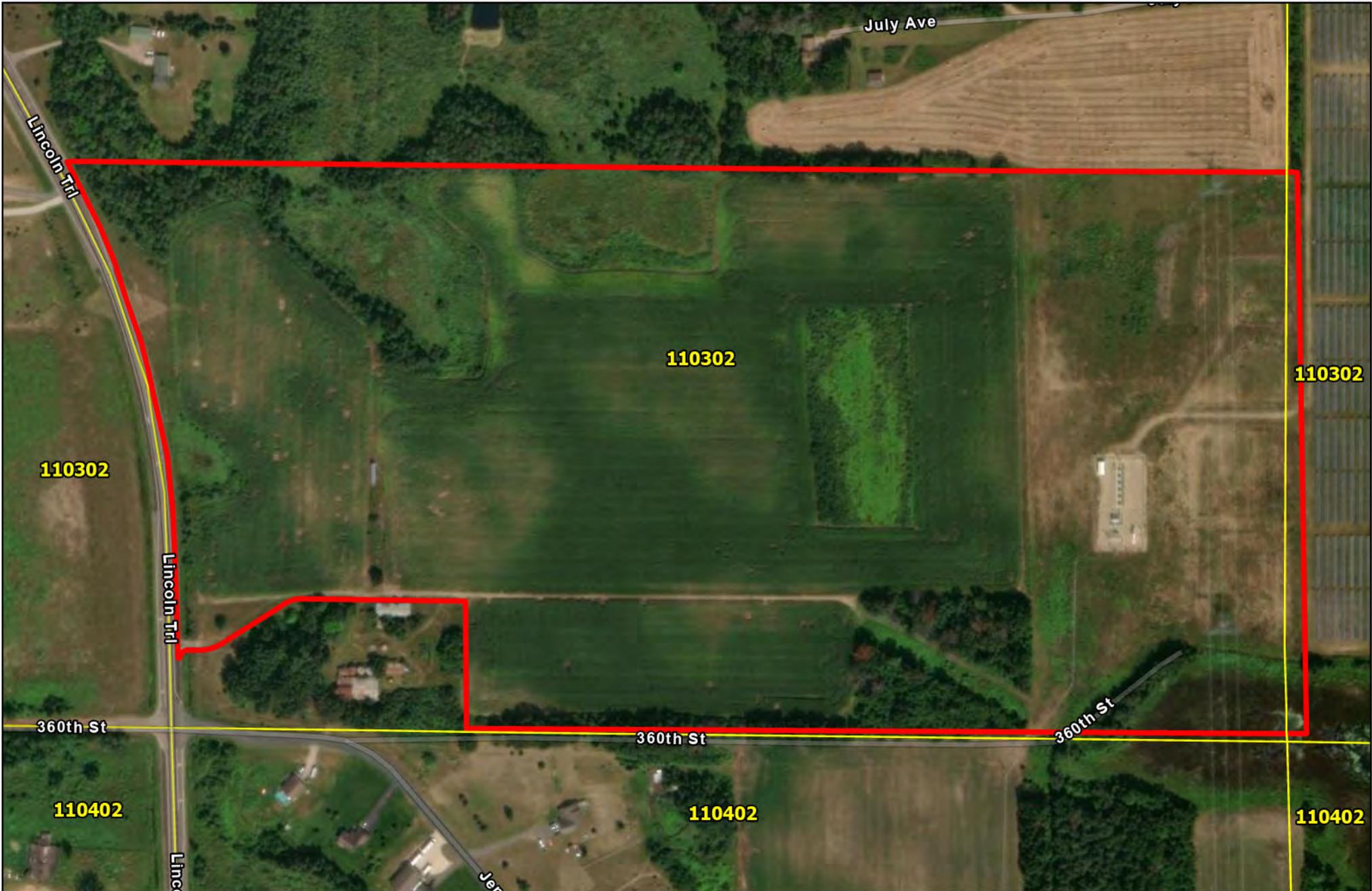


Figure 3: Land Cover
North Star BESS Project
Chisago County, Minnesota



- Census Tracts
- Land Control Area

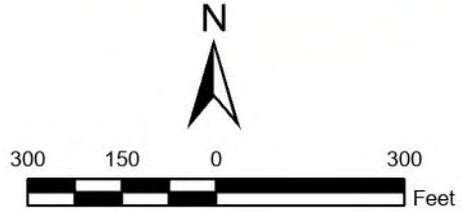
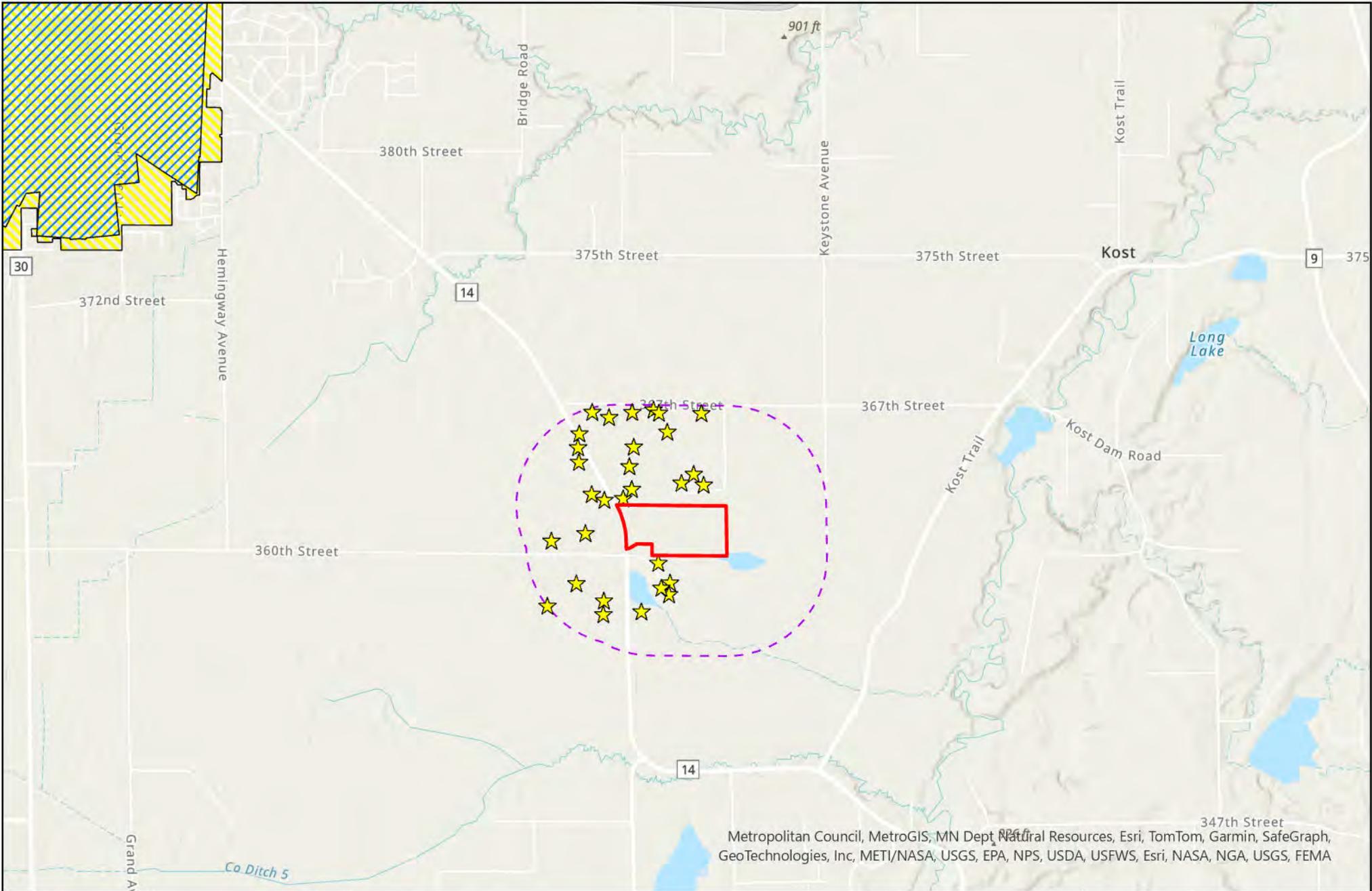


Figure 4: USA Census Tracts
North Star BESS Project
Chisago County, Minnesota



Metropolitan Council, MetroGIS, MN Dept Natural Resources, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, USDA, USFWS, Esri, NASA, NGA, USGS, FEMA



- Land Control Area
- ★ Active Wells
- MDH Wellhead Protection Areas
- MDH Drinking Water Supply Management Areas
- 0.5-mile buffer around LCA

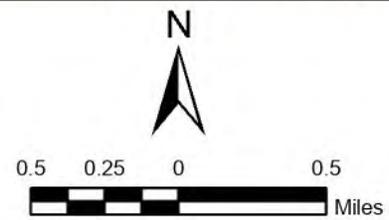
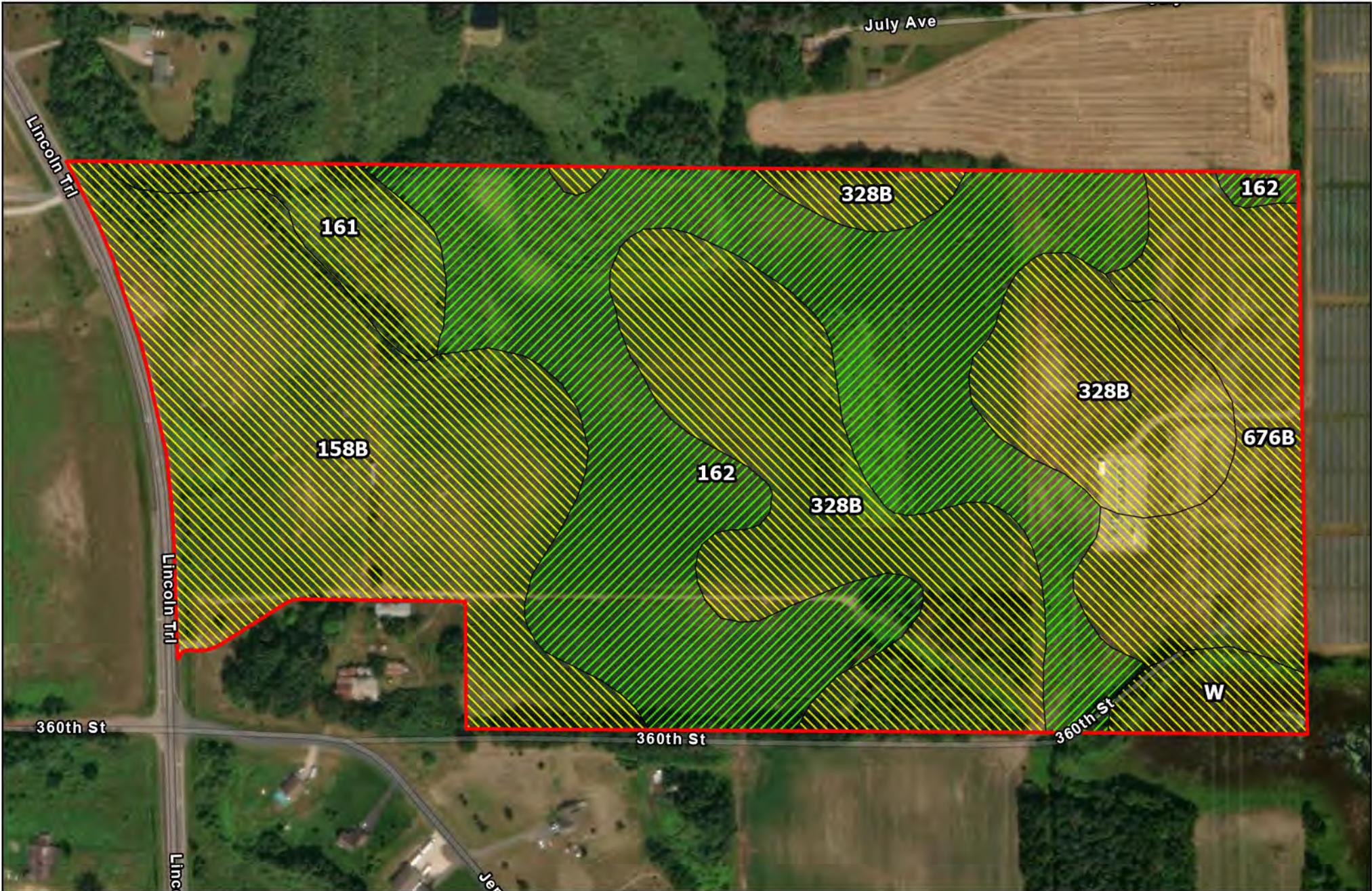


Figure 5: Groundwater Resources
 North Star BESS Project
 Chisago County, Minnesota



- Land Control Area
- Farmland of statewide importance
- Not prime farmland

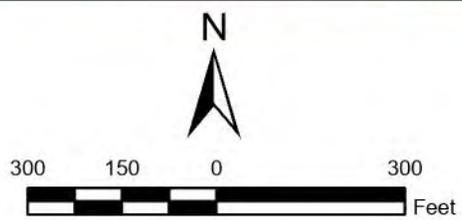
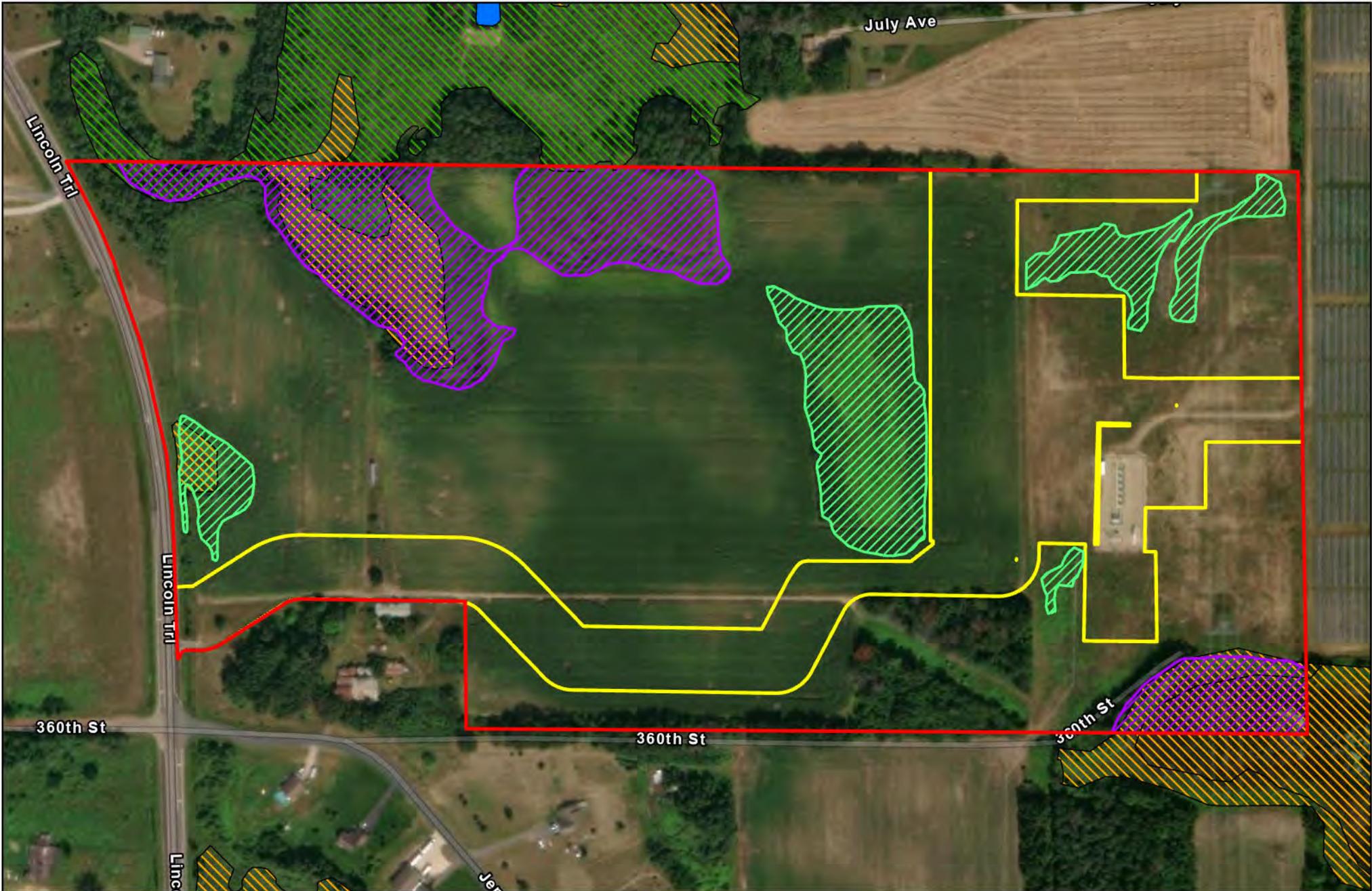


Figure 6: SSURGO Soil Map Units
 North Star BESS Project
 Chisago County, Minnesota



- Land Control Area
- Preliminary Development Area
- Likely Jurisdictional Delineated Wetlands
- Likely Non-jurisdictional Delineated Wetlands
- NWI Emergent Wetland
- NWI Forested or Shrub / Scrub Wetland
- NWI Ponds and Lakes

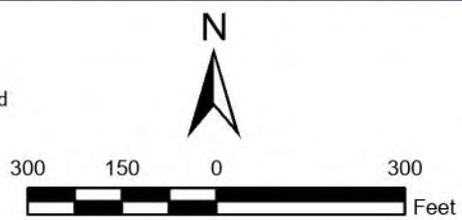
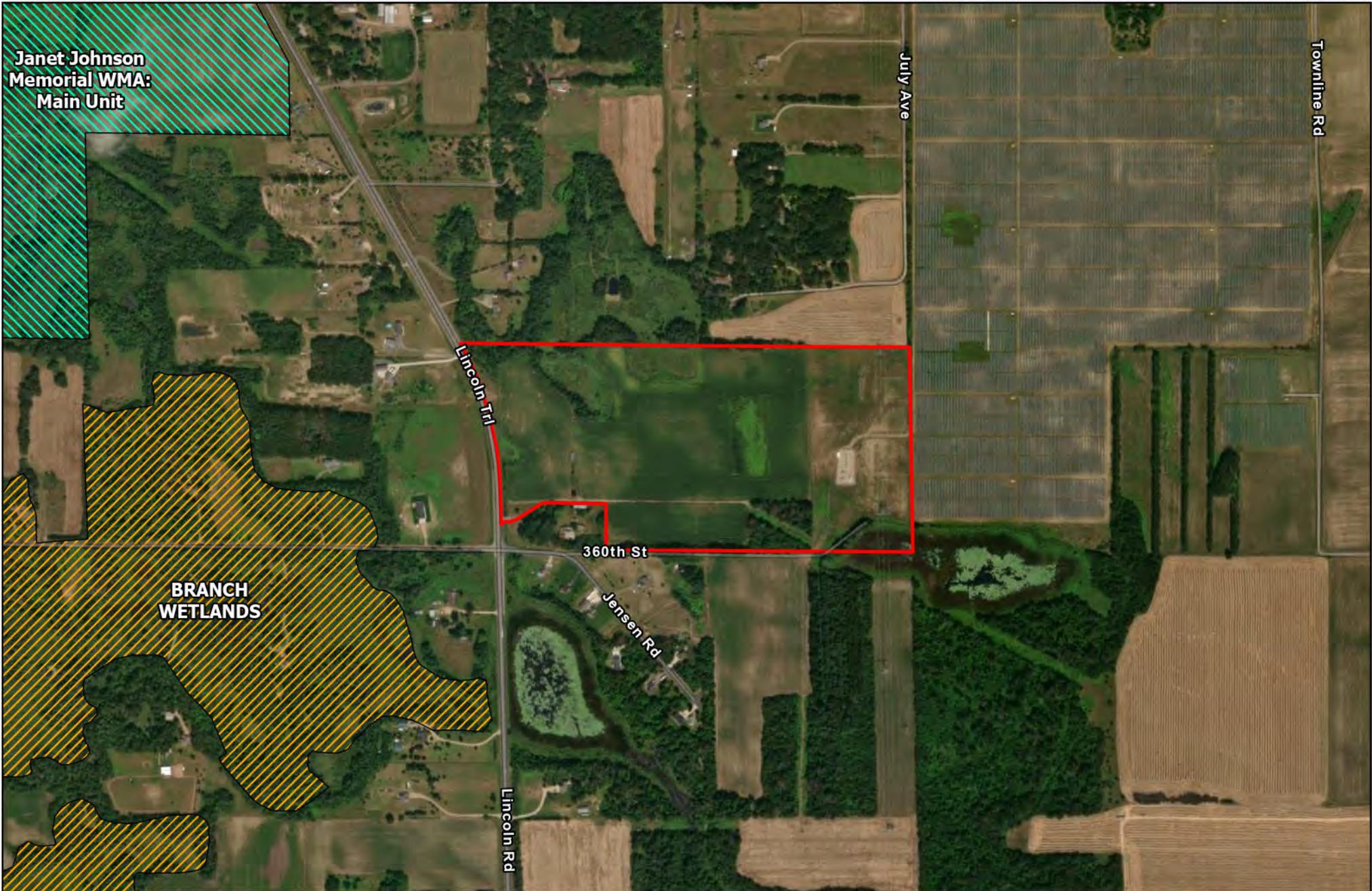


Figure 7: Surface Water Resources
 North Star BESS Project
 Chisago County, Minnesota

mi MINNESOTA
 PUBLIC UTILITIES COMMISSION



Janet Johnson
Memorial WMA:
Main Unit

BRANCH
WETLANDS

-  Land Control Area
-  MBS Sites of Biodiversity Significance
-  DNR Wildlife Management Areas

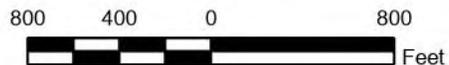


Figure 8: Wildlife Resources
North Star BESS Project
Chisago County, Minnesota



Appendix B: Scoping Decision

**In the Matter of the Application of North Star
Energy Storage, LLC for an up to 100 MW
Battery Energy Storage System Site Permit for the
North Star Storage Project in Chisago
County, Minnesota**

**AMENDED ENVIRONMENTAL ASSESSMENT
SCOPING DECISION**

DOCKET NO. IP-7155/ESS-25-123

The above matter has come before the Executive Secretary of the Minnesota Public Utilities Commission (Commission) for a decision on the scope of the environmental assessment (EA) to be prepared for North Star Energy Storage, LLC's proposed 100 megawatt (MW) battery energy storage system (BESS) to be located Chisago County, Minnesota. The Commission is reviewing this application under [Minnesota Statute 216E \(2023\)](#).

Project Description

On February 28, 2025, North Star Energy Storage, LLC (North Star Storage) submitted a site permit application to the Minnesota Public Utilities Commission (Commission) to construct and operate the North Star Battery Energy Storage System Project (project) – a BESS facility with an up to 80 MW / 320 megawatt hour (MWh) nameplate capacity.¹ On August 22, 2025, North Star Storage submitted an amendment to their site permit application.² The amendment increased the project nameplate capacity from 80 MW to 100 MW, included vegetative screening and noise mitigation measures, and relocated project access roads.

The project footprint will remain the same (Figure 1). The project will be located adjacent to the existing North Star Solar Facility in Chisago County, Minnesota. Approximately 26.6 acres of land will be needed to construct the project. Operation of the project is anticipated to require less than 10.0 acres.

Preliminary design of the project includes up to 120 BESS containers, an onsite maintenance area, and two stormwater basins. Underground electric and communication lines will connect the BESS units to the existing North Star Solar Farm substation. Security fencing will encompass all BESS components and warning signs will be installed on the security fencing. 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.

The project will be sited adjacent to the existing North Star Solar Facility substation and the existing infrastructure that connects the North Star Solar Facility to the Chisago County Substation. The Chisago County Substation, which is owned and operated by Xcel Energy, is the point of interconnection (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. No new gen-tie line is required for the project.

¹ North Star Storage, Site Permit Application to the Minnesota Public Utilities Commission, February 28, 2025, [eDockets](#) Nos. [20252-215915-01](#) (through -10).

² North Star Storage, Site Permit Application Amendment, August 22, 2025, eDocets No. [20258-222299-01](#)

North Star Storage is currently negotiating the project's offtake agreement with Xcel Energy. The agreement will be a long-term contract for the project to provide energy storage capacity to Xcel Energy's service territory.

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.

Project Purpose

North Star Storage indicates that project will provide emission-free energy resources to the electric grid. The project will store excess energy from the grid that may have otherwise been curtailed, and inject up to 100 MW back into the grid during times of increased demand or brief power outages. 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.

Regulatory Background

Energy Storage System Site Permit

In Minnesota, no person may construct an energy storage system (ESS), defined as a facility capable of operating at a capacity of 10 MW or more³ without a site permit from the Commission.⁴ North Star Storage's proposed project will have a nominal power rating of up to 100 MW and therefore requires a site permit from the Commission. As an ESS facility, the site permit application qualifies for Commission review under the alternative permitting process described in Minnesota Statute 216E.04.⁵

Certificate of Need

As North Star Storage is an independent power producer, a certificate of need (CN) is not required for the project. The project is exempt under Minnesota Statute 216B.243, subd. 8(a)(8), which provides that a CN is not required for a "solar energy generating system, as defined in section 216E.01, subdivision 9a, for which a site permit application is submitted by an independent power producer under chapter 216E."⁶

Environmental Review

Commission Energy Infrastructure Permitting (EIP) staff will prepare an EA for the project. An EA contains an overview of the resources affected by the project. It also discusses potential human and environmental impacts and possible mitigation measures⁷. Under the alternative permitting process, an EA is the only required state environmental review document.

³ Minnesota Statute 216E.01, subd. 3°, Edition Year 2023.

⁴ Minnesota Statute 216E.03, subd. 1, Edition Year 2023.

⁵ Minnesota Statute 216E.04, subd. 2, Edition Year 2023 (noting those projects that are eligible to proceed under an alternative permitting process).

⁶ Minnesota Statute 216B.243, Subd. 8(a)(8), Edition Year 2023

⁷ Minnesota Statute 216E.04, subd. 5, Edition Year 2023; Minn. Rule 7850.3700, subp. 4, Published 2024.

Scoping Process

Scoping is the first step in the environmental review process. The scoping process has two primary purposes: (1) to gather public input as to the impacts and mitigation measures to study in the EA and (2) to focus the EA on those impacts and mitigation measures that will aid in the Commission's decision on the site permit application.

Staff use the information gathered during scoping to inform the content of the EA. EIP staff gathered input on the scope of the EA through public meetings and an associated comment period. This scoping decision identifies the impacts and mitigation measures that will be analyzed in the EA.

Public Information and Scoping Meetings

On May 29, 2025, Commission staff held a remote-access public meeting. No individuals from the public attended this meeting, and there were no comments.⁸ On May 28, 2025, Commission staff held an in-person public meeting in Stacy, Minnesota. Approximately 12 people attended this meeting. Several attendees noted their support for the project, renewable energy resources, and North Star Storage's dedication to using local union labor. Other attendees, including local residents and homeowners, had questions and concerns related to the project. These attendees raised concerns predominantly related to wildlife and its habitat, fire safety, and noise pollution. Attendees also discussed a potential alternative location for a project access road.

Written Public Comments

A comment period ending on June 13, 2025, provided the public with an opportunity to provide input on the scope of the EA. Written comments were received from two members of the general public and the Minnesota Department of Natural Resources.⁹

General Public

Two members of the general public provided written comments related to the project. Nathan Runke, on behalf of the IUOE Local 49 and NCSRC of Carpenters, expressed his support for the project and advocated for the use of local union labor to the greatest extent feasible. Dennis Anderson, the owner of the western parcel leased by North Star Storage for the project, included surveys of his parcel from 2023, and expressed his support for the project, stating that North Star Storage has worked with him to address his initial concerns with the project.

⁸ North Star Storage Project, Oral Comments on the Scope of Environmental Assessment, June 2025, eDockets No. [20256-219969-01](#).

⁹ North Star Storage Project, Written Comments on the Scope of Environmental Assessment, June 2025, eDockets No. [20256-219970-01](#).

Minnesota Department of Natural Resources (DNR)

The Minnesota Department of Natural Resources (DNR) provided written comments related to several project components and also provided a copy of its National Heritage Review letter.¹⁰ Comments included:

- Recommending the Applicant adhere to the DNR-recommended security fence height of ten feet rather than the six foot height proposed in the application. The DNR also recommended that the Applicant not use barbed wire in their fencing.
- Recommending that the EA discuss project fencing plans, dust control products, lighting, erosion control, and mitigating impacts on wildlife (specifically Blanding’s turtles) consistent with DNR guidance.¹¹
- Requesting the EA discuss the construction and vegetation reestablishment phases in order to minimize stormwater runoff, stabilize soil, and support habitat for the solar and BESS facilities, recommending the utilization of a Vegetation Management Plan (VMP), that is consistent with with the DNR’s *Prairie Establishment and Maintenance Technical Guidance for Solar Projects*.¹²

HAVING REVIEWED THE MATTER, consulted with EIP staff, and in accordance with Minnesota Rule 7850.3700, I hereby make the following scoping decision:

MATTERS TO BE ADDRESSED

The EA will describe the project and the human and environmental resources of the project area. It will provide information on the potential impacts of the project as they relate to the topics outlined in this scoping decision and possible mitigation measures. It will identify impacts that cannot be avoided and irretrievable commitments of resources, as well as permits from other government entities that may be required for the project. The EA will discuss the relative merits of the proposed project site with respect to the siting factors in Minnesota Rule 7850.4100.

The issues outlined below will be analyzed in the EA for the project. This outline is not intended to serve as a table of contents for the document itself.

I. GENERAL DESCRIPTION OF THE PROJECT

- A. Project Description
- B. Project Purpose
- C. Project Costs

II. REGULATORY FRAMEWORK

¹⁰ Comments from the Minnesota Department of Natural Resources, eDockets Nos. [20256-219887-01](#) and [20256-219887-02](#)

¹¹ Minnesota DNR, Commercial Solar Siting Guidance, February 2023. Retrieved from: https://files.dnr.state.mn.us/publications/ewr/commercial_solar_siting_guidance.pdf.

¹² Minnesota DNR, Prairie Establishment and Maintenance Technical Guidance for Solar Projects, February, 2025. Retrieved from: https://files.dnr.state.mn.us/publications/ewr/prairie_solar_tech_guidance.pdf.

- A. Site Permit
- B. Environmental Review
- C. Grid Interconnection
- D. Other Permits and Approvals

III. ENGINEERING, DESIGN, AND CONSTRUCTION

- A. BESS Modules
- B. Electrical Collection Systems
- C. Substation
- D. Associated Facilities

IV. OPERATION AND DECOMMISSIONING

- A. Maintenance
- B. Vegetation Management
- C. Augmentation, Repowering and Decommissioning

V. AFFECTED ENVIRONMENT, POTENTIAL IMPACTS AND MITIGATIVE MEASURES

The EA will include a discussion of the human and environmental resources potentially impacted by the project. Potential impacts of the project will be described and characterized. Based on the impacts identified, the EA will describe mitigation measures that could reasonably be implemented to reduce or eliminate the identified impacts. The EA will describe any unavoidable impacts resulting from implementation of the project.

Data and analyses will be commensurate with the level of impact for a given resource and the relevance of the information to consider mitigation measures. EIP staff will consider the relationship between the cost of data and analyses and the relevance and importance of the information in determining the level of detail of information to be prepared for the EA. Less important material may be summarized, consolidated, or simply referenced.

If relevant information cannot be obtained within timelines prescribed by statute and rule, the costs of obtaining such information is excessive, or the means to obtain it is unknown, EIP staff will include in the EA a statement that such information is incomplete or unavailable and the relevance of the information in evaluating potential impacts or alternatives.

- A. Environmental Setting
- B. Human Settlements
 - 1. Noise
 - 2. Aesthetics (visual screening)
 - 3. Displacement
 - 4. Property Values
 - 5. Zoning and Land Use Compatibility (setbacks, land use change)
 - 6. Cultural Values
 - 7. Transportation and Public Services (access roads)
- C. Socioeconomics
 - 1. Environmental Justice
 - 2. Local Economies (employment, wages)
- D. Public Health and Safety

1. Electric and Magnetic Fields
2. Emergency Services
- E. Land-Based Economies
 1. Agriculture (land impacts)
 2. Forestry
 3. Mining
 4. Recreation and Tourism (aesthetic changes)
- F. Archaeological and Historic Resources
- G. Natural Environment
 1. Water Resources (stormwater, groundwater)
 2. Soils (erosion control)
 3. Geology
 4. Flora (vegetation removal and management, weed control, native plant communities)
 5. Fauna (wildlife corridors, erosion control, fencing, and lighting)
 6. Air Quality (fugitive dust)
 7. Climate Change / Climate Resiliency
- H. Threatened / Endangered / Rare and Unique Natural Resources (protected species, DNR-managed lands)
- I. Cumulative Impacts
- J. Adverse Impacts that Cannot be Avoided
- K. Irreversible and Irrecoverable Commitments of Resources

ISSUES OUTSIDE THE SCOPE OF THE EA

The EA will not address following topics:

- Any site other than the site proposed by the applicant in its application.
- The manner in which landowners are compensated for the project.

SCHEDULE

The EA is anticipated to be completed and available in October of 2025. Upon completion, it will be noticed and made available for review. Public hearings will be noticed and held in the project area after issuance of the EA. Comments on the EA may be submitted into the hearing record.

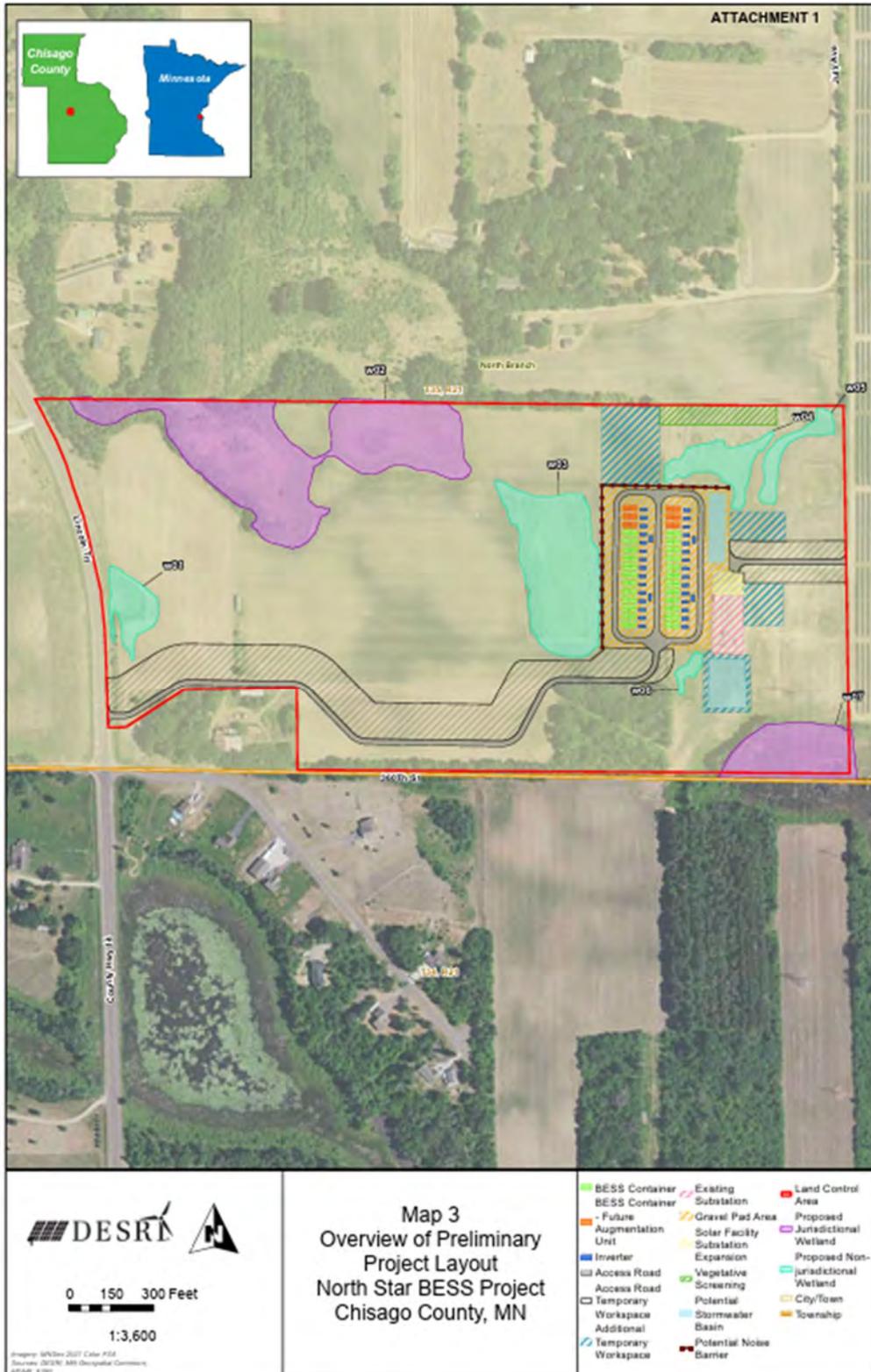
Signed this 28th day of August, 2025

STATE OF MINNESOTA
MINNESOTA PUBLIC UTILITIES COMMISSION



Mike Bull, Acting Executive Secretary

Figure 1. North Star Storage Project Overview Map



Appendix C: Draft Site Permit

STATE OF MINNESOTA PUBLIC UTILITIES COMMISSION

**SITE PERMIT FOR
NORTH STAR STORAGE PROJECT**

AN ENERGY STORAGE SYSTEM

**IN
CHISAGO COUNTY**

**ISSUED TO
NORTH STAR ENERGY STORAGE, LLC**

PUC DOCKET NO. IP-7138/ESS-24-279

In accordance with the requirements of Minnesota Statutes Chapter 216I and Minnesota Rules Chapter 7850 this site permit is hereby issued to:

NORTH STAR ENERGY STORAGE, LLC

North Star Storage, LLC is authorized by this site permit to construct and operate the North Star Battery Energy Storage System Project, a battery energy storage system (BESS) with a nominal power rating of up to 100 MW alternating current (AC) with approximately 400 megawatt-hours (MWh) of energy capacity on a site of approximately 78 acres in the City of North Branch in Chisago County.

The energy storage system shall be constructed and operated within the site identified in this site permit and in compliance with the conditions specified in this site permit.

This site permit shall expire 30 years from the date of this approval.

Approved and adopted this ____ day of [Month, Year]

BY ORDER OF THE COMMISSION

Sasha Bergman,
Executive Secretary

To request this document in another format such as large print or audio, call 651-296-0406 or 800-657-3782 (voice). Persons with a hearing or speech impairment may call using their preferred Telecommunications Relay Service or email consumer.puc@state.mn.us for assistance.

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ATTACHMENTS

Attachment 1 – Complaint Handling Procedures for Permitted Energy Facilities

Attachment 2 – Compliance Filing Procedures for Permitted Energy Facilities

Attachment 3 – Site Permit Maps

1 SITE PERMIT

The Minnesota Public Utilities Commission (Commission) hereby issues this site permit to North Star Battery Storage, LLC (Permittee) pursuant to Minnesota Statutes Chapter 216I and Minnesota Rules Chapter 7850. This site permit authorizes the Permittee to construct and operate an up to 100 megawatt energy storage system located in Chisago County, Minnesota ([North Star Energy Storage Project], henceforth known as Project). The energy storage system shall be constructed and operated within the site identified in this site permit and in compliance with the conditions specified in this site permit.

1.1 Pre-emption

Pursuant to Minn. Stat. § 216I.18, this site permit shall be the sole site approval required for the location, construction, and operation of the energy storage system and this site permit shall supersede and preempt all zoning, building, or land use rules, regulations, or ordinances promulgated by regional, county, local and special purpose governments.

2 PROJECT DESCRIPTION

The North Star Energy Storage Project is a battery energy storage system (BESS) with a nominal power rating of up to 100 MW alternating current (AC) with approximately 400 megawatt-hours (MWh) of energy capacity on a site of approximately 78 acres in North Branch in Chisago County. In addition to batteries, racking, and enclosures, the facility will also include inverters and transformers, electrical feeder lines, expanding an existing substation, stormwater drainage basins, storage and parking areas, and fencing surrounding the perimeter of the facility. The facility will be connected to the electric grid through an existing connection between the project substation and the adjacent Chisago County Substation.

The Project is located in the following:

County	City Name	Township	Range	Section
Chisago	North Branch	107N	15W	35

2.1 Project Ownership

At least 14 days prior to the pre-construction meeting, the Permittee shall file a description of its ownership structure, identifying, as applicable:

- (a) the owner(s) of the financial and governance interests of the Permittee;

- (b) the owner(s) of the majority financial and governance interests of the Permittee's owners; and
- (c) the Permittee's ultimate parent entity (meaning the entity which is not controlled by any other entity).

The Permittee shall notify the Commission of:

- (a) a change in the owner(s) of the majority* financial or governance interests in the Permittee; or
- (b) a change in the owner(s) of the majority* financial or governance interests of the Permittee's owners; or
- (c) a sale which changes the ultimate parent entity of the Permittee

*When there are only co-equal 50/50 percent interests, any change shall be considered a change in majority interest.

In the event of an ownership change, the new Permittee must provide the Commission with a certification that it has read, understands, and is able to comply with the conditions of this permit.

3 DESIGNATED SITE

The site designated by the Commission for the Project is depicted on the site maps attached to this site permit (Designated Site). The site maps show the approximate location of the energy storage system including future augmentation units, and associated facilities within the Designated Site and identify a layout that seeks to minimize the overall potential human and environmental impacts of the Project, as they were evaluated in the permitting process.

The Designated Site serves to provide the Permittee with the flexibility to augment the Project in the future to maintain Project capacity and make minor adjustments to the layout to accommodate requests by landowners, local government units, federal and state agency requirements, and unforeseen conditions encountered during the detailed engineering and design process. The Permittee shall provide notice to the Commission pursuant to Section 5.10 prior to commencing augmentation activities. Any modification to the location of energy storage systems or associated facility shall be done in such a manner as to have human and environmental impacts that are comparable to those associated with the layouts on the maps attached to this site permit. The Permittee shall identify any modifications in the Site Plan pursuant to Section 8.3.

4 GENERAL CONDITIONS

The Permittee shall comply with the following conditions during construction and operation of the energy storage system over the life of this site permit.

4.1 Site Permit Distribution

Within 30 days of issuance of this site permit, the Permittee shall provide all affected landowners with a copy of this site permit and the complaint procedures. An affected landowner is any landowner or designee that is within or adjacent to the permitted site. In no case shall a landowner receive this site permit and complaint procedures less than five days prior to the start of construction on their property. The Permittee shall also provide a copy of this site permit and the complaint procedures to the applicable regional development commissions, county environmental offices, and city and township clerks. The Permittee shall file with the Commission an affidavit of its site permit and complaint procedures distribution within 30 days of issuance of this site permit.

4.2 Access to Property

The Permittee shall notify landowners prior to entering or conducting maintenance within their property, unless otherwise negotiated with the landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3 Construction and Operation Practices

The Permittee shall comply with the construction practices, operation and maintenance practices, and material specifications described in the permitting record for this Project unless this site permit establishes a different requirement in which case this site permit shall prevail.

4.3.1 Field Representative

The Permittee shall designate a field representative responsible for overseeing compliance with the conditions of this site permit during construction of the Project. This person shall be accessible by telephone or other means during normal business hours throughout site preparation, construction, cleanup, and restoration.

The Permittee shall file with the Commission the name, address, email, phone number, and emergency phone number of the field representative at least 14 days prior to the pre-construction meeting. The Permittee shall provide the field representative's contact information to affected landowners, local government units and other interested persons at least 14 days prior to the pre-construction meeting. The Permittee may change the field representative at any time upon notice to the Commission, affected landowners, local government units and other interested persons. The Permittee shall file with the Commission

an affidavit of distribution of its field representative's contact information at least 14 days prior to the pre-construction meeting and upon changes to the field representative.

4.3.2 Site Manager

The Permittee shall designate a site manager responsible for overseeing compliance with the conditions of this site permit during the commercial operation and decommissioning phases of the Project. This person shall be accessible by telephone or other means during normal business hours for the life of this site permit.

The Permittee shall file the name, address, email, phone number, and emergency phone number of the site manager with the Commission within 14 days prior to the pre-operation meeting. The Permittee shall provide the site manager's contact information to landowners within or adjacent to the Project Boundary, local government units and other interested persons at least 14 days prior to the pre-operation meeting. The Permittee may change the site manager at any time upon notice to the Commission, landowners within or adjacent to the Project Boundary, local government units, and other interested persons. The Permittee shall file with the Commission an affidavit of distribution of its site manager's contact information at least 14 days prior to the pre-operation meeting and upon changes to the site manager.

4.3.3 Employee Training - Site Permit Terms and Conditions

The Permittee shall train and educate all employees, contractors, and other persons involved in the construction and ongoing operation of the energy storage system of the terms and conditions of this site permit. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.4 Independent Third-Party Monitoring

Prior to any construction, the Permittee shall propose a scope of work and identify an independent third-party monitor to conduct Project construction monitoring on behalf of the Commission. The scope of work shall be developed in consultation with and approved by Commission staff. This third-party monitor will report directly to and will be under the control of the Commission with costs borne by the Permittee. Commission staff shall keep records of compliance with this section and will ensure that status reports detailing the construction monitoring are filed with the Commission in accordance with the approved scope of work approved by [Commission staff](#).

4.3.5 Public Services, Public Utilities, and Existing Easements

During Project construction, the Permittee shall minimize any disruption to public services or public utilities. To the extent disruptions to public services or public utilities occur these shall be temporary, and the Permittee shall restore service promptly. Where any impacts to utilities have the potential to occur the Permittee shall work with both landowners and local entities to determine the most appropriate mitigation measures if not already considered as part of this site permit.

The Permittee shall cooperate with county and city road authorities to develop appropriate signage and traffic management during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.6 Temporary Workspace

The Permittee shall select temporary workspace and equipment staging areas that limit the removal and impacts to vegetation. The Permittee shall not site temporary workspace in wetlands or native prairie as defined in sections 4.3.13 and 4.3.14. The Permittee shall site temporary workspace to comply with standards for development of the shorelands of public waters as defined in Section 4.3.13. The Permittee shall obtain temporary easements outside of the authorized Project Boundary from affected landowners through rental agreements. Temporary easements are not provided for in this site permit.

4.3.7 Noise

The Permittee shall comply with noise standards established under Minn. R. 7030.0010 to 7030.0080, at all times and at all appropriate locations during operation of the Project. The Permittee shall limit construction and maintenance activities to daytime working hours to the extent practicable.

4.3.8 Aesthetics

The Permittee shall consider input pertaining to visual impacts from landowners and the local unit of government having direct zoning authority over the area in which the Project is located. The Permittee shall use care to preserve the natural landscape, minimize tree removal and prevent any unnecessary destruction of the natural surroundings in the vicinity of the Project during construction and operation.

4.3.9 Topsoil Protection

The Permittee shall implement measures to protect and segregate topsoil from subsoil on all lands utilized for Project construction unless otherwise negotiated with affected landowner.

4.3.10 Soil Compaction

The Permittee shall implement measures to minimize soil compaction of all lands during all phases of the Project's life and shall confine compaction to as small an area as feasible. The Permittee shall use soil decompaction measures on all lands utilized for Project construction and travelled on by heavy equipment (*e.g.*, cranes and heavy trucks), even when soil compaction minimization measures are used.

4.3.11 Soil Erosion and Sediment Control

The Permittee shall implement those erosion prevention and sediment control practices recommended by the Minnesota Pollution Control Agency (MPCA) Construction Stormwater Program. If construction of the Project disturbs more than one acre of land or is sited in an area designated by the MPCA as having potential for impacts to water resources, the Permittee shall obtain a National Pollutant Discharge Elimination System/State Disposal System Construction Stormwater Permit from the MPCA that provides for the development of a Stormwater Pollution Prevention Plan that describes methods to control erosion and runoff.

The Permittee shall implement reasonable measures to minimize erosion and sedimentation during construction and shall employ perimeter sediment controls, protect exposed soil by promptly planting, seeding, using erosion control blankets and turf reinforcement mats, stabilizing slopes, protecting storm drain inlets, protecting soil stockpiles, and controlling vehicle tracking. Contours shall be graded as required so that all surfaces provide for proper drainage, blend with the natural terrain, and are left in a condition that will facilitate re-vegetation and prevent erosion. All areas disturbed during construction of the Project shall be returned to pre-construction conditions.

4.3.12 Public Lands

In no case shall the energy storage system and associated facilities including foundations, access roads, underground cable, and transformers, be located in the public lands identified in Minn. R. 7850.4400, subp. 1, or in federal waterfowl production areas. Energy storage systems and associated facilities shall not be located in the public lands identified in Minn. R. 7850.4400, subp. 3, unless there is no feasible and prudent alternative.

4.3.13 Wetlands and Water Resources

The Permittee shall not place the energy storage system or associated facilities in public waters and public waters wetlands, as shown on the public water inventory maps prescribed by Minnesota Statutes Chapter 103G, except that electric collector or feeder lines may cross or be placed in public waters or public waters wetlands subject to permits and approvals by the

Minnesota Department of Natural Resources (DNR) and the United States Army Corps of Engineers (USACE), and local units of government as implementers of the Minnesota Wetlands Conservation Act. The Permittee shall locate the energy storage system and associated facilities in compliance with the standards for development of the shorelands of public waters as identified in Minn. R. 6120.3300, and as adopted, Minn. R. 6120.2800, unless there is no feasible and prudent alternative.

The Permittee shall construct in wetland areas during frozen ground conditions, to the extent feasible, to minimize impacts. When construction during winter is not possible, wooden or composite mats shall be used to protect wetland vegetation. The Permittee shall contain and manage soil excavated from the wetlands and riparian areas in accordance with all applicable wetland permits. The Permittee shall access wetlands and riparian areas using the shortest route possible in order to minimize travel through wetland areas and prevent unnecessary impacts.

The Permittee shall restore wetland and water resource areas disturbed by construction activities to pre-construction conditions in accordance with the requirements of applicable state and federal permits or laws and landowner agreements. The Permittee shall meet the USACE, DNR, Minnesota Board of Water and Soil Resources, and local government wetland and water resource requirements.

4.3.14 Native Prairie

The Permittee shall not place the energy storage system or associated facilities in native prairie, as defined in Minn. Stat. § 84.02, subd. 5, unless addressed in a prairie protection and management plan and not located in areas enrolled in the Native Prairie Bank Program. The Permittee shall not impact native prairie during construction activities, as defined in Minn. Stat. § 216I.02, unless addressed in a prairie protection and management plan.

The Permittee shall prepare a prairie protection and management plan in consultation with the DNR if native prairie, as defined in Minn. Stat. § 84.02, subd. 5, is identified within the Project Boundary. The Permittee shall file the prairie protection and management plan with the Commission at least 30 days prior to submitting the Site Plan required by Section 8.3 of this site permit. The prairie protection and management plan shall address steps that will be taken to avoid impacts to native prairie and mitigation to unavoidable impacts to native prairie by restoration or management of other native prairie areas that are in degraded condition, by conveyance of conservation easements, or by other means agreed to by the Permittee, the DNR, and the Commission.

4.3.15 Vegetation Management

The Permittee shall disturb or clear vegetation within the Designated Site only to the extent necessary to assure the safe construction, operation, and maintenance of the Project. The Permittee shall minimize the number of trees removed within the Designated Site specifically preserving to the maximum extent practicable windbreaks, shelterbelts, and living snow fences.

4.3.16 Application of Pesticides

The Permittee shall restrict pesticide use to those pesticides and methods of application approved by the MDA, DNR, and the U.S. Environmental Protection Agency (EPA). Selective foliage or basal application shall be used when practicable. All pesticides shall be applied in a safe and cautious manner so as not to damage adjacent properties including crops, orchards, tree farms, apiaries, or gardens. The Permittee shall contact the landowner at least 14 days prior to pesticide application on their property. The Permittee may not apply any pesticide if the landowner requests that there be no application of pesticides within the landowner's property. The Permittee shall provide notice of pesticide application to landowners and beekeepers operating known apiaries within three miles of the pesticide application area at least 14 days prior to such application. The Permittee shall keep pesticide communication and application records and provide them upon the request of Commission staff.

4.3.17 Invasive Species

The Permittee shall employ best management practices to avoid the potential introduction and spread of invasive species on lands disturbed by Project construction activities. The Permittee shall develop an Invasive Species Prevention Plan and file it with the Commission at least 14 days prior to the pre-construction meeting. The Permittee shall comply with the most recently filed Invasive Species Prevention Plan.

4.3.18 Noxious Weeds

The Permittee shall take all reasonable precautions against the spread of noxious weeds during all phases of construction. When utilizing seed to establish temporary and permanent vegetative cover on exposed soil the Permittee shall select site-appropriate seed certified to be free of noxious weeds. To the extent possible, the Permittee shall use native seed mixes. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.19 Roads

The Permittee shall advise the appropriate governing bodies having jurisdiction over all state, county, city, or township roads that will be used during the construction phase of the Project. Where practical, existing roadways shall be used for all activities associated with construction

of the Project. Oversize or overweight loads associated with the Project shall not be hauled across public roads without required permits and approvals.

The Permittee shall locate all perimeter fencing and vegetative screening in a manner that does not interfere with routine road maintenance activities and allows for continued safe travel on public roads.

The Permittee shall construct the fewest number of site access roads required. Access roads shall not be constructed across streams and drainage ways without the required permits and approvals. Access roads shall be constructed in accordance with all necessary township, county or state road requirements and permits.

The Permittee shall promptly repair private roads or lanes damaged when moving equipment or when accessing construction workspace, unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.20 Archaeological and Historic Resources

The Permittee shall make every effort to avoid impacts to archaeological and historic resources when constructing the Project. In the event that a resource is encountered, the Permittee shall consult with the State Historic Preservation Office (SHPO) and the State Archaeologist. Where feasible, avoidance of the resource is required. Where not feasible, mitigation must include an effort to minimize Project impacts on the resource consistent with SHPO and State Archaeologist requirements.

Prior to construction, the Permittee shall train workers about the need to avoid cultural properties, how to identify cultural properties, and procedures to follow if undocumented cultural properties, including gravesites, are found during construction. If human remains are encountered during construction, the Permittee shall immediately halt construction and promptly notify local law enforcement and the State Archaeologist. The Permittee shall not resume construction at such location until authorized by local law enforcement or the State Archaeologist. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.21 Interference

If interference with radio or television, satellite, wireless internet, GPS-based agriculture navigation systems or other communication devices is caused by the presence or operation of the Project, the Permittee shall take whatever action is necessary to restore or provide reception equivalent to reception levels in the immediate area just prior to the construction of

the Project. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.22 Drainage Tiles

The Permittee shall avoid, promptly repair, or replace all drainage tiles broken or damaged during all phases of the Project's life unless otherwise negotiated with the affected landowner. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.23 Restoration

The Permittee shall restore the areas affected by construction of the Project to the condition that existed immediately before construction began to the greatest extent possible. The time period to complete restoration may be no longer than 12 months after the completion of construction. Restoration shall be compatible with the safe operation, maintenance, and inspection of the Project. Within 60 days after completion of all restoration activities, the Permittee shall file with the Commission a Notice of Restoration Completion.

4.3.24 Cleanup

The Permittee shall remove and properly dispose of all construction waste and scrap from the right-of-way and all premises on which construction activities were conducted upon completion of each task. The Permittee shall remove and properly dispose of all personal litter, including bottles, cans, and paper from construction activities daily.

4.3.25 Pollution and Hazardous Wastes

The Permittee shall take all appropriate precautions to protect against pollution of the environment. The Permittee shall be responsible for compliance with all laws applicable to the generation, storage, transportation, clean up and disposal of all waste generated during construction and restoration of the Project.

4.3.26 Damages

The Permittee shall fairly restore or compensate landowners for damage to crops, fences, private roads and lanes, landscaping, drain tile, or other damage sustained during construction. The Permittee shall keep records of compliance with this section and provide them upon the request of Commission staff.

4.3.27 Public Safety

The Permittee shall provide educational materials to landowners within and adjacent to the Designated Site and, upon request, to interested persons about the Project and any restrictions or dangers associated with the Project. The Permittee shall also implement any necessary safety measures such as placing warning signs and gates for traffic control or restricting public access. The Permittee shall file with the Commission an affidavit of its public safety notifications at least 14 days before the pre-construction meeting.

The Permittee shall submit the location of all underground facilities, as defined in Minn. Stat. § 216D.01, subd. 11, to Gopher State One Call following the completion of the construction of the Project.

4.3.28 Site Identification

The Permittee shall mark the energy storage system with a clearly visible identification number and/or street address.

4.4 Collector and Feeder Lines

The Permittee may use overhead or underground collector and feeder lines to carry power from an internal Project interconnection point to the energy storage system. The Permittee shall place overhead and underground collector and feeder lines that parallel public roads within the public right-of-way or on private land immediately adjacent to the road. The Permittee shall obtain approval from the landowner or government unit responsible for the affected right-of-way.

The Permittee shall locate collector and feeder lines in such a manner as to minimize interference with agricultural operations including but not limited to existing drainage patterns, drain tile, future tiling plans, and ditches. The Permittee shall place safety shields on all guy wires associated with overhead collector and feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines with the Site Plan pursuant to Section 8.3.

4.5 Other Requirements

4.5.1 Safety Codes and Design Requirements

The Permittee shall design the energy storage system and associated facilities to meet or exceed all relevant local and state codes, the National Electric Safety Code, and North American Electric Reliability Corporation requirements. This includes standards relating to clearances to ground, clearance to crossing utilities, clearance to buildings, strength of materials, clearances

over roadways, right-of-way widths, and permit requirements. The Permittee shall keep records of compliance with these standards and provide them upon the request of Commission staff.

4.5.2 Other Permits and Regulations

The Permittee shall comply with all applicable state statutes and rules. The Permittee shall obtain all required permits for the Project and comply with the conditions of those permits unless those permits conflict with or are preempted by federal or state permits and regulations.

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission an Other Permits and Regulations Submittal that contains a detailed status of all permits, authorizations, and approvals that have been applied for specific to the Project. The Other Permits and Regulations Submittal shall also include the permitting agency name; the name of the permit, authorization, or approval being sought; contact person and contact information for the permitting agency or authority; brief description of why the permit, authorization, or approval is needed; application submittal date; and the date the permit, authorization, or approval was issued or is anticipated to be issued.

The Permittee shall demonstrate that it has obtained all necessary permits, authorizations, and approvals by filing an affidavit stating as such and an updated Other Permits and Regulations Submittal prior to commencing Project construction. The Permittee shall provide a copy of any such permits, authorizations, and approvals at the request of or Commission staff.

5 SPECIAL CONDITIONS

The special conditions shall take precedence over other conditions of this permit should there be a conflict.

5.1 Lighting

Permittees must use shielded and downward facing lighting and LED lighting that minimizes blue hue at the gate locations, BESS Enclosures, and along fence lines. Downward facing lighting must be clearly visible on the plan and profile submitted for the Project.

5.2 Visual Screening Plan

The Permittee shall develop a site-specific Visual Screening Plan. The Visual Screening Plan shall be designed and managed to mitigate visual impacts to adjacent residences. The Visual Screening Plan shall at a minimum include:

- (a) objectives for screening of nearby residences; and

(b) a description of the types of trees and shrub species to be used, the location of plantings, and plans for installation, establishment, and maintenance.

The location of trees and shrubs included in the Visual Screening Plan that are located within the Permittee's site control shall be included in the Site Plan filed under Section 8.3. The Permittee is required to maintain and ensure the successful growth, health, and maintenance of the vegetation for 3 years. At least 14 days prior to the pre-construction meeting, the Permittee shall file:

- (a) the Visual Screening Plan;
- (b) documentation of coordination with landowners adjacent to the project site; and
- (c) an affidavit of its distribution of the Visual Screening Plan to landowners adjacent to the project site.

5.3 Pre-construction Noise Modeling and Impact Assessment

The Permittee shall file a noise impact assessment at least 14 days prior to the pre-construction meeting. The noise impact assessment shall summarize the results from noise propagation modeling that incorporates noise inputs from the selected equipment and the facility layout shown in the site plans required in Section 8.3 of this permit. The permittee shall file an updated noise impact assessment including any revisions to selected equipment or facility layout prior to any modifications to the facility over its operating life.

5.4 Noise Studies and Noise Mitigation

The Permittee shall file a proposed methodology for the conduct of a post-construction noise study at least 14 days prior to the pre-construction meeting. The Permittee shall develop the post-construction noise study methodology in consultation with Commission staff. The Permittee must conduct the post-construction noise study and file with the Commission the completed post-construction noise study within 18 months of commencing commercial operation.

The BESS facilities and associated facilities shall be placed and operated such that the Permittee shall, at all times, comply with noise standards established by the MPCA. Operation of the facility shall be modified, or project components shall be removed from service if necessary to comply with these noise standards.

5.5 Vegetation Management Plan

The Permittee shall amend its existing vegetation management plan (VMP) for the North Star Solar Facility, as presented in the North Star Solar Docket 15-33 (eDockets no. 20164-120014-03). This amended VMP will be developed in coordination with Commission staff and the Vegetation Management Working Group, using best management practices established by the DNR and BWSR. The Permittee shall file the amended VMP to the dockets for both North Star Solar and North Star Storage, and documentation of the coordination efforts between the Permittee and the coordinating agencies with the Commission at least 14 days prior to the pre-construction meeting. Landowner-specific vegetation requests resulting from individual consultation between the Company and a landowner need not be included in the VMP. The Permittee shall provide all landowners within the Designated Site copies of the VMP. The Permittee shall file, with the Commission, an affidavit of its distribution of the VMP to landowners at least 14 days prior to the pre-construction meeting.

The amended VMP must include the following:

- (a) management objectives addressing short term (year 0-5, seeding and establishment) and long term (year 5 through the life of the Project) goals;
- (b) a description of planned restoration and vegetation management activities, including how the site will be prepared, timing of activities, how seeding will occur (e.g., broadcast, drilling, etc.), and the types of seed mixes to be used;
- (c) a description of how the site will be monitored and evaluated to meet management goals;
- (d) a description of the management tools used to maintain vegetation (e.g., mowing, spot spraying, hand removal, fire, grazing, etc.), including the timing and frequency of maintenance activities;
- (e) identification of the third-party (e.g., consultant, contractor, site manager, etc.) contracted for restoration, monitoring, and long-term vegetation management of the site;
- (f) identification of on-site noxious weeds and invasive species (native and non-native) and the monitoring and management practices to be utilized; and
- (g) a marked-up copy of the Site Plan showing how the site will be revegetated and that identifies the corresponding seed mixes. Best management practices should be followed concerning seed mixes, seeding rates, and cover crops.

5.6 Unanticipated Discoveries Plan

Prior to construction, the Permittee shall survey areas of construction activity within undisturbed land that have not been surveyed.

The Permittee shall develop an Unanticipated Discoveries Plan (UDP) to identify guidelines to be used in the event previously unrecorded archeological or historic properties, or human remains, are encountered during construction, or if unanticipated effects to previously identified archaeological or historic properties occur during construction. This is in addition to and not in lieu of any other obligations that may exist under law or regulation relating to these matters. The UDP shall describe how previously unrecorded, non-human burial, archaeological sites found during construction shall be marked and all construction work must stop at the discovery location. The Permittee shall file the UDP with the Commission at least 14 days prior to the preconstruction meeting.

5.7 Security Fencing

The Permittee shall design the security fence surrounding the energy storage system to minimize the visual impact of the Project while maintaining compliance with the National Electric Safety Code. The Permittee shall develop a final fence plan for the specific site in coordination with the DNR. The final fence plan shall be submitted to the Commission as part of the Site Plan pursuant to Section 8.3.

5.8 Wildlife -Friendly Erosion Control

The Permittee shall use only “bio-netting” or “natural netting” types of erosion control materials and mulch products without synthetic (plastic) fiber additives.

5.9 Dust Control

The Permittee shall minimize and avoid, if possible, the use of chloride-based dust control chemicals (i.e., calcium chloride, magnesium chloride).

5.10 Blanding’s Turtle

The Permittee shall implement the following avoidance measures described in the DNR’s Natural Heritage Review letter to mitigate impacts to Blanding’s turtles;

- (a) Avoid wetland and aquatic impacts during hibernation season, between September 15 and April 15, if the area is suitable for hibernation
- (c) 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 project is complete.
- (d) Limit erosion and sediment control to wildlife friendly erosion control (see section 5.8).
- (e) Avoid hydro-mulch products that contain any materials with synthetic (plastic) fiber additives, as the fibers can re-suspend and flow into waterbodies.

(f) Check bare ground within construction areas for turtles before the use of heavy equipment or any ground disturbance.

(g) The Blanding's turtle flyer must be given to all contractors working in the area.

Report any sightings using the 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

5.11 Battery Augmentation

The Permittee shall notify the Commission of scheduled augmentation at least 30 days prior to commencing augmentation activities. In its filing, the Permittee shall describe the number and types of batteries included in the augmentation. The Permittee shall indicate the location of the augmentation on the project Site Plan. In its filing the Permittee shall demonstrate compliance with the noise impact assessment submitted to the Commission as required in Section 5.2 of this permit.

5.12 Offtake Agreement:

In the event the Permittee does not have an offtake agreement, or some other enforceable mechanism for sale of energy capacity provided by the Project at the time this site permit is issued, the Permittee shall provide notice to the Commission when it obtains a commitment for the energy capacity. This site permit does not authorize construction of the Project until the Permittee has obtained an offtake agreement, or some other enforceable mechanism for energy capacity provided by the Project. In the event the Permittee does not obtain an offtake agreement or some other enforceable mechanism for the energy capacity provided by the Project within two years of the issuance of this site permit, the Permittee must advise the Commission of the reason for not having such commitment. In such event, the Commission may determine whether this site permit should be amended or revoked. No amendment or revocation of this site permit may be undertaken except in accordance with Minn. Stat. § 216I.09 or Minn. Stat. § 216I.14.

5.13 Annual Report

The Permittee shall, by February 1st following each complete or partial year of Project operation, file a report with the Commission on the monthly availability of the facility including:

1. the installed nameplate capacity of the permitted facility;
2. the monthly and annual availability of the facility;
3. the operational status of the facility and any major outages, major repairs, incidents that required an emergency response, battery augmentation, or performance improvements occurring in the previous year; and

4. any other information reasonably requested by the Commission.

The Permittee shall file this information in a format recommended by the Commission. This information shall be considered public and must be filed electronically.

6 DELAY IN CONSTRUCTION

If the Permittee has not commenced construction or improvement of the site within four years after the date of issuance of this site permit the Permittee shall file a Failure to Construct Report and the Commission shall consider revocation or suspension of this site permit in accordance with Minn. Stat., §216I.14.

7 COMPLAINT PROCEDURES

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission the complaint procedures that will be used to receive and respond to complaints. The complaint procedures shall be in accordance with the requirements of Minn. R. 7829.1500 or Minn. R. 7829.1700, and as set forth in the complaint procedures attached to this site permit.

Upon request, the Permittee shall assist Commission staff with the disposition of unresolved or longstanding complaints. This assistance shall include, but is not limited to, the submittal of complaint correspondence and complaint resolution efforts.

8 COMPLIANCE REQUIREMENTS

Failure to timely and properly make compliance filings required by this site permit is a failure to comply with the conditions of this site permit. Compliance filings must be electronically filed with the Commission.

8.1 Pre-Construction Meeting

Prior to the start of construction, the Permittee shall participate in a pre-construction meeting with Commission staff to review pre-construction filing requirements, scheduling, and to coordinate monitoring of construction and site restoration activities. Within 14 days following the pre-construction meeting, the Permittee shall file with the Commission a summary of the topics reviewed and discussed and a list of attendees. The Permittee shall indicate in the filing the anticipated construction start date.

8.2 Pre-Operation Meeting

At least 14 days prior to commercial operation of the Project, the Permittee shall participate in a pre-operation meeting with Commission staff to coordinate field monitoring of operation activities for the Project. Within 14 days following the pre-operation meeting, the Permittee shall file a summary of the topics reviewed and discussed and a list of attendees with the Commission.

8.3 Site Plan

At least 14 days prior to the pre-construction meeting, the Permittee shall file with the Commission and provide the counties where the Project will be constructed with a Site Plan that includes specifications and drawings for site preparation and grading; specifications and locations of the energy storage system and associated facilities; and procedures for cleanup and restoration. The documentation shall include maps depicting the Designated Site, energy storage system, and associated facilities layout in relation to that approved by this site permit.

The Permittee may not commence construction until the earlier of (i) 30 days after the pre-construction meeting or (ii) or until the Commission staff has notified the Permittee in writing that it has completed its review of the documents and determined that the planned construction is consistent with this site permit.

If the Commission notifies the Permittee in writing within 30 days after the pre-construction meeting that it has completed its review of the documents and planned construction, and finds that the planned construction is not consistent with this site permit, the Permittee may submit additional and/or revised documentation and may not commence construction until the Commission has notified the Permittee in writing that it has determined that the planned construction is consistent with this site permit.

If the Permittee intends to make any significant changes in its Site Plan or the specifications and drawings after submission to the Commission, the Permittee shall notify the Commission and county staff at least five days before implementing the changes. No changes shall be made that would be in violation of any of the terms of this site permit.

8.4 Status Reports

The Permittee shall file with the Commission monthly Construction Status Reports beginning with the pre-construction meeting and until completion of restoration. Construction Status Reports shall describe construction activities and progress, activities undertaken in compliance with this site permit, and shall include text and photographs.

If the Permittee does not commence construction of the Project within six months of this site permit issuance, the Permittee shall file with the Commission Pre-Construction Status Reports

on the anticipated timing of construction every six months beginning with the issuance of this site permit until the pre-construction meeting. The status updates shall include information on the Project's Midcontinent Independent System Operator (MISO) interconnection process, if applicable.

8.5 Labor Statistic Reporting

The Permittee shall file quarterly Labor Statistic Reports with the Commission within 45 days of the end of the quarter regarding construction workers that participated in the construction of the Project. The Labor Statistic Reports shall:

- (a) detail the Permittee's efforts and the site contractor's efforts to hire Minnesota workers; and
- (b) provide an account of:
 - i. the gross number of hours worked by or full-time equivalent workers who are Minnesota residents, as defined in Minn. Stat. § 290.01, subd. 7;
 - ii. the gross number of hours worked by or full-time equivalent workers who are residents of other states, but maintain a permanent residence within 150 miles of the Project; and
 - iii. the total gross hours worked or total full-time equivalent workers.

The Permittee shall work with its contractor to determine the suitable reporting metric. The report may not include personally identifiable data.

8.6 Prevailing Wage

The Permittee, its contractors, and subcontractors shall pay no less than the prevailing wage rate as defined in Minn. Stat. § 177.42 and shall be subject to the requirements and enforcement provisions under Minn. Stat. §§ 177.27, 177.30, 177.32, 177.41 to 177.435, and 177.45. The Permittee shall keep records of contractor and subcontractor pay and provide them at the request of Commission staff.

8.7 In-Service Date

At least three days before the Project is to be placed into service, the Permittee shall notify the Commission of the date on which the Project will be placed into service and the date on which construction was completed.

8.8 As-Builts

Within 90 days after completion of construction, the Permittee shall submit to the Commission copies of all final as-built plans and specifications developed during the Project construction.

8.9 GPS Data

Within 90 days after completion of construction, the Permittee shall submit to the Commission, in the format requested by the Commission, geo-spatial information (*e.g.*, ArcGIS compatible map files, GPS coordinates, associated database of characteristics) for all structures associated with the Project.

8.10 Right of Entry

The Permittee shall allow Commission designated representatives to perform the following, upon reasonable notice, upon presentation of credentials and at all times in compliance with the Permittee's site safety standards:

- (a) To enter upon the facilities easement of the property for the purpose of obtaining information, examining records, and conducting surveys or investigations.
- (b) To bring such equipment upon the facilities easement of the property as is necessary to conduct such surveys and investigations.
- (c) To sample and monitor upon the facilities easement of the property.
To examine and copy any documents pertaining to compliance with the conditions of this site permit.

8.11 Emergency Response

The Permittee shall prepare an Emergency Response Plan (ERP) in consultation with the emergency responders having jurisdiction over the Project prior to construction. The Permittee shall file the ERP, along with any comments from emergency responders to the Commission at least 14 days prior to the pre-construction meeting and a revised ERP, if any, at least 14 days prior to the pre-operation meeting. At least 14 days prior to the pre-operation meeting the Permittee shall file with the Commission an affidavit of the distribution of the ERP to emergency responders and Public Safety Answering Points (PSAP) with jurisdiction over the Project. The Permittee shall obtain and register the Project address or other location indicators acceptable to the emergency responders and PSAP having jurisdiction over the Project.

8.12 Extraordinary Events

Within 24 hours of discovery of an occurrence, the Permittee shall notify the Commission of any extraordinary event. Extraordinary events include but shall not be limited to fires, acts of sabotage, collector or feeder line failure, and injured worker or private person. The Permittee

shall, within 30 days of the occurrence, file a report with the Commission describing the cause of the occurrence and the steps taken to avoid future occurrences.

8.13 Wildlife Injuries and Fatalities

The Permittee shall report any wildlife injuries and fatalities to the Commission quarterly.

9 DECOMMISSIONING AND RESTORATION

9.1 Decommissioning Plan

The Permittee shall comply with the provisions of the most recently filed and accepted Decommissioning Plan. The initial version of the Decommissioning Plan was submitted for this Project as Appendix D of the Site Permit Application. The Permittee shall file an updated Decommissioning Plan incorporating comments and information from the permit application process and any updates associated with the final construction plans with the Commission at least fourteen 14 days prior to the pre-construction meeting. The Permittee shall update and file the Decommissioning Plan with the Commission every five years following the commercial operation date.

The Decommissioning Plan shall provide information identifying all surety and financial securities established for decommissioning and site restoration. The Decommissioning Plan shall provide an itemized breakdown of costs of decommissioning all Project components, which shall include labor and equipment.

The Permittee shall also submit the Decommissioning Plan to the local unit of government having direct zoning authority over the area in which the Project is located. The Permittee shall ensure that it carries out its obligations to provide for the resources necessary to fulfill its requirements to properly decommission the Project at the appropriate time. The Commission may at any time request the Permittee to file a report with the Commission describing how the Permittee is fulfilling this obligation.

9.2 Site Final Restoration

Upon expiration of this site permit or upon termination of operation of the Project, the Permittee shall have the obligation to dismantle and remove from the site all Project components in accordance with the most recently filed and accepted decommissioning plan. To the extent feasible, the Permittee shall restore and reclaim the site to pre-project conditions. Landowners may require the site be returned to agricultural production or may retain restored prairie vegetation, or other land uses as agreed to between the landowner and the Permittee. All access roads shall be removed unless written approval is given by the affected landowner

requesting that one or more roads, or portions thereof, be retained. All such agreements between the Permittee and the affected landowner shall be filed with the Commission prior to commencing restoration activities. The Permittee shall restore the site in accordance with the requirements of this condition and file a Notification of Final Restoration Completion to the Commission within 18 months of termination of operation of the Project.

10 COMMISSION AUTHORITY AFTER SITE PERMIT ISSUANCE

10.1 Expansion of Designated Site Boundaries

No expansion of the site boundary described in this site permit shall be authorized without the approval of the Commission. The Permittee may submit to the Commission a request for a change in the boundary of the site for the Project. The Commission will respond to the requested change in accordance with applicable statutes and rules.

10.2 Periodic Review

The Commission shall initiate a review of this site permit and the applicable conditions at least once every five years. The purpose of the periodic review is to allow the Commission, the Permittee, and other interested persons an opportunity to consider modifications in the conditions of this site permit. No modification may be made except in accordance with applicable statutes and rules.

10.3 Modification of Conditions

After notice and opportunity for hearing this site permit may be modified or amended for cause, including but not limited to the following:

- (a) violation of any condition in this permit;
- (b) endangerment of human health or the environment by operation of the Project; or
- (c) existence of other grounds established by rule.

10.4 More Stringent Rules

The issuance of this site permit does not prevent the future adoption by the Commission of rules or orders more stringent than those now in existence and does not prevent the enforcement of these more stringent rules and orders against the Permittee.

11 SITE PERMIT AMENDMENT

This site permit may be amended at any time by the Commission. Any person may request an amendment of the conditions of this site permit by submitting a request to the Commission in writing describing the amendment sought and the reasons for the amendment. The Commission will mail notice of receipt of the request to the Permittee. The Commission may amend the conditions after affording the Permittee and interested persons such process as is required under Minn. Stat. §216I.09.

12 TRANSFER OF SITE PERMIT

The Permittee may request at any time that the Commission transfer this site permit to another person or entity (transferee). In its request, the Permittee must provide the Commission with:

- (a) the name and description of the transferee;
- (b) the reasons for the transfer;
- (c) a description of the facilities affected; and
- (d) the proposed effective date of the transfer.

The transferee must provide the Commission with a certification that it has read, understands and is able to comply with the plans and procedures filed for the Project and all conditions of this site permit.

The transferee must provide the Commission with the name and contact information for the site manager, as described in Section 4.3.2, and either a current version with eDocket reference, or a revised version of the following:

- (a) complaint procedures, as described in Section 7 and Attachment 1;
- (b) ERP, as described in Section 8.12; and
- (c) Decommissioning Plan, as described in Section 9.1.

The Commission may authorize transfer of the site permit after affording the Permittee, the transferee, and interested persons such process as is required under Minn. Stat. §216I.13 .

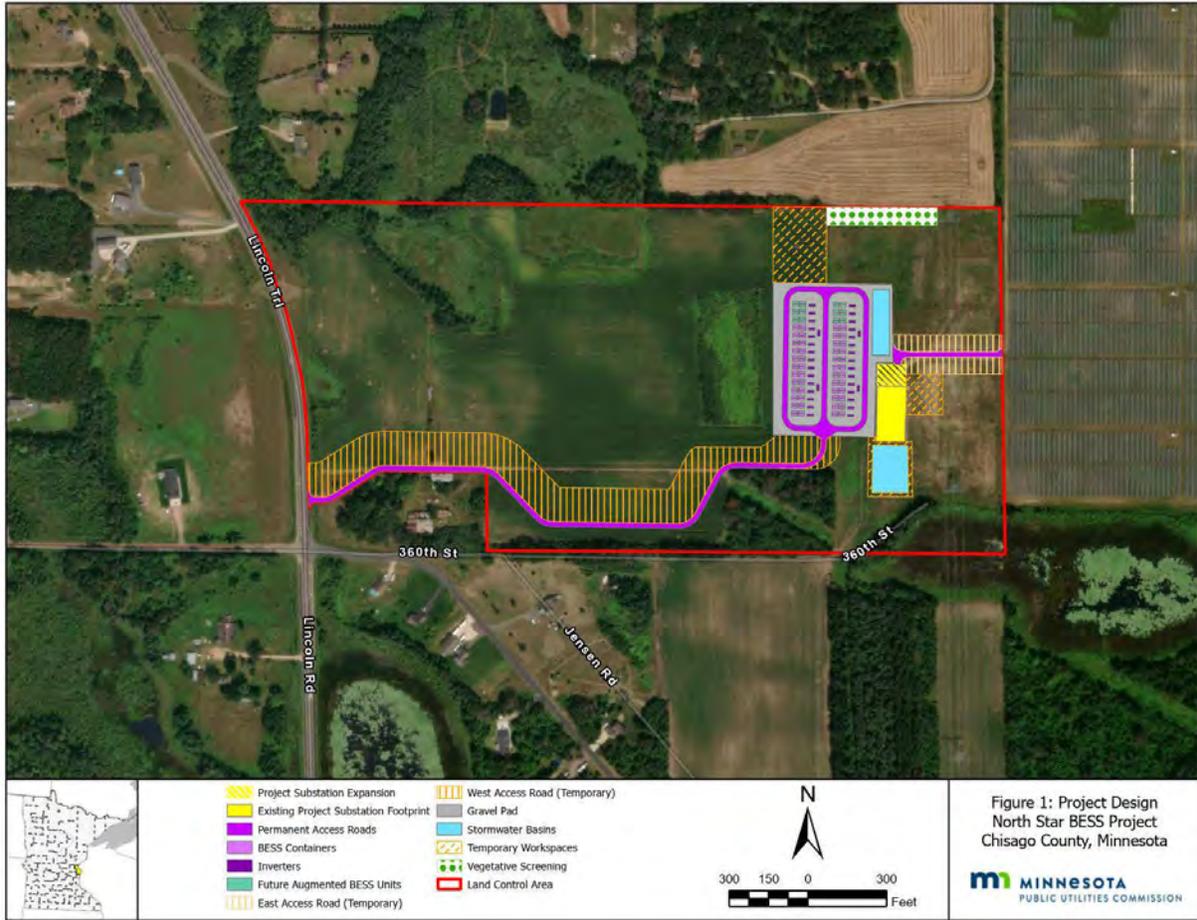
13 REVOCATION OR SUSPENSION OF SITE PERMIT

The Commission may initiate action to revoke or suspend this site permit at any time. The Commission shall act in accordance with the requirements of Minn. Stat. §216I.14, to revoke or suspend this site permit.

14 EXPIRATION DATE

This site permit shall expire 30 years after the date this site permit was approved and adopted.

Site Map



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