

Scoping Environmental Assessment Worksheet:

Prairie Island Nuclear Generating Plant Spent Fuel Storage Expansion Project

April 9, 2024

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List of Acronyms and Definitions

10 CFR	Title 10 of the Code of Federal Regulations
2009 EIS	2009 Final Environmental Impact Statement for Additional Dry Cask Storage prepared by the Minnesota Department of Commerce, Energy Environmental Review and Analysis.
2016 PBO	2016 programmatic biological opinion
ALARA	as low as reasonably achievable
ATP	Area Transportation Partnership
amsl	above mean sea level
ANSI/ANS	American National Standards Institute/American Nuclear Society
BMPs	best management practices
Canister or Cask	Interchangeable; A component of the DFS system (see definition below), typically a steel cylinder that is welded or bolted closed. The steel cylinder provides containment of the spent fuel. Each cylinder is surrounded by additional steel, concrete, or other material to provide radiation shielding to the public.
CFR	<i>Code of Federal Regulations</i>
CON	Certificate of Need
CP	Canadian Pacific
CPT	Seismic Cone Penetration Test
CRMP	Cultural Resource Management Plan
DKeys	U.S. Fish and Wildlife Service Determination Keys
dBA	A-weighted decibels
DFS	dry fuel storage
DFS system	A dry fuel storage system consisting of a cask or canister and other components that provide spent fuel containment, radiation shielding, and transportation. Spent fuel assemblies are stored inside a DFS system cask or canister, but they are not considered a part of the DFS system.
EA	Environmental Assessment
EAW	Environmental Assessment Worksheet
EIS	Environmental Impact Statement
END	Endangered
EPA	U.S. Environmental Protection Agency
EQB	Minnesota Environmental Quality Board
ESA	Endangered Species Act
F	Fahrenheit
FEMA	Federal Emergency Management Agency
FR	Federal Register
GEIS	Generic Environmental Impact Statements
GHG	greenhouse gas
HI-STORM FW	Holtec International vertical DFS system
HSM	Horizontal Storage Module
IBA	Audubon MN Important Bird Area
IPaC	Information for Planning and Consultation
IRP	Integrated Resource Plan
ISFSI	Independent Spent Fuel Storage Installation
MAGNASTOR	NAC International vertical DFS system
MCE	Minnesota Conservation Explorer

MDH	Minnesota Department of Health
DNR	Minnesota Department of Natural Resources
DOC	Minnesota Department of Commerce
EERA	Energy Environmental Review and Analysis
MNDOT	Minnesota Department of Transportation
PUC	Minnesota Public Utilities Commission
MPCA	Minnesota Pollution Control Agency
MWI	Minnesota Well Index
Net Zero Project	Prairie Island Indian Community Net Zero Project
NHIS	Natural Heritage Information System
NLEB	northern long-eared bat
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRC 1996 GEIS	Nuclear Regulatory Commission's first Generic Environment Impact Statement prepared by the U.S. Nuclear Regulatory Commission
NRC 2002 Decommissioning GEIS	Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Regarding the Decommissioning of Nuclear Power Reactors prepared by the U.S. Nuclear Regulatory Commission
NRC 2011 SEIS	Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39 prepared by the U.S. Nuclear Regulatory Commission
NRC 2013 GEIS	2013 Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437, Volume 1, Revision 1) prepared by the U.S. Nuclear Regulatory Commission
NRC 2023 GEIS	2023 Generic Environmental Impact Statement for License Renewal of Nuclear Plants (NUREG-1437, Volume 1, Draft Revision 2) prepared by the U.S. Nuclear Regulatory Commission
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSAs	noise-sensitive areas
NSPM	Northern States Power Company, a Minnesota Corporation
NUHOMS EOS	Nuclear HOrizontal Module System; also referred to as EOS 37PTH
ODCM	Offsite Dose Calculation Manual
Orano TN Americas	Manufacturer of NUHOMS EOS 37PTH; Referred to as "Orano"
OSA	Office of the State Archaeologist
pCi/L	picocuries per liter
PIIC	Prairie Island Indian Community
PINGP	Prairie Island Nuclear Generating Plant
Project	Independent Spent Fuel Storage Installation Expansion Project
PWI	Public Waters Inventory
PWR	pressurized water reactor
REMP	Radiological Environmental Monitoring Program
RERR	Radioactive Effluent Release Report
RFP	request for proposal
RGU	Responsible Government Unit
S&L	Sargent & Lundy
SAR	Safety Analysis Report
SDS	State Disposal System

SEIS	Supplemental Environmental Impact Statements
SHPO	State Historic Preservation Office
SLR	Subsequent License Renewal
SPC	Species of Special Concern
SSTS	subsurface sewage treatment systems
SWPPP	Stormwater Pollution Prevention Plan
TEDE	Total Effective Dose Equivalent
The Company	Northern States Power Company, d.b.a. Xcel Energy
THR	Threatened
TN-40/40HT	The current DFS system utilized on-site at the PINGP ISFSI; the acronym stands for the Transnuclear (TN) bolted-lid dry fuel storage system which holds 40 fuel assemblies (TN-40); for the TN-40HT, the TN-40 name is modified to include High Burnup ¹ (H) fuel and the designation as suitable for Transportation/Transportable (T)
UO ₂	Uranium Oxide
USACE	U.S. Army Corps of Engineers
USAR	Updated Safety Analysis Report
USCB	U.S. Census Bureau
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WNS	white-nose syndrome

¹ Burnup is measured in gigawatt-days per metric ton of uranium. Spent fuel is considered “high burnup” at a value greater than 45 gigawatt-days per metric ton of uranium.

December 2022 version

Environmental Assessment Worksheet

This most recent Environmental Assessment Worksheet (EAW) form and guidance documents are available at the Environmental Quality Board’s website at: <https://www.eqb.state.mn.us/> The EAW form provides information about a project that may have the potential for significant environmental effects. Guidance documents provide additional detail and links to resources for completing the EAW form.

Cumulative potential effects can either be addressed under each applicable EAW Item or can be addressed collectively under EAW Item 21.

Note to reviewers: Comments must be submitted to the RGU during the 30-day comment period following notice of the EAW in the *EQB Monitor*. Comments should address the accuracy and completeness of information, potential impacts that warrant further investigation and the need for an EIS.

1. PROJECT TITLE

Prairie Island Nuclear Generating Plant (PINGP) Independent Spent Fuel Storage Installation (ISFSI) Expansion Project (Project).

2. PROPOSER

Name: Northern States Power Company, d.b.a. Xcel Energy (the Company)
Contact person: Monsherra Blank
Title: Director of Regulatory and Strategic Analysis
Address: 401 Nicollet Mall
City, State, ZIP: Minneapolis, MN 55401
Phone: (214) 422-3672
Email: monsherra.s.blank@xcelenergy.com

3. RGU

Name: Minnesota Department of Commerce (DOC) Energy Environmental Review & Analysis (EERA)
Contact person: Jenna Ness
Title: Project Manager
Address: 85 7th Place East, Suite 280
City, State, ZIP: St. Paul, MN 55101
Phone: (651) 539-1693
Email: jenna.ness@state.mn.us

4. REASON FOR EAW PREPARATION

Required:

- EIS Scoping
- Mandatory EAW

Discretionary:

- Citizen petition
- RGU discretion

Proposer initiated

If EAW or EIS is mandatory give EQB rule category subpart number(s) and name(s):

An Environmental Impact Statement (EIS) is required under Minn. Stat. §116C.83 Subdivision 6(b) to construct and operate an expanded ISFSI facility with the DOC as the Responsible Governmental Unit (RGU).

5. PROJECT LOCATION

County: Goodhue

City/Township: Red Wing

PLS Location (¼, ¼, Section, Township, Range): NW ¼ of the SE ¼ of Section 5, T113N, R15W

Watershed (81 major watershed scale): 38-Mississippi River-Lake Pepin; State Waterbody ID MN07040001-531

GPS Coordinates: 44.62° 37' N latitude, 92.64° 38' W longitude

Tax Parcel Number: 557050160

At a minimum attach each of the following to the EAW:

- County map showing the general location of the project;
- U.S. Geological Survey 7.5 minute, 1:24,000 scale map indicating project boundaries (photocopy acceptable); and
- Site plans showing all significant project and natural features. Pre-construction site plan and post-construction site plan.
- List of data sources, models, and other resources (from the Item-by-Item Guidance: Climate Adaptation and Resilience or other) used for information about current Minnesota climate trends and how climate change is anticipated to affect the general location of the project during the life of the project (as detailed below in item 7. Climate Adaptation and Resilience).

6. PROJECT DESCRIPTION

a) Provide the brief project summary to be published in the EQB Monitor (approximately 50 words).

Northern States Power Company, d/b/a. Xcel Energy proposes to construct and operate an expanded ISFSI at PINGP to provide 20 additional years of spent fuel storage between 2033/2034 and 2053/2054. The expansion would use a welded canister dry fuel storage (DFS) system licensed by the U.S. Nuclear Regulatory Commission (NRC) for both storage and transportation. The Project is proposed with the Company's intent to seek necessary federal approvals to extend the existing operating life of the two pressurized water reactors at the plant. The Project would construct up to two pads, as needed, to store a projected 34 additional DFS systems (approximately 1,200 spent fuel assemblies) within the current fence line of the ISFSI.

b) Give a complete description of the proposed project and related new construction, including infrastructure needs. If the project is an expansion include a description of the existing facility. Emphasize: 1) construction, operation methods and features that would cause physical manipulation of the environment or would produce wastes, 2) modifications to existing

equipment or industrial processes, 3) significant demolition, removal, or remodeling of existing structures, and 4) timing and duration of construction activities.

PINGP and ISFI - Current Operations

The PINGP is owned and operated by the Company. PINGP consists of two pressurized water reactors (Unit 1 and Unit 2) that are licensed for a gross output of 584 megawatts of electricity each. These reactors produce on average a nominal value of 550 megawatt hours in each unit. The NRC approved renewed operating licenses for the facilities in 2011, allowing PINGP Units 1 and 2 to operate through 2033 and 2034, respectively.

The PINGP is within the city limits of Red Wing, Minnesota in Goodhue County, bordered by the Vermillion River on the west and by the Mississippi River on the east, in Section 5, Township 113N, Range 15W, at 44.62° 37' N latitude and 92.64° 38' W longitude. PINGP is approximately 28 miles southeast of the Minneapolis-St. Paul metropolitan area. The PINGP site in total consists of approximately 578 acres of land owned by the Company. Access to the PINGP is restricted by a perimeter fence and other barriers. Maps 1 and 2 in Appendix A show the PINGP location and boundaries on topographical and U.S. Geological Survey (USGS) Quad maps, respectively; Maps 3 and 4 are aerial maps depicting a 1- and 2-mile radius around the PINGP, respectively; and Map 5 depicts the PINGP property boundary.

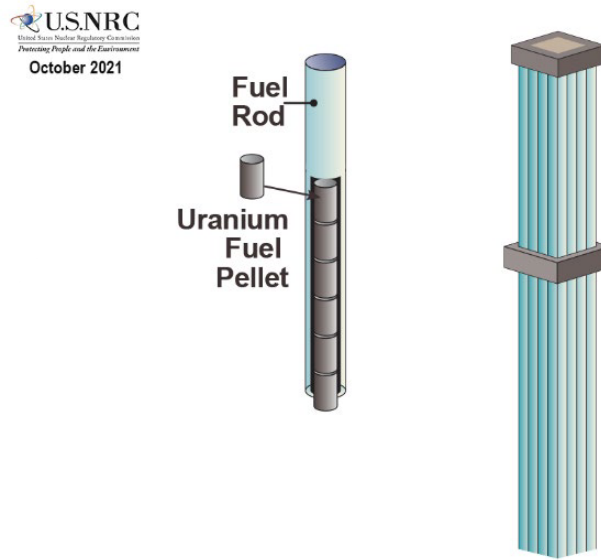
The ISFSI is currently licensed by the NRC under a site-specific License (No. SNM-2506) to store up to 64 TN-40/40HT DFS systems containing used fuel assemblies through October 31, 2053. In Minnesota, the PUC also issues a Certificate of Need (CON) to operate spent fuel storage facilities such as the ISFSI. The PUC issued the Company a CON for its current ISFSI for the storage of up to 64 DFS systems (equivalent to 2,560 fuel assemblies, considering each current DFS has the capacity to store 40 spent fuel assemblies).

As discussed in the Company's 2024-2040 Upper Midwest Integrated Resource Plan (IRP) filed with the PUC on February 1, 2024, and detailed in the CON application filed with the PUC on February 7, 2024, the Company proposes to apply to the NRC to extend the existing federal operating licenses to operate Units 1 and 2 until 2053 and 2054, respectively. The NRC defines this extended operating period as Subsequent License Renewal (SLR), which the NRC grants in twenty-year increments.

Presently, when nuclear fuel assemblies are spent after use in the reactor for several fuel cycles, they are offloaded to the spent fuel pool in the auxiliary building adjacent to both reactor buildings. A fuel assembly has the volume of 0.158 cubic meters. After sufficient cooling time (approximately 10 years) in the spent fuel pool, the used fuel assemblies can be loaded into DFS systems. Fuel assemblies are separate from, but eventually stored within, DFS systems.

Figure 1 below shows the construct of a fuel assembly. A fuel assembly consists of multiple uranium oxide (UO₂) pellets stacked inside a fuel rod; multiple fuel rods are constructed into a grid formation to make up the assembly. One PINGP fuel assembly has 121 fuel rods.

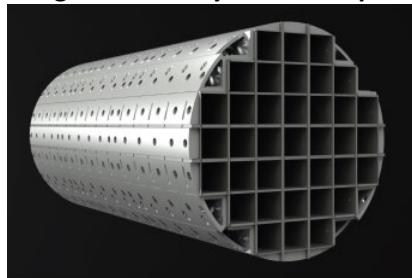
Figure 1: Construct of a Fuel Assembly



Fuel assemblies have the following life cycle after their useful life is complete in the reactor:

- Spent fuel assemblies in the reactor are transferred out of the reactor and into the spent fuel pool to empty locations (1/3-1/2 of the fuel in the reactor core is replaced with new fuel every 24 months, or one operating cycle).
- Spent fuel assemblies are stored in the spent fuel pool for cooling for approximately 10 years.
- When cooling is complete, spent fuel assemblies are transferred to DFS system canisters or casks as shown in Figure 2 below.

Figure 2: DFS System Example



- When loading of a DFS system is complete, it is transferred out to the ISFSI and placed onto a pad.

Moving spent fuel out of the spent fuel pool and into a DFS system allows continuation of the cycle above.

The DFS systems currently utilized and stored in the PINGP ISFSI are referred to as the TN-40 and TN-40HT DFS systems. Each system is designed, licensed, and manufactured by Orano USA (formerly TN Americas, LLC). They are vertical, bolted-lid DFS systems and are comprised of the following components:

- a cylindrical metal container called a cask (or canister in some DFS systems) that provides containment of the spent fuel;

- a fuel basket in a grid formation that provides storage locations for the spent fuel assemblies (note that the fuel assemblies are not considered part of the DFS system);
- cask body lid;
- protective weather cover;
- overpressure system;
- four trunnions for lifting;
- penetrations with bolted and sealed covers for leak detection and venting;
- closure bolts; and
- locating pins.

The process of moving fuel from the spent fuel pool involves a number of steps. First, when fuel is ready to be removed from the spent fuel pool, the DFS system cask is lowered into the pool where the fuel assemblies are loaded into the cask. The cask is then removed from the spent fuel pool and the water is drained from the cask. The cask is then vacuum dried and backfilled with helium. After the lid is bolted shut, the DFS system is moved out of PINGP via a haul path to the ISFSI to be securely stored on a concrete pad.

Figure 3 shows a DFS system cask sitting in the spent fuel pool and a spent fuel assembly being lowered into the internal metal fuel basket. The TN-40/40HT has 40 basket cells, or locations, for spent fuel assembly storage. The Orano TN Americas LLC NUHOMS EOS 37PTH DFS system selected by the Company for the Project will have 37 available storage cells for 37 spent fuel assemblies. Figure 4 shows the current TN-40/40HT DFS systems sitting on a PINGP ISFSI pad following loading in the spent fuel pool.

Figure 3: DFS in Spent Fuel Pool

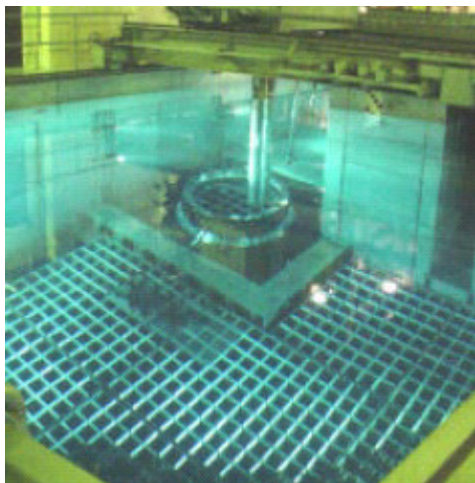


Figure 4: Current DFS on ISFSI Pad



The current ISFSI consists of an outdoor lighted area, approximately 720 feet long and 340 feet wide, roughly 5.5 acres in size. Within the ISFSI, the DFS systems are currently stored on three reinforced concrete pads. As of February 1, 2024, the ISFSI holds 50 DFS systems (2,000 fuel assemblies). An equipment storage building and a security building are also within the ISFSI. The tallest structures are approximately 40 foot tall light poles. Two fences surround the facility with a monitored clear zone

between the two fences. A 17-foot-high vegetated earthen berm surrounds the ISFSI. The next dry fuel loading campaign (the action whereby additional casks are placed on the ISFSI) under the current license operation is anticipated in 2024.

PINGP and ISFSI – Proposed Project

The Company requests the PUC approve the storage necessary to support an additional 20 years of PINGP operation. The Company submitted the CON application for this Project to the PUC on February 7, 2024, and the CON proceeding was assigned Docket No. E002/CN-24-68. The Company will use the NUHOMS EOS 37PTH DFS system, an NRC-approved DFS system certified for dual-use as storage and transportation under Title 10 Code of Federal Regulations (10 CFR) § 72 and 71, respectively. The DFS system is covered by a general NRC license as opposed to the site-specific NRC license currently issued for the TN-40/TN-40HT. There are several DFS systems currently licensed under Part 72 by the NRC.

The Company solicited several vendors who manufacture NRC-licensed DFS systems for the Project to assess all available NRC-licensed designs via a request for proposal (RFP) which included NAC International, Holtec International, and Orano. All three vendors manufacture different welded DFS system technologies. These welded systems were evaluated by the PUC and the DOC in the Human and Environmental Impacts of Change in Spent Fuel Storage Technology at the Prairie Island Nuclear Generating Plant Final Supplemental Environmental Impact Statement (SEIS).² The only differences in human health and environmental impact determined between the TN-40/40HT systems and the three different welded DFS systems are in the systems' radiological impact. Therefore, when preparing its CON application, the Company conducted a bounding analysis using the technology with the most limiting dose rate to ensure all NRC safety regulations for dose would be met over a 20-year license extension, regardless of the technology ultimately selected. Radiological impact due to 20 additional years of operation was analyzed under this environmental scope per Sargent & Lundy (S&L) report SL-018015, "Dose Study to Support ISFSI Certificate of Need".³ The NUHOMS EOS 37PTH DFS system selected by the Company is bounded by this analysis. Results are discussed in the Radiological Impact section of this document (Section 22.2).

The use of a new spent fuel storage technology does not require new PUC certification per the Company's approved petition filed under Docket No. E-002/CN-08-510, in which the PUC found that the use of a new technology would not require recertification.⁴ Under the same docket, the PUC authorized the Company to use an NRC-approved spent nuclear fuel storage system certified for dual-use as storage and transportation under 10 CFR § 72.212(b). Information on the Company's RFP process for the new technology, the evaluation criteria, the proposals received, and the Company's evaluation of each proposal and its decision can be viewed in eDockets under Docket No. E-002/CN-08-510. Selection was approached with the following methodology: 1) a technical team evaluated if and how each vendor met design criteria established by the Company and how the vendor would be able to support transport when offsite storage options become available; 2) a supply chain team evaluated costs associated with proposed contracts; and 3) the executive team reviewed the evaluations performed and with the Dry Fuel Storage Department team, selected a vendor and associated DFS technology. The specific vendor and spent fuel

² Final Supplemental Environmental Impact Statement – Prairie Island Spent Fuel Storage. The Human and Environmental Impacts of a Change in Spent Fuel Storage Technology at the Prairie Island Nuclear Generating Plant. April 2022. Available online at: <https://apps.commerce.state.mn.us/eera/web/project-file/12198>. Accessed July 2023.

³ Sargent & Lundy, 2023. Report SL-018015, Dose Study to Support ISFSI Certificate of Need.

⁴ PUC eDockets Document ID [202210-189557-01](#).

storage technology selected by the company in November 2023 is the Orano TN Americas LLC NUHOMS EOS 37PTH.

The Orano TN Americas LLC NUHOMS EOS 37PTH DFS system is a welded DFS system. This system uses a welded closure for the lid assembly, which is common among the vendor technologies. The NUHOMS EOS-37PTH system are dual purpose. They are designed and licensed to store and transport spent fuel with the following components:

- a sealed metal canister which stores up to 37 spent fuel assemblies;
- a concrete storage overpack to protect and shield the metal canister;
- a transfer cask that is a steel cask used to handle and move the metal canister from the spent fuel pool to the concrete storage module or overpack;
- a lifting yoke which is a steel lifting device that interfaces with the crane to lift the transfer cask into and out of the spent fuel pool;
- a transfer vehicle which is a multi-wheel trailer or vehicle used to safely support and move the transfer cask from the reactor building to ISFSI;
- ancillary devices that are used to dry, weld, backfill (with helium) and seal the steel canisters for storage; and
- a transportation cask that is a steel overpack cask used to ship the spent fuel canister from one site to another.

Figure 5 depicts the Orano TN Americas LLC NUHOMS EOS 37PTH DFS system being inserted into a Horizontal Storage Module for onsite storage.

Figure 5: Project DFS Technology Onsite Storage



The Project will involve construction of up to two pads, as needed, in addition to the three pads currently located within the ISFSI. The current ISFSI configuration is shown in Appendix A, Map 6. These pads will be constructed within the 5.5-acre ISFSI footprint to store approximately 34 additional DFS systems. This is equivalent to approximately 1,200 fuel assemblies. The exact number of DFS systems will be determined by the specific amount of nuclear fuel required to run an additional 20 years from 2033/2034 to 2053/2054. This is determined by how much fuel is loaded each cycle, inventory management of the spent fuel pool, and the technologies available to the Company during future loading campaigns. The potential variation in the number of total DFS systems or the location(s) of the pad(s) within the ISFSI will not result in a modification to the footprint of the ISFSI or the scope of the Project as proposed. Construction of the new pads would require temporary ground-disturbing activities within the existing ISFSI security fencing

on previously disturbed ground. Potential locations for the new pads relative to the existing pads is shown on Appendix A, Map 7.

The Company will first conduct soil testing to verify conditions are suitable for building the pads. When constructing the up to two new storage pads, the Company would first excavate up to 6 feet of surface material within the existing ISFSI where the new pad(s) would be placed. The Company would also remove up to 6 feet of surface material in the areas immediately adjacent to the storage pads where the new concrete approach aprons would be placed. This excavation would total approximately 5,760 cubic yards. Excavation would be limited to removal of sub-grade materials that were previously disturbed and/or placed as part of original ISFSI construction. The excavated materials may be stored temporarily on site within the ISFSI fence line or outside the fence line on a previously disturbed/gravel area prior to permanent removal from the site. Any excavation would then be backfilled with engineered fill and compacted.

The Company would then pour the new concrete storage pad(s) and concrete approach aprons within the excavated areas. The Company expects that minimal grading and drainage would need to be performed to maintain the existing drainage pattern. The concrete will be allowed to cure, then the area surrounding the concrete will be backfilled. Gravel surfacing stone would then be placed on the area surrounding the pad(s). The pads would then be available for placement of DFS systems. The construction sequence would not undermine the substrate beneath the existing pads.

The Company estimates that the Project will be executed on the following timeline:

- The Company anticipates a single construction mobilization to complete the work within the ISFSI to construct and pour the initial concrete pad(s) and approach aprons for the DFS systems. Construction of the pads could take 9-12 months and will occur once environmental review is complete and after a CN is granted for the Project sometime between 2027 and 2029 to support the 2030 loading campaign. The 2030 DFS system loading campaign would occur on the existing third pad as well as a new fourth pad.
- Outside of the earthen berm and to the northeast is an instrumentation building. Due to the expansion of the ISFSI and the addition of more DFS systems, the Company could determine that it needs to expand the existing instrumentation building to the northeast of the ISFSI. This is considered a phased/connected action. Construction would begin as needed to support future loadings once environmental review is complete and after a CN is granted for the Project which may overlap with the initial pad construction in the 2027 to 2029 time period and would take approximately 3 months. The cumulative potential effects associated with the expansion of the instrumentation building are considered in Section 21 of this EAW and will be analyzed in the EIS.
- Additional loading campaigns are anticipated to occur in 2035, 2040, and 2045.

The Project would not involve any modifications to existing industrial processes. Operational activities at the ISFSI currently include routine inspection and monitoring of the ISFSI. No maintenance is required on the welded canister DFS systems or storage modules. The ISFSI does not produce any waste, and this would not change following construction of the Project. The Company does not anticipate any changes to these routine activities because of the Project.

c) Project Magnitude

Table 6-1: Project Magnitude

Total Project Acreage	0.6 acres
Up to Two Reinforced Concrete Pads (DFS Storage) and Approach Aprons	Approximately 62,640 cubic feet <i>(for calculation purposes, this assumes two 216-foot-long by 40-foot-wide by 36-inch-deep storage pads with two 216-foot-long by 20-foot-wide by 15-inch-deep approach aprons)^a</i>
ISFSI Structure Heights	Not to exceed 20 feet <i>(excluding the existing 40-foot-tall light poles, which will not be modified)</i>
^a These assumptions are based on the size of the existing third pad. The potential variation in the number of total DFS systems or the location(s) of the pad(s) within the ISFSI will not result in a modification to the footprint of the ISFSI or the scope of the Project as proposed.	

d) Explain the project purpose; if the project would be carried out by a governmental unit, explain the need for the project and identify its beneficiaries.

As stated in Section 6.b above, the Company has proposed to the PUC through its IRP (Docket No. E002/RP-24-67) that it plans to operate PINGP Units 1 and 2 for 20 years beyond the existing license, from 2033/2034 to 2053/2054. The Company has filed a CON application with the PUC for expansion of ISFSI storage in support of a 20-year license extension in concert with the IRP filing. The current ISFSI is authorized to store 64 equivalent TN-40/HT systems on three existing storage pads, with each TN-40/HT system having the capacity to store 40 spent fuel assemblies (for a total of 2,560 spent fuel assemblies). The ISFSI will be at capacity to meet the needs of operating the plant to the end of its current operating licenses for Units 1 and 2 by 2034. Therefore, to meet future spent fuel storage needs, the Company is proposing to construct the Project to allow 20 years of additional operation and the storage of approximately 34 additional DFS systems, or the number of systems required to support the storage of approximately 1,200 spent fuel assemblies. This expansion would allow continued operation of PINGP through 2053/2054. The Company intends for the storage at the ISFSI to be interim, pending availability of a federal or private storage facility or other offsite option that would allow for removal of spent fuel from the site. Currently, however, no private or federally operated storage or disposal facilities are available to receive spent nuclear fuel.

Spent Fuel Inventory and Production Estimate

As of February 1, 2024, 3,013 spent fuel assemblies have been discharged from PINGP’s reactor, with 1,013 currently located in the spent fuel pool, and 2,000 stored in the ISFSI. The Company estimates that approximately 1,200 additional spent fuel assemblies will need to be discharged to the spent fuel pool over the plant’s life if the operation is extended an additional 20 years to 2053/2054. Therefore, to accommodate this additional spent fuel production, the Company would need to offload the fuel currently stored in the spent fuel pool to the ISFSI in approximately 34 additional DFS systems.

PINGP maintains the ability to remove all fuel from both reactors. This is referred to as full core offload capability.⁵ The existing pool has sufficient storage capacity to allow full core offload until the end of the existing operating license in 2033/2034.

e) Are future stages of this development including development on any other property planned or likely to happen? Yes No

⁵ Full core offload capability is addressed in eDockets No. E-002/RP-98-32.

If yes, briefly describe future stages, relationship to present project, timeline and plans for environmental review.

No additional future development is being planned for PINGP or the ISFSI at this time. As described in Section 6.b, the Company will conduct loading campaigns in 2030, 2035, 2040, and 2045 as part of the Project. The environmental impacts of these campaigns are discussed throughout this EAW. The potential of an expanded Instrumentation Building in the future would be considered a phased/connected action that is not part of the proposed Project; the environmental impacts of this action is presented in Section 21.

However, at some undetermined point in the future an additional expansion of the ISFSI could potentially be needed to accommodate PINGP decommissioning operations. The need for additional ISFSI capacity for decommissioning will depend on a number of variables, most notably the availability of an offsite facility to take spent fuel from PINGP and the timing of decommissioning. At this time, the Company is not able to anticipate whether additional on-site storage will be required in connection with the eventual decommissioning of PINGP. However, the cumulative potential effects of developing additional ISFSI capacity to accommodate decommissioning are addressed in Section 21 of this EAW. Decommissioning activities would be addressed pursuant to additional state and federal processes prior to expiration of PINGP's Unit 1 and Unit 2 licenses, should decommissioning be ultimately pursued.

The Company intends to seek an NRC SLR to allow the PINGP to operate beyond its current licenses, which end in 2033 and 2034. The SLR would not require any expansion or development beyond the activities contemplated as part of the Project. The cumulative potential effects of operating PINGP until 2053/2054 are addressed in Section 21 of this EAW.

f) Is this project a subsequent stage of an earlier project? Yes No

If yes, briefly describe the past development, timeline, and any past environmental review.

The existing ISFSI, constructed originally with two pads in 1993 and expanded to include the third pad in 2021, has the present capacity to hold up to 64 DFS systems. The types of physical disturbances that will occur as part of this Project were reviewed as part of state environmental review conducted for the initial ISFSI construction and operation⁶ and the 2021 expansion.⁷ Most recently, DOC completed a supplement to the 2009 EIS when it studied the Company's request to the PUC to use a different DFS technology than the current DFS technology.⁸ Environmental review documents for these past projects consisted of a Scoping EAW, Draft and Final Scoping Decision Documents, and Draft and Final Environmental Impact Statements (or SEIS). The DOC and PUC decision and order dates are identified in Table 6-2.

⁶ Final Environmental Impact Statement – Prairie Island Independent Spent Fuel Installation. April 12, 1991.

⁷ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

⁸ DOC. 2022. Final Supplemental Environmental Impact Statement – Prairie Island Spent Fuel Storage. The Human and Environmental Impacts of a Change in Spent Fuel Storage Technology at the Prairie Island Nuclear Generating Plant. April 2022. Available online at: <https://apps.commerce.state.mn.us/eera/web/project-file/12198>.

Table 6-2: Prairie Island ISFSI Past Projects

Project Docket Number	Description	EIS Adequacy Record of Decision Date	MN PUC Record of Decision and Order
E-002/CN-91-19	Application for a Certificate of Need for Construction of an Independent Spent Fuel Storage Installation	May 16, 1991 ^a	August 10, 1992
E-002/CN-08-510	Application for a Certificate of Need for Additional Dry Cask Storage at the Prairie Island Nuclear Generating Plant (also included Extended Power Uprate CON application)	October 22, 2009 ^b	December 18, 2009
E-002/CN-08-510	Request for Change in Spent-Fuel Storage Technology Prairie Island Fuel Storage	May 26, 2022 ^c	October 5, 2022
^a	The 1991 adequacy decision was made by the Environmental Quality Board and the EIS was ratified by the legislature in 1994. Minn. Stat. § 116C.77(b). The same legislation designated the Department of Commerce as the responsible governmental unit for environmental review of any future or expanded ISFSI. Minn. Stat. § 116C.83, subd. 6.		
^b	Pursuant to Minn. Stat. § 116C.83, subd. 6, the Department of Commerce made this adequacy determination.		
^c	Pursuant to Minn. Stat. § 116C.83, subd. 6, the Department of Commerce determined the Supplemental EIS to be adequate.		

In addition to state environmental review efforts, the NRC has also studied the environmental impacts of the ISFSI construction and operation. The NRC studied the impacts of the original ISFSI construction and operation in 1992 through an Environmental Assessment (EA);⁹ the renewal of the ISFSI’s site-specific License No. SNM-2506 in 2015 through an EA;¹⁰ and the expansion to the third pad and storage of up to 64 equivalent TN-40/HT systems in 2020 through an EA.¹¹

7. CLIMATE ADAPTATION AND RESILIENCE

- a) Describe the climate trends in the general location of the project (see guidance: *Climate Adaptation and Resilience*) and how climate change is anticipated to affect that location during the life of the project.**

According to the Minnesota Department of Natural Resources’ (DNR’s) Climate Trends website, Minnesota’s climate has been changing and continues to change. Minnesota’s average temperature increased by 3.0 degrees Fahrenheit (F) between 1895 and 2020, and the state’s annual rainfall has increased by 3.4 inches over that same period. The 10 warmest and wettest years have all occurred since

⁹ NRC. 1992. Environmental Assessment Related to Construction and Operation of the Prairie Island Independent Spent Fuel Storage Installation.

¹⁰ NRC. 2015. Final Environmental Assessment for the Proposed Renewal of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, June 2015. Available online at: <https://www.nrc.gov/docs/ML1509/ML15098A026.pdf>. Accessed July 2023.

¹¹ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

1998. In addition to more annual precipitation, the number of extreme storms has also been increasing and is likely to continue on this trend for the foreseeable future.¹²

The Minnesota Climate Trends historical data shows that the temperature has risen in Goodhue County by an average of 0.29 degrees F per decade from 1895 to 2023.¹³ The Minnesota Climate Explorer website shows that the projected future average annual temperature for Goodhue County, for the mid-century time period (2040 to 2059), could rise from a Model Mean of 44.94 degrees F (modeled present average temperature) to a Model Mean of 48.49 degrees F, for an expected rise of 3.6 degrees F.¹⁴

The PINGP ISFSI elevation is 211.7 meters (694.5 feet) above mean sea level (amsl). The normal water level of the Mississippi River is 205.6 meters (674.5 feet) amsl.¹⁵ River levels at PINGP are evenly controlled by a series of U.S. Army Corps of Engineers (USACE) locks and dams, including the nearby Lock and Dam 3.¹⁶

b) For each Resource Category in the table below (see Table 7-1): Describe how the project’s proposed activities and how the project’s design will interact with those climate trends. Describe proposed adaptations to address the project effects identified.

Table 7-1: Interactions with Climate Trends

Resource Category	Climate Considerations	Project Information	Adaptations
Project Design	See below, this section.	See below, this section.	See below, this section.
Land Use	See Section 10	See Section 10	See Section 10
Water Resources	See Section 12	See Section 12	See Section 12
Contamination/Hazardous Materials/Wastes	See Section 13	See Section 13	See Section 13
Fish, wildlife, plant communities, and sensitive ecological resources (rare features)	See Section 14	See Section 14	See Section 14

The Project is not expected to interact with climate trends described above in any material way. Specifically, NRC approves spent fuel DFS systems, such as the Orano TN Americas LLC NUHOMS EOS 37PTH DFS system, by evaluating each design for resistance to accident conditions such as floods, earthquakes, tornado missiles,¹⁷ and temperature extremes. These conditions include events that are Design Events III and IV as defined by the American National Standards Institute/American Nuclear Society

¹² DNR Climate Trends. Available online at: https://www.dnr.state.mn.us/climate/climate_change_info/climate-trends.html. Accessed July 2023.

¹³ DNR Climate Trends Map – Historical Data. Goodhue County. Available online at: <https://arcgis.dnr.state.mn.us/ewr/climate-trends/>. Accessed November 2023.

¹⁴ DNR Minnesota Climate Explorer. Projected (Future) Climate (Average Annual Temperature) for Goodhue County. Available online at: <https://arcgis.dnr.state.mn.us/ewr/climateexplorer/main/historical>. Accessed November 2023.

¹⁵ NRC, 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

¹⁶ NRC, 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

¹⁷ A tornado missile is a missile that’s generated by a tornado and can cause damage to buildings and equipment.

(ANSI/ANS) 57.9, “Design Criteria for an Independent Spent Fuel Storage Installation (Dry Storage Type)”. Extreme conditions from the ANSI/ANS are based on historical data.

As part of DFS system design approval, the manufacturer will develop a Safety Analysis Report (SAR) for a new DFS design citing design criteria and referencing American Society of Mechanical Engineering codes, requirements, and how these requirements are met including evaluation of hypothetical accident conditions. Using NUREG-2215, “Standard Review Plan for Spent Fuel Dry Storage Systems and Facilities – Final Report”, the NRC will review the SAR as part of the licensing approval process. The NRC issues a Certificate of Compliance for a DFS system design to a vendor if the review of the design finds it technically adequate. Licensees are required to perform evaluations of their site to demonstrate that the site is adequate for storing spent fuel in the DFS system. These evaluations must show that the cask Certificate of Compliance conditions can be met.¹⁸

Rising Temperatures

The Orano TN Americas LLC NUHOMS EOS 37PTH DFS system has been approved under a general license from the NRC. All NRC-approved DFS are licensed for use at any facility in the nation, including plants and nuclear facilities in Arizona, Southern California, Louisiana, and Texas which experience warmer temperatures than the area near PINGP. All DFS designs certified by the NRC, including the Orano TN Americas LLC NUHOMS EOS 37PTH DFS system selected by the Company, are designed to withstand ambient temperature extreme highs and lows based on historical data. These highs and lows, as outlined in NUREG-2215, are estimated to be to a low of -40 degrees F and a high of 125 degrees F based on previously accepted conditions; however, it is stated that “the maximum and minimum ambient temperature values should equal the 99-percent values in Table 1, ‘Climatic Conditions for the United States,’ in the American Society of Heating, Refrigeration and Air-Conditioning Engineers’ publication, ‘ASHRAE Handbook – Fundamentals’.”

Therefore, because the DFS design selected by the Company has a general license from the NRC and because the projected annual average temperatures in Goodhue County are expected to rise by approximately 3.6 degrees F through the year 2059 (see Section 7.a), rising temperatures resulting from climate change are not expected to interact with the Project in a material way; the designed temperature tolerances of the selected DFS system are up to 125 degrees F as noted above, which far exceeds any local climatological increase at the ISFSI.

Increased Precipitation and Extreme Storms

The probable maximum flood level calculated to occur at the ISFSI is 706.7 amsl and considered water velocity of 6.2 feet per second, including wave run-up. The ISFSI has been sited and designed so that the lowest point of potential water entry into the DFS is above the level of the probable maximum flood. A study titled “Probable Maximum Flood Study Mississippi River at Prairie Island, Minnesota” was performed and is included as Appendix F in the Prairie Island Updated Safety Analysis Report. This can be publicly accessed from the NRC.gov ADAMS web-based search site¹⁹. This study is also described in the

¹⁸ NRC, Spent Fuel Storage Licensing. Available online at: <https://www.nrc.gov/waste/spent-fuel-storage/licensing.html>. Accessed July 2023.

¹⁹ [ADAMS Public Documents | NRC.gov](#); see NRC ascension no. ML16090A254 (PINGP). A generic internet search engine can also be used by typing in the ascension number.

Prairie Island ISFSI Updated Safety Analysis Report²⁰. In addition, as mentioned above in Section 7a, river levels at PINGP are evenly controlled by the USACE Lock and Dam 3 near the PINGP's setting on the Mississippi River.²¹ The Project would not change the surface elevation of the existing ISFSI footprint.

Project Design

The Project will not expand or otherwise change the existing fenced area of the ISFSI. The area that will be modified to accommodate additional storage pads is currently made up of compacted Class 5 gravel, an impervious surface. The Project will replace portions of the Class 5 gravel area with concrete pads and approach aprons with the same area of impact as the present graveled footprint. National Pollutant Discharge Elimination System (NPDES) and State Disposal System (SDS) Permit MN0004006 authorizes PINGP (including the ISFSI) to discharge stormwater associated with industrial activity in accordance with the terms and conditions of the NPDES/SDS Permit. The term "impervious" as defined by the PINGP Stormwater Pollution Prevention Plan (SWPPP for Xcel Energy's Permit No. MN0004006, July 1, 2015) is a "constructed hard surface that either prevents or retards the entry of water into the soil and causes water to run off the surface in greater quantities and at an increased rate of flow than prior to development. Examples include rooftops, sidewalks, patios, driveways, parking lots, storage areas, and concrete, asphalt, or gravel roads." Gravel and concrete are equally defined as impervious surfaces.

Section 15.11 of the SWPPP describes the stormwater drainage system at the ISFSI. As stated previously, the ISFSI is surrounded, except for an opening to allow travel in and out of the ISFSI, by a large earthen berm. Within the ISFSI, stormwater is directed by grade to the southwest and southeast corners, where stormwater travels through two metal drainage pipes which outlet to riprap structures outside of the berm. Once stormwater is outside of the berm, stormwater flows overland through a minor swale to a "landlock ditch." The landlock ditch is an extensive ditch system that originates southwest of the PINGP site and receives stormwater from multiple PINGP areas. Because the ISFSI stormwater flow does not flow to a retention basin or similar structure with volume limitations, but towards a generally diffuse overland area to the southeast eventually leading to the landlock ditch, there are currently no limiting factors on the volume of stormwater produced by the ISFSI. Regardless, the Project will not produce any new impervious area, which will result in no change in the quantity or quality of stormwater. No design changes are needed to account for potential impacts from climate change. The project design is not expected to make a contribution to climate change.

²⁰ [ADAMS Public Documents | NRC.gov](https://www.nrc.gov/publications/ADAMS%20Public%20Documents%20-%20NRC.gov); NRC ascension no. ML16090A254. The ISFSI USAR is a report submitted to the NRC with the application for the operating license, as amended or supplemented, and reviewed by the NRC in granting the initial license to operate the facility. There are three main purposes of the USAR: 1) contains the Safety Analyses which are analyses that demonstrate the integrity of the storage systems in NRC required accident scenarios; 2) contains the Design Bases which is the information that identifies the specific functions to be performed by a structure, system, or component of a facility and the specific values or ranges of values chosen for controlling parameters as reference bounds for design; and 3) contains the SAR Description which includes text, tables, diagrams, etc., that provide an understanding of the design bases, safety analyses and facility operation under conditions of normal operation, anticipated operational occurrences, design basis accidents, external events, and natural phenomena for which the ISFSI and storage system is designed to function.

²¹ NRC, 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

8. COVER TYPES

Estimate the acreage of the site with each of the following cover types before and after development:

Table 8-1: Cover Types

Cover Type	Before (acres)	After (acres)	Cover Type	Before (acres)	After (acres)
Wetlands	0.0	0.0	Lawn/landscaping	0.0	0.0
Deep water/streams	0.0	0.0	Stormwater Pond	0.0	0.0
Wooded/forest	0.0	0.0	Impervious Surfaces:		
Brush/Grassland	0.0	0.0	Concrete surfaces	0.0	0.6
Cropland	0.0	0.0	Asphalt drive surface	0.0	0.0
Rangeland/Pastureland	0.0	0.0	Class 5 gravel*	0.6	0.0
			TOTAL	0.6	0.6

*Class 5 gravel is considered an impervious surface per the SWPPP for Xcel Energy's Permit No. MN0004006, issued July 1, 2015.

No green infrastructure will be included in the Project's design. Such uses would compromise the integrity of the intended use of the facility. No trees will be removed or planted as part of the Project.

9. PERMITS AND APPROVALS REQUIRED

List all known local, state, and federal permits, approvals, certifications, and financial assistance for the project. Include modifications of any existing permits, governmental review of plans and all direct and indirect forms of public financial assistance including bond guarantees, Tax Increment Financing, and infrastructure. *All of these final decisions are prohibited until all appropriate environmental review has been completed. See Minnesota Rules, Chapter 4410.3100.*

Table 9-1: Permits and Approvals

Unit of Government/Agency	Type of Application	Status
Federal		
Nuclear Regulatory Commission	Operating License, Subsequent License Renewal ^a	Anticipated application submission in 2026
State		
Minnesota Public Utilities Commission	Certificate of Need ^b	Submitted February 7, 2024
City		
City of Red Wing	Building Permit	Need for permit to be determined – Pending agency review closer to construction

Unit of Government/Agency	Type of Application	Status
a	An NRC SLR to extend the operating life of Units 1 and 2 is governed by NRC regulations under Title 10 of the Code of Federal Regulations (10 CFR) Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants." The NRC and the Nuclear Energy Institute have standardized the process for subsequent license renewal in NUREG-2191, <i>Generic Aging Lessons Learned for Subsequent License Renewal Report</i> ²² and NUREG-2192, <i>Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants</i> . ²³	
b	A CON for additional dry fuel storage is needed to store additional spent fuel within the ISFSI.	

There are no public loans and/or grants associated with the Project and no other forms of direct and/or indirect public financial assistance.

Cumulative potential effects may be considered and addressed in response to individual EAW Item Nos. 10-20, or the RGU can address all cumulative potential effects in response to EAW Item No. 21. If addressing cumulative effect under individual items, make sure to include information requested in EAW Item No. 21.

10. LAND USE

a) Describe:

- i) **Existing land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands.**

The land area within the ISFSI security fences is approximately 5.5 acres and includes three storage pads, equipment storage building, and a security building. The area within the ISFSI fence line is limited to use by Company operations. Operational activities include the storage and periodic transfer of filled DFS systems to the ISFSI pads and routine inspections and monitoring. The instrumentation building is located outside the earthen berm and north of the access road (Appendix A, Map 16).

Land use in and around the ISFSI has remained the same since the facility was constructed. Land use in the area immediately adjacent to the PINGP and the ISFSI is a mixture of commercial, light industrial, residential, municipal, and commercial farming. The PINGP and the ISFSI occupy a former agricultural field and the predominant land use west of the site is agricultural, while the area to the east of the site is the Mississippi River. Some of the ISFSI area was used for the concrete batch plant and dredge material disposal area during the initial construction of PINGP.^{24,25} Appendix A, Map 8 depicts public lands and land cover/land use in the area.

²² NRC. 2017. *Generic Aging Lessons Learned for Subsequent License Renewal Report – Final Report*. NUREG-2191). Revision 1. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2191/index.html>. Accessed July 2023.

²³ NRC. 2017. *Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants – Final Report*. NUREG-2192. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr2192/index.html>. Accessed July 2023.

²⁴ NRC. 2015. *Final Environmental Assessment for the Proposed Renewal of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation*, Docket No. 72-0010, June 2015. Available online at: <https://www.nrc.gov/docs/ML1509/ML15098A026.pdf>. Accessed July 2023.

²⁵ NRC. 2020. *Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation*, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

The City of Red Wing is located along the banks of the Mississippi River about 28 miles southeast of the Minneapolis-St. Paul metropolitan area. The PINGP property is located on a low island terrace associated with the Mississippi River floodplain that lies within the northwestern portion of the Red Wing city limits. The property is bordered by the Vermillion River to the west and the Mississippi River to the east.

The Canadian Pacific (CP) Railroad is near the ISFSI; from Red Wing, it runs northwest towards PINGP along County Road 18 until it approaches near the PINGP cooling towers and the ISFSI. From there, it runs further northwest towards the Prairie Island Indian Community (PIIC) and then back along Highway 18 towards Hastings. A spur from the CP Railroad connects the rail line to the PINGP. This portion of the railway is only used for material deliveries to PINGP.

The USACE Lock and Dam No. 3 is located about 1-mile south of the PINGP property and about 1.4 miles southeast of the ISFSI; the road to the lock and dam runs north-south past the entrance to the PINGP. Numerous wetlands, sloughs, and basins are present along the Vermillion and Mississippi Rivers and their tributaries.

The PIIC is immediately adjacent to the PINGP property to the north and west and about 0.5-mile northwest of the ISFSI site at the nearest point. The PIIC is the ancestral homeland of the Mdewakanton Band of Eastern Dakota. The PIIC Tribal Council has jurisdiction over land use within the reservation. Developments within the PIIC include residential areas, various community buildings, a wastewater treatment plant, Treasure Island Resort and Casino, and the Prairie Island Sports Complex. Sturgeon Lake Road and Wakonade Drive (which becomes Lock and Dam Road after it passes by the PINGP) separate the PIIC and the PINGP property. Additionally, NSP Road and the CP Railroad spur run between the ISFSI and the PIIC. The immediate area surrounding the ISFSI is forested which creates a natural vegetative buffer between the ISFSI, the PIIC, and public roads.

The Treasure Island Resort and Casino is the closest business to the PINGP ISFSI and is approximately 1 mile north of the site. The hotel has 788 rooms and is the second largest hotel in the state. The amphitheater, opened in 2017, holds concerts and events for up to 16,000 people.²⁶ The PIIC also owns and operates Dakota Station, a gas station and convenience store approximately 1 mile northwest of the ISFSI. The Prairie Island Sports Complex is also about 1 mile northwest of the ISFSI. Additional facilities within the PIIC and a 1-mile radius of the site include the Lower Island residential area,²⁷ the PIIC Land & Environment Office, church, clinic, community center, education building, elder center, fitness center, pow-wow grounds, public safety building, community garden, tribal court, tribal government administration building, water treatment facility, and wastewater treatment facility. The nearest resident is approximately 0.45 miles (724 meters) northwest of the ISFSI within the PIIC.²⁸

Certain portions of the undeveloped areas of Prairie Island (both on- and off-reservation) are used for traditional ceremonies, medicinal plant gathering, prairie restoration, the PIIC Edwin Buck Jr. Memorial Buffalo Project, wild rice restoration, hunting, fishing, and other recreational activities.²⁹ In addition, the PIIC Tribal Council issues land assignment certificates to tribal members, who are granted lifetime use of

²⁶ Treasure Island Resort and Casino, 2023. Homepage, Resorts Page, Concerts and Events Page. Available online at: <https://www.ticasino.com/>. Accessed July 2023.

²⁷ The Lower Island residential area consists of 53 Tribal member houses and 4 houses that are not native owned.

²⁸ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

²⁹ PIIC. 2023. Edwin Buck Jr. Buffalo Project. Available online at: <https://prairieisland.org/who-we-are/our-culture/buffalo-project>. Accessed July 2023.

that parcel as a homestead. Each assignee granted a new land assignment (one without an existing dwelling) has 1 year to make improvements (i.e., construct or place a home on the assignment). Reservation and trust lands are not subject to state or local land use jurisdiction and Indian tribes are free to develop independent land-use policies and management plans. Xcel has worked with PIIC on a number of projects to provide information that supports land management, restoration, and enhancement efforts on Prairie Island. Among the projects is a medicinal and culturally important plant study conducted in 2008 and 2009 within the PINGP property boundary.³⁰ The Company continues to engage PIIC regarding land use activities that occur on the PINGP property and within the ISFSI per the Company's Cultural Resource Management Plan (CRMP).

Further development in the immediate area of PINGP is naturally constrained by the presence of rivers, wetlands, sloughs, the PIIC, and the existing infrastructure and development described herein. No impacts on or changes to land use or ownership would occur as part of the Project other than the modification of areas within the PINGP. The Project would have no effect on the current or future use of land within the City of Red Wing or the PIIC. Associated operations will remain unchanged under the activities proposed as part of this Project.

ii) Plans. Describe planned land use as identified in comprehensive plan (if available) and any other applicable plan for land use, water, or resources management by a local, regional, state, or federal agency.

PINGP is an established facility within the community and has been present since the 1970s. Additional development in the area surrounding PINGP is unlikely due to the proximity of the PIIC and natural constraints such as the Mississippi and Vermillion rivers and numerous lakes, sloughs, and wetlands in the area between PINGP and the Red Wing city center. The Company sent letters to Goodhue County, the City of Red Wing and PIIC in July 2023 to solicit comment on the Project (Appendix B). Goodhue County responded on August 10, 2023. The Company, Goodhue County, the City of Red Wing, and the PIIC continue to meet on a recurring basis to discuss PINGP. Comments included in the Goodhue County response are included in the relevant section of this EAW.

According to the City of Red Wing's 2040 Community Plan,³¹ Red Wing's land use has been defined and somewhat limited by the prevalence of rivers, floodplains, wetlands, bluffs, valleys, and steep slopes associated with the Mississippi River and its tributaries. Early settlement was concentrated around a major bend in the Mississippi River, eventually expanding to the south along the bluffs and west along Highway 61 which runs east-west through the city. In 1971, adjacent Burnside Township was annexed into the city expanding the size of the city to more than 40 square miles.

The 2040 Community Plan outlines goals for encouraging residential and commercial development within the city, as well as preserving valuable open space and agricultural land. Current land use within Red Wing is heavily weighted toward open space, agricultural, and rural residential uses.³² Open space areas include rivers, creeks, wetlands, bluffs, valleys, and prairie landscapes that are primarily located between Highway 61 and the Mississippi River. Agricultural and rural residential areas are prevalent along the north and

³⁰ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

³¹ City of Red Wing. 2019. Red Wing 2040 Community Plan. February 25, 2019. Available online at <https://www.red-wing.org/846/Red-Wing-2040-Community-Plan>. Accessed July 2023.

³² *Ibid.*

south sides of Highway 61 throughout much of the former Burnside Township area. Urban, residential, and commercial development in Red Wing is predominantly along the Highway 61 corridor and the historic downtown area. The 2040 Community Plan specifically calls out the PINGP as a vital economic resource, providing 56 percent of total tax revenues for the community.³³ No land use or resource management changes at PINGP are contemplated under the 2040 Community Plan.

In 2021, the PIIC established the Prairie Island Net Zero Project (Net Zero Project) with a goal of achieving net zero carbon emissions within the community and gaining energy resiliency and sovereignty within the next few years.^{34,35} These efforts will involve development of several energy infrastructure developments to offset of carbon emissions and move the PIIC toward its goal of net zero carbon emissions. The Net Zero suite of projects is currently under development and the solar photovoltaic and geothermal energy projects are almost complete.^{36,37} Additional information about the Net Zero Project is provided and assessed in Section 21, however, the PINGP is not subject to the Net Zero Project.

PIIC also has plans to develop more than 1,000 acres of land in Pine Island, Minnesota in an area known as Elk Run. The land was purchased after state legislation allowed the tribe to purchase land within a 50 mile radius of Prairie Island back in 2019. The PIIC is the closest community to a nuclear plant in the United States, and this was one of the factors in the decision to approve purchase of the land.³⁸

As stated above, Project activities would occur entirely within previously disturbed areas wholly on PINGP property. Therefore, there would be no impacts on or changes to local and/or regional planning.

iii) Zoning, including special districts or overlays such as shoreland, floodplain, wild and scenic rivers, critical area, agricultural preserves, etc.

The PINGP is within the city limits of Red Wing in an area described as split zoning. Review of the 2040 Community Plan clarifies that the PINGP and the ISFSI are zoned as Industrial. The PINGP is within the City of Welch, Minnesota due to being within the zip code 55089 assigned to the City but also overlaps with City of Red Wing.

The Project is entirely within the PINGP property. The PINGP site, which contains the ISFSI and the Project area, is zoned as Industrial.³⁹ The Project would not require a zoning amendment or conditional use permit. Continued use as an ISFSI is a compatible use in the Industrial zoning district.

³³ City of Red Wing. 2019. Red Wing 2040 Community Plan. February 25, 2019. Available online at <https://www.red-wing.org/846/Red-Wing-2040-Community-Plan>. Accessed July 2023.

³⁴ PIIC. 2023b. Righting an Environmental Injustice. Available online at <https://prairieisland.org/who-we-are/our-land/net-zero>. Accessed July 2023.

³⁵ Sahan Journal. 2022. Prairie Island Indian Community Nuclear Concern Powers Net Zero Carbon Emissions Plan, August 5, 2022. Available online at <https://sahanjournal.com/climate-environment/prairie-island-indian-community-nuclear-concern-powers-new-emissions-plan/>. Accessed July 2023.

³⁶ Sahan Journal. 2023. In the Shadow of a Nuclear Power Plant, Prairie Island Celebrates Steps Toward a Green Future, October 2, 2023. Available online at <https://sahanjournal.com/climate-environment/prairie-island-indian-community-celebrates-green-future/>. Accessed November 2023.

³⁷ PIIC. 2023. Prairie Island Net Zero Project Progress Report, July 1, 2023. Available online at <https://prairieisland.org/uploads/PIIC-Net-Zero-2023-Progress-Report.pdf>. Accessed November 2023.

³⁸ KTTC. 2023. Caplan, Noah. "Prairie Island Indian Community discusses plans for land off Highway 52 near Pine Island".

³⁹ City of Red Wing. 2019. Red Wing 2040 Community Plan. February 25, 2019. Available online at <https://www.red-wing.org/846/Red-Wing-2040-Community-Plan>. Accessed July 2023.

The ISFSI is not within a shoreland overlay district, though agricultural conservation overlays are present in the area directly adjacent to the PINGP property boundary on the east and along the south side of the Canadian-Pacific Railroad.

The ISFSI is within a Federal Emergency Management Agency (FEMA)-designated 500-year floodplain with 100-year floodplains directly adjacent to the east of the PINGP property (i.e., the Mississippi River, a designated FEMA floodway), south, and on the opposite side of the Canadian-Pacific Railroad. Appendix A, Map 9 depicts floodplain locations within 5 miles of the Project. There are no wild and scenic rivers, critical areas, or agricultural preserves in the vicinity of the Project. Both the Vermillion (Public Waters Inventory [PWI] Number 19010a) and Mississippi Rivers (PWI Number 01001a) are designated PWI watercourses as are several tributaries. The Mississippi River (PWI Number 01001a) is also designated as State Water Trail; the Hastings to Iowa segment passes by the Project area.⁴⁰ The Project is not visible from the Mississippi or Vermillion Rivers and will not result in impacts to these features during construction or operation.

(iv) If any critical facilities (i.e., facilities necessary for public health and safety, those storing hazardous materials, or those with housing occupants who may be insufficiently mobile) are proposed in floodplain areas and other areas identified as at risk for localized flooding, describe the risk potential considering changing precipitation and event intensity.

The Project is not proposed within a FEMA 100-year floodplain but is within a FEMA 500-year floodplain; however, this is associated with low to moderate risk of flooding (0.2% annual chance of flooding.⁴¹ In addition, as mentioned above in Section 7a, river levels at PINGP are evenly controlled by the USACE Lock and Dam 3 near the PINGP's setting on the Mississippi River.⁴²

b) Discuss the project's compatibility with nearby land uses, zoning, and plans listed in Item 9a above, concentrating on implications for environmental effects.

The proposed Project is located entirely on PINGP property. As the PINGP site and the ISFSI footprint are already zoned as Industrial, the Project would be consistent with the existing zoning designation. Development opportunities identified in Red Wing's 2040 Community Plan are clustered around the Highway 61 corridor and areas to the south and west; no development opportunities are identified in the vicinity of PINGP. The existing ISFSI has not impacted nearby land uses, zoning, and/or plans to date and no incompatibility with future land use, zoning, or development is anticipated. There are no additional land use plans, either current or proposed, which have been or could be impacted by the Project.

c) Identify measures incorporated into the proposed project to mitigate any potential incompatibility as discussed in Item 10b above and any risk potential.

As there are no anticipated incompatibilities with land use, local and regional planning, zoning, or land use plans, no mitigation measures are required.

⁴⁰ DNR. 2023. Public Waters Inventory Lists, Goodhue County. Available online at: https://files.dnr.state.mn.us/waters/watermgmt_section/pwi/GOOD_PWILIST.PDF. Accessed July 2023.

⁴¹ USDA, n.d., FEMA Flood Zone Designations (100-year/500-year floodplain). Available online at: https://efotg.sc.egov.usda.gov/references/public/NM/FEMA_FLD_HAZ_guide.pdf. Accessed January 2024.

⁴² NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

Project Interaction with Climate Trends

Because no changes to land use will result from the Project, no land use-related interactions with climate trends will occur. Increased likelihood of flooding as a result of climate change will not impact ISFSI operations because the ISFSI has been sited and designed so that the lowest point of potential water entry into the DFS is above the level of the probable maximum flood (per the study described in the ISFSI Updated Safety Analysis Report). In addition, as mentioned above in Section 7a, river levels at PINGP are evenly controlled by the USACE Lock and Dam 3 near the PINGP's setting on the Mississippi River.⁴³

11. GEOLOGY, SOILS AND TOPOGRAPHY/LANDFORMS

- a) Geology - Describe the geology underlying the project area and identify and map any susceptible geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. Discuss any limitations of these features for the project and any effects the project could have on these features. Identify any project designs or mitigation measures to address effects to geologic features.**

Information regarding the geology of the area has not changed significantly from the analysis last presented for the 2009 EIS, and is referenced here.⁴⁴ The PINGP site occupies an outwash terrace formed on the Minnesota side of the Mississippi River. The type of bedrock beneath the area is predominantly composed of sedimentary rock of the St. Lawrence and Franconia Formations, both within the Upper Cambrian System. The St. Lawrence Formation is comprised of tan to gray, well-cemented, thin- to medium-bedded silty dolostone and siltstone. This formation is typically about 40 to 50 feet in thickness. The Franconia Formation is mostly comprised of glauconitic, feldspathic, very fine to fine-grained sandstone. The Franconia Formation is generally coarser grained and more poorly cemented than the St. Lawrence Formation. This formation is typically about 165 to 175 feet in thickness. The depth to bedrock beneath the PINGP site is approximately 100 feet. Overlying the bedrock is sand and gravel of the Holocene and Pleistocene age.⁴⁵ The area within the ISFSI not currently used for storage pads is covered with compacted aggregate.

There are several major faults in the Minnesota–Wisconsin region, but there is no evidence of recent activity along any of the known fault zones in the region. The southern portion of the Lake Owen fault, known as the Hastings fault, trends southwest. Movements along these faults appear to have been restricted to Precambrian timeframes (about 541 million years to 4.6 billion years ago).

No sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions were noted in prior environmental review of the ISFSI. Karst is known to occur in Goodhue County, although is not mapped in areas along the Mississippi River.⁴⁶

When the ISFSI was originally constructed, the Project location was excavated and granular base material (gravel/sand) was installed and compacted. Excavation would be limited to removal of sub-grade materials that were previously disturbed and/or placed as part of original ISFSI construction. As the

⁴³ *Ibid.*

⁴⁴ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

⁴⁵ *Ibid.*

⁴⁶ E. Calvin Alexander Jr et al. 2006. Minnesota Karst Lands map. Available online at: https://www.researchgate.net/figure/Minnesota-Karst-Lands-map-2006-Alexander-2015-Gao-and-Alexander-2008_fig4_306062296. Accessed July 2023.

excavations would be limited to removing no more than the top 6 feet of material, the excavations are not anticipated to extend beyond unconsolidated, previously disturbed materials and thus impacts to subsurface geology are not expected.

- b) Soils and topography - Describe the soils on the site, giving NRCS (SCS) classifications and descriptions, including limitations of soils. Describe topography, any special site conditions relating to erosion potential, soil stability or other soils limitations, such as steep slopes, highly permeable soils. Provide estimated volume and acreage of soil excavation and/or grading. Discuss impacts from project activities (distinguish between construction and operational activities) related to soils and topography. Identify measures during and after project construction to address soil limitations including stabilization, soil corrections or other measures. Erosion/sedimentation control related to stormwater runoff should be addressed in response to Item 12.b.ii.**

Information regarding the soils and topography of the area has not changed significantly from the analysis presented in the 2009 DOC EIS. The ISFSI is constructed on alluvial soils (loamy sands) which are supported by sedimentary rock of the St. Lawrence and Franconian formation (see Section 11.a). The soils at the PINGP are all classified as Sparta Loamy Sand, with 0-6 percent slopes, and deep, excessively drained soils formed in sandy outwashes on stream terraces in areas such as river valleys. Appendix A, Map 10 identifies soils in the general area. Soils were mapped using the Natural Resources Conservation Service (NRCS) Web Soil Survey mapping application.⁴⁷

The Company has performed additional study of the ISFSI area since the 2009 EIS which advise on soils at the ISFSI site,⁴⁸ as follows:

- In September 2014, the Company conducted deep soil testing at the ISFSI as part of a Phase I Archaeological Investigation to support expansion to the third pad. The 2014 Phase I investigation involved 15 shovel tests, of which 10 were within the proposed footprint for the third pad. As part of the archaeological investigation, deep soil cores were taken at six locations, three within ISFSI footprint, and were excavated to a depth of 10 feet. An archaeologist analyzed the six soil cores and found no evidence of buried paleosols.⁴⁹ Additional detail can be found in Section 15 of this EAW.
- Concurrent with the archaeological investigations, the Company completed geotechnical exploration to characterize subsurface soil and groundwater conditions. The soil conditions from three borings within the ISFSI fence line revealed 1 foot of aggregate base and about 1 foot of fill. Fill consisted of silty sand or poorly graded sand overlying native granular soils. The presence of fill indicates previous disturbance, likely from initial construction of the ISFSI. The native granular soils consisted of silty sand and poorly graded sand with silt and poorly graded sand corresponding to the American Society for Testing and Materials Classifications SM, SP-SM and SP, respectively.⁵⁰

⁴⁷ USDA-NRCS. 2023. Web Soil Survey. Available online at <https://websoilsurvey.sc.egov.usda.gov/App/WebSoilSurvey.aspx>.

⁴⁸ Xcel Energy, 2019. U.S. Nuclear Regulatory Commission, Prairie Island Independent Spent Fuel Storage Installation, ISFSI Site-specific License Amendment Request, Environmental Report Supplement. May 8, 2019.

⁴⁹ Westwood Professional Services, Inc., 2014. Phase I Archaeological Investigations for the Proposed Expansion of the Independent Spent Fuel Storage Installation and Associated Infrastructure at the Prairie Island Nuclear Generating Plant, Goodhue County, Minnesota. Eden Prairie, Minnesota: Westwood Professional Services, Inc. December 2014.

⁵⁰ Haugo GeoTechnical Services. 2014. Preliminary Geotechnical Exploration Report Proposed Storage Facility Prairie Island Nuclear Generating Plant Welch, Minnesota. Minneapolis, Minnesota. November 2014.

- In 2018, the Company performed a series of four Seismic Cone Penetration Test (CPT) soundings in July 2018 within the ISFSI and in the area of the third pad. The fieldwork included 425 feet of CPT sounding, with anticipated termination depths of 100 to 125 feet below the ground surface.⁵¹ Soil types were characterized as loose sand to very dense sand. At locations CPT-1, CPT-3, and CPT-4, the probe hit refusal due to dense soil layers at depths varying from 45 feet to 56 feet below grade. CPT-2 encountered a shallower refusal at just 14.8 feet below grade due to an unknown underground obstruction. The area surrounding the CPT-2 boring location exhibited reflections that suggest both large and small subsurface features from this area that would be consistent with buried debris, rubble, or concrete. A “trench-like” feature was found in the precise location of CPT-2 running in the east-west direction. This location would be consistent with a “pit” like feature (approximately the width of front-end loader) that would be filled with ready-mix dump or wash-out. Additionally, reflections surrounding this feature suggest smaller buried anomalies or other buried debris. These finds are consistent with the PINGP ISFSI’s history as the site of the former concrete batch plant for construction of the PINGP facility.^{52,53}

The Company will perform soil analyses within the ISFSI, prior to construction, to characterize the subsurface materials. No soil corrections are anticipated to be needed during construction or operation of the proposed Project. During construction, soil stabilization measures would consist of erosion and sediment structural controls and best management practices (BMPs), refer to Section 12.b.ii.1 for additional details. Upon Project completion, those areas not covered by concrete would be regraded to preconstruction contours and recovered with Class 5 gravel. No additional stabilization measures would be required during regular ISFSI operations. Other than slight sloping of the pad (2 percent grade) to direct stormwater runoff towards drainage structures which outlet on the southwest and southeast sides of the berm, the immediate Project area is flat with no steep slopes present.⁵⁴ The current ISFSI facility has had no structural issues since its construction. There are no sources of contamination associated with the ISFSI that could contaminate surrounding soils. There are no highly erodible soils or silica sands present.

As stated in Section 6.b, excavation would be limited to removing no more than 6 feet of surface material. This excavation would total approximately 5,760 cubic yards on about 0.6 acre. The Company anticipates that excavation would be limited to removal of sub-grade materials that were previously disturbed and/or placed as part of original ISFSI construction.

12. WATER RESOURCES

- a) **Describe surface water and groundwater features on or near the site in a.i. and a.ii. below.**
 - i) **Surface water - lakes, streams, wetlands, intermittent channels, and county/judicial ditches. Include any special designations such as public waters, trout stream/lake, wildlife lakes, migratory waterfowl feeding/resting lake, and outstanding resource value water. Include water quality impairments or special designations listed on the current MPCA 303d**

⁵¹ Braun Intertec. March 29, 2019. Ground Penetrating Radar Letter, Prairie Island Nuclear Generating Plant ISFSI Subsurface Evaluation Welch, Minnesota. Minneapolis, MN.

⁵² NRC. 2015. Final Environmental Assessment for the Proposed Renewal of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, June 2015. Available online at: <https://www.nrc.gov/docs/ML1509/ML15098A026.pdf>. Accessed July 2023.

⁵³ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

⁵⁴ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

Impaired Waters List that are within 1 mile of the project. Include DNR Public Waters Inventory number(s), if any.

The Mississippi River, Vermillion River, and Sturgeon Lake are adjacent to PINGP. Both the Vermillion and Mississippi Rivers are designated PWI watercourses and most of the tributaries, wetlands, sloughs, and basins along them are also designated as PWIs.^{55,56} PWI waters within one mile of the PINGP ISFSI are provided in Table 12-1 and those within a 5 mile radius are shown in Appendix A, Map 11. The Mississippi River also is designated as a State Water Trail.⁵⁷

Table 12-1: Minnesota Public Waters within 1 mile of the PINGP ISFSI

PWI Name	PWI Number	PWI Label	Distance to Project (miles)	Direction from Project
Vermillion River	19010a	PWI Watercourse	0.8	Southwest
Mississippi River	01001a	PWI Watercourse	0.7	East
MAJ-070440751	None provided	PWI Watercourse	0.4	Southwest
U.S. Lock and Dam #3 Pool	25-17	PWI Basin	0.3	East
Sturgeon Lake	None provided	PWI Basin	0.6	North
Brunner Lake	25-6	PWI Wetland	0.9	South
Buffalo Slough	25-25	PWI Basin	0.9	Southeast
Jones Lake	25-8	PWI Wetland	0.8	South
Wildcat Lake	25-7	PWI Basin	0.6	South
Birch Lake	25-9	PWI Basin	0.3	South
Goose Lake	25-5	PWI Basin	0.3	Southwest

Lock and Dam Number 3, which controls the flow and level of the Mississippi River in the vicinity of PINGP and Sturgeon Lake, is a PWI basin approximately one mile downstream from the site. Typically, the Mississippi River is kept at a water level higher than that of the Vermillion River and discharge from Lock and Dam 3 tends to be at its peak in the spring and summer. The Project is not near trout streams/lakes, wildlife lakes, migratory waterfowl feeding/resting lakes, or outstanding resource value waters.

Waters within one mile of the PINGP ISFSI listed in the Minnesota Pollution Control Agency’s (MPCA) draft 2024 list of 303d impaired waters are provided in Table 12-2. Because the project will not result in any new impervious surface or modifications to the quality or quantity of stormwater runoff, additional impacts to impaired waters are not expected. The following waters have Total Maximum Daily Load plans,

⁵⁵ Xcel Energy, 2019. U.S. Nuclear Regulatory Commission, Prairie Island Independent Spent Fuel Storage Installation, ISFSI Site-specific License Amendment Request, Environmental Report Supplement. May 8, 2019.

⁵⁶ DNR. 2023. Mississippi State Water Trail. Available online at <https://www.dnr.state.mn.us/watertrails/mississippiriver/index.html>. Accessed July 2023.

⁵⁷ *Ibid.*

or TMDLs, approved by the EPA⁵⁸: the Mississippi River (AUID 07040001-531) for mercury in fish tissue and water column, and the Vermillion River (AUID 07040001-504) for mercury in fish tissue.

Table 12-2: MPCA 303d Impaired Waters within 1 mile of the PINGP ISFSI

Waterbody Name	Impaired Use	Impairment Parameters	Distance to Project (miles)	Direction from Project
Vermillion River/Vermillion Slough (AUID 07040001-504)	Aquatic consumption	Polychlorinated biphenyls (PCBs) in fish tissue	0.3	South/Southwest
Mississippi River (AUID 07040001-531)	Aquatic consumption, aquatic life	Aluminum, PCBs in fish tissue	0.5	East
Sturgeon Lake (AUID 25-0017-01)	Wild rice production	Sulfate	0.6	Northeast

There are no withdrawals of river water for city water supply for at least 300 miles downstream from the site. Minor withdrawals of river water for irrigation purposes do occur, the nearest user being the City of Red Wing.⁵⁹

The Project would require no water resources for construction nor maintenance of the additional DFS systems. There are no surface water discharges from the ISFSI other than stormwater runoff that is permitted under the existing PINGP Industrial Stormwater NPDES/SDS permit (MN0004006). The associated SWPPP does not require updating for the Project. Prior to starting work, the Company will implement erosion control measures that will consist of BMPs such as silt fences and straw bales to minimize any surface drainage off the site. The Company does not expect that a construction SWPPP, or coverage under Minnesota’s construction stormwater permitting program will be required, as the disturbed area will be less than one acre (approximately 0.6 acres). Expansion of the ISFSI will have no other impacts on surface water hydrology.

The Project location is not projected to be subject to more frequent and intense flood events resulting from climate change (see Section 7).

- ii) Groundwater – aquifers, springs, seeps. Include: 1) depth to groundwater; 2) if project is within a MDH wellhead protection area; 3) identification of any onsite and/or nearby wells, including unique numbers and well logs if available. If there are no wells known on site or nearby, explain the methodology used to determine this.**

The ISFSI site is on an island terrace within the Mississippi River floodplain. The aquifers near the site consist of the water table aquifer, which is recharged by precipitation, floodwaters, snowmelt, and from underlying aquifers, and the underlying confined bedrock aquifers. The groundwater table near PINGP is generally within 5 to 20 feet of the ground surface and slopes to the southwest.⁶⁰ The local groundwater

⁵⁸ MPCA. Draft 2024 Impaired Waters List, retrieved from: <https://www.pca.state.mn.us/air-water-land-climate/minnesotas-impaired-waters-list>.

⁵⁹ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

⁶⁰ *Ibid.*

table responds quickly to changes in river elevation.⁶¹ There are no known springs or seeps on the PINGP property.

Generally, wells in the alluvial material near the PINGP site are less than 100 feet deep.⁶² The Company draws groundwater for potable and industrial use from nine wells installed within the alluvial aquifer. The PIIC and Red Wing community public water supply withdraws water from groundwater sources, as do several industries in the Red Wing area.⁶³ The construction of new concrete storage pads and the operation of the ISFSI will not impact groundwater resources. There are no effluents from the ISFSI. There are no borings, holes, or other channels within the ISFSI that could reach groundwater.

According to the Minnesota Department of Health’s (MDH) Minnesota Well Index,⁶⁴ no portion of PINGP, including the Project site, is within a Drinking Water Supply Management Area or Wellhead Protection Area. Table 12-3 below identifies the 10 wells on the PINGP property. The next nearest well is approximately 0.6 miles southeast of the ISFSI on private property, also known as the Suter Farm well.⁶⁵ Appendix A, Map 11 depicts Minnesota Well Index (MWI) wells within a 5-mile radius of the Project.

Table 12-3: PINGP Well Locations

Well ID	Well Name	Well Depth	DNR Permit No.	Well Use
256074	Training Center	154	1996-5042	Potable water, sanitary, lawn
780008	Distribution Center	231	N/A	Potable water
801757	Site Administration Building	356	2015-0785	Air conditioning, irrigation, commercial
523953	Environmental Lab Well	285	N/A	Other categories
256120	Deep Well #121	141	1969-0171	Power generation – non-cooling
256121	Deep Well #122	143	1969-0171	Potable water
463332	New Administration Building Well	160	N/A	Potable water
170784	STA/SEC Well (sealed)	67	N/A	Potable water
611076	Cooling Tower Pumphouse Well	75	1978-5153	Other power generation
402599	Old Screenhouse Well	120	1986-5114	Lubricating pump bearings
780202	Multi-Use Facility Well	258	N/A	Other special categories
807310	Flex Storage Building FP Well	160	2018-0210	Fire protection water supply

⁶¹ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

⁶² Xcel Energy, 2019. U.S. Nuclear Regulatory Commission, Prairie Island Independent Spent Fuel Storage Installation, ISFSI Site-specific License Amendment Request, Environmental Report Supplement. May 8, 2019.

⁶³ *Ibid.*

⁶⁴ MDH. 2023. Minnesota Well Index. Available online at <https://mnwellindex.web.health.state.mn.us>. Accessed July 2023.

⁶⁵ NSPM. 2023. 2022 Annual Radiological Environmental Monitoring Program Report. Available online at: <https://www.nrc.gov/docs/ML2312/ML23128A109.pdf/>. Accessed July 2023.

Radiological impacts of the ISFSI expansion are discussed in Section 22.2. The DOC's 2009 EIS stated that the radiological impacts from expansion of ISFSI to three pads was anticipated to be within NRC regulatory limits and would not be significant during normal operations. This has been demonstrated to be accurate since the 2009 EIS as shown in annual reports submitted to the NRC. The DFS systems are passive systems that emit no radioactive effluents. There are no projected impacts or discharges to groundwater from ISFSI operations. Accordingly, there is a "reasonable expectation that the operation of the facility will not result in groundwater contamination" as required by Minn. Stat. § 116C.83, Subd. 6.⁶⁶

Annually, the Company submits Radiological Environmental Monitoring (REMP) Reports to the NRC.⁶⁷ As described in the 2022 Prairie Island REMP Report,⁶⁸ the Company collects well water and groundwater quarterly from five locations near the plant and analyzes for tritium and gamma-emitting isotopes. Drinking water is collected weekly from the City of Red Wing well. Monthly composites are analyzed for gross beta, iodine-131, and gamma-emitting isotopes and are reported in picocuries per liter (pCi/L). Quarterly composites are analyzed for tritium. In 2022, water samples tested from the control well, P-43 (Peterson Farm) and from four indicator wells (P-8, Community Center, P-6, Lock and Dam No. 3, P-9, Plant Well No. 2 and P-24, Suter Farm) showed no tritium detected above the detection limit. Gamma-emitting isotopes were below detection limits in all samples. In 2022, drinking water from the City of Red Wing well measured tritium activity below the detection limit for all samples. In summary, well water data for 2022 show no radiological effects from the plant operation, which includes the ISFSI.

On March 8, 2024, the Department of Commerce Division of Energy Resources (DOC-DER) submitted comments related to the completeness of the Company's Certificate of Need filing.⁶⁹ Among other topics, DOC-DER referenced the Company's fourth quarter sampling results for tritium⁷⁰ which referenced that the level of tritium in the November 2023 septic sample was higher than previous sample results, and requested that the Company provide an estimated timeline for determining the cause of the elevated tritium levels and actions needed to reduce those levels in its reply comments. In its March 15 Comments, the Company stated that, "The source of elevated tritium levels, which as noted were well below the Environmental Protection Agency's safe drinking water standards, was identified as condensation collected and directed to septic system drains. That issue has been addressed, and levels are now below what our equipment can detect.⁷¹ No groundwater monitoring wells have indicated increased levels of tritium. We will continue to monitor the septic system monthly to ensure we have resolved the issue."⁷²

⁶⁶ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

⁶⁷ Both Radioactive Effluent Reports (sometimes referred to as Radioactive Effluent Release Reports) and Environmental Reports are available for the years 2005 to 2022 at: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/prai1-2.html>. Select any year under these topics to find associated details.

⁶⁸ NSPM. 2023. 2022 Annual Radiological Environmental Monitoring Program Report. Available online at: <https://www.nrc.gov/docs/ML2312/ML23128A109.pdf/>. Accessed July 2023.

⁶⁹ Comments of the Minnesota Department of Commerce, Docket No. E002/CN-24-68, at 5 (March 8, 2024).

⁷⁰ Well Monitoring Report-Fourth Quarter 2023, Docket No. E002/GS-08-690 (February 28, 2024).

⁷¹ Plant equipment can detect down to approximately 800 picocuries per liter.

⁷² Reply Comments – Completeness, Docket No. E002/CN-24-68 at 5 (March 15, 2024).

In addition, the MDH maintains an environmental monitoring program for radioactivity around PINGP. For the last year reported, 2022, no sample results with the environmental monitoring program were found to exceed any federal or state standards or guidelines.⁷³

The ISFSI is not a source of tritium. As construction and operation of the ISFSI will not use any groundwater sources, and the excavation needed to construct the facility will not impact the groundwater table, the Project is not expected to have impacts on groundwater hydrology.

b) Describe effects from project activities on water resources and measures to minimize or mitigate the effects in Item b.i. through Item b.iv. below.

i) Wastewater - For each of the following, describe the sources, quantities and composition of all sanitary, municipal/domestic, and industrial wastewater produced or treated at the site.

(1) If the wastewater discharge is to a publicly owned treatment facility, identify any pretreatment measures and the ability of the facility to handle the added water and waste loadings, including any effects on, or required expansion of, municipal wastewater infrastructure.

The current ISFSI does not, nor would the Project, require restroom facilities and does not discharge wastewater. There would be no change in wastewater produced or discharged as part of this Project; therefore, there would be no wastewater impacts.

(2) If the wastewater discharge is to a subsurface sewage treatment system (SSTS), describe the system used, the design flow, and suitability of site conditions for such a system. If septic systems are part of the project, describe the availability of septage disposal options within the region to handle the ongoing amounts generated as a result of the project. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity, and amount with this discussion.

There are no wastewater discharges from the ISFSI or proposed as part of the Project; therefore, there would be no impacts related to wastewater discharge.

(3) If the wastewater discharge is to surface water, identify the wastewater treatment methods and identify discharge points and proposed effluent limitations to mitigate impacts. Discuss any effects to surface or groundwater from wastewater discharges, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects.

There are no wastewater discharges from the ISFSI or proposed as part of the Project; therefore, there would be no effects from discharged wastewater.

ii) Stormwater - Describe changes in surface hydrology resulting from change of land cover. Describe the routes and receiving water bodies for runoff from the project site (major downstream water bodies as well as the immediate receiving waters). Discuss environmental effects from stormwater discharges on receiving waters post construction

⁷³ MDH. 2024. Environmental Monitoring Report. 2022 Data – January 9, 2024. Available online at:

<https://www.health.state.mn.us/communities/environment/radiation/docs/monitor/pi/2022enviropt.pdf><https://www.health.state.mn.us/communities/environment/radiation/monitor/index.html>.

including how the project will affect runoff volume, discharge rate, and change in pollutants. Consider the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity, and amount with this discussion. For projects requiring NPDES/SDS Construction Stormwater permit coverage, state the total number of acres that will be disturbed by the project and describe the stormwater pollution prevention plan (SWPPP), including specific best management practices to address soil erosion and sedimentation during and after project construction. Discuss permanent stormwater management plans, including methods of achieving volume reduction to restore or maintain the natural hydrology of the site using green infrastructure practices or other stormwater management practices. Identify any receiving waters that have construction-related water impairments or are classified as special as defined in the Construction Stormwater permit. Describe additional requirements for special and/or impaired waters.

Construction

NPDES Permit MN0004006 from MPCA authorizes the discharge of stormwater associated with industrial activity from the PINGP and the ISFSI. The existing ISFSI was designed with a slight slope to the southwest and southeast drainage structures to direct runoff to the perimeter of the ISFSI. From there, stormwater travels through two metal pipes to riprap outfall structures outside of the berm. Once stormwater is outside of the berm, stormwater flows overland through a minor swale to a “landlock ditch.”

As the area of construction would be less than 1 acre in size, the Company would not be required to obtain MPCA construction stormwater permit coverage for construction stormwater discharges. Nevertheless, the Company would implement BMPs and erosion and sediment controls to ensure stormwater runoff did not leave the property. During construction it is estimated that most stormwater would drain into the surrounding soils, which are highly permeable. Construction BMPs and sediment and erosion control devices would prevent the occurrence of point discharges from the site into any conveyances that could permit sediment or silt-laden runoff into natural flow routes that discharge into the Mississippi and Vermillion Rivers, or the tributaries, wetlands, sloughs, and basins along them. Perimeter controls, such as silt fence and/or straw wattles, would be installed to ensure sediment or silt-laden runoff does not leave the property. Controls would be installed and maintained in accordance with manufacturer specifications and repaired or replaced when found to be no longer functioning properly.

Potential pollutants that could result from construction activities would be related to sediment or oil and gas residue that could potentially be generated from onsite construction equipment. The Project would not expose any industrial activities to stormwater and the existing DFS systems will remain secure during construction.

The Project would have minimal impacts related to construction stormwater with proper controls. Stormwater impacts that could occur would be managed by the Company-implemented BMPs. The Company does not anticipate that the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount will overwhelm the stormwater conveyance system already in place at PINGP (see Section 7.b) because the Project will not alter the quantity of stormwater produced or needing to be managed.

Operations

As stated in Section 7.b, the existing ISFSI is surrounded by a berm. Within the ISFSI, stormwater is directed by grade to the southwest and southeast corners, where stormwater travels through two metal drainage pipes which outlet to riprap structures outside of the berm. Once stormwater is outside of the berm, stormwater flows overland through a minor swale to a "landlock ditch." Because the ISFSI stormwater flow does not flow to a retention basin or similar structure with volume limitations, but towards a generally diffuse overland area to the southeast, eventually leading to the landlock ditch, there are no limiting factors on the volume of stormwater produced by the ISFSI. Stormwater runoff during operations is expected to be relatively unaffected by the Project. The area impacted by expansion activities is currently covered in Class 5 gravel, which is considered an impervious surface; therefore, the installation of the concrete pads and aprons would not increase the impervious nature of the area. The Company does not anticipate that the effects of current Minnesota climate trends and anticipated changes in rainfall frequency, intensity and amount will overwhelm the stormwater conveyance system already in place at PINGP (see Section 7.b) because the Project will not alter the quantity of stormwater produced or needing to be managed.

Because the Project would not introduce any pollutants to stormwater, it is expected that the quality of the stormwater runoff produced during operations would be similar to the existing runoff quality. Due to the measures outlined above, no environmental impacts are anticipated as a result of the operation of the Project.

- iii) Water appropriation - Describe if the project proposes to appropriate surface or groundwater (including dewatering). Describe the source, quantity, duration, use and purpose of the water use and if a DNR water appropriation permit is required. Describe any well abandonment. If connecting to an existing municipal water supply, identify the wells to be used as a water source and any effects on, or required expansion of, municipal water infrastructure. Discuss environmental effects from water appropriation, including an assessment of the water resources available for appropriation. Discuss how the proposed water use is resilient in the event of changes in total precipitation, large precipitation events, drought, increased temperatures, variable surface water flows and elevations, and longer growing seasons. Identify any measures to avoid, minimize, or mitigate environmental effects from the water appropriation. Describe contingency plans should the appropriation volume increase beyond infrastructure capacity or water supply for the project diminish in quantity or quality, such as reuse of water, connections with another water source, or emergency connections.**

The Project will not involve water appropriation or construction dewatering activities. If water use is required during Project construction, such as for dust control, water would be obtained from on-site wells or municipal sources. Dust control activities are estimated to use no more than one to two truckloads of water per day over a 9- to 12-month period during pad earthwork activities. Water trucks typically hold about 7,500 gallons of water. Assuming two trucks are required daily, then 15,000 gallons could be used per day. Over a 9- to 12-month period (60 to 80 workdays) a total of 900,000 to 1,200,000 gallons could be used; however, the actual total volume of water is expected to be much less, as dust generating ground disturbance would not likely occur every workday during the 9 to 12 months. Additionally, should construction occur during winter, the use of water trucks will decrease dramatically as water is rarely, if ever, needed as a dust control measure during frozen ground conditions. Therefore, minimal to no impacts are expected due to water appropriation.

iv) Surface Waters

- (1) Wetlands - Describe any anticipated physical effects or alterations to wetland features such as draining, filling, permanent inundation, dredging and vegetative removal. Discuss direct and indirect environmental effects from physical modification of wetlands, including the anticipated effects that any proposed wetland alterations may have to the host watershed, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid (e.g., available alternatives that were considered), minimize, or mitigate environmental effects to wetlands. Discuss whether any required compensatory wetland mitigation for unavoidable wetland impacts would occur in the same minor or major watershed and identify those probable locations.**

There are no wetlands within the ISFSI site. The project does not require water appropriation or discharge to surface waters and will not change regular operations, thus impacts to wetlands are not expected. No mitigation is proposed.

- (2) Other surface waters- Describe any anticipated physical effects or alterations to surface water features (lakes, streams, ponds, intermittent channels, county/judicial ditches) such as draining, filling, permanent inundation, dredging, diking, stream diversion, impoundment, aquatic plant removal and riparian alteration. Discuss direct and indirect environmental effects from physical modification of water features, taking into consideration how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Identify measures to avoid, minimize, or mitigate environmental effects to surface water features, including in-water Best Management Practices that are proposed to avoid or minimize turbidity/sedimentation while physically altering the water features. Discuss how the project would change the number or type of watercraft on any water body, including current and projected watercraft usage.**

Several surface waters are within 5 miles of PINGP and the ISFSI (Appendix A, Map 11). The Cannon River enters the Mississippi River just south of Lock and Dam No. 3. The Cannon River is designated as a State Wild and Scenic River and a State Water Trail.^{74, 75} Rice Lake Complex is a large wetland complex at the confluence of the Cannon and Mississippi Rivers. In addition to Sturgeon Lake, numerous wetlands, sloughs, and basins are along the Mississippi and Vermillion Rivers within 1 mile of the PINGP property including Birch Lake, Brunner Lake, Buffalo Slough, Goose Lake, Jones Lake, Pool 3, Wildcat Lake, and Gantenbein Lake. Impacts on these resources are not expected and no mitigation would be required.

Project Interaction with Climate Trends

Because no significant changes to water resources will result from the Project, the Project is not expected to have water resource-related interactions with climate trends.

⁷⁴ DNR. 2023. The Wild & Scenic Cannon River. Available online at https://www.dnr.state.mn.us/waters/watergmt_section/wild_scenic/wsrivers/cannon.html#:~:text=Designation,confluence%20with%20the%20Mississippi%20River. Accessed July 2023.

⁷⁵ DNR. 2023g. Cannon River State Water Trail. Available online at <https://www.dnr.state.mn.us/watertrails/cannonriver/index.html>. Accessed July 2023.

13. CONTAMINATION/HAZARDOUS MATERIALS/WASTES

- a) **Pre-project site conditions - Describe existing contamination or potential environmental hazards on or in close proximity to the project site such as soil or ground water contamination, abandoned dumps, closed landfills, existing, or abandoned storage tanks, and hazardous liquid or gas pipelines. Discuss any potential environmental effects from pre-project site conditions that would be caused or exacerbated by project construction and operation. Identify measures to avoid, minimize or mitigate adverse effects from existing contamination or potential environmental hazards. Include development of a Contingency Plan or Response Action Plan.**

According to the MPCA What's in My Neighborhood web-mapper, one inactive State Assessment Site is on the PINGP property (Site Assessment SA0007562) besides six other PINGP sites, which are characterized as construction stormwater or "multiple activity" activities.⁷⁶ Appendix A, Map 12 depicts MPCA What's in My Neighborhood sites within 2 miles of the proposed Project. Site Assessment SA0007562 consists of a resin disposal site that was registered in 1987 and closed in 1998. Eleven additional non-PINGP sites are within a 2 mile radius of the Project including four construction stormwater sites, two underground tank sites, two feedlots, one wastewater activity, one minimal quantity hazardous waste generator, and one hazardous waste activity. No other existing contamination, or potential environmental hazards, such as soil or ground water contamination, abandoned dumps, closed landfills, or and hazardous liquid or gas pipelines, are present near the Project site. Therefore, no impacts are anticipated.

- b) **Project related generation/storage of solid wastes - Describe solid wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from solid waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of solid waste including source reduction and recycling.**

Construction of the Project would result in generation of non-radiological solid waste. The Company would dispose of the 62,640 cubic feet excavated to construct the Project and normal construction debris (e.g., trash, waste parts). Trash would be collected in appropriate, leak-proof waste dumpsters or bins, and would be disposed of properly offsite by a licensed waste transporter. The Company has processes in place to address management of waste produced by construction and operation activities at the facility.

Based on past ISFSI expansion activities, it is estimated that up to 1,000 gallons of liquid waste could be produced by cement truck flushing. Previously, minimal flushing has been performed – just enough to ensure no concrete dries inside the trucks. Liquid waste is contained inside plastic-lined containers and the waste is disposed of offsite by the contractor. Following completion of facility expansion, no additional non-radioactive solid or liquid wastes will be produced.

During operations, the new concrete pads would support additional DFS systems that house spent nuclear fuel in sealed containers. The storage system is completely passive, and no solid wastes are generated during its operation. Solid wastes produced during operation activities (e.g., minor trash) would be collected in appropriate, leak-proof waste dumpsters or bins, and be disposed of properly offsite by a licensed waste transporter.

⁷⁶ MPCA. 2023. What's in My Neighborhood. Available online at <https://www.pca.state.mn.us/data/whats-my-neighborhood>. Accessed July 2023.

No potential environmental impacts are anticipated from solid waste generation or storage as a result of the construction and operation of the Project.

- c) Project related use/storage of hazardous materials - Describe chemicals/hazardous materials used/stored during construction and/or operation of the project including method of storage. Indicate the number, location, and size of any above or below ground tanks to store petroleum or other materials. Indicate the number, location, size, and age of existing tanks on the property that the project will use. Discuss potential environmental effects from accidental spill or release of hazardous materials. Identify measures to avoid, minimize or mitigate adverse effects from the use/storage of chemicals/hazardous materials including source reduction and recycling. Include development of a spill prevention plan.**

Chemicals potentially onsite during construction would consist of construction equipment fuels and fluids, such as gasoline, diesel fuel, and mechanical lubricants. Construction equipment would be inspected prior to use to ensure all connections and hoses are in working order. Spill response equipment, such as drip pans and absorbents, would be on site in the event of spills or leaks. Any spills or releases would be managed in accordance with the PINGP Spill Prevention, Control, and Countermeasure Plan and with state and federal spill response and reporting regulations. Any onsite fueling that occurs would be attended at all times. Used oils or other equipment liquids would be stored in lidded containers appropriate for the contents and labeled. No additional hazardous materials would be used or stored during Project construction. No hazardous materials would be used or produced during operation. The Company has processes in place to address management of hazardous waste produced by construction and operation activities at the facility.

Due to the measures and conditions outlined above, no impacts related to hazardous materials are anticipated as a result of the construction or operation of the Project. Radiological impacts from the storage of spent fuel in the DFS systems are addressed in Section 22.2.

- d) Project related generation/storage of hazardous wastes - Describe hazardous wastes generated/stored during construction and/or operation of the project. Indicate method of disposal. Discuss potential environmental effects from hazardous waste handling, storage, and disposal. Identify measures to avoid, minimize or mitigate adverse effects from the generation/storage of hazardous waste including source reduction and recycling.**

Chemicals potentially onsite during construction would consist of construction equipment fuels and fluid. All wastes would be stored, recycled, and/or transported offsite for proper disposal by a licensed waste hauler. No additional hazardous materials would be generated or stored during Project construction. The Company has instituted *Chemical Leak or Spill Implementing Procedures* to address management of waste produced by construction and operation activities. No other generation or storage of hazardous wastes would occur as a result of the construction or regular operation of the ISFSI facility; therefore, no potential environmental impacts are anticipated as a result of the construction or operation of the Project.

Project Interaction with Climate Trends

As described above and in Section 7, the DFS systems are designed to meet NRC standards, which dictate a resiliency to conditions that are far more extreme than the Project area is likely to encounter as a result of climate change. Therefore, the Project is not expected to have interactions with climate trends related to contamination, hazardous materials, and wastes.

14. FISH, WILDLIFE, PLANT COMMUNITIES, AND SENSITIVE ECOLOGICAL RESOURCES (RARE FEATURES)

a) Describe fish and wildlife resources as well as habitats and vegetation on or near the site.

The Project is within a previously disturbed area, and as the existing land use is industrial consisting of a graded surface that is covered with gravel material, there is no suitable habitat for fish and wildlife within the ISFSI. Environmental resources within 2 miles of the ISFSI are depicted on Appendix A, Map 13.

b) Describe rare features such as state-listed (endangered, threatened, or special concern) species, native plant communities, Minnesota County Biological Survey Sites of Biodiversity Significance, and other sensitive ecological resources on or within close proximity to the site. Provide the license agreement number (LA-____) and/or correspondence number (MCE _____) from which the data were obtained and attach the Natural Heritage letter from the DNR. Indicate if any additional habitat or species survey work has been conducted within the site and describe the results.

The proposed Project site does not overlap with any Minnesota Biological Survey Sites of Biodiversity Significance, native plant communities, calcareous fens, old growth stands, native prairies, or lakes of biological significance. However, the proposed Project site overlaps with one Audubon MN Important Bird Area (IBA) – the Vermillion Bottoms-Lower Cannon River IBA. This IBA is one of the top four sites in Minnesota for rare forest birds.⁷⁷ It has the highest numbers of two special concern bird species in southeast Minnesota: red-shouldered hawks and cerulean warblers. It also provides important nesting and/or migratory habitat for peregrine falcons, bald eagles, and Acadian flycatchers, and includes a bald eagle winter roost site and two colonial nesting sites for great blue herons and great egrets. A total of 14 birds of conservation concern have been documented in the site by the Minnesota County Biological Survey.⁷⁸ Peregrine falcons, which are state threatened, nest in a nest box installed and maintained by the Company on the PINGP reactor building.⁷⁹ The nest box has been in place since 1994; a pair of falcons first used the nest site in 1997 and 75 young have fledged from this site as of 2022.⁸⁰ The peregrine falcons find the boxes attractive as nesting sites because they offer some of the same features as high cliffs. The box provides the falcons a view of the skies around them and allows them to quickly dive for prey.

In addition, there is one calcareous fen approximately 3.4 miles southeast of the proposed Project site. Calcareous fens are rare groundwater-fed wetlands that are sensitive to changes in water quality and quantity. Reductions in groundwater discharge or increases in surface water can cause damage to the fen community, both in terms of its condition and size. Given the distance between the proposed Project site and the calcareous fen and the scope of the proposed Project activities (i.e., no impacts expected to groundwater; see Section 12.a.ii), impacts to the calcareous fen would not be anticipated.

In 2009, the Company engaged Biological Services Inc. and John P. McCrady, Inc. (McCrady) to conduct surveys for medicinally and culturally important plant species present on the PINGP site. Prior to its work at PINGP, McCrady conducted a plant species inventory on the PIIC reservation that focused on medicinally and culturally important plants present on the reservation. McCrady conducted its surveys in

⁷⁷ Audubon. 2023. Vermillion Bottoms-Lower Cannon River Important Bird Area. Available online at: <https://www.audubon.org/iba/Site/2922>. Accessed July 2023.

⁷⁸ Audubon. 2023. Vermillion Bottoms-Lower Cannon River Important Bird Area. Available online at: <https://www.audubon.org/iba/Site/2922>. Accessed July 2023.

⁷⁹ *Ibid.*

⁸⁰ Raptor Resource Project, 2022. Raptor Resource Project 2022 Peregrine Falcon Monitoring Report. Available online at: <https://www.raptorresource.org/raptorresource/pdf/2022RRPBandingReport.pdf>. Accessed July 2023.

2008/2009. Of the 208 species observed, 78 were determined to have medicinal or cultural significance to the Dakota Indians.⁸¹ As a result of these surveys, the Company prepared a PINGP Plant Field Guide which presents information for 113 species of plants that are of cultural and medicinal importance to the PIIC. The Plant Field Guide was developed in association with the PIIC⁸² and is part of PINGP's CRMP, which is discussed further in Section 15.

The Company has not completed any habitat or species survey within the Project area, as the area impacted by construction and operation does not provide habitat for fish, wildlife, or other sensitive ecological resources and did not necessitate such surveys. Agency coordination regarding federal and state sensitive features is provided in the following Section.

Agency Coordination

The Company reviewed the U.S. Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IpaC) website⁸³ for federally endangered, threatened, candidate, and proposed species; and designated critical habitat that may occur within the Project area. The Company also utilized the USFWS Determination Keys (Dkeys) in IpaC to determine if the proposed action has the potential to adversely affect federally listed species.

The DNR Natural Heritage Information System (NHIS) was also reviewed for documented occurrences of federally listed species and state-listed species within one mile of the Project Area⁸⁴ (Table 14-1). The DNR maintains the NHIS database through their Natural Heritage Program and Nongame Game Research Program; the NHIS is the most complete source of data on Minnesota's rare, endangered, or otherwise significant plant and animal species, plant communities, and other rare natural features. Although these reviews do not represent a comprehensive survey, they provide information on the potential presence of rare and unique species and habitats. The NHIS information provided here is based on a query of licensed NHIS data (per DNR license agreement LA 1066).⁸⁵ In addition, the Company submitted a Natural Heritage Review Request to the DNR via the DNR's Minnesota Conservation Explorer (MCE) online tool on July 6, 2023; the DNR provided a response (correspondence number MCE 2023-00167) on July 12, 2023 (Appendix B). A discussion of the DNR Natural Heritage Review is provided below.

State-Listed Species

A query of the NHIS database (DNR license agreement LA-1066) was conducted for rare or sensitive features within 1 mile of the Project area. Based on that review, records for 16 threatened or endangered species (14 mussels, 1 fish, and 1 turtle) are within 1 mile of the Project area. In addition, records for eight special concern species (2 fish, 1 plant, 3 mussels, 1 bird, and 1 mammal) are also within 1 mile of the Project area. Table 14-1 below provides a list of these species and habitat requirements for each.

⁸¹ McCrady, Inc, John P. and Biological Services, Inc. 2009. Medicinally and Culturally Important Plants of the Prairie Island Nuclear Generating Plant Property. August 2009.

⁸² NSPM. 2011. Prairie Island Independent Spent Fuel Storage Installation Application for Renewed ISFSI Site-Specific License, Environmental Report Supplement. Welch, Minnesota: Northern States Power Company.

⁸³ USFWS. 2023. Information for Planning and Consultation. Available online at <https://ecos.fws.gov/ipac/>. Accessed July 2023.

⁸⁴ DNR. 2022. Natural Heritage Information System. License to Merjent, Inc.

⁸⁵ *Ibid.*

Table 14-1: Rare Species Records within 1 Mile of the Project Area ^a

Common Name <i>Scientific Name</i>	State Status ^b	Habitat requirements ^c	Habitat Present?
American Eel <i>Anguilla rostrata</i>	SPC	Moderate-sized or large rivers having continuous flow and a mud or rock bottom that provides daytime cover (e.g., boulders and log jams).	No
American Ginseng <i>Panax quinquefolius</i>	SPC	Grows only in well-developed forest soil, typically mesic loamy soil.	No
Black Sandshell <i>Ligumia recta</i>	SPC	Riffle and run areas of medium to large rivers in areas dominated by sand or gravel.	No
Blanding's Turtle <i>Emydoidea blandingii</i>	THR	Wetland complexes and adjacent sandy uplands are necessary to support viable populations of Blanding's turtles. Calm, shallow waters, including wetlands associated with rivers and streams with rich aquatic vegetation are especially preferred.	No
Butterfly Mussel <i>Ellipsaria lineolata</i>	THR	Large rivers with swift currents in sand or gravel substrates.	No
Ebonysell <i>Reginaia ebenus</i>	END	Large rivers in sand or gravel.	No
Elephant-ear <i>Elliptio crassidens</i>	END	Large rivers in mud, sand, or fine gravel.	No
Fawnsfoot <i>Truncilla donaciformis</i>	THR	Flowing areas of large rivers in soft or coarse substrate, and they have been found at depths up to 30 feet.	No
Higgins Eye ^d <i>Lampsilis higginsii</i>	END	Occurs only in the Mississippi River and the lower portion of some of its large tributaries. It occupies stable substrates that vary from sand to boulders, but not firmly packed clay, flocculent silt, organic material, bedrock, concrete, or unstable sand.	No
Lake Sturgeon <i>Acipenser fulvescens</i>	SPC	Moderately clear, large rivers and lakes. They are most often found over firm sand, gravel, or rubble bottoms.	No
Monkeyface <i>Theliderma metanevra</i>	THR	Only the St. Croix River appears to still support a viable monkeyface population, where the mussels peaked in habitats dominated by stable substrates in water over 6.6 feet deep.	No
Mucket <i>Actinonaias ligamentina</i>	THR	Medium to large rivers; substrates that are most preferred include coarse sand and gravel.	No
Mudpuppy <i>Necturus maculosus</i>	SPC	This species is entirely aquatic; inhabits rivers, lakes, reservoirs, and sluggish streams.	No
Paddlefish <i>Polyodon spathula</i>	THR	Open waters of large rivers and river lakes (such as Lake Pepin and Lake St. Croix), oxbow lakes, and backwaters. In the Upper Mississippi River drainage, they have been associated with areas of deep water and low current velocities.	No

Common Name <i>Scientific Name</i>	State Status ^b	Habitat requirements ^c	Habitat Present?
Peregrine Falcon <i>Falco peregrinus</i>	SPC	Presently, they nest primarily on buildings and bridges in urban settings and locally, also use historic eyries on cliffs along the Mississippi River in the rugged bluff southeastern part of the state.	Yes
Pistolgrip <i>Tritogonia verrucosa</i>	END	Larger rivers in areas with moderate current and gravel substrates.	No
Rock Pocketbook <i>Arcidens confragosus</i>	END	Medium to large rivers; it may be found in fine substrates such as silt or sand in slow current areas.	No
Round Pigtoe <i>Pleurobema sintoxia</i>	SPC	Medium to large rivers but occasionally occurs in smaller rivers. Preferred habitats include fast current areas dominated by coarse sand and gravel substrates.	No
Sheepnose ^e <i>Plethobasus cyphus</i>	END	Large rivers with sand and gravel substrates, in water depths up to 15 feet.	No
Spike <i>Eurytnia dilatata</i>	THR	Small to large rivers, but they are also known to inhabit reservoirs and lakes. Whether in rivers or lakes, they are most often found in sand and gravel substrates in depths ranging from 2 to 24 feet.	No
Wartyback <i>Quadrula nodulata</i>	THR	Large rivers in fine or coarse substrates in areas of slow or moderate current.	No
Washboard <i>Megalonaias nervosa</i>	END	Large river species, inhabiting the main channel areas of a stream. Suitable habitat consists of slow current areas with substrates composed of sand, gravel, or mud.	No
Western Harvest Mouse <i>Reithrodontomys megalotis</i>	SPC	Prefers upland prairie habitats. Within Minnesota, the species is typically found in ditches, fence rows, and grassy areas due to habitat destruction and fragmentation.	No
Yellow Sandshell <i>Lampsilis teres</i>	END	Large sized rivers; prefers fine sediments, but it may also occur in coarse substrates, and in slow or moving current.	No
<p>^a DNR Natural Heritage Information System database; License Agreement LA 1066</p> <p>^b END=Endangered, THR=Threatened, SPC=Species of Special Concern</p> <p>^c Source: DNR Rare Species Guide (https://www.dnr.state.mn.us/rsq/index.html)</p> <p>^d This species is also federally listed and is discussed further below.</p> <p>^e This species is also federally listed; however, the Project-specific IPaC review and corresponding Determination Keys did not identify this species as a species that may occur within the Project area.</p>			

Federally Listed Species

The Company reviewed the USFWS IPaC website⁸⁶ for the federal endangered, threatened, candidate, and proposed species; and designated critical habitat that may occur within the Project area. IPaC identified

⁸⁶ USFWS. 2023. Information for Planning and Consultation. Available online at <https://ecos.fws.gov/ipac/>. Accessed July 2023.

two federally endangered species: the Higgins eye pearlymussel, northern long-eared bat (NLEB), one proposed endangered species (tricolored bat), one candidate species (monarch butterfly), and one experimental population, non-essential (whooping crane). According to IPaC, there are no critical habitats at this location.

Higgins Eye (Pearlymussel)

The Higgins eye pearlymussel is a freshwater mussel that only occurs in parts of the upper Mississippi River north of Lock and Dam 9 at Keokuk, Iowa.⁸⁷ It is also found in three tributaries of the Mississippi: the St. Croix River between Minnesota and Wisconsin, the Wisconsin River in Wisconsin and the lower Rock River between Illinois and Iowa.⁸⁸ Primarily a sedentary species, the Higgins buries itself at the bottom of large rivers. It has a soft body enclosed by the shell and consists of gills for breathing, a digestive tract for processing food, and a large, muscled foot for moving and for anchoring on the stream bottom.⁸⁹

The Higgins eye pearlymussel was listed as an endangered species on June 14, 1976. Zebra mussels (*Dreissena polymorpha*) are the greatest known threat to the Higgins eye. They are a freshwater mussel native to the Black and Caspian Seas that were introduced into Lake Erie in the late 1980s from ship ballast water discharge.⁹⁰ These small mussels are less than 2 inches long, but tens of thousands can colonize a square meter area.⁹¹ Zebra mussels attach to any hard surface, including shells of other mussels, preventing them from normal travel, burrowing, and opening and closing their shells. Several Higgins eye populations in the Mississippi River have been hit hard by zebra mussel colonization.⁹²

Northern Long-eared Bat

The NLEB is medium-sized bat species that occurs across the eastern and central U.S.⁹³ During the summer, the species roosts in live and dead trees in cavities and crevices and under bark.⁹⁴ Most foraging occurs above the understory, 3 to 10 feet above the ground, but under the canopy on forested hillsides and ridges, rather than along riparian areas. Foraging also takes place over small forest clearings and water, and along roads.⁹⁵ USFWS defines suitable forested/wooded habitat as containing potential roosts (i.e., live trees or snags greater or equal to 3 inches in diameter at breast height that have exfoliating bark, cracks, crevices, or cavities), as well as forested linear features such as wooded fencerows, riparian forests, and other wooded corridors. Individual trees may be suitable habitat when they exhibit

⁸⁷ USFWS. n.d. Higgins' Eye (*Lampsilis higginsii*). Available online at: <https://fws.gov/species/higgins-eye-lampsilis-higginsii>. Accessed July 2023.

⁸⁸ *Ibid.*

⁸⁹ *Ibid.*

⁹⁰ *Ibid.*

⁹¹ *Ibid.*

⁹² *Ibid.*

⁹³ Caceres, M.C and R.M.R. Barclay. 2000. *Myotis septentrionalis*. Mammalian Species 634:1-4.

⁹⁴ Timpone, J.C., J.G. Boyles, K.L. Murray, D.P. Aubrey, and L.W. Robbins. 2010. Overlap in roosting habits of Indiana bats (*Myotis sodalis*) and northern bats (*Myotis septentrionalis*). The American Midland Naturalist 163:115-123.

⁹⁵ USFWS. 2022. Species Status Assessment Report for the Northern Long-eared Bat (*Myotis septentrionalis*) - Version 1.2. Great Lakes Region. August 2022. Available at:

<https://www.fws.gov/sites/default/files/documents/Species%20Status%20Assessment%20Report%20for%20the%20Northern%20long-eared%20bat-%20Version%201.2.pdf>. Accessed July 2023.

characteristics of potential roost trees and are within 1,000 feet of other forested/wooded habitat.⁹⁶ The NLEB is currently declining due to a disease that affects hibernating bats called white-nose syndrome.

The NLEB was listed as threatened under the Endangered Species Act (ESA) in 2015 (80 Federal Register [FR] 17974), and a special rule pursuant to section 4(d) of the ESA was finalized in 2016 (81 FR 1900 or 4(d) Rule). The 4(d) Rule limited the species' take prohibitions for energy projects not involving wind facilities to tree removal near hibernacula and maternity roost trees and activity within hibernacula. The USFWS provided a framework for streamlined Section 7 consultation for federal actions consistent with the 4(d) Rule that may affect the NLEB but would not result in prohibited take. The USFWS completed its intra-agency consultation and issued a non-jeopardy programmatic biological opinion (2016 PBO) for both the 4(d) Rule and implementation of the streamlined framework. Federal agencies could rely upon the finding of the 2016 PBO to fulfill their project-specific Section 7(a)(2) responsibilities.

The 4(d) Rule and 2016 PBO were rendered obsolete on March 31, 2023, when the species was reclassified to endangered (87 FR 73488, November 30, 2022; 88 FR 4908, January 26, 2023), as 4(d) Rules are only available for threatened species. All take occurring on or after March 31, 2023, is now prohibited under the ESA.

Tricolored Bat

The tricolored bat is one of the smallest bats native to North America.⁹⁷ The once common species is wide ranging across the eastern and central United States and portions of southern Canada, Mexico, and Central America. During the winter, tricolored bats are found in caves and mines, although in the southern United States, where caves are sparse, tricolored bats are often found roosting in road-associated culverts.⁹⁸ During the spring, summer and fall, tricolored bats are found in forested habitats where they roost in trees, primarily among leaves. As its name suggests, the tricolored bat is distinguished by its unique tricolored fur that appears dark at the base, lighter in the middle and dark at the tip.⁹⁹

White-nose syndrome, a disease that impacts bats, is caused by a fungal pathogen. It has led to 90 to 100% declines in tricolored bat winter colony abundance at sites impacted by the disease.¹⁰⁰ Since white-nose syndrome was first observed in New York in 2006, it has spread rapidly across the majority of the tricolored bat range.¹⁰¹

On September 14, 2022, the USFWS, under the U.S. Department of the Interior, published a proposed rule to the Federal Register proposing to list the tricolored bat (*Perimyotis subflavus*) as an endangered species under the ESA. The USFWS is proposing the species for listing due to substantial declines in tricolored bat abundance across its range. The main threats to the species are the impacts of white nose syndrome, wind-energy-related mortality, the effects of climate change, and habitat loss and disturbance.

⁹⁶ USFWS. 2022. Endangered and Threatened Wildlife and Plants; Endangered Species Status for Northern Long-eared Bat; Final Rule. 87 Federal Register 73488 (November 30, 2022). Available online at: <https://www.federalregister.gov/documents/2022/11/30/2022-25998/endangered-and-threatened-wildlife-and-plants-endangered-species-status-for-northern-long-eared-bat>. Accessed July 2023.

⁹⁷ USFWS. n.d. Tricolored Bat (*Perimyotis subflavus*). Available online at: <https://fws.gov/species/tricolored-bat-perimyotis-subflavus>. Accessed July 2023.

⁹⁸ *Ibid.*

⁹⁹ *Ibid.*

¹⁰⁰ *Ibid.*

¹⁰¹ *Ibid.*

Monarch Butterfly

With its iconic orange and black markings, the monarch butterfly is one of the most recognizable butterfly species in North America and is known for its impressive long-distance migration.¹⁰² Whether it is a field, roadside area, open area, wet area or urban garden, milkweed and flowering plants are needed for monarch habitat. Adult monarchs feed on the nectar of many flowers during breeding and migration, but they can only lay eggs on milkweed plants as milkweed is the larval host plant.¹⁰³

On December 17, 2020, the USFWS published the result of their 12-month review of the monarch butterfly and determined that listing the species under the ESA was warranted but precluded. The species meets the criteria for listing as an endangered or threatened species, but the USFWS cannot currently implement the listing due to limited staff and/or funding and because there are other listing actions with a higher priority. The species is now a candidate for listing; however, candidate species are not protected under the ESA.

Whooping Crane

The whooping crane occurs only in North America, specifically within Canada and the United States, and is North America's tallest bird. Historically, more than 10,000 whooping cranes once populated North America.¹⁰⁴ Its north to south range included Canada and the United State to Mexico, and its east to west range included the Rocky Mountains to the East Coast.¹⁰⁵ Population declines were caused primarily by shooting and destruction of habitat in the prairies from agricultural development. The whooping crane breeds, migrates, winters and forages in a variety of habitats, including coastal marshes and estuaries, inland marshes, lakes, open ponds, shallow bays, salt marsh and sand or tidal flats, upland swales, wet meadows and rivers, pastures, and agricultural fields. Four geographically distinct populations exist in the wild.¹⁰⁶ The only natural, self-sustaining population in existence migrates between Aransas National Wildlife Refuge on the Texas Coast and Wood Buffalo National Park in Alberta, Canada.¹⁰⁷ The other three geographically distinct populations include one experimental, non-migratory population in Central Florida; an experimental population that was reintroduced from 2001 to 2010 and migrates between Wisconsin and Florida; and a non-migratory flock that was introduced in 2011 in White Lake, Louisiana.¹⁰⁸

In the Project area, the whooping crane is listed as an experimental, non-essential population. An experimental, non-essential population is a population that has been established within its historical range under section 10(j) of the ESA to aid recovery of the species. The USFWS has determined a non-essential population is not necessary for the continued existence of the species. For the purposes of consultation, non-essential experimental populations are treated as a proposed species on private land. There are no section 7(a)(2) requirements, but federal agencies must not jeopardize their existence per section 7(a)(4).

¹⁰² USFWS. n.d. Monarch (*Danaus plexippus*). Available online at: <https://www.fws.gov/species/monarch-danaus-plexippus>. Accessed July 2023.

¹⁰³ *Ibid.*

¹⁰⁴ USFWS. n.d. Whooping Crane (*Grus americana*). Available online at: <https://www.fws.gov/species/whooping-crane-grus-americana>. Accessed July 2023.

¹⁰⁵ *Ibid.*

¹⁰⁶ *Ibid.*

¹⁰⁷ *Ibid.*

¹⁰⁸ *Ibid.*

- c) **Discuss how the identified fish, wildlife, plant communities, rare features and ecosystems may be affected by the project including how current Minnesota climate trends and anticipated climate change in the general location of the project may influence the effects. Include a discussion on introduction and spread of invasive species from the project construction and operation. Separately discuss effects to known threatened and endangered species.**

State Species

As shown in Table 14-1 above, with the exception of the peregrine falcon, all of the state-listed threatened, endangered, and special concern species utilize habitat that is not present within the vicinity of the Project area and/or would not be impacted by the Project. As the Project involves no water appropriation or discharge to the Mississippi River, and no other work in or near the river, there are no anticipated impacts to mussel or fish species. In addition, suitable habitats for the American ginseng, Blanding's turtle, and western harvest mouse (i.e., well-developed forest soil, wetland complexes and adjacent sandy uplands, and prairie habitat, respectively) are also not present within the Project area and/or would not be impacted by the Project. The DNR provided a Natural Heritage Review of the Project in a letter dated July 12, 2023 (Appendix B). The DNR noted that given the land use in the immediate vicinity of the Project area, impacts to the Blanding's turtle are not anticipated. However, in the unlikely event that a Blanding's turtle is found onsite, they must be moved by hand out of harm's way, or otherwise they are to be left undisturbed.

Peregrine falcons are currently listed as a special concern species in Minnesota, a designation that does not provide legal protection from take (harm). The species is protected by the Migratory Bird Treaty Act. Historically, peregrine falcons nested on cliff ledges or in shallow caves in cliffs. However, this species has adapted to a wide range of environments, demonstrated by the diversity of habitats it now occupies throughout the world. Urban environments are becoming an important habitat for peregrine falcons, where buildings and bridges provide nesting structures and birds such as pigeons provide a food base. These urban peregrine falcons have contributed to the recovery of the species as a whole. As noted in Section 14.b, the Company and the Raptor Resource Project have supported a successful falcon nesting program at this location since 1997. The nest box is on top of the reactor building, over 200 feet off of the ground.

The proposed Project would be constructed well to the southeast of the nesting site, at ground level. Construction and operation activities could increase noise levels as a result of equipment operations, and may produce some dust, but these impacts would be minor and temporary and would not be greater than the existing noise from the operating power plant, vehicles, and equipment. Peregrine falcons utilizing the nest box are accustomed to the noise and activity at the power plant, which operates continuously except for during temporary outages. The female that nested at PINGP in 2022 had nested at this nest box since 2019.^{109,110} The DNR Natural Heritage response stated that it is unlikely that construction activities would affect the peregrine falcon. DNR further noted that if the falcons are present and exhibit unusual behaviors or other signs of potential distress during construction, and especially during the breeding season (April through July), the DNR should be contacted for further guidance. The Company participates

¹⁰⁹ Raptor Resource Project, 2019. Raptor Resource Project 2019 Peregrine Falcon Monitoring Report. Available online at: <https://raptorresource.org/raptorresource/pdf/2019BandingReport.pdf>. Accessed July 2023.

¹¹⁰ Raptor Resource Project, 2022. Raptor Resource Project 2022 Peregrine Falcon Monitoring Report. Available online at: <https://www.raptorresource.org/raptorresource/pdf/2022RRPBandingReport.pdf>. Accessed July 2023.

in the peregrine falcon nest box program and is attentive to conditions during the nesting season. There are no anticipated impacts on peregrine falcons.

Federal Species

The USFWS Dkeys streamline the consultation process by asking structured sets of questions designed to assist users in determining if a project qualifies for a pre-determined consultation outcome based on existing programmatic consultations or internal USFWS standing analyses. Each Dkey starts with a qualification interview to see if the key is appropriate for a given project. There are two Dkeys available in IPaC for the Project:

- **The Minnesota-Wisconsin Federal Endangered Species Determination Key:** a tool to help Federal agencies and project proponents decide if their proposed action has the potential to adversely affect federally listed species and designated critical habitat on certain routine and predictable projects in Minnesota and Wisconsin. This key covers the following species expected to occur in the Project area: Higgins Eye (pearlymussel), monarch butterfly, tricolored bat, and whooping crane.
- **Northern Long-eared Bat Rangewide Determination Key:** this key is intended to streamline review of projects for potential effects to the NLEB.

The Company completed both Dkeys noted above for the Project and the resulting July 6, 2023, consistency letters are included in Appendix B and summarized in Table 14-2 below. As there is no vegetation present at the Project site and the work would occur on a graveled area within an existing industrial area, suitable habitat for the species shown in Table 14-2 is not present and impacts to federally listed species would not occur.

Table 14-2: Determinations for Federal Species

Common Name <i>Scientific Name</i>	Status	Determination
Higgins Eye (pearlymussel) <i>(Lampsilis higginsii)</i>	Endangered	No Effect
Northern long-eared bat <i>(Myotis septentrionalis)</i>	Endangered	No Effect
Tricolored bat <i>(Perimyotis subflavus)</i>	Proposed Endangered	No Effect
Monarch Butterfly <i>(Danaus plexippus)</i>	Candidate	No Effect
Whooping Crane <i>(Grus americana)</i>	Experimental Population, Non-Essential	No Effect

Project Interaction with Climate Trends

Because no changes to fish, wildlife, plant communities, and sensitive ecological resources are expected to result from the Project, the Project should have no resource-related interactions with climate trends.

d) Identify measures that would be taken to avoid, minimize, or mitigate adverse effects to fish, wildlife, plant communities, and sensitive ecological resources.

Direct and indirect impacts on fish, wildlife, plant communities, and sensitive ecological resources are not anticipated. In accordance with the DNR Natural Heritage Review response for the Project, the Company will implement the measures provided by the DNR for the Blanding’s turtle and peregrine falcon. Specifically, if a Blanding’s turtle is found onsite, they will be moved by hand out of harm’s way, or otherwise they will be left undisturbed; and if peregrine falcons are seen to exhibit unusual behaviors or other signs of potential distress during construction, especially during the breeding season (April through July), the DNR will be contacted for further guidance.

15. HISTORIC PROPERTIES

Describe any historic structures, archeological sites, and/or traditional cultural properties on or in close proximity to the site. Include: 1) historic designations, 2) known artifact areas, and 3) architectural features. Attach letter received from the State Historic Preservation Office (SHPO). Discuss any anticipated effects to historic properties during project construction and operation. Identify measures that would be taken to avoid, minimize, or mitigate adverse effects to historic properties.

State Historic Preservation File Search

To evaluate the cultural resources in the area, the Company conducted a site file search from the Minnesota SHPO for the Project area and a surrounding five mile-radius, restricted by the Mississippi River northeast of the Project area. The results of the site file search were cross-checked against the Office of the State Archaeologist (OSA) online database to confirm the site information and determine the distance between recorded sites and the Project area. SHPO responded on September 7, 2023. These letters are included in Appendix B.

Eighty-four inventoried aboveground properties are located within 5 miles of the PINGP, including 28 houses, 14 farmsteads, and several churches, stores, dams, commercial buildings, highway segments and bridges. Prairie Island is also listed as an historic landscape. These properties represent the early Euro-American settlement and development of the area, both private enterprise and public infrastructure. Three of these historic properties are listed on the National Register of Historic Places (NRHP) as shown in Table 15-1. There are no NRHP-listed aboveground historic sites within the Project boundary or within a one-mile radius. The SHPO concurred with this assessment in its September 7, 2023, response to the Company; however, SHPO noted that there may be sites within this review area that have not yet been identified and noted that the PINGP itself is nearing the age where it could be considered for listing in the NRHP (50 years).

Table 15-1: Historic Properties Listed on the NRHP within Five Miles of the Project

Historic Property Name	Year Listed	Approximate Distance from Project	Description
Alexander P. Anderson Estate – Tower View	1977	3.5 miles	Georgian Revival styled house built in 1916 of reinforced concrete faced with brick.
Cross of Christ Lutheran Church	1980	4.7 miles	An example of the type of churches the Swedish settlers built in southeastern Minnesota.

Historic Property Name	Year Listed	Approximate Distance from Project	Description
Mendota to Wabasha Military Road: Cannon River Section	1991	2.8 miles	A well-preserved fragment of the Mendota-Wabasha Military Road located within the municipal boundaries of the City of Red Wing.

There are no archaeological sites within the Project boundary. There are twenty archaeological sites within one mile of the Project area, including five Pre-European contact (Pre-contact) villages, five individual mounds, four mound groups, two farmsteads, one trading post, one pre-contact artifact scatter, one alpha site, and one lithic workshop.

There are 115 archaeology sites recorded within five miles of the Project. Of these, 47 are burial mound groups, 15 are individual mounds, 15 are lithic scatters, 13 are artifact scatters, including Pre-Contact, historic, and multicomponent sites, 11 are Pre-Contact habitation sites, two are isolated finds, one is a trading post, and one is a lithic workshop. Five sites are historic farmsteads. As archaeology sites, they contain buried material within a farmstead, whether the above-ground farmstead structures remain intact or not. Five recorded sites are alpha sites, reported archaeology sites that have not been professionally field verified. The recorded archaeology sites represent the Pre-Contact occupation of the area, which is well documented in this region of Minnesota that lies in a landscaped defined by the Mississippi River, as well the Euro-American occupation and development of the region. A total of five archaeological sites have been determined eligible for listing on the NRHP (21GD0074, 21GD0078, 21GD0157, 21GD0158, and 21GD0148); all five of these sites are more than 1 mile from the ISFSI. In the SHPO’s September 7, 2023, correspondence to the Company, it confirmed that, “there are no recorded archaeological sites in the ISFSI Project area. In general, based upon current documentation, we understand that the level of disturbance to install additional storage pads would not exceed previously disturbed ground and therefore, we agree that the likelihood of intact archaeological sites in this location is low and additional archaeological survey for the ISFSI Project is not warranted.”

Prairie Island Indian Community and Additional Studies

The ISFSI is located immediately adjacent to (south and southeast of) the PIIC Reservation on the ancestral homeland of the Mdewakanton Band of Eastern Dakota. The lands and waters of the PIIC are a cultural and historic resource.¹¹¹ The Company has conducted numerous archaeological studies over the history of PINGP. The Company submitted a letter to PIIC prior to submittal of its CON application (Appendix B). The Company and the PIIC continue to meet on a recurring basis to discuss PINGP and ISFSI operations.

Northern States Power Company, a Minnesota Corporation (NSPM) and the PIIC entered into a “Settlement Agreement Among the Prairie Island Indian Community and Northern States Power Co. Regarding Contentions 1, 6 and 11” in 2009 to address a number of PIIC concerns expressed during the plant license renewal process. One commitment was to prepare and implement a CRMP to protect significant historical, archaeological, and cultural resources that may currently exist on the PINGP site.¹¹² NSPM has implemented a CRMP to manage and ensure the protection of archaeological and cultural resources on the PINGP property. The CRMP includes a discussion of existing cultural and historic resources within the PINGP property, the activities which have potential to cause disturbance to these

¹¹¹ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

¹¹² NSPM. 2011. Prairie Island Independent Spent Fuel Storage Installation Application for Renewed ISFSI Site-Specific License, Environmental Report Supplement. Welch, Minnesota: Northern States Power Company.

resources, and procedures and practices for proper review, notification, and consultation with concerned parties prior to initiating construction and excavation projects.

As part of the CRMP, Xcel Energy maintains a procedure titled *Archaeological, Cultural, and Historic Resources* that supports the protection of such resources discovered on nuclear sites operated by Xcel Energy by raising awareness about the federal and state laws which protect these resources. The procedure applies to all ground-disturbing activities on the Prairie Island Plant site, which will include the proposed expansion activities, and requires completion of an Excavation Permit and compliance with another site procedure, *Excavation and Trenching Controls*. Together, these procedures require Xcel Energy to consider site review for such resources and potential consultation with qualified archaeologists, the SHPO, and other agencies, including tribal governments, as appropriate, prior to the execution of work to protect previously undiscovered cultural resources. The CRMP includes requirements for notification and consultation with a variety of federal, state, tribal, and local agencies and entities depending on the nature and scope of planned activities.¹¹³

The Company's 2011 NRC application for ISFSI license renewal provides a historical background on archaeological work conducted in the PINGP area.¹¹⁴ The following discussion provides an update on cultural resource studies completed since the 2009 EIS.¹¹⁵

- In 2009, NSPM conducted a limited Phase I survey to provide baseline information about the archaeological sites within the PINGP grounds as part of the Settlement Agreement, noted above. A secondary goal was to evaluate the disturbance within the PINGP grounds and consider the potential for discovery of unrecorded sites. The survey attempted to identify levels of disturbance, specifically areas of disturbance that would preclude the discovery of intact archaeological deposits. The survey revisited the locations of eight previously recorded sites and recorded five newly identified archaeological sites.¹¹⁶
- In 2010, NSPM conducted a Phase I Archaeological Reconnaissance Survey of the ground surface surrounding the ISFSI. The purpose of the survey was to assess the nature of previous construction disturbance and determine the potential for the presence of previously undocumented cultural resources within the ISFSI footprint. The investigation was conducted per an agreement with the PIIC to ensure protection of both recorded and unrecorded cultural resources on Company property. The project consisted of a literature review and field investigation at 8 test pits around the perimeter of the ISFSI. No prehistoric or diagnostic historic artifacts were recovered as a result of the screening of the excavated materials. Visual inspection of the exposed soil profiles in all but one of the test pits suggested that the subsurface deposits in the project area are significantly disturbed and contain limited original integrity.¹¹⁷

¹¹³ Xcel Energy, 2019. U.S. Nuclear Regulatory Commission, Prairie Island Independent Spent Fuel Storage Installation, ISFSI Site-specific License Amendment Request, Environmental Report Supplement. May 8, 2019.

¹¹⁴ NSPM. 2011. Prairie Island Independent Spent Fuel Storage Installation Application for Renewed ISFSI Site-Specific License, Environmental Report Supplement. Welch, Minnesota: Northern States Power Company.

¹¹⁵ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

¹¹⁶ NSPM. 2011. Prairie Island Independent Spent Fuel Storage Installation Application for Renewed ISFSI Site-Specific License, Environmental Report Supplement. Welch, Minnesota: Northern States Power Company.

¹¹⁷ Westwood Professional Services, Inc., 2010. Phase I Archaeological Reconnaissance Survey Report for the Proposed Upgrades to the Independent Spent Fuel Storage Facility (ISFSI) at the Xcel Energy Prairie Island Nuclear Generating Plant, Goodhue County, Minnesota. November 29, 2010.

- In 2014, while engaged in the process to extend the license term of the existing ISFSI and anticipating the need for future storage in the license renewal term, the Company sponsored a Phase I archaeological investigation of some portions of the ISFSI.¹¹⁸ PIIC reviewed the work plan, provided comments, and monitored ground-disturbing activities. The study excavated 15 shovel tests (in different locations than the 2010 survey noted above), of which 10 were within the ISFSI in an area where a potential third pad would be placed (all to the south of the original two pads). The remaining 5 shovel tests were within areas that were, at the time proposed for a turn-around area and a new DFS system transport storage facility that were not ultimately constructed. Six soil cores were also excavated to test for the potential for buried paleosols. Paleosols are older land surfaces that may contain possible evidence of human occupation but have been buried by alluvial deposition.
- The survey found no archaeological properties and no evidence of paleosols. The report also concluded that no additional archaeological investigations were warranted within the studied area.¹¹⁹ PIIC reviewed the final reports. Concurrent with the archaeological investigations, the Company completed geotechnical exploration to characterize subsurface soil conditions.¹²⁰ These findings are discussed in more detail in Section 11.
- When the NRC issued its 2015 EA for ISFSI license renewal it stated, “NSPM will perform subsurface archaeological surveys within the area where any new ISFSI pads will be located, to a depth expected to be excavated for construction of the new ISFSI pads. These subsurface archaeological surveys will be performed consistent with the CRMP and implementing procedures and will be completed prior to submittal of a License Amendment Request for the ISFSI expansion”.¹²¹ Therefore, in 2018, as it was preparing to apply to the NRC for permission to install the third pad, the Company’s consulting archaeologist, Westwood, reviewed the areas that would be disturbed for the third pad against the locations studied in 2014, to ensure compliance with the commitment memorialized in the 2015 EA. After reviewing the information provided, Westwood determined that the area of the third pad had been previously surveyed in 2014 and recommended no additional archaeological investigations.¹²²
- Also in 2018, the Company performed a series of four CPT soundings within the ISFSI and in the area of the proposed third pad. These studies were in the vicinity of some of the 2014 survey locations noted above. The fieldwork included 425 feet of CPT sounding, with anticipated termination depths of 100 to 125 feet below the ground surface.¹²³ These findings are discussed in more detail in Section 11 and are consistent with the PINGP ISFSI’s history as the site of the former concrete batch plant for construction of the PINGP facility.

¹¹⁸ Westwood Professional Services, Inc., 2014. Phase I Archaeological Investigations for the Proposed Expansion of the Independent Spent Fuel Storage Installation and Associated Infrastructure at the Prairie Island Nuclear Generating Plant, Goodhue County, Minnesota. Eden Prairie, Minnesota: Westwood Professional Services, Inc. December 2014.

¹¹⁹ *Ibid.*

¹²⁰ Haugo GeoTechnical Services. 2014. Preliminary Geotechnical Exploration Report Proposed Storage Facility Prairie Island Nuclear Generating Plant Welch, Minnesota. Minneapolis, Minnesota. November 2014.

¹²¹ NRC. 2015. Final Environmental Assessment for the Proposed Renewal of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, June 2015. Available online at: <https://www.nrc.gov/docs/ML1509/ML15098A026.pdf>. Accessed July 2023.

¹²² Xcel Energy, 2019. U.S. Nuclear Regulatory Commission, Prairie Island Independent Spent Fuel Storage Installation, ISFSI Site-specific License Amendment Request, Environmental Report Supplement. May 8, 2019.

¹²³ Braun Intertec. March 29, 2019. Ground Penetrating Radar Letter, Prairie Island Nuclear Generating Plant ISFSI Subsurface Evaluation Welch, Minnesota. Minneapolis, MN.

The Company is subject to commitments to conduct additional survey for the Project. When NRC issued its 2020 EA for approval of expansion to include the third pad, it stated, “In addition, the Settlement Agreement memorializes NSMP’s commitment to conduct further subsurface surveys, if further expansion of the ISFSI (up to 98 casks) is undertaken.” Now that the Company is pursuing expansion of the ISFSI storage capacity, the Company engaged its consulting archaeologist, Merjent, to review the areas that would be disturbed for the fourth and potentially fifth pad against the locations studied in 2014. Merjent determined that although the area south of the original two pads had already been surveyed in 2014, and SHPO has stated that a survey is not required, additional study would be required to survey the area north of the original two pads due to the 2009 Commitment with the PIIC, which was previously discussed in this section. The Company is working with PIIC to plan this work and will complete the survey prior to construction of the Project. The results will be included in the EIS if available.

The previously disturbed nature of the site and the lack of historic properties has been confirmed by multiple surveys in coordination between the Company, the SHPO, and the PIIC. The CRMP requires engagement for all ground-disturbing activities on the PINGP site, including those at the ISFSI. Because the proposed Project site was previously disturbed and is currently graveled, there would likely be no impacts on historic properties.

16. VISUAL

Describe any scenic views or vistas on or near the project site. Describe any project related visual effects such as vapor plumes or glare from intense lights. Discuss the potential visual effects from the project. Identify any measures to avoid, minimize, or mitigate visual effects.

The major natural landscape feature near the ISFSI is the Mississippi River. The turbine building and reactor containment structures dominate the industrial landscape of the PINGP site.¹²⁴ The Project location is located entirely within PINGP property and is completely obscured from public view from adjacent roads, the Vermillion and Mississippi Rivers, the PIIC, or other residential or recreational users. It is also obscured from view from most PINGP workers. It is surrounded by an earthen berm that is constructed of fill material reinforced with geofabric, except for one gravel road entrance through a gated double fence line. Erosion control material, trees, and other natural vegetation give the berm a natural appearance.¹²⁵

During construction, a minor increase in traffic entering and exiting the facility would be seen in the immediate area but would not be distinguishable from the traffic that normally enters PINGP on a daily basis. Construction would be conducted during daylight hours; therefore, no lighting would be added and the lighting that currently exists around the ISFSI fence would be adequate.

During operation, existing lighting along the ISFSI fence line would continue to illuminate the ISFSI for security reasons. The fixtures are 40 feet high, which is less than the height of many of the trees surrounding the site and is less than the height of PINGP. The addition of concrete pads and DFS systems would not create a new visual impact and is consistent with the present view from PINGP. The ISFSI does not produce any visible emissions or serve as a heat source that could create a visible vapor.

¹²⁴ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

¹²⁵ *Ibid.*

Because the Project would be conducted out of public view and will not result in structures that present a new or larger visual impact, there will be no permanent impacts on visual resources.

17. AIR

- a) **Stationary source emissions - Describe the type, sources, quantities, and compositions of any emissions from stationary sources such as boilers or exhaust stacks. Include any hazardous air pollutants, criteria pollutants. Discuss effects to air quality including any sensitive receptors, human health, or applicable regulatory criteria. Include a discussion of any methods used assess the project's effect on air quality and the results of that assessment. Identify pollution control equipment and other measures that would be taken to avoid, minimize, or mitigate adverse effects from stationary source emissions.**

Dry storage of spent fuel is a passive operation that results in no stationary source emissions; therefore, the Project would not generate any stationary air emissions during operation and no mitigation would be necessary.

- b) **Vehicle emissions - Describe the effect of the project's traffic generation on air emissions. Discuss the project's vehicle-related emissions effect on air quality. Identify measures (e.g., traffic operational improvements, diesel idling minimization plan) that would be taken to minimize or mitigate vehicle-related emissions.**

During the 9-12 month concrete pad construction period between 2027 and 2029, a total of 40 construction workers are estimated with a maximum at any one time of 12 workers and an average of 8 workers on-site each day. Commuting workers would use local roadways to access the Project site. Construction equipment would include bulldozers, scrapers, front end loaders, graders, dump trucks, cement trucks, and delivery trucks/trailers. Vehicle emissions during construction are expected to be negligible, and no new vehicle emissions would occur as a result of ISFSI operations. No traffic improvements or mitigation measures are warranted.

During Project operations, loaded DFS systems would continue to be moved from the PINGP reactor building to the ISFSI during loading campaigns. The DFS systems will be transported using a DFS system transport vehicle, as has been done since the existing ISFSI was operational. This is a travel distance of approximately 1,200 feet.

The Project would not cause any increase or change in operational traffic or vehicle-related emissions at the PINGP, rather, it would prolong the activities that currently occur. Therefore, the Project would not result in any appreciable vehicle-related emission effects on air quality, and no mitigation would be required.

- c) **Dust and odors - Describe sources, characteristics, duration, quantities, and intensity of dust and odors generated during project construction and operation. (Fugitive dust may be discussed under item 17a). Discuss the effect of dust and odors in the vicinity of the project including nearby sensitive receptors and quality of life. Identify measures that would be taken to minimize or mitigate the effects of dust and odors.**

Fugitive Dust

Construction of the Project could generate what is expected to be insignificant amounts of dust. Earth-moving equipment such as bulldozers, scrapers, and graders would clear/excavate the area where the concrete pads and aprons would be placed. Concrete trucks would then deliver concrete to the site and pumping trucks would place it. The Company may need to control fugitive dust by applying water to exposed soil areas and covering spoil piles with tarps. Fugitive dust from construction activities would be short in duration and intensity.

During operation, minor fugitive dust may be produced by the DFS system transfer vehicle driving on road surfaces during the delivery campaigns. As such, no appreciable dust impacts are expected to occur, and no mitigation would be required.

Odors

Any odors from construction would be associated with the operation of construction equipment and would be negligible and temporary. There is presently no odor associated with the operation of the ISFSI, aside from minor exhaust fumes from the equipment used to transfer loaded DFS systems from the PINGP reactor building to the ISFSI. These activities will occur in the same manner during future loading campaigns. Therefore, the proposed Project would not result in any appreciable effects from odors.

18. GREENHOUSE GAS (GHG) EMISSIONS / CARBON FOOTPRINT

- a) GHG Quantification: For all proposed projects, provide quantification and discussion of project GHG emissions. Include additional rows in the tables as necessary to provide project-specific emission sources. Describe the methods used to quantify emissions. If calculation methods are not readily available to quantify GHG emissions for a source, describe the process used to come to that conclusion and any GHG emission sources not included in the total calculation.**

Construction equipment would include bulldozers, scrapers, front end loaders, graders, dump trucks, cement trucks, and delivery trucks/trailers. Pad construction is expected to occur over approximately 9 to 12 months. The duration would be comparable to the construction of a residential home.

GHG emissions for construction activities, which are calculated in Table 18-1, were estimated by multiplying estimated fuel use by a CO₂ emission factor for diesel fuel and converting from kilograms CO₂ to tons.¹²⁶ The CO₂ emission factor used for diesel fuel is 10.2 kilograms of CO₂ per gallon of diesel fuel.¹²⁷ Fuel use was estimated based on fuel use per hour by various construction equipment.¹²⁸

¹²⁶ EQB. 2023. Minnesota Environmental Quality Board. Environmental Assessment Worksheet (EAW) Guidance: Developing a carbon footprint and incorporating climate adaptation and resilience, July 2023. Available at <https://www.eqb.state.mn.us/sites/default/files/documents/2023%20EAW%20Climate%20Guidance.pdf>. Accessed July 2023.

¹²⁷ EPA. 2023. U.S. Environmental Protection Agency. GHG Emissions Factor Hub. <https://www.epa.gov/climateleadership/ghg-emission-factors-hub>. Accessed July 2023.

¹²⁸ Fuel Use, 2023: Fuel Use. Hourly Fuel Use Consumption Tables, retrieved from: <https://www.jscole.com/fueltables/>; <https://www.truxnow.com/blog/dump-truck-fuel-consumption>; https://www.concreteconstruction.net/how-to/concrete-production-precast/tips-for-specing-ready-mix-trucks_o; <https://www.trucklabs.com/blog/top-ten-ways-to-improve-semi-truck-fuel-efficiency/>. Accessed July 2023.

Table 18-1: CO₂ Emissions from Construction Equipment for Storage Pad Construction

Equipment	Gallons of Diesel Fuel Used (gallon/ hour)	Equipment Operating Hours for Pad Construction (hours)^a	CO₂ Emission Factor (kilogram/ gallon)	Conversion Factor (kilogram/ ton)	CO₂ Emissions from Pad Construction (tons)^b
Bulldozer	10	120	10.2	907.185	13.5
Soil Compactor	8	120	10.2	907.185	10.8
Cement Truck	5	2,304	10.2	907.185	129.5
Dump Truck	5	1,920	10.2	907.185	107.9
Grader	8	80	10.2	907.185	7.2
Semi-Trailer	10	320	10.2	907.185	36.0
TOTAL					304.9
^a <i>Considers the total estimated number of hours that each type of equipment will operate over the course of the construction project.</i>					
^b <i>Total emissions are rounded to the nearest whole number.</i>					

Total GHG emissions are estimated to be approximately 305 tons of CO₂. Operation of the Project will not result in an increase in GHG emissions. At this time, there is no state-specific threshold for determining whether impacts of GHG emissions from an individual project will have a significant impact on global climate change. Minnesota Administrative Rule 4410.4300, Subpart 15, Part B, requires preparation of an EAW for stationary source facilities generating 100,000 tons or more of GHGs annually or increasing GHG emissions by 100,000 tons or more annually. The purpose of an EAW is to assess whether a proposed project has the potential to result in significant environmental effects, which aids in determining whether an EIS is needed. A reasonable conclusion is that a project with GHG emissions below 100,000 tons per year does not have the potential to result in significant GHG effects. GHG emissions from construction of the PINGP ISFSI are therefore anticipated to be negligible.

b) GHG Assessment

- i) Describe any mitigation considered to reduce the project’s GHG emissions.**
- ii) Describe and quantify reductions from selected mitigation, if proposed to reduce the project’s GHG emissions. Explain why the selected mitigation was preferred.**
- iii) Quantify the proposed projects predicted net lifetime GHG emissions (total tons/#of years) and how those predicted emissions may affect achievement of the Minnesota Next Generation Energy Act goals and/or other more stringent state or local GHG reduction goals.**

Construction and operation of the project will result in minimal GHG emissions; thus, no GHG mitigation is warranted. Lifetime operation of the Project will not adversely affect achievement of Minnesota’s Next Generation Energy Act goals, and may assist by allowing PINGP to continue operating and providing zero-emission energy to the grid.

GHG emissions are further discussed in the Company’s 2024 Integrated Resource Plan (IRP) which was filed on February 1, 2024.

19. NOISE

Describe sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. Discuss the effect of noise in the vicinity of the project including 1) existing noise levels/sources in the area, 2) nearby sensitive receptors, 3) conformance to state noise standards, and 4) quality of life. Identify measures that would be taken to minimize or mitigate the effects of noise.

Outdoor sound levels change continually because of the temporal and spatial variations of sound sources. The temporal variation in the resulting sound levels is described by statistical levels in the form L_x, where L_x designates a sound that exceeds the level L for x percent of the sampling duration. Minnesota has established noise pollution rules under Minnesota Administrative Rule 7030: Noise Pollution Control. These rules quantify noise levels over a 1-hour period where L₁₀ is the noise level that is exceeded for 10 percent (6 minutes) of the hour, and L₅₀ is the noise level exceeded for 50 percent (30 minutes) of the hour. Stationary limits for residential areas are the most stringent as shown in Table 19-1.

Table 19-1: Noise Rules for Noise Area Classifications

Noise Area Classification	Daytime (7AM-10PM) (dBA)		Nighttime (10PM-7AM) (dBA)	
	L10	L50	L10	L50
Area 1 (Residential)	65	60	55	50
Area 2	70	65	70	65
Area 3	80	75	80	75

Sensitive receptors, or noise-sensitive areas (NSAs), are defined as homes, schools, churches, or any location where people reside or gather. The NSAs nearest to the Project are several residential homes approximately 0.5 miles to the northwest within the PIIC. Appendix A, Map 14 depicts the NSAs near the proposed Project area. NRC notes that noise typically associated with the ISFSI is not audible.¹²⁹ The earthen berm around the ISFSI mutes noise generated by the transport vehicle during DFS system transfer.¹³⁰

Ambient sound level data was collected in the vicinity of the PINGP in 2006 as shown in Table 19-2 below. The purpose of the survey was to document the existing ambient sound levels at the closest residential receptors to identify potential noise impacts from future construction and operation of the expanded ISFSI. The plant was operating during the ambient surveys, but the cooling towers were not. The morning L₉₀s varied from 31.9 to 43.8 A-weighted decibels (dBA) and the afternoon L₉₀s varied from 32.3 to 46.1 dBA depending on location. The study and analysis focused on daytime noise levels, because construction would not affect nighttime noise levels as construction would be limited to daylight hours (7 AM to 10 PM) as defined by Minnesota Administrative Rule 7030.0020. As noted in the 2009 EIS, ambient noise levels are highly dependent on location. For example, daytime ambient noise levels at the Prairie Island

¹²⁹ NRC. 2020. Environmental Assessment for the Proposed Amendment of the of U.S. Nuclear Regulatory Commission License No. SNM-2506 for Prairie Island Independent Spent Fuel Storage Installation, Docket No. 72-0010, October 2020. Available online at: <https://www.nrc.gov/docs/ML2027/ML20275A342.pdf>. Accessed July 2023.

¹³⁰ *Ibid.*

Casino are in the range of 45 dBA, due primarily to casino related traffic. Daytime ambient noise levels at rural residences are in the range of 35 dBA.¹³¹

Table 19-2: Summary of Measured Ambient L₉₀S

Location	Morning		Afternoon		L _{dn} ^a dBA	Controlling Noise Sources
	11/15/06	11/16/06	11/15/06	11/16/06		
5016 Lock and Dam Rd./ C. Suter Residence	34	31.9	34.6	32.3	39.4	Vents from PINGP
1754 Messiah Rd.	38.2	37.8	40.7	37.5	44.6	Local vehicle and train traffic
Casino parking lot	42.5	43.8	46.1	43.3	49.8	Local vehicle and train traffic and casino vent fans on roof
1960 Edoka St.	39.9	40	41.7	39.9	46.5	Local vehicle and train traffic
1824 Edoka St.	35.3	32.2	35.7	33.5	40.3	Local vehicle and train traffic
5390 Sturgeon Lake Rd.	36.1	34.5	33.1	40.7	42.0	Local vehicle and train traffic
^a The morning and afternoon measured ambient L ₉₀ s were used to calculate L _{dn} , with the morning values assumed to be representative of "nighttime" values and the afternoon values representative of "daytime" values.						

As indicated in Table 19-2, the residual morning and afternoon L₉₀s are mostly contributed to by local vehicle traffic and trains. The measured sound levels at the casino parking lot were the loudest, due to casino related traffic. 5016 Lock and Dam Road and 5390 Sturgeon Lake Road were generally the quietest as these locations are farther from the casino. The change in sound level from morning to afternoon varied from 0.1 to 6.2 dBA. PINGP activities were only audible at 5016 Lock and Dam Road. The 2009 EIS concluded that some citizens would experience noise impacts of 10-20 additional dBA due to construction activities; other citizens would experience no increase in noise. For those impacted, the additional noise is limited in extent and duration. The impact would be below the Minnesota daytime limit of 60 dBA.¹³² There has been no substantial change to the level or quality of noise in the area since the time of this data collection.

Construction noise for the Project will be in the range of 40-55 dBA.¹³³ The predicted sound levels for residences near the Project are shown in Table 19-3 below, in which it is assumed one dump truck, one grader, one water truck, and one light truck are operating simultaneously.

¹³¹ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

¹³² *Ibid.*

¹³³ *Ibid.*

Table 19-3: Summary of Construction Sound Levels and Daytime Ambient L₉₀s

Location	Measured Ambient Daytime Sound Levels (L ₉₀) dBA ^a	Sound Level Attributable to Construction (L ₅₀) dBA	Estimated Total Daytime Sound Level (L ₅₀) dBA	Calc'd Increase Over Existing Sound Level (L ₅₀) dBA
5016 Lock and Dam Rd. / C. Suter Residence	33.5	48.3	48.4	15.0
1754 Messiah Rd.	39.1	50.0	50.3	11.2
Casino parking lot	44.7	46.0	48.4	3.7
1960 Edoka St.	40.8	47.9	48.6	7.8
1824 Edoka St.	34.6	50.3	50.5	15.9
5390 Sturgeon Lake Rd.	36.9	48.0	48.3	11.4
^a The average measured ambient afternoon L ₉₀ measured at each location.				

The changing number and type of construction equipment at the ISFSI would result in varying levels of sound. The maximum noise level occurs only when the equipment is operating at full power. However, not all equipment would be operating all the time, and, when operating, would often be in a quieter, low power mode. Because sounds levels are measured on a logarithmic scale, they are not directly additive. “A doubling of sound energy yields an increase of three decibels.”¹³⁴ For example, if a sound level of 50 dBA is added to another sound level of 50 dBA, the total sound level is 53 dBA, not 100 dBA. This change in sound level (three dBA) would be barely detectible.

Construction of the pad(s) would create a temporary source of noise that is estimated to last 9 to 12 months (refer to Section 6b for additional details). These noises would come and go during construction. Earth-moving equipment such as bulldozers, scrapers, and graders would clear/excavate the area. Concrete trucks would deliver concrete to the site and pumping trucks would place it. Sound generated during construction of the Project would be greatest in the immediate vicinity of construction activities and would diminish with distance from the work area. The sound levels attributable to construction activities would occur during daylight hours and would be below the MPCA 60 dBA L₅₀ noise threshold as shown in Table 19-3 above.

During operations, the DFS systems would be moved from the PINGP to the ISFSI facility with the DFS transport vehicle. There would be no change in operation activities and no operational impacts on sound levels at the NSAs due to the proposed Project. Therefore, measurable noise impacts as a result of the Project are not expected and no mitigation measures are proposed.

20. TRANSPORTATION

- a) Describe traffic-related aspects of project construction and operation. Include: 1) existing and proposed additional parking spaces, 2) estimated total average daily traffic generated, 3) estimated maximum peak hour traffic generated and time of occurrence, 4) indicate source of trip generation rates used in the estimates, and 5) availability of transit and/or other alternative transportation modes.

¹³⁴ MPCA. A Guide to Noise Control in Minnesota. (2015), retrieved from: <https://www.pca.state.mn.us/sites/default/files/p-gen6-01.pdf>.

Appendix A, Map 15 depicts major roadways and transportation systems within a 5-mile radius of the proposed Project. No parking spaces are currently located at the ISFSI, nor would any be added. Adequate parking exists at the adjacent PINGP parking lots. The equipment that would be employed to construct the Project would include bulldozers, scrapers, front end loaders, graders, dump trucks, cement trucks, delivery trucks, and various small support vehicles. Work and travel would occur during daytime hours. Alternative transportation methods in the area that could be used by construction personnel are limited and will not likely be used.

During the 9-12 month concrete pad construction period between 2027 and 2029, a total of 40 construction workers are estimated with a peak at any one time of 12 workers and an average of 8 workers during a 40-hour week. Additional traffic would be generated from truck deliveries. It is estimated that deliveries would add an average of 7 trips each day.

The number of construction workers needed for this Project is small, compared to the over 800 full-time, contract, and security employees at PINGP. Construction activities would be conducted during daytime hours. No measurable additional traffic is expected to occur as a result of Project construction or operation and no additional full-time staff would be required to operate the Project; therefore, no Project-related traffic impacts are anticipated.

- b) Discuss the effect on traffic congestion on affected roads and describe any traffic improvements necessary. The analysis must discuss the project's impact on the regional transportation system. If the peak hour traffic generated exceeds 250 vehicles or the total daily trips exceeds 2,500, a traffic impact study must be prepared as part of the EAW. Use the format and procedures described in the Minnesota Department of Transportation's Access Management Manual, Chapter 5 (available at: <http://www.dot.state.mn.us/accessmanagement/resources.html>) or a similar local guidance.**

During the 9-12 month concrete pad construction period between 2027 and 2029, with a peak construction force of 12 workers, the peak hour traffic generated during the morning and evening commuting hours would be 12 vehicles. During peak construction activity (between the morning and evening commuting hours) it is estimated that the peak hour traffic generated due to deliveries would be three trucks. The addition of 12 vehicles on local roadways during construction and operations activities is not expected to create traffic impacts. Additional traffic impacts would not occur during operation of the ISFSI facility.

- c) Identify measures that would be taken to minimize or mitigate project related transportation effects.**

Due to the small number of workers required to construct the Project and no new workers needed during operation of the Project, mitigation measures are not proposed.

21. CUMULATIVE POTENTIAL EFFECTS

(Preparers can leave this item blank if cumulative potential effects are addressed under the applicable EAW Items)

- a) Describe the geographic scales and times of the project related environmental effects that could combine with other environmental effects resulting in cumulative potential effects.**

Development of the Project would be limited geographically to work within PINGP boundaries and temporally to the initial construction and loading campaign (2027-2030; estimated to last 9 to 12 months for construction between 2027 and 2029 and 3 months for the first loading campaign in 2030) and successive loading campaigns in 2035, 2040, and 2045 (each estimated to last approximately three months). The following are other projects that are and could occur within the geographic and temporal scope of the Project.

The PIIC has established the Net Zero Project with a goal of achieving net zero carbon emissions within the community and gaining energy resiliency and sovereignty within the next few years.¹³⁵⁻¹³⁶ PIIC intends to reach its net zero carbon emissions goals through a combination of energy efficiency measures, renewable energy generation, and electrification projects at both the commercial and residential levels. According to the Prairie Island Net Zero Project Progress Report,¹³⁷ the project involves three phases: Phase I Net Zero Project Plan, Phase II Costing and Contractor Procurement, and Phase III Construction and Implementation. The project is currently in Phase III, and development of the solar photovoltaic and geothermal energy project are nearly complete, and commercial and residential energy efficiency projects are underway.¹³⁸ Because the Net Zero Project consists of development within the reservation boundary and the Company's Project will be limited to the PINGP property, the two projects would not physically overlap. However, minor, temporary indirect effects such as increases in traffic, noise, and dust, could result in cumulative potential effects if the projects overlap temporally, but these would not result in significant impacts due to the size of these projects and their distance from one another. Furthermore, much of the work to complete the Net Zero development projects is already underway and would likely be complete by the time Project construction begins.

The City of Red Wing maintains a list of active and proposed projects on its website.¹³⁹ Projects listed include an improvement plan for the He Mni Can - Barn Bluff landmark and park, a bicycle and pedestrian plan, surface water management projects, and various park and conservation development projects.

He Mni Can – Barn Bluff is adjacent to downtown Red Wing between Highway 61 and the Mississippi River and about six miles southeast of PINGP and the Project area. Based on location, there is no potential for the various improvement projects at He Mni Can – Barn Bluff to result in cumulative potential effects.

Additional plans adopted by the City of Red Wing include Bicycle and Master Plan Parts 1 and 2, Management Plans for Barn Bluff Habitat, Billings-Tomfohr Conservation Area, Memorial Park, and Upper Harbor Conservation Area. Each of these areas is located within or directly adjacent to the developed portions of Red Wing, between three and six miles southeast of the PINGP. While the nature, scope, and timeline of the improvement projects outlined in each of these plans varies, based on the distance

¹³⁵ PIIC. 2023. Righting an Environmental Injustice. Available online at <https://prairieisland.org/who-we-are/our-land/net-zero>. Accessed July 2023.

¹³⁶ Sahan Journal. 2022. Prairie Island Indian Community Nuclear Concern Powers Net Zero Carbon Emissions Plan, August 5, 2022. Available online at <https://sahanjournal.com/climate-environment/prairie-island-indian-community-nuclear-concern-powers-new-emissions-plan/>. Accessed July 2023.

¹³⁷ PIIC. 2023. Prairie Island Net Zero Project Progress Report, July 1, 2023. Available online at <https://prairieisland.org/uploads/PIIC-Net-Zero-2023-Progress-Report.pdf>. Accessed November 2023.

¹³⁸ Sahan Journal. 2023. In the Shadow of a Nuclear Power Plant, Prairie Island Celebrates Steps Toward a Green Future, October 2, 2023. Available online at <https://sahanjournal.com/climate-environment/prairie-island-indian-community-celebrates-green-future/>. Accessed November 2023.

¹³⁹ City of Red Wing. 2023. Current Planning Projects. Available online at: <http://www.red-wing.org/352/Current-Planning-Projects>. Accessed July 2023.

between the Project and the location of each bike trail, park, or conservation area there is no potential for activities associated with these management plans to result in cumulative potential effects.

Review of the USACE St. Paul District's Projects website indicates that the USACE has various improvements and maintenance activities planned for Mississippi River Locks and Dams 2 through 10.¹⁴⁰ The timing of any planned improvements for Lock and Dam No. 3 near PINGP is not known currently. However, because the Project will be limited to the area of the PINGP site away from the river, any work at Lock and Dam No. 3 would not result in cumulative potential effects.

The Minnesota Department of Transportation (MNDOT), District 6, Southeast Minnesota Regional Information planning website provides information about planning studies and potential future projects throughout southeastern Minnesota.¹⁴¹ The Southeast Minnesota Area Transportation Partnership (ATP), the District 6 Bicycle Plan, and the District 6 Freight Plan are the planning studies that are most likely to identify improvement and maintenance projects that could overlap temporally with the proposed Project. The Southeast Minnesota ATP provides a list of planned projects during the 2024 to 2027 timeframe, but these projects would be completed at least a year or more before construction within the PINGP ISFSI is anticipated to begin. The potential projects identified in the District 6 Bicycle Plan are located a minimum of two miles from the Project area. Potential projects identified in the District 6 Freight Plan have the potential to occur closer to the Project area, as the CP Rail System and Lock and Dam No. 3 are identified as key components of the District 6 freight system; the rail line is within 0.1 mile and the lock and dam is within 1.5 miles of the ISFSI. However, neither the rail line nor the lock and dam are included in the District 6 Freight Plan's list of priority projects for conceptual design and analysis. Based on location of identified planned projects and the lack of a firm timeline for completing this work, it is unlikely that MndOT's planned highway, bicycle trail, and freight system projects would result in cumulative potential effects.

Due to the short duration of the construction (estimated at 9 to 12 months) and the localized impacts of DFS system loading campaigns in 2030, 2035, 2040, and 2045, as well as the Project's spatial limitation within the boundaries of the PINGP property, no cumulative potential effects due to the geographic and temporal scope are anticipated as a result of these Projects.

b) Describe any reasonably foreseeable future projects (for which a basis of expectation has been laid) that may interact with environmental effects of the proposed project within the geographic scales and timeframes identified above.

Two reasonably foreseeable future projects related to PINGP and the ISFSI, and one potential future project on the PINGP property that affects the same environmental resources as the Project, are considered in the cumulative potential effects assessment:

- Operation of PINGP past its current NRC operating license from 2033/2034 to 2053/2054;
- Additional on-site storage for DFS systems required to decommission PINGP in 2053/2054, should no off-site storage options be available; and
- Potential expansion of the instrumentation building on the northeast side of the ISFSI.

¹⁴⁰ USACE. n.d. St. Paul District Website, District Projects Home. Available online at <https://www.mvp.usace.army.mil/About/District-Projects/Mississippi-River-Basin/>. Accessed July 2023.

¹⁴¹ MNDOT. 2023. Southeast Minnesota Regional Information, MndOT District 6, Planning and Public Involvement. Available online at <http://www.dot.state.mn.us/d6/planningandinvolvement.html>. Accessed July 2023.

Details of these projects are summarized in Section 21.b.i through Section 21.b.iii, and the way in which they may interact with environmental effects of the proposed Project is presented in Section 21.c.

21.b.i Continued Operation of PINGP

The 2009 EIS prepared by the DOC for the ISFSI expansion to 64 DFS systems through 2033/2034 considered the impacts of decommissioning PINGP at the end of 2033/2034. Continued operation of the PINGP facility through 2033/2034 was also a reasonably foreseeable future action related to the ISFSI expansion at that time, as its ongoing operation into new license terms was reliant on the availability of spent fuel storage. At that time, given the connected action of ongoing plant operation to 2033/2034, and the uncertainty as to when an off-site spent fuel storage facility would be available, DOC determined it was appropriate to consider the impacts of continued operation of PINGP through 2033/2034 and on-site storage of spent fuel for decommissioning the plant starting in 2033/2034. The 2009 EIS also considered the cumulative impacts of potential on-site storage of spent fuel at PINGP for up to 200 years.¹⁴² Presently, the proposed action is similar in that the Company is requesting new spent fuel storage capacity in advance of applying to the NRC for extended operating licenses. The Company anticipates submitting the NRC SLR license extension application in 2026.

Once the application is received, the NRC will complete environmental review of the proposed action. The NRC manages its environmental review of license renewals through use of its “Generic Environmental Impact Statements” (GEIS) which are documents which have already analyzed the effects of extended operation of licensed nuclear plants using a general approach. The NRC uses its GEIS as a baseline from which to conduct the site-specific review of a plant such as PINGP. Then, to document the specific environmental impacts of the applicant plant, the NRC conducts a “supplemental” plant-specific review through the preparation of a SEIS, which supplements the GEIS.

While generally projects outlined in the cumulative impacts section should have “sufficiently detailed information available about the project to contribute to the understanding of cumulative potential effects”¹⁴³, Minn. Stat. 216B requires any certificate of need for additional storage of spent nuclear fuel for a facility seeking a license extension to address the impacts of continued operations over the period for which approval is sought. Thus, although continued operation of PINGP does not have specific information available about the Project’s potential impacts, there is a basis of expectation laid for it and is evaluated herein to the extent possible. Overall, this discussion is framed around the fact that there are no planned changes at PINGP between 2033 and 2054 that are expected to lead to materially different impacts.

NRC prepared its first GEIS in 1996 (NRC 1996 GEIS)¹⁴⁴ and revised the GEIS in 2013 (NRC 2013 GEIS) for License Renewal of Nuclear Plants (NUREG-1437, Volume 1, Revision 1).¹⁴⁵ In the NRC 2013 GEIS, NRC identified 78 impact issues from continued operations and refurbishment associated with license renewal. Fifty-nine were determined to be “Category 1” issues that are generic to all plants, which require no

¹⁴² DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

¹⁴³ EQB, 2013. EAW Guidelines, retrieved from:

https://www.eqb.state.mn.us/sites/eqb/files/documents/EAW%20guidelines%202013%20revision_0.pdf

¹⁴⁴ NRC. 1996. Generic Environmental Impact Statement for License Renewal of Nuclear Plants: Main Report (NUREG-1437, Volume 1). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/v1/index.html>. Accessed July 2023.

¹⁴⁵ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

additional plant-specific analysis unless new and significant information is discovered during license renewal review. Seventeen “Category 2” issues require additional plant-specific review. Two issues were “uncategorized.”

More recently, the NRC has prepared a draft Revision 2 to NUREG-1437 (NRC 2023 GEIS), which will replace the 2013 GEIS.¹⁴⁶ The NRC 2023 GEIS will redefine the number and scope of environmental issues that must be addressed during the review of each application for plant license renewal. There are now 80 proposed environmental issues, 20 of which will require a plant-specific analysis such as impingement of fish and shellfish (for plants with once-through and cooling-pond heat dissipation systems), and heat shock (for plants with once-through and cooling-pond heat dissipation systems).¹⁴⁷ Some prior issues from the 2013 GEIS were consolidated and recategorized. One new Category 1 issue was added (Greenhouse Gas Impacts on Climate Change) and two new Category 2 issues were added (Climate Change Impacts on Environmental Resources and National Marine Sanctuaries Act: Sanctuary Resources). Publication of the final NRC 2023 GEIS could occur around August 2024.¹⁴⁸ The Company will submit its SLR application to the NRC after 2024, so the application will be reviewed against the NRC 2023 GEIS.

The NRC completed a SEIS in 2011 for extension of the PINGP operating licenses to 2033/2034 (NRC 2011 SEIS).¹⁴⁹ The NRC 2011 SEIS was Supplement 39 to the NRC 1996 GEIS. The NRC has not yet initiated or completed an environmental review addressing the continued operation of PINGP between 2033/2034 and 2053/2054 and will review any application against the revised rules noted above. However, for purposes of this cumulative potential effects assessment, the conclusions from the NRC 2011 SEIS contain the most recent PINGP-specific environmental review information. The impacts of extending the operation of PINGP from 2033/2034 - 2053/2054 are not expected to be different enough from the effects of extending operation from 2013/2014 – 2033/2034 to warrant additional analysis in this EAW. There are no planned changes at PINGP between 2033/2034 and 2053/2054 that would lead to materially different impacts.

21.b.ii Decommissioning of PINGP and Storage of Spent Fuel On-Site

In the 2009 EIS, DOC discussed that an additional 34 DFS systems, on top of the 64 being requested, would be needed for decommissioning in 2033/2034, for a total of 98 DFS systems (with the change in

¹⁴⁶ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁴⁷ Anything that is Category 2 would require a site-specific analysis. The two examples cited are categorized as Category 2 in the 2023 GEIS. For impingement of fish and shellfish: **Small, moderate, or large (Category 2)**. The impacts of impingement mortality and entrainment would generally be small at nuclear power plants with once-through cooling systems or cooling ponds that have implemented best technology requirements for existing facilities under Clean Water Act (CWA) Section 316(b). For all other plants, impacts could be small, moderate, or large depending on characteristics of the cooling water intake system, results of impingement and entrainment studies performed at the plant, trends in local fish and shellfish populations, and implementation of mitigation measures. For heat shock: **Small, moderate, or large (Category 2)**. Acute, sublethal, and community-level effects of thermal effluents on aquatic organisms would generally be small at nuclear power plants with once-through cooling systems or cooling ponds that adhere to state water quality criteria or that have and maintain a valid CWA Section 316(a) variance. For all other plants, impacts could be small, moderate, or large depending on site-specific factors, including ecological setting of the plant; characteristics of the cooling system and effluent discharges; and characteristics of the fish, shellfish, and other aquatic organisms present in the area.

¹⁴⁸ NRC. 2023. License Renewal Generic Environmental Review. Available online at: <https://www.nrc.gov/reactors/operating/licensing/renewal/sled.html>. Accessed November 2023.

¹⁴⁹ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

technology being implemented, this will result in approximately 99 DFS systems). The 2009 EIS notes that, “the storage facility is laid out so that the storage pads could be extended to the north and south to accommodate a total of 100 casks without having to change the security perimeter. The extra space could be used for casks to decommission the Prairie Island plant”.¹⁵⁰ This amount of space exceeds the current Project proposal which requests one or possibly two storage pads that can hold approximately 34 DFS systems with 1,200 assemblies.

The Company is not planning to decommission PINGP in 2033/2034 as was contemplated in the 2009 EIS and instead plans to seek SLR to 2053/2054. Should PINGP operate to 2053/2054, it is possible that additional DFS capacity will be needed in approximately 20 years for decommissioning should offsite storage options not become available in the interim. The number of DFS systems that would need to be stored upon decommissioning in 2053/2054 would be approximately 126 DFS systems (65 TN-40 equivalents, plus 34 EOS 37PTH being requested, plus approximately 27 EOS 37PTH for decommissioning noting that a different DFS technology and, therefore, capacity DFS system, could be in use at the time of decommissioning).

Should PINGP need to decommission in 2053/2054 and no offsite storage options are available, the Company could store all fuel from PINGP in the existing ISFSI without expansion beyond the current footprint of the ISFSI. Based on Orano’s proposed ISFSI layout, the Company could store 75 EOS DFS systems, along with the 55 TN-40s¹⁵¹ for a total of 130 DFS systems without expanding the perimeter. Therefore, the cumulative potential effects assessment does not need to consider constructing new storage outside of the footprint of the existing ISFSI.

Decommissioning activities have been generically addressed by the NRC in its “Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Regarding the Decommissioning of Nuclear Power Reactors” (NRC 2002 Decommissioning GEIS)¹⁵² and specifically in the NRC 2011 SEIS. For all issues, the NRC determined that the impacts of decommissioning at PINGP would be small.¹⁵³ These impacts will likely be re-evaluated as part of the SEIS that the NRC will prepare for the Company’s SLR application. DOC’s 2009 EIS also evaluated the impacts related to the expansion of the PINGP ISFSI for decommissioning as discussed in Section 21.c.ii. Details of the spent fuel storage strategy to accommodate decommissioning have not been fully analyzed by the Company at this time.

21.b.iii Potential Instrumentation Building Expansion

There is a potential need to modify or expand the 10-foot by 10-foot instrumentation building, which currently houses pressure monitoring equipment for the existing DFS systems, to accommodate the use of equipment needed to monitor the additional DFS systems. It is unclear how this building may be modified at this time, but with the addition of new DFS systems and associated pressure monitoring and potential temperature monitoring systems, it is anticipated the building could expand by up to 1,200

¹⁵⁰ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

¹⁵¹ Fifty TN-40s are currently stored in ISFSI. Five more TN-40s will be filled and stored in ISFSI between 2024 and 2025.

¹⁵² NRC. 2002. Final Generic Environmental Impact Statement on Decommissioning of Nuclear Facilities: Regarding the Decommissioning of Nuclear Power Reactors (NUREG-0586, Supplement 1, Volume 1). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0586/s1/v1/index.html>. Accessed July 2023.

¹⁵³ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

square feet, adjacent to the current building. The Company assumes that the height of the building expansion would be approximately 12 feet, which is the same as the existing structure.

The location of this project relative to the Project site are shown on Appendix A, Map 16.

- c) Discuss the nature of the cumulative potential effects and summarize any other available information relevant to determining whether there is potential for significant environmental effects due to these cumulative effects.**

21.c.i Continued Operation of PINGP

Land Use

The NRC 2013 GEIS considered changes to onsite land use and determined impacts would be small. Changes in onsite land use from continued operations and refurbishment would be a small fraction of the nuclear power plant site and would only involve land that is controlled by the Company. Impacts of continued operations and refurbishment on offsite land use would not be affected, of which impacts of transmission line rights-of-way were considered.¹⁵⁴ NRC also studied land use in the NRC 2011 SEIS (see Section 2.2.1 and 2.2.8.3) but concluded that there were no impacts during the license renewal term beyond those discussed in the GEIS.¹⁵⁵

The NRC's draft Revision 2 to NUREG-1437 continues to find that onsite and offsite land use impacts for all nuclear power plants are small and they remain Category 1 issues.¹⁵⁶ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Geology and Soils

The NRC 2013 GEIS determined that the effect of geologic and soil conditions on ongoing plant operations and the impact of continued operations and refurbishment activities on geology and soils would be small and would not change appreciably during the license renewal term.¹⁵⁷ The impacts considered were changes to soils, bedrock, and topography, and seismic conditions. This issue was not addressed in the NRC 2011 SEIS as it was a Category 1 issue that did not require plant-specific review.

The NRC's draft Revision 2 to NUREG-1437 continues to find that impacts to geology and soils for all nuclear power plants are small and it remains a Category 1 issue.¹⁵⁸ Pending the issuance of the final

¹⁵⁴ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁵⁵ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁵⁶ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁵⁷ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁵⁸ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Water Resources

The NRC 2013 GEIS determined that ongoing plant operations and the impact of continued operations and refurbishment activities would result in mostly small impacts on surface water and ground water resources. The impacts considered were surface water use and quality; altered current patterns at intake and discharge structures; altered salinity gradients; altered thermal stratification of lakes; scouring caused by discharged cooling water; discharge of metals in cooling system effluent; discharge of biocides, sanitary wastes, and minor chemical spills; surface water use conflicts (plants with once-through cooling systems); effects of dredging on surface water quality; temperature effects on sediment transport capacity; groundwater contamination and use; groundwater use conflicts (withdrawals of less than 100 gallons per minute [gpm]); groundwater quality degradation resulting from water withdrawals; groundwater quality degradation (plants with cooling ponds in salt marshes). Some water resource issues were Category 2 issues that required site-specific analysis in the SEIS (see Sections 2.2.3 and 2.2.4)¹⁵⁹ such as surface water use conflicts (plants with cooling towers using makeup water from a river); potable and service water groundwater use conflicts (withdrawals of more than 100 gpm); and groundwater use conflicts (plants with closed-cycle cooling systems that withdraw makeup water from a river). In the NRC 2011 SEIS, the NRC concluded that the impacts on these surface and groundwater uses and quality were small.¹⁶⁰

The NRC's draft Revision 2 to NUREG-1437 finds that most surface water impacts from license renewal at all nuclear power plants are small and they remain Category 1 issues, except for surface water use at plants which rely on cooling ponds or cooling towers using makeup water from a river. These impacts could be small or moderate, and they are a Category 2 issue that will require site-specific analysis in the future PINGP SEIS because PINGP utilizes cooling towers that use makeup water from the Mississippi River. In regard to groundwater, most impacts are considered Category 1 issues, except for the following Category 2 issues: groundwater use at plants which withdraw more than 100 gpm, closed-cycle cooling systems that withdraw makeup water from a river, plants that have cooling ponds, and radionuclides released to groundwater, particularly tritium, due to inadvertent leaks of radioactive liquids from plant components and pipes. These impacts could be small or moderate, and they are Category 2s issue that will require site-specific analysis in the future PINGP SEIS.¹⁶¹ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Contamination/Hazardous Materials/Wastes

¹⁵⁹ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁶⁰ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁶¹ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

In the NRC 2013 GEIS, the NRC studied low-level waste storage¹⁶² and disposal; onsite storage of spent nuclear fuel; offsite radiological impacts of spent nuclear fuel and high-level waste¹⁶³ disposal; mixed waste storage and disposal; and nonradioactive waste storage and disposal¹⁶⁴ and determined these activities would have small impacts. The NRC 2011 SEIS did not identify any site-specific issues related to plant license renewal.¹⁶⁵

The NRC's draft Revision 2 to NUREG-1437 continues to find that impacts from low-level waste storage and disposal; onsite storage of spent nuclear fuel; offsite radiological impacts of spent nuclear fuel and high-level waste disposal; mixed waste storage and disposal; and nonradioactive waste storage and disposal are small, and they remain Category 1 issues.¹⁶⁶ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

The NRC 2013 GEIS analyzed the impacts of operating license renewal on a number of terrestrial and aquatic resources and special status species and habitats. Some issues were determined to be Category 1 issues with no need for further analysis in a SEIS. These impacts include issues such as bird collisions with plant structures and transmission lines and effects on aquatic resources (non-cooling system impacts). Other issues were determined to be Category 2 issues include effects on terrestrial resources (non-cooling system impacts); water use conflicts with terrestrial resources (plants with cooling ponds or cooling towers using makeup water from a river); thermal impacts on aquatic organisms; water use conflicts with aquatic resources; aquatic species and essential fish habitats.

NRC determined that PINGP license renewal would not be likely to adversely affect the only federally listed threatened or endangered aquatic species in the area of PINGP, the Higgins' eye pearly mussel,¹⁶⁷ however, was likely to affect state-listed mussel species and could cause long-term destabilization to certain mussel populations. The overall impact on threatened or endangered aquatic species from an additional 20 years of operation would vary from species to species, but overall, would be moderate. The

¹⁶² Low-level waste is a general term for a wide range of wastes having low levels of radioactivity. Nuclear fuel cycle facilities (e.g., nuclear power reactors and fuel fabrication plants) that use radioactive materials generate low-level wastes as part of their normal operations. These wastes are generated in many physical and chemical forms and levels of contamination (see 10 CFR 61.2). Low-level radioactive wastes containing source, special nuclear, or by-product material are acceptable for disposal in a land disposal facility. For the purposes of this definition, low-level waste has the same meaning as in the Low-Level Radioactive Waste Policy Act, that is, radioactive waste not classified as high-level radioactive waste, transuranic waste, spent nuclear fuel, or by-product material as defined in Section 11e.(2) of the Atomic Energy Act (uranium or thorium tailings and waste).

¹⁶³ High-level waste is the highly radioactive material produced as a byproduct of the reactions that occur inside nuclear reactors. High-level wastes take one of two forms (1) spent (used) reactor fuel when it is accepted for disposal, or (2) waste materials remaining after spent fuel is reprocessed.

¹⁶⁴ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁶⁵ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁶⁶ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁶⁷ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

NRC will need to conduct new consultations and analyses for SLR at PINGP; and if impacts exist, additional mitigation may be necessary.

The NRC's draft Revision 2 to NUREG-1437 continues to find that some terrestrial, aquatic, and threatened and endangered resource impacts are Category 1 issues, except for the following Category 2 issues that will require site-specific analysis in a SEIS:¹⁶⁸ non-cooling system impacts on terrestrial resources; consumption of water at rates that cause occasional or intermittent water use conflicts with nearby and downstream terrestrial and riparian communities; impacts of impingement mortality and entrainment of aquatic organisms; effects of thermal effluents on aquatic organisms at nuclear power plants that have once-through cooling systems or cooling ponds; water use conflicts with aquatic resources at nuclear power plants that have cooling ponds or cooling towers using makeup water from a river; and effects of continued nuclear power plant operation and refurbishment on federally listed species, critical habitats, essential fish habitat, and sanctuary resources. Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Historic Properties

In the NRC 2013 GEIS the NRC determined that continued operations and refurbishment associated with license renewal are expected to have no more than small impacts on historic and cultural resources, but that it is a Category 2 issue and site-specific analysis in the SEIS is required (see Section 2.2.9).¹⁶⁹ The impacts considered were the need to determine for every site whether 1) no historic properties are present; 2) historic properties are present, but not adversely affected; or 3) there is an adverse effect on a historic property. In the NRC 2011 SEIS, the NRC determined that impacts to known historical and archaeological resources would be small to moderate during the license renewal term because PINGP is situated in an archaeologically sensitive area. These impacts would be potentially mitigated by commitments made by the Company, specifically, the development of a CRMP and site procedures regarding excavation which integrated cultural resource considerations with ongoing PINGP activities. Additionally, the Company committed to training of PINGP staff in the Section 106 process, and to using a professional archaeologist to survey lands not already surveyed prior to any ground disturbance.¹⁷⁰

The NRC's draft Revision 2 to NUREG-1437 continues to find that impacts to historic and archaeological resources for all nuclear power plants during the license renewal term should be analyzed on a plant-specific basis and remains a Category 2 issue.¹⁷¹ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Visual

¹⁶⁸ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁶⁹ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁷⁰ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁷¹ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

The NRC 2013 GEIS determined that no major changes to the visual appearance of plant structures or transmission lines would be expected from continued operations and refurbishment associated with license renewal, and that impacts would be small (the impacts considered were the visual profile of existing plants and the visual appearance of transmission lines). The NRC 2011 SEIS' brief mention of visual resource impacts stated that both units can be seen from the river but are partly shielded by surrounding vegetation. The turbine building and reactor containment structures dominate the landscape of the site. The mechanical draft cooling towers produce a visible steam plume in the sky.¹⁷²

The NRC's draft Revision 2 to NUREG-1437 continues to find that visual impacts for all nuclear power plants are small and it remains a Category 1 issue.¹⁷³ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Air

The NRC 2013 GEIS determined that air quality impacts from continued operations and refurbishment associated with license renewal are expected to be small at all plants (the impacts considered were fugitive dust and emissions from construction vehicles).¹⁷⁴ The NRC 2011 SEIS also noted that the impacts of continued plant operation on air quality would likely be small (the impacts considered were exhaust from refurbishment activities); potential mitigation measures included use of a dust control plan and use of vans and workforce changes to reduce the number of vehicles on the road at any one given time.¹⁷⁵

The NRC's draft Revision 2 to NUREG-1437 continues to find that impacts on air quality for all nuclear power plants are small and they remain Category 1 issues.¹⁷⁶ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Greenhouse Gas Emissions

In Section 6.2 of the 2011 SEIS, the NRC noted that it had received comments during the scoping period regarding the impacts of the proposed PINGP license renewal on the release of CO₂ and other GHG emissions. At that time, the NRC 1996 GEIS provided only limited qualitative discussion regarding the GHG impacts of the nuclear fuel cycle. The NRC stated that since the development of the GEIS, extensive further research into the relative volumes of GHGs emitted by nuclear and other electricity generating methods

¹⁷² NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁷³ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁷⁴ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁷⁵ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁷⁶ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

had been performed. In support of the analysis for the SEIS, the NRC staff performed a survey of the recent literature on the subject.

In the case of the proposed PINGP relicensing, the NRC was able to conclude that the relicensing action will not involve additional GHG emissions associated with construction because the facility already exists. In addition, the proposed relicensing action will not involve additional GHG emissions associated with facility decommissioning, because that decommissioning must occur whether the facility is relicensed or not. Some emissions will occur as a result of construction associated with refurbishment activities. They stated that estimating the GHG emissions associated with current nuclear energy sources is challenging because of differing assumptions and noncomparable analyses performed by the numerous studies. The differences and complexities in these assumptions and analyses increase when using them to project future GHG emissions. However, even with these differences, the NRC drew the following conclusions. First, the studies indicate a consensus that nuclear power currently produces fewer GHG emissions than fossil-fuel-based electrical generation. Second, the studies indicate no consensus on future relative GHG emissions from nuclear power and other sources of electricity. Considering the current estimates and future uncertainties, it appears that GHG emissions associated with the proposed PINGP relicensing action are likely to be lower than those associated with fossil-fuel-based energy sources. Because nuclear fuel production is the most significant contributor to potential future increases in GHG emissions from nuclear power, and because most renewable energy sources lack a fuel component, it is likely that GHG emissions from renewable energy sources would be lower than those associated with PINGP at some point during the period of extended operation.

The NRC 2013 SEIS contains a section called “GHG Emissions and Climate Change” (Section 4.12.3.2). The NRC now includes a section within each SEIS that contains a plant-specific analysis of any impacts caused by GHG emissions over the course of the license renewal term as well as any cumulative impacts caused by potential climate change upon the affected resources during the license renewal term. As noted above, the NRC is considering adding two new issues to Revision 2 to NUREG-1437 (Greenhouse Gas Impacts on Climate Change: Category 1 and Climate Change Impacts on Environmental Resources: Category 2). Following issuance of the final NUREG-1437 Revision 2, the NRC will consider these impacts in the SEIS prepared for SLR at PINGP.

The NRC’s draft Revision 2 to NUREG-1437 presents initial conclusions on GHG impacts. GHG impacts on climate change from continued operation and refurbishment associated with license renewal are expected to be small, as GHG emissions from routine operations at nuclear power plants are typically very minor because such plants, by their very nature, do not normally combust fossil fuel to generate electricity. This is proposed as a Category 1 issue. However, climate change can have additive effects on environmental resource conditions that may also be directly impacted by continued operations and refurbishment during the license renewal term. The impacts of climate change on environmental resources are location-specific and cannot be evaluated generically; therefore, this is proposed as a Category 2 issue.¹⁷⁷ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Noise

The NRC 2013 GEIS determined that the impacts of continued operations and refurbishment to offsite noise levels would be small (the impacts considered were noise from construction vehicles and from

¹⁷⁷ *Ibid.*

continued plant operations).¹⁷⁸ The 2011 SEIS notes that noise from PINGP operation can be detected offsite and is generally nothing more than an intermittent minor nuisance, and that noise levels may at some time exceed the 55 dBA level that the U.S. Environmental Protection Agency (EPA) uses as a threshold. During the review of PINGP license renewal, the NRC did not identify any new and significant information beyond those discussed in the NRC 1996 GEIS.¹⁷⁹

Continued operation of PINGP must meet noise standards in Minnesota Rules 7030.0040. The NRC's draft Revision 2 to NUREG-1437 continues to find that impacts from noise for all nuclear power plants are small and it remains a Category 1 issue.¹⁸⁰ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Transportation

In the NRC 2013 GEIS, the NRC determined that transportation impacts would be small as changes resulting from continued operations and refurbishment associated with license renewal to traffic volumes would be small (the impacts considered were any increases in employee vehicle traffic resulting from continued operations).¹⁸¹ In the NRC 2011 SEIS, NRC concluded that any impact of PINGP employees on transportation service during the extended license term would be small.¹⁸²

The NRC's draft Revision 2 to NUREG-1437 continues to find that transportation impacts at all nuclear power plants during the license renewal term are small and it remains a Category 1 issue.¹⁸³ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Socioeconomics and Environmental Justice

The NRC 2013 GEIS determined that the impacts of continued operations and refurbishment on offsite socioeconomics conditions would be small. The impacts considered were employment and income, recreation, and tourism; tax revenues; community services and education; population and housing; and transportation.¹⁸⁴ The NRC 2013 GEIS found through a review of license renewal applications that the

¹⁷⁸ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁷⁹ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁸⁰ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁸¹ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁸² NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁸³ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

¹⁸⁴ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

number of permanent power plant operations workers tended to remain steady during the license renewal term.¹⁸⁵

In the NRC 2013 GEIS, potential impacts to minority and low-income populations were determined to be a Category 2 issue and site-specific analysis in the SEIS is required.¹⁸⁶ In the 2011 SEIS, the NRC conducted an environmental justice review of minority and low-income populations residing within a 50-mile radius of PINGP; NRC indicated there would be no disproportionately high and adverse impacts to these populations from the continued operation of PINGP during the license renewal period. Additionally, based on monitoring results, concentrations of contaminants in native leafy vegetation, soils and sediments, surface water, and fish in areas surrounding PINGP 1 and 2 have been low (at or near the threshold of detection) and seldom above background levels.¹⁸⁷ Consequently, no disproportionately high and adverse human health impacts would be expected in special pathway receptor populations in the region as a result of subsistence consumption of fish and wildlife.¹⁸⁸

The NRC's "Policy Statement on the Treatment of Environmental Justice Matters in NRC Regulatory and Licensing Actions" (69 CFR 52040, August 24, 2004) requires a determination of whether human health and environmental effects of continued operations during the license renewal term and refurbishment associated with license renewal on minority populations and low-income populations would be disproportionately high and adverse. This determination will be made by the NRC in each plant-specific SEIS.

The NRC's draft Revision 2 to NUREG-1437 continues to find that socioeconomic impacts for license renewal at all nuclear power plants are small and they remain Category 1 issues. Environmental justice impacts on minority populations, low-income populations, Indian Tribes, and subsistence consumption resulting from continued operations and refurbishment associated with license renewal will be addressed in plant-specific reviews and is a Category 2 issue.¹⁸⁹ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

Radiological Impacts

Operation of PINGP for an additional license renewal term between 2053-2054 will result in continued radiation from a number of pathways. PINGP's radioactive waste disposal systems are designed to collect, treat, and dispose of the radioactive and potentially radioactive wastes that are byproducts of plant operations. Byproducts include activation products resulting from the irradiation of reactor water and impurities therein (principally metallic corrosion products) and fission products resulting from defective fuel cladding or uranium contamination within the reactor coolant system. Operating procedures for radioactive waste disposal systems ensure that the radioactive wastes are safely processed and discharged from the plant in manners that meet the release limits as set forth in 10 CFR Part 20, "Radiation

¹⁸⁵ *Ibid.*

¹⁸⁶ *Ibid.*

¹⁸⁷ Retrieved from: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/prai1-2.html>. Click on any year under "Environmental Reports."

¹⁸⁸ NRC. 2011. Generic Environmental Impact Statement for License Renewal of Nuclear Plants, Supplement 39 Regarding Prairie Island Nuclear Generating Plant, Units 1 and 2. NUREG-1437, Supplement 39. Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/supplement39/sr1437s39.pdf>. Accessed July 2023.

¹⁸⁹ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

Protection Standards;" 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities;" the plant's technical specifications; and the PINGP Offsite Dose Calculation Manual (ODCM). Radioactive wastes resulting from plant operations are classified as liquid, gaseous, or solid. Liquid radioactive wastes are generated from liquids received directly from portions of the reactor coolant system or were contaminated by contact with liquids from the reactor coolant system. Gaseous radioactive wastes are generated from gases or airborne particulates vented from reactor and turbine equipment containing radioactive material. Solid radioactive wastes are solids from the reactor coolant system, solids that have contacted reactor coolant system liquids or gases, or solids used in the reactor coolant system or steam and power conversion system operation or maintenance.

PINGP's liquid radioactive waste processing system, in combination with the steam generator blowdown system, collects, holds, treats, processes, and monitors all liquid radioactive wastes for reuse or disposal. The PINGP liquid radioactive waste processing system segregates various stream wastes at the point of their collection into the following categories: non-aerated and aerated wastes, chemical drains, steam generator blowdown and resin waste. Liquid wastes are collected in sumps and drain tanks and transferred to the appropriate subsystem collection tanks for subsequent treatment, disposal, or recycling as described below. When performing a batch release, this is typically a shorter-term duration release and a higher activity. A batch release is the release of liquid radioactive wastes of a discrete volume or the release of a tank or purge of radioactive gasses into the environment. As such, samples or radiochemical batch analysis must be performed prior to release.

A continuous release is uninterrupted release of low activity gaseous or liquid effluent for an extended period of time during normal operation where the volume of radioactive waste is non-discrete and there is input flow during the release. Because of the continuous input and output flow, samples are drawn during the release for generation of a release permit. PINGP's ODCM¹⁹⁰ contains the methodology and parameters used to calculate offsite doses (i.e., beyond the PINGP boundary) resulting from radioactive gaseous and liquid effluents, and the gaseous and liquid effluent monitoring alarm and trip set points used to verify that the radioactive material being discharged meets regulatory limits as defined in 10 CFR 20 and 10 CFR 50 and further described below.

The ODCM also contains regulatory details around the radioactive effluent controls and radiological environmental monitoring activities as summarized below.

Liquid

Occasionally (such as during startup) the blowdown used to control steam generator chemistry is released to the circulating water canal via a radiation monitor. Liquid releases from the steam generator blowdown monitor tank are made based on the results of a radiochemical batch analysis of the tank contents and are monitored by the waste disposal system liquid effluent monitor. The PINGP liquid radwaste discharge point and steam generator blowdown are located just upstream of the circulating water canal discharge structure at the Mississippi River in order to minimize the potential for the tritium to enter the local ground water. Liquid releases are limited to the maximum extent possible to satisfy the design objectives of 10 CFR Part 50. Controls defined in PINGP's technical specifications¹⁹¹ also ensure that the concentration of radioactive materials released in liquid waste effluents from the site to unrestricted areas will conform to ten times the concentration levels specified in 10 CFR 20, Appendix B, Table 2,

¹⁹⁰ PINGP's ODCM demonstrates compliance with 10 CFR 20, "Radiation Protection Standards" and 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities."

¹⁹¹ Regulatory operating specifications or limitations based on the design of the Prairie Island Nuclear Generating plant.

Column 2.¹⁹² This technical specification limitation allows the instantaneous concentrations to be 10 times the 10 CFR 20 table values, but the resulting doses must conform to 10 CFR 20 and 10 CFR 50 limits. This means the Plant cannot release these concentrations for extended periods of time. Liquid discharges occur when the radioactive material has been analyzed and the projected dose to be released has been calculated within the values specified in the ODCM, 10 CFR 20, and 10 CFR 50. The Company prepares a Radioactive Effluent Release Report (RERR)¹⁹³ each year in compliance with the ODCM and 10 CFR Part 50; the NRC notes that variations in the amount of radioactive effluents from year to year can be expected based on the overall performance of the plant and the number and scope of outages. These releases result in minimal doses to members of the public that are well below the as low as reasonably achievable (ALARA) dose design objectives of 10 CFR 50.

Gaseous

The gaseous radioactive waste processing system and the plant ventilation exhaust system control, collect, process, store, and dispose of gaseous radioactive wastes generated as a result of normal operation. The gaseous radioactive waste processing system is used to reduce radioactive materials in gaseous effluents before discharge to meet the ALARA dose objectives in 10 CFR Part 50. The gaseous radioactive waste processing system receives radioactive gases mainly from the four sources: displacement of cover gases as liquid accumulates in various tanks, miscellaneous equipment vents and relief tanks, automatic gas analysis and sampling for hydrogen and oxygen in cover gases and nitrogen stripping of reactor coolant to remove hydrogen during shutdown operations. The system is vented into the atmosphere and results in an occasional discharge only in cases of the disposal of the gases collected from shutdown operations and from miscellaneous vents. Prior to discharge the gases are sampled and analyzed to record gas activity and discharged to the auxiliary building vent at a controlled rate. PINGP maintains radioactive gaseous effluents in accordance with the procedures and methodology described in the ODCM. To comply with the 10 CFR Part 20.1301, Dose Limits for Individual Members of the Public, dose is limited to 100 mrem Total Effective Dose Equivalent (TEDE) per year for members of the public. The Company prepares RERR reports for gaseous radioactive waste releases each year; the NRC notes that similar small quantities of radioactive gaseous effluents are expected from PINGP and are not expected to change significantly during the period of extended operation. These releases result in minimal doses to members of the public that are well below the ALARA dose design objectives of 10 CFR 50.

Solid

The solid radioactive waste management system is designed to collect, package, provide shielded storage facilities and to allow temporary storage prior to offsite shipment for processing or disposal of low-level radioactive wastes generated as a result of normal plant operation. The solid radioactive waste is shipped in vehicles equipped with adequate shielding to comply with U.S. Department of Transportation regulations or is stored on-site if off-site shipping is not available. Access to the process equipment and solid radioactive waste storage areas is controlled to minimize personnel exposure by suitable barriers such as locked doors, gates, or control cards. Radioactive solid waste is comprised mainly of dry active waste such as contaminated paper, plastic, wood, metals and spent resins. The system is designed to

¹⁹² [eCFR :: Appendix B to Part 20, Title 10 -- Annual Limits on Intake \(ALIs\) and Derived Air Concentrations \(DACs\) of Radionuclides for Occupational Exposure; Effluent Concentrations; Concentrations for Release to Sewerage](#)

¹⁹³ Historic reports are available on the NRC's website at: <https://www.nrc.gov/reactors/operating/ops-experience/tritium/plant-specific-reports/prai1-2.html>

maintain ALARA radiation exposure to plant personnel in accordance with 10 CFR Part 50; this system maintains personnel exposures below 10 CFR Part 20 requirements.

Summary

PINGP's most recent RERR for the year 2022 was reviewed to determine the plant's dose contribution from effluents and direct radiation (including skyshine). Computed doses were well below the 40 CFR Part 190 Standards and 10 CFR Part 50 Appendix I Guidelines. There were no abnormal releases in 2022. The annual dose to the nearest receptor (resident) 724 meters from the ISFSI was 0.9 mrem/year. For reference, the 40 CFR 190 limit is 25 mrem/year for whole body, 75 mrem/year for thyroid, and 25 mrem/year for other organs.¹⁹⁴

Plant personnel would also receive radiological exposure from on-going operations at PINGP. Exposure and doses for plant personnel will continue to be managed by the PINGP radiation protection program to ensure they are within NRC regulations (10 CFR 20) and ALARA. This is managed through radiologically controlled access points which require workers be on radiological working permits that indicate to worker and employer expected dose for employee based on area that will be worked in. Once on a permit, personal dosimetry will be given to the employee which will have dose and dose rate alarm setpoints assigned to their dosimeter. The employee is required to periodically monitor their dosimetry to ensure their dose is not nearing the alarm, but if it did reach an alarm setpoint, they would hear the alarm and would immediately exit the area and notify radiation access control. Additionally, access requires security badges be scanned on card readers to unlock doors or gates for entry.

Through its analysis in Section 2.1.2 of the 2011 SEIS, the NRC found that there would be no significant changes to the radioactive effluent releases or exposures from operations during the renewal period and, therefore, the impacts on the environment were not expected to change. It is reasonable to assume that this same conclusion would be reached for an extended period of operations. In addition, in the NRC 2013 GEIS, the NRC determined that radiation doses to the public and plant workers from continued operations and refurbishment associated with an extended power plant license renewal term would be expected to continue at current levels and would be well below regulatory limits. The impacts from radiation doses to the public would be small and within regulatory limits.¹⁹⁵

The NRC's draft Revision 2 to NUREG-1437 continues to find that the impacts from radiation doses to the plant workers and the public from continued operation of nuclear power plants are small and they remain Category 1 issues.¹⁹⁶ Pending the issuance of the final Revision 2 to NUREG-1437, these issues will be revisited by the NRC as part of the environmental review effort to develop the forthcoming SEIS.

21.c.ii Decommissioning of PINGP and Storage of Spent Fuel On-Site

Land Use

¹⁹⁴ Xcel Energy, 2023. 2022 Annual Radioactive Effluent Report. May 8, 2023. Available online at: <https://www.nrc.gov/docs/ML2312/ML23128A092.pdf>. Accessed July 2023.

¹⁹⁵ NRC. 2013. Generic Environmental Impact Statement for License Renewal of Nuclear Plants. NUREG-1437, Volume 1, Revision 1. June 2013. Available online at: <https://www.nrc.gov/docs/ML1310/ML13106A241.pdf>. Accessed July 2023.

¹⁹⁶ NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

Building additional storage capacity within the existing ISFSI boundaries would not change the land use of the site. It is possible that some support facilities could be constructed within or outside of the existing ISFSI boundary, but these structures would not be significant and would not result in a change from the industrial nature of the site. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the PINGP ISFSI (during decommissioning) are not significant.¹⁹⁷

Geology and Soils

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would result in some impacts to local soils and geology. These impacts would be small, localized, and contained within the ISFSI site, which has already been heavily disturbed. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the PINGP ISFSI (during decommissioning) are not significant.¹⁹⁸

Water Resources

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would not be expected to impact water resources, as none exist within the ISFSI. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the PINGP ISFSI (during decommissioning) are not significant.¹⁹⁹

Contamination/Hazardous Materials/Wastes

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would not result in appreciable changes to contamination, hazardous materials, or wastes, as the ISFSI is a passive structure which produces no wastes. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the PINGP ISFSI (during decommissioning) are not significant.²⁰⁰

Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would not result in impacts to fish, wildlife, plant communities, or other sensitive ecological resources because none exist within the ISFSI. The Company would complete appropriate consultation with state and federal agencies which regulate these features prior to construction. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the PINGP ISFSI (during decommissioning) are not significant.²⁰¹

Historic Properties

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in impacts to historic properties. The Company would continue to coordinate with the PIIC and would conduct subsurface testing prior to excavation in areas where studies were not

¹⁹⁷ DOC. 2009. Final Environmental Impact Statement – Request for Additional Dry Cask Storage. PUC Docket No E002/CN-08-510. July 31, 2009.

¹⁹⁸ *Ibid.*

¹⁹⁹ *Ibid.*

²⁰⁰ *Ibid.*

²⁰¹ *Ibid.*

previously conducted and would follow its CRMP and site procedures to protect archaeological and historic resources. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.²⁰²

Visual

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in visual impacts, as any new pads would house DFS systems that are similar to the existing features. The ISFSI is also surrounded by a berm which obscures it from view. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.²⁰³

Air

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in long-term air quality impacts. The additional construction vehicles on local roadways during construction activities for such a short duration will result in negligible air emissions. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.²⁰⁴

GHG and Climate Change

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in long-term air quality impacts. The additional emissions created by construction vehicles will result in negligible air emissions. The ISFSI itself does not produce any GHGs. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.²⁰⁵

Noise

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in noise impacts because construction noise would be lower than the ambient sound levels. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.²⁰⁶

Transportation

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in traffic impacts. The Project would use major roads in good condition and increased traffic would be unlikely to have significant negative impact due to the small nature of

²⁰² *Ibid.*

²⁰³ *Ibid.*

²⁰⁴ *Ibid.*

²⁰⁵ *Ibid.*

²⁰⁶ *Ibid.*

construction activities. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.²⁰⁷

Socioeconomics and Environmental Justice

Building additional storage capacity within the ISFSI to provide storage associated with decommissioning would likely not result in socioeconomic or Environmental Justice impacts. As discussed in DOC's 2009 EIS, the non-radiological impacts related to the expansion of the ISFSI (during decommissioning) are not significant.

Radiological Impacts

Chapter 2, Section 5 of the 2009 EIS found that, assuming regular monitoring and maintenance continue as currently performed at the ISFSI, radiological impacts from continued operation of the ISFSI for up to 200 years would be within NRC regulatory limits and would not be significant during normal operations. The DFS systems are passive systems that emit no radioactive effluents (i.e., there are no gaseous and liquid wastes produced or released). DFS systems are designed with a confinement barrier that ensures there is no release of radioactive material to the environment under normal, off normal, or accident conditions of storage. Radiation exposure from ionizing radiation would occur solely through DFS monitoring by employees and skyshine radiation. At the time, the additional 34 DFS systems would increase radiation exposure to the public by increasing skyshine radiation. The maximum exposure and dose rate would occur when the 99th DFS system is placed in the ISFSI. Once it is placed, exposure rates would decrease due to radioactive decay of the contents of the DFS system.²⁰⁸

These findings would still be representative of present conditions and those under decommissioning with up to 126 DFS systems, in that the maximum exposure and dose rate would occur when the 126th DFS system is placed in the ISFSI (assuming no DFS systems are moved off-site prior to the execution of decommissioning). Once it is placed, exposure rates would decrease due to radioactive decay of the contents of the DFS system.

Should PINGP cease operations in 2053/2054 and need to store all fuel from the facility in the ISFSI because there are no off-site options available, there are a number of variables which make estimating the total dose from a new ISFSI facility, fully loaded with PINGP fuel, extremely difficult to predict. Variables include a number of site- and timing-specific considerations such as the number of loaded DFS systems stored in the ISFSI, the contents of each DFS system, the placement of the DFS system within the storage facility, and the distance to the controlled area boundary as well as nearby receptors.

This EAW does not consider a simplified, linear extrapolation of dose rate from existing and planned spent fuel canisters due to these variables just mentioned and the DFS system technology changing. At the time this analysis was performed, the Orano TN Americas LLC NUHOMS EOS 37PTH DFS system had not yet been selected, and therefore, a bounding analysis approach was taken. There were several additional unknown variables that were considered including: the contact dose rates of the proposed new technologies, the DFS system storage locations within ISFSI relative to distance from the nearest resident, and the allowable radioactivity of the spent fuel stored within the new technology DFS systems per design and regulatory limits.

²⁰⁷ *Ibid.*

²⁰⁸ *Ibid.*

For this Project, the Company conducted a conservative dose rate analysis for an additional 20 years of operation.²⁰⁹ A bounding analysis was performed using the following conservative inputs: proprietary theoretical (analyzed) license maximum contact dose rates from the DFS systems that were evaluated for use at PINGP (i.e., the new technology), doubling of the neutron scaling factor (to address possible radionuclides within the potential DFS systems), and an assumption that the DFS systems were positioned within the ISFSI at the closest point to the nearest resident. The maximum offsite dose rate allowed per 10 CFR 72.104 is 25 millirem (mrem) per year. The report concluded that the maximum dose rate, conservatively calculated to be 22.11 mrem/year, will remain below the federal limit with extended operation of PINGP through 2053/2054. This maximum is theoretical. Empirical data from PINGP's previous years' RERRs indicate this dose rate will be closer to 1 mrem/year.

In 2022, the PINGP REMP (or RERR) indicates dose rate to the nearest resident was 0.9 mrem/year. This is based on empirical data associated with 50 TN-40/40HT DFS systems currently stored in the ISFSI. This empirical data demonstrates that actual dose rates are much lower than theoretical (analyzed) dose rates used in licensing of DFS technology. This dose rate and associated health impacts seen annually with the new EOS 37PTH DFS system are expected to have similar results and be indistinguishable from background radiation and within all federal guidelines.

Importantly to note, the federal limit of 25 mrem per year is well below the average annual dose rate of approximately 620 mrem/year. Average background radiation levels are 310 mrem/year and an additional annual dose rate of 310 mrem/year comes from man-made sources of radiation including medical, commercial and industrial sources.²¹⁰

The Company is using a system approved by the NRC with a general license. The general license from the NRC requires that the Company evaluate and verify that it meets the standards in 10 CFR 72.104. This would involve conducting dose evaluations to demonstrate that doses at the controlled area boundary due to PINGP ISFSI and other fuel cycle facility operations comply with the requirements of 10 CFR 72.104. If plant operations are ceased at the end of the extended license, offsite exposure from the plant would drop to essentially zero, offsetting most, if not all, of the expected dose from the additional DFS.

In the event additional storage capacity is needed past 2053/2054 for any reason, the Company would file another CON application, and that petition would be subject to environmental review under Minn. Stat. §116C.83 Subdivision 6(b). The dose calculations would be more accurately predicted at that time and disclosed throughout that environmental review process.

21.c.iii. Potential Instrumentation Building Expansion

Land Use

Expansion of the instrumentation building would be consistent with present land use, would not be significant, or result in a change from the industrial nature of the site.

Geology and Soils

²⁰⁹ Included in CN filing Docket No. E002/CN-24-68.

Sargent & Lundy. 2023. Report SL-018015, Dose Study to Support ISFSI Certificate of Need.

²¹⁰ [Doses In Our Daily Lives | NRC.gov](https://www.nrc.gov/about-nrc/radiation/around-us/doses-daily-lives.html) (https://www.nrc.gov/about-nrc/radiation/around-us/doses-daily-lives.html)

Expansion of the instrumentation building would result in some impacts to local soils. These impacts would be small, localized, and contained within the PINGP site. It would not result in excavation to depths which would impact geology.

Water Resources

Expansion of the instrumentation building may result in minor water use. There would be no use of on-site water to develop concrete, as concrete would be delivered by trucks to the site. If water use is required during construction, such as for dust control, water would be obtained from on-site wells or municipal sources.

Contamination/Hazardous Materials/Wastes

Expansion of the instrumentation building may result in generation of non-radiological solid waste. Normal construction debris (e.g., trash, waste parts) would likely be generated as a result. Trash would be collected in appropriate, leak-proof waste dumpsters or bins, and would be disposed of properly offsite by a licensed waste transporter. The Company has processes in place to address management of waste produced by construction and operation activities at PINGP. Chemicals potentially onsite during construction would consist of construction equipment fuels and fluids, such as gasoline, diesel fuel, and mechanical lubricants. Construction equipment would be inspected prior to use to ensure all connections and hoses are in working order. Spill response equipment, such as drip pans and absorbents, would be on site in the event of spills or leaks. Any spills or releases would be managed in accordance with the PINGP Spill Prevention, Control, and Countermeasure Plan and with state and federal spill response and reporting regulations.

Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

Expansion of the instrumentation building would not result in impacts to fish, wildlife, plant communities, or other sensitive ecological resources because none exist within the footprints of these areas. There is no habitat present as the building is presently located in a cleared areas with no vegetation present. Construction will be short term and localized.

Historic Properties

The Company sponsored a Phase I archaeological investigation of the instrumentation building expansion area in 2014 (See Section 15).²¹¹ The survey found no archaeological properties and no evidence of paleosols. The report also concluded that no additional archaeological investigations were warranted within the studied area.

Visual

Expansion of the instrumentation building will not result in visual impacts that are unique to the PINGP industrial area. Modifications to the instrumentation building would result in a change in view but is not visible by most PINGP staff or the public.

²¹¹ Westwood Professional Services, Inc., 2014. Phase I Archaeological Investigations for the Proposed Expansion of the Independent Spent Fuel Storage Installation and Associated Infrastructure at the Prairie Island Nuclear Generating Plant, Goodhue County, Minnesota. Eden Prairie, Minnesota: Westwood Professional Services, Inc. December 2014.

Air

Expansion of the instrumentation building would likely not result in long-term air quality impacts. The additional construction vehicles on local roadways during construction activities for such a short duration will result in negligible air emissions.

GHG and Climate Change

Expansion of the instrumentation building would likely not result in long-term air quality impacts. The additional emissions created by construction vehicles will result in negligible GHG emissions. The facilities themselves do not produce any GHGs.

Noise

Expansion of the instrumentation building will result in some temporary, localized noise impacts. Construction noise would likely be in the range of 40-55 dBA when equipment is operating, at the site of construction. This site is well within the PINGP property boundary. Impacts are expected to be below the Minnesota daytime limit of 60 dBA.

Transportation

Expansion of the instrumentation building would likely not result in traffic impacts, as vehicles would use major roads in good condition and the slight increase in traffic would be unlikely to have significant negative impact due to the small and relatively short-term nature of construction activities.

Socioeconomics and Environmental Justice

Expansion of the instrumentation building would likely not result in socioeconomic or Environmental Justice impacts. This is a small construction project which is highly localized within the PINGP property.

Radiological Impacts

Expansion of the instrumentation building would likely not result in radiological impacts as this feature does not produce or manage radioactive material.

21.c.iv Conclusions (The Sum Total of Impact Contributions from All Sources)

Land Use

Section 10 of this Scoping EAW outlines the land use of the site as well as areas adjacent to and near the site, including parks, trails, prime or unique farmlands. For the proposed Project, land use within the ISFSI boundaries has remained the same since the facility was constructed. The impacts on land use activities from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Geology and Soils

Section 11 of this Scoping EAW examines the geology underlying the project area including geologic features such as sinkholes, shallow limestone formations, unconfined/shallow aquifers, or karst conditions. It discusses limitations of these features for the Project and any effects the project could have on these features. It also describes soils and topography at the site. The impacts on geology and soils from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Water Resources

Section 12 of this Scoping EAW outlines surface water and groundwater features on or near the site. Revision 2 to NUREG-1437 notes that plant license renewal could have some surface and groundwater impacts that are small or moderate.²¹² The NRC will evaluate the impacts to some groundwater and surface water resources on a plant-specific basis during the SEIS prepared for the SLR, which is anticipated to occur in 2027-2028. Although it is possible for PINGP license renewal to have some impact on ground or surface water resources, pending the NRC's review of that effort, those features would be reviewed by the NRC as part of the SLR effort and the SEIS. The Project, as well as the additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site would not result in any impacts to ground or surface water features, therefore, no significant cumulative potential effects are expected.

Contamination/Hazardous Materials/Wastes

Section 13 of this Scoping EAW outlines the impacts from existing contamination or potential environmental hazards on or in proximity to the Project site as well as potential environmental effects from pre-Project site conditions that would be caused or exacerbated by Project construction and operation. The impacts on contamination, hazardous materials, and wastes from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Fish, Wildlife, Plant Communities, and Sensitive Ecological Resources (Rare Features)

Section 14 of this Scoping EAW outlines the fish and wildlife resources as well as habitats and vegetation on or near the site, including rare features. In the 2011 SEIS, the NRC determined that moderate impacts to state-listed mussel species during the license renewal term could occur and cause destabilization. The NRC will evaluate the impacts to all listed species on a plant-specific basis in the SEIS prepared for the SLR and will include consultations with state agencies as part of its review process. Although it is possible for PINGP license renewal to have some impact on rare features, pending the NRC's review of that effort, those features would be reviewed by the NRC as part of the SLR effort and the SEIS. The Project, as well as additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site would not result in any impacts to rare features, therefore, no significant cumulative potential effects are expected.

Historic Properties

²¹² NRC. 2023. Generic Environmental Impact Statement for License Renewal of Nuclear Plants – Draft Report for Comment (NUREG-1437, Revision 2). Available online at: <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1437/r2/index.html>. Accessed July 2023.

Section 15 of this Scoping EAW outlines the historic structures, archeological sites, and/or traditional cultural properties on or in proximity to the site. In the 2011 SEIS, the NRC determined that small to moderate impacts to known historical and archaeological resources during the license renewal term could occur. These impacts would be potentially mitigated by commitments made by the Company. Although it is possible for PINGP license renewal to have some impact on historic properties, pending the NRC's review of that effort, those features would be reviewed by the NRC as part of the SLR effort and the SEIS. The Company will conduct additional archaeological studies in 2024 in the area of the Project. Additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site would not result in any impacts to historic properties; therefore, no significant cumulative potential effects are expected.

Visual

Section 16 of this Scoping EAW outlines scenic resources near the Project site, as well as Project related visual effects. The impacts on visual resources from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Air

Section 17 of this Scoping EAW outlines the type, sources, quantities, and compositions of any emissions, hazardous air pollutants, criteria pollutants, and any greenhouse gases as a result of the Project. The impacts on air resources from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Greenhouse Gas Emissions

Section 18 of this Scoping EAW outlines the type, sources, quantities, and compositions of greenhouse gases as a result of the Project. The NRC's draft Revision 2 to NUREG-1437 presents initial conclusions on GHG impacts. GHG impacts on climate change from continued operation and refurbishment associated with license renewal are expected to be small, as GHG emissions from routine operations at nuclear power plants are typically very minor because such plants, by their very nature, do not normally combust fossil fuel to generate electricity. The NRC will evaluate the additive effects of climate change on environmental resource conditions that may also be directly impacted by continued operations and refurbishment during the license renewal term in the review of the PINGP SLR effort. Although it is possible for PINGP license renewal to have some impact on GHG emissions, pending the NRC's review of that effort, those impacts would be reviewed by the NRC as part of the SLR effort and the SEIS. The Project, as well additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site would not result in any impacts to GHG emissions; therefore, no significant cumulative potential effects are expected.

Noise

Section 19 of this Scoping EAW outlines the sources, characteristics, duration, quantities, and intensity of noise generated during project construction and operation. The noise impacts from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and

expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Transportation

Section 20 of this Scoping EAW outlines the traffic-related aspects of Project construction and operation. The impacts on transportation from the proposed action, PINGP license renewal, additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site are all small; therefore, no significant cumulative potential effects are expected.

Socioeconomics and Environmental Justice

Section 22.1 of this Scoping EAW provides a description of the socioeconomic conditions in the Project area and an analysis of potential impacts on environmental justice areas. The NRC will evaluate PINGP license renewal for environmental justice impacts on minority populations, low-income populations, Indian Tribes, and subsistence consumption in its SEIS for SLR. Although it is possible for PINGP license renewal to have some impact on environmental justice populations, pending the NRC's review of that effort, those impacts would be reviewed by the NRC as part of the SLR effort and the SEIS expected between 2027 and 2028. The Project, as well as the additional storage within the ISFSI to accommodate decommissioning, and expansion of the instrumentation building on site, would not result in any impacts to socioeconomics; therefore, no significant cumulative potential effects are expected.

Radiological Impacts

Section 22.2 of this Scoping EAW outlines the radiological impacts from the Project. The Company will continue to operate the ISFSI so that doses at the controlled area boundary due to the Project, PINGP operations under an extended license term, as well as the potential addition of additional storage capacity in the future within the ISFSI to accommodate decommissioning would continue to comply with the requirements of 10 CFR 72.104. There would be no radiological impact from expansion of the instrumentation building on site.

22. OTHER POTENTIAL ENVIRONMENTAL EFFECTS

If the project may cause any additional environmental effects not addressed by items 1 to 19, describe the effects here, discuss the how the environment would be affected, and identify measures that would be taken to minimize and mitigate these effects.

Socioeconomics

The Project site is within the city limits of Red Wing, in Goodhue County, Minnesota. According to the 2020 U.S. Census, the population of Goodhue County was 47,582 and the population of Red Wing was 16,547, which is about 35 percent of the total population of Goodhue County.²¹³ The population of Minnesota increased by 7.6 percent between 2010 and 2020 and Goodhue County's population increased by about 3.0 percent during this period. In contrast to population trends at the state and county level, Red Wing's population has remained relatively stable with only a 0.5% increase between 2010 and 2020.²¹⁴

²¹³ USCB. 2023. QuickFacts, Red Wing, Goodhue County, Minnesota. Available online at <https://www.census.gov/quickfacts/fact/table/redwingcityminnesota,goodhuecountyminnesota,MN/PST045222.%20Accessed%20January%202023>. Accessed January 2024.

²¹⁴ *Ibid.*

Appendix A, Maps 17, 18, and 19 depict population density within 5, 10, and 50 miles, respectively, of the Project. Appendix A, Map 20 shows residences within 1 mile.

U.S. Census Bureau demographic data for Minnesota, Goodhue County, and the City of Red Wing is provided in Table 22-1.

Table 22-1: Demographic Data for the State, County, and City of the Project

Demographic Category	Minnesota	Goodhue County	Red Wing
Population (2020 Census) ^a	5,706,494	47,582	16,547
Population Change (2010 to 2020) ^a	7.6%	3.0%	0.5%
Population per square mile (2020) ^a	71.7	62.9	475.0
Minority Population ^{a, c}	22.4%	8.9%	12.8%
White Alone, not Hispanic or Latino	77.6%	91.1%	87.2%
Black or African American Alone	7.6%	1.6%	3.1%
American Indian and Alaska Native Alone	1.4%	1.4%	1.9%
Asian Alone	5.5%	0.8%	0.8%
Native Hawaiian and Other Pacific Islander Alone	0.1%	0.1%	0.0%
Two or More Races	2.8%	1.9%	3.4%
Hispanic or Latino	6.0%	3.8%	5.4%
Median Income (in 2022 U.S. \$) ^a	\$84,313	\$78,338	\$65,107
Unemployment Rate ^b	4.0%	4.0%	5.2%
Persons Below the Poverty Line ^a	9.6%	9.0%	12.6%
^a	USCB, 2023		
^b	USCB, 2022a		
^c	Total minority population is calculated from total population for whom race, and ethnicity is known, minus the percent of total population of White alone, not Hispanic or Latino.		

According to U.S. Census Bureau (USCB) data, the total minority population in Goodhue County, that is the total population minus the “White Alone, not Hispanic or Latino” population, is 8.9 percent. The City of Red Wing’s minority population is higher than the county percentage at 12.8 percent. Overall, minority populations in Red Wing and Goodhue County are lower than the State of Minnesota, which is 22.4 percent (see Table 22-1). The largest minority group in Red Wing and Goodhue County is comprised of persons who identify as Hispanic or Latino, at 5.4 and 3.8 percent of the total population, respectively.

The primary industries in Goodhue County and Red Wing are educational services, and health care and social assistance, and manufacturing.²¹⁵ Retail trade is the third most prevalent industry in Goodhue County while arts, entertainment, and recreation and accommodation, and food services is the third most prevalent industry in Red Wing. In its letter dated August 10, 2023, Goodhue County advised on several issues pertinent to its community:

²¹⁵ USCB. 2022: ACS 5-Year Estimates Data Profiles, DP03 Selected Economic Characteristics, Red Wing, Goodhue County, Minnesota. Available online at https://data.census.gov/table/ACSDP5Y2022.DP03?q=selected%20economic&g=160XX00US2753620_050XX00US27049_040XX00US27&moe=false&tid=ACSDP5Y2021.DP03. Accessed January 2024.

- The safety of the proposed new infrastructure, including the change in technology (see Section 7.b) and desire for a federal storage solution (see Section 6.d);
- Management of tritium (see Section 12.a.iii);
- The socioeconomic benefits of continued operation of PINGP and the ISFSI and concerns regarding losses should the extension of the operating license not be renewed. Specifically, Goodhue County notes that PINGP provides an extraordinary tax base for local communities and is one of the county's largest and best-equipped employers.

Property associated with the PINGP represents approximately 50% of the City of Red Wing's 2022 net tax capacity (\$17,229,443). PINGP is the third largest employer, following Treasure Island Casino and Red Wing Shoe Company.²¹⁶

As described in Section 10, the PIIC is immediately adjacent to the PINGP property to the north and west and about 0.5-mile northwest of the ISFSI site at the nearest point. As of February 10, 2023, there are 1,110 enrolled members of the PIIC, nearly half of which are under 18 years of age, and not all of whom live in the area adjacent to PINGP. PIIC is the number one employer in Goodhue County with more than 1,500 employees across the government and business operations.²¹⁷ In 2023, Xcel increased its payment to PIIC from \$2.5 million per year to \$10 million per year to store spent fuel in the ISFSI. PIIC also receives \$50,000 for each DFS system stored within the ISFSI (Xcel Energy, 2023b; MinnPost, 2023).

The estimated 2022 median household income in Goodhue County and Red Wing was between \$6,000 and \$19,000 lower than the state average, respectively. 2022 unemployment rates in Goodhue County were the same as the state average of 4.0 percent, while unemployment rates in Red Wing were slightly higher. Compared to the State of Minnesota, Goodhue County has slightly fewer people living below the poverty line, but Red Wing's poverty rate is three points higher than the state average.

Socioeconomic impacts of extending plant operation an additional 20 years are currently being evaluated by a third-party consultant. The 2024 IRP will be supplemented with the results of this study in the upcoming months. The Prairie Island Indian Community will have an opportunity to review the results of this study prior to the Company filing the supplement.

Environmental Justice

According to the EPA and the MPCA, Environmental Justice is the "fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies".²¹⁸ ²¹⁹ Environmental Justice involves a responsibility by local, state, and federal governments to consider the potential impacts of official actions and to avoid actions that disproportionately affect historically disadvantaged groups such as people of color, low-income, and Indigenous communities.

²¹⁶ City of Red Wing. 2023. <https://www.red-wing.org/DocumentCenter/View/7398/2022-Annual-Comprehensive-Financial-Report-PDF>. Accessed July 2023.

²¹⁷ PIIC. 2023. Media Packet. Available online at: <https://prairieisland.org/media>. Accessed July 2023.

²¹⁸ EPA. 2023. Environmental Justice. Available online at <https://www.epa.gov/environmentaljustice>. Accessed July 2023.

²¹⁹ MPCA. 2023. Environmental Justice. Available online at <https://www.pca.state.mn.us/about-mpca/environmental-justice>. Accessed July 2023.

The percentage of people of color in relation to the overall population of an area is one of the factors used to identify communities with environmental justice concerns. Indigenous groups and federally recognized Indian reservations are defined by EPA and MPCA as communities with environmental justice concerns. Income considerations for identifying communities with environmental justice concern typically focus on the portion of the population that is living below the federal poverty level.

Recently passed Minnesota House Bill 7 includes an update in Minn. Statutes § 216B.1691, Subd. 1(e) that defines areas with environmental justice concerns in Minnesota:

- (e) "Environmental justice area" means an area in Minnesota that, based on the most recent data published by the United States Census Bureau, meets one or more of the following criteria:
 - (1) 40 percent or more of the area's total population is nonwhite;
 - (2) 35 percent or more of households in the area have an income that is at or below 200 percent of the federal poverty level;
 - (3) 40 percent or more of residents over the age of five have limited English proficiency; or
 - (4) the area is located within Indian country, as defined in United State Code, title 18, section 1151.

The PINGP ISFSI is in Census Tract 802.02 and the only other Census Tract within one mile of the ISFSI is Census Tract 9606 in Pierce County, Wisconsin. U.S. Census Bureau data relevant to identifying areas of environmental justice concern is provided for both Census Tracts in Table 22-2.

Table 22-2: Demographic Data for Census Tracts Within One Mile of the Project

Demographic Category	Census Tract 802.02	Census Tract 9606 ^a
Total Population	4,299	4,988
Minority Population ^b	17.4%	6.3%
White Alone, not Hispanic or Latino	82.6%	93.7%
Black or African American Alone	1.6%	0.3%
American Indian and Alaska Native Alone	6.9%	0.4%
Asian Alone	0.8%	0.5%
Native Hawaiian and Other Pacific Islander Alone	<0.1%	0.0%
Two or More Races	5.3%	4.4%
Hispanic or Latino	4.3%	1.6%
All Individuals with Income Below 200 Percent of the Federal Poverty Level	1,035 Individuals or 24%	685 Individuals or 14%
Limited English-Speaking Households	0.1%	0.1%
^a Census Tract 9606 is in Pierce County, Wisconsin. ^b Total minority population is calculated from total population for whom race and ethnicity is known, minus the percent of total population of White alone, not Hispanic or Latino. Source: USCB, 2022b; USCB, 2020		

The MPCA developed the Understanding Environmental Justice in Minnesota online screening tool to assist with identifying areas of concern for environmental justice.²²⁰ The online tool uses demographic and economic data from the U.S. Census Bureau's five-year 2017-2021 American Community Survey data at the census tract level to identify areas of environmental justice concern in Minnesota. Review of MPCA's screening tool indicates that the only area environmental justice concern within 5 miles of the PINGP ISFSI in Minnesota is the PIIC. The demographic data for Census Tracts 802.02 and 9606 in Table 22-2 further confirms the MPCA screening tool results when compared to the parameters in Minn. Statutes § 216B.1691, Subd. 1(e).

However, the PIIC is immediately adjacent to the PINGP property to the north and west and about 0.5-miles northwest of the ISFSI site at the nearest point (see Section 10.a.ii). The PIIC is a federally recognized Indian reservation and is therefore considered a community with environmental justice concerns.

Impacts and Mitigation Measures

The Project is not anticipated to result in negative socioeconomic impact to the City of Red Wing, Goodhue County, or the identified area of environmental justice concern within the same census tract as the project: the PIIC. Operation of the PINGP provides tax revenue and financial compensation to Goodhue County and the City of Red Wing as well as the PIIC. The construction and operation of the Project will not displace residents, contribute to any new jobs, or change the demographics of the Project area. No increase in demand for long-term housing is anticipated from operation of the Project, and short-term housing demands during construction are expected to be met through nearby lodging providers such as hotels, motels, and RV parks if construction staff are not locally based. No socioeconomic mitigation measures are proposed because the Project is not expected to change the socioeconomics of the surrounding area.

The Project will occur in a developed area within the existing PINGP facility, which is not visible from the PIIC reservation or any other community. No measurable additional traffic would occur as a result of Project construction or operation (see Section 20), and the Project is not expected to result in impacts to historic or archaeological resources within the ISFSI footprint. Overall, impacts from construction and operation of the Project are anticipated to be minor and temporary to negligible.

The PIIC meets the criteria for an area of environmental justice concern, as defined by the EPA and recent updates to Minn. Statutes § 216B.1691, Subd. 1(e). Because most human health and environmental impacts would range from minor and temporary to negligible, the Project is not anticipated to disproportionately impact an area of environmental justice concern (i.e., the PIIC).

However, as stated in Section 22.2, the Project will result in an increase in offsite radiological dose that will be within federal regulatory limits. In the DOC 2009 EIS, DOC recognized that the PIIC was a community of persons for whom there are radiological environmental justice concerns. Concerns included (1) radiological impacts from normal operations at PINGP, and (2) uncertainty and risk should there be an incident at the PINGP or ISFSI. Further, DOC stated that, as is concluded in Section 22.2, radiological impacts to the public related to normal operations of the ISFSI will be within federal regulatory guidelines and are not expected to be significant.

²²⁰ MPCA. 2023. Understanding Environmental Justice in Minnesota, Interactive Map. Available online at <https://mpca.maps.arcgis.com/apps/MapSeries/index.html?appid=f5bf57c8dac24404b7f8ef1717f57d00>. Accessed July 2023.

The DOC 2009 EIS acknowledged, as is also true for this Project, that the PIIC is the closest community to the ISFSI and its members who reside near the ISFSI will receive slightly higher exposure levels and doses than communities at a greater distance. These doses will create a small incremental risk that the PIIC will bear differentially from other communities as an area of environmental justice concern. However, because there are no other cumulative contributors to radiological exposure in the impact area, the increased radiation is not expected to be a significant or to have a cumulatively disproportional impact to the PIIC. Regarding radiological impacts experienced by the PIIC related to this project alone, despite the increase in offsite doses that are expected to remain well within federal limits, impacts would not be mitigated until the DFS systems can be removed from the ISFSI and transported offsite to a federally licensed storage facility.

The DOC 2009 EIS also stated that PIIC bears the concern of uncertainty related to an incident at the ISFSI. At the time, and with this Project, the probabilities associated with incidents at the ISFSI are projected to be very low and consequently their impacts are not anticipated to be significant. While this uncertainty is borne by all communities surrounding the ISFSI, it is likely more directly felt by members of PIIC as they are the closest community to a nuclear power plant and spent fuel storage in the country.²²¹

DFS systems are required to be designed to normal, off-normal, and accident conditions defined by the NRC. NUREG-1567, the Standard Review Plan for Spent Fuel Dry Storage Facilities dated March 2000, states in Section 9.4.2.1 that, “For storage casks having storage lids designed and tested to be “leak tight” as defined in “American National Standard for Leakage Tests on Packages for Shipment of Radioactive Materials,” ANSI N14.5-1997, confinement calculation of the doses under normal, off-normal and accident conditions are unnecessary.” Any DFS system used at the PINGP ISFSI will be designed and tested to meet the “leak tight” criteria of ANSI N14.5-1997. As a result, doses from an accident, as defined by the NRC for the purposes of licensing a storage container, will be no greater than those calculated for normal conditions described further in Section 22.2.

For illustrative purposes only, the “worst case scenario” generic analysis of potential on-site and off-site consequences of accidental releases associated with the operation of an ISFSI completed by the NRC in NUREG-1140 is presented here. The accident assumed for the analysis is the removal of the lid of a DFS system cask containing 24 damaged pressurized water reactor (PWR) spent fuel assemblies. It is assumed that the fuel had been removed from the reactor core 5 years earlier and that 10 percent of the Kr-85 and 1 percent of the 1-129 are released. The NUREG-1140 analysis concluded that this postulated worst-case accident involving an ISFSI has insignificant consequences to the public health and safety. The maximum dose to a member of the public off-site due to an accidental release of radioactive materials under this scenario is calculated to be .003 rem (3 millirem) at 100 meters. Even in this extreme scenario, which is highly unlikely, the offsite doses will remain well within the federal limits of 25 mrem per year.

The Company is actively engaging with the PIIC to identify and address any concerns they may have about PINGP, the ISFSI, and the Project. The Company and the PIIC continue to meet on a recurring basis. As stated above, Xcel increased its payment to PIIC from \$2.5 million per year to \$10 million per year to store spent fuel in the ISFSI. PIIC also receives \$50,000 for each DFS system stored within the ISFSI.²²²

²²¹ MinnPost, 2023. Xcel Energy Agrees to Pay Prairie Island \$7.5 Million More a Year to Store Spent Nuclear Waste. Available online at: <https://www.minnpost.com/greater-minnesota/2023/03/xcel-energy-agrees-to-pay-prairie-island-7-5-million-more-a-year-to-store-spent-nuclear-waste/#:~:text=Under%20a%20deal%20announced%20Tuesday,governments%20like%20Red%20Wing%20get.>

²²² *Ibid.*

In addition, the Company has an executed CRMP in place with PIIC that outlines procedures for land use activities within the PINGP property and the ISFSI.

Radiological Impacts

In order to determine the radiological impacts from the addition of a new DFS technology through the year 2054, the Company arranged for a third-party dose rate analysis to be performed by the engineering firm of Sargent & Lundy (S&L report SL-018015, "Dose Study to Support ISFSI Certificate of Need").²²³ At the time of analysis, the Company had not yet selected the new DFS system technology, and therefore, the calculation performed was bounding in that it used the most conservative inputs; however, it fully bounds the Orano TN Americas LLC NUHOMS EOS 37PTH DFS system that was selected. The study included conservative assumptions for contact dose rates of the proposed new technologies, the DFS system storage locations within ISFSI relative to distance from the nearest resident, and the allowable radioactivity of the spent fuel stored within the new technology DFS systems per design and regulatory limits. Loading schedule and the number of DFS systems loaded also impacts the calculation.

Sargent & Lundy evaluated the impact of storing an additional 44 new technology DFS systems on site in the existing ISFSI footprint (34 of the 44 will contribute to the additional 20 years of continued operation from 2033/2034 to 2053/2054) The most bounding new technology system dose rate data was used to determine the total normal operation radiation dose values at the nearest site boundary and at the nearest resident (approximately 0.45 miles [724 meters] northwest of the ISFSI, within the PIIC) when including dose contribution due to the existing 55 TN-40/TN-40HT DFS systems and the 44 new technology DFS systems. It assumes 50 TN-40/40HT systems are currently stored within ISFSI and 5 more will be loaded and stored by end of 2025. Ten new technology DFS systems will then be loaded potentially beginning in 2026 in support of the current operating license through 2033/2034. Loading for extended operations through 2053/2054 (for an additional approximately 34 new technology DFS systems) will begin approximately in the 2030 timeframe.

The additional dose rates and collective dose to PINGP personnel and the offsite population were also calculated. The executive summary of the final report, SL-018015, states, "It was determined that the calculated dose values at the nearest site boundary and at the nearest resident meet the acceptance criteria of 10 CFR 72.104(a), 40 CFR 190.10(a), and 10 CFR 20.1301(a)." The conservative maximum dose calculated was 22.11 mrem/year to the nearest resident, although empirical data per previous years' RERs show this will likely be closer to 1 mrem/year. This is considered acceptable with respect to the radiation levels at the nearest site boundary and at the nearest resident. As previously noted, the federal limit of 25 mrem per year is well below annual average background radiation levels of 310 mrem/year.²²⁴

Per the aforementioned regulations, the Company is required to monitor ISFSI dose rates. The 2022 PINGP REMP indicates 0.9 mrem/year to the nearest resident. This is based on TN-40/40HT empirical dose rate data. This empirical data demonstrates that actual dose rates are much lower than theoretical (analyzed) dose rates of 22.11 mrem/year, as detailed above, used in licensing of DFS technology. It is anticipated that similar empirical results of approximately 1 mrem/year dose to the nearest resident (724 meters) will be observed annually with the Orano TN Americas LLC NUHOMS EOS 37PTH DFS system. The conservative bounding analysis performed ensures no matter what technology is selected, the regulatory limits are adhered to and health impacts are anticipated to be minimal.

²²³ Sargent & Lundy. 2023. Report SL-018015, Dose Study to Support ISFSI Certificate of Need.

²²⁴ [Doses In Our Daily Lives | NRC.gov](https://www.nrc.gov/about-nrc/radiation/around-us/doses-daily-lives.html) (https://www.nrc.gov/about-nrc/radiation/around-us/doses-daily-lives.html)

23. RGU CERTIFICATION

(The Environmental Quality Board would only accept SIGNED Environmental Assessment Worksheets for public notice in the EQB Monitor.)

I hereby certify that:

- The information contained in this document is accurate and complete to the best of my knowledge.
- The EAW describes the complete project; there are no other projects, stages, or components other than those described in this document, which are related to the project as connected actions or phased actions, as defined at Minnesota Rules, parts 4410.0200, subparts 9c and 60, respectively.
- Copies of this EAW are being sent to the entire EQB distribution list.

Signature Jenna Ness Date April 9, 2024

Title Environmental Review Project Manager