Information Provided by Xcel Energy to
Department of Commerce, Energy Environmental Review and Analysis Staff to
Aid Preparation of the Draft Environmental Impact Statement for
Xcel Energy's Proposed Additional Spent Fuel Storage at the
Monticello Nuclear Generating Plant

Docket No. E002/CN-21-668

Monticello EIS – Additional Information
May 2022
Request #1

1. Will local permits / approvals be required for the project? The scoping EAW (Section 9) says a building permit ***may*** be required from the city of Monticello. What would trigger / not trigger a building permit being needed?

   Response:
   We do not expect the project will require a building permit from the City of Monticello. In discussion with the city, they informed Xcel Energy that a final determination could only be made when plans are final, so the EAW simply noted that a permit may be required.

2. When was MNGP ISFSI license issued? When does it expire? Or is it the case that the general license process does not expire, so long as you are on the site of an NRC licensed reactor? Links to NRC documents?

   Response:
   The Monticello ISFSI is licensed under the General License provision of 10 CFR 72.210, which grants a general license to store fuel in NRC certified casks to holders of a Part 50 or Part 72 license. Monticello holds an NRC license to operate the plant under 10 CFR Part 50, so the license is valid so long as the site maintains a license under Part 50;

   > ***§ 72.210 General license issued.***
   > *A general license is hereby issued for the storage of spent fuel in an independent spent fuel storage installation at power reactor sites to persons authorized to possess or operate nuclear power reactors under 10 CFR part 50 or 10 CFR part 52. (*Subpart K--General License For Storage Of Spent Fuel At Power Reactor Sites | NRC.gov)

   The NRC Certificate of Compliance for the current cask used at Monticello (NUHOMS® model 61B, Certificate Number 1004) is valid until January 23, 2055. (§ 72.214 List Of Approved Spent Fuel Storage Casks. | NRC.gov)

3. Is there an earthen berm around the MNGP ISFSI? Similar to Prairie Island?

   Response:
   The Monticello ISFSI does not have an earthen berm around it.

4. Would (could) Xcel select a vertical canister system for the ISFSI? The CN application says a canister system, but does not specify horizontal or vertical. Seems that all the infrastructure is in place at Monticello for continuing a horizontal system, yes? Does this mean a horizontal system would be selected? Or is it still a possibility that a vertical system would be used?

   Response:
   A vertical cask system could be used for the expanded storage at Monticello. Xcel Energy expects the request for bids for the additional casks will include both horizontal and vertical systems.

5. Is there a safety analysis report for the NUHOMS® system used at the ISFSI? Is this it: https://www.nrc.gov/docs/ML0510/ML051040569.pdf? The 2005 Monticello EIS cites a Transnuclear FSAR from 2004. Are there other safety analysis documents for the NUHOMS® system or for the MNGP ISFSI?

   Response:
   The Safety Analysis Report referenced is a valid source of information for the NUHOMS® system, although the current version may be slightly different. The NUHOMS® cask design Certification has been amended several times over the years and is currently on Amendment 17. Depending on the nature of the Amendment, the Safety Analysis Report is revised. The canisters currently loaded at Monticello were fabricated to Amendments 9, 10, and 13 of the NUHOMS® Certificate.

   If there is a specific section of Safety Analysis Report you wish to reference we could work with Transnuclear to verify the version you referenced is the most current source. A full copy of the current SAR can be made available if needed. It is a large file so a specialized file transfer system made be needed.

   Follow-up request submitted 6/1/2022
   I'm interested in this information to describe possible non-normal operating conditions at the MNGP ISFIS – earthquake, flood, tornado, fire, explosion, etc. I've attached a section of the 2009 Prairie Island EIS that talks about these matters.

   As the MNGP ISFSI is licensed through the general license process, it occurs to me that maybe some of the information I'm seeking is not solely in a safety analysis report, but may also be in documents that Xcel provided to the NRC demonstrating that the NUHOMS® system could be properly deployed at the MNGP. Yes? Maybe? If this is the case, please send along these documents too… or direct me to where I can find them.

   Response: While Xcel Energy was required to perform evaluations prior to using the Certified design, these evaluations all refer back to the results contained in the NUHOMS® Safety Analysis Report to describe off-normal events and demonstrate compliance with NRC regulations. In particular 10 CFR 72.212 (b)(6) requires a user of a certified cask to review the Safety Analysis Report (and the related NRC Safety Evaluation Report) to determine whether or not the reactor site parameters, including analyses of earthquake intensity and tornado missiles, are enveloped by the cask design bases considered in these reports. If there was any off-normal event possible at Monticello that was not bounded by the NUHOMS® SAR then Transnuclear would be required to amend the Certificate of Compliance prior to use under the General License. The Monticello evaluation of their site parameters is not submitted to the NRC but is retained for their inspection. The NRC documented their review of the Monticello evaluation in their December 31, 2008 Pre-Operational Inspection Report 072-00058/2008-003(DNMS) (NRC Adams number ML083660296) and concluded;

   > *The inspectors reviewed the licensee's 10 CFR 72.212 evaluation and determined that it was in compliance with conditions set forth in the CoC, the FSAR, and 10 CFR Part 72 requirements in regards to the NUHOMS® 61BT cask system.*

6. How many person live near the MNGP? Within one mile? Within 2 miles? The 2005 EIS says 130 (1 mile) and 2,300 (2 mile), citing the 2005 Environmental Report. (Do you have a link to this 2005 ER? Is this the most recent ER?)

Response:
The link to the 2005 Environmental Report is NRC Adams number ML050880250, which is the most recent ER for Monticello.

The most current population distribution estimate is contained in the Monticello Updated Safety Analysis Report and is based on the 2010 population census. This shows the following distribution.

0-1 Miles	22
1-2 miles	1,934

7. How many person work at the MNGP? Is there data on the worker doses? Collective dose, e.g., 100 person-rem per year? And is there data over time, e.g., over the past 5 years… to discuss/show trends?

Response:
Approximately 600 people work at Monticello.

The best public reference for worker exposure trends for Monticello (and all US nuclear plants) is the NRC NUREG-0713, which is published annually and complies exposure reporting for all licensees. The reports can be found at NUREG-0713 | NRC.gov

8. What is the most up to date analysis of radiological impacts from an ISFSI release? The scoping EAW cites NUREG-1140 for a "worst case scenario." Anything since? Anything more? NUREG-1140 appears based on 24 PWR fuel assemblies. Any analysis more like MNGP (61 BWR assemblies)?

Response:
In March 2007 the NRC published NUREG-1864, A Pilot Probabilistic Risk Assessment Of A Dry Cask Storage System At A Nuclear Power Plant (NUREG-1864) | NRC.gov

This study performed a Probabilistic Risk Assessment for a cask containing 68 BWR fuel assemblies. The assessment concludes;

The risk to the public is measured in terms of the individual probabilities of a prompt fatality within 1.6 km (1 mi) and a latent cancer fatality within 16 km (10 mi) of the site. No prompt fatalities are expected. The resulting calculated risk is extremely small, with an individual probability of a latent cancer fatality of 1.8x 10^{-2} during the first year of service, and 3.2x 10^{14} per year during subsequent years of storage.

It should be noted that this study examined cask events outside the NRC design basis for dry cask systems. As noted in the NUHOMS® SAR referenced above there are no credible events that lead to the release of radioactive material from the contents of the cask;

The NUHOMS®®-61BT DSC is designed as a pressure retaining containment boundary to prevent leakage of contaminated materials. The analyses of normal, off-normal, and accident conditions have shown that no credible conditions can breach the DSC shell or fail the double seal welds at each end of the DSC. The NUHOMS®@-61BT DSC is designed and tested to be leak tight. Therefore DSC leakage is not considered a credible accident scenario.

9. Please describe radiological monitoring for the MNGP and ISFSI. For example, the 2005 EIS (page 45) has MDH recommendations for TLDs and PICs in/near the ISFSI, similar to Prairie Island. Is this happening? How many sites does Xcel monitor? MDH? What is monitored – air, water, groundwater, foods?

- Please provide up to date information similar to the 2005 EIS, pages 43-45, regarding beta air and water concentrations.

Response:
The locations and results of the Xcel Energy radiation monitoring program are contained in the annual Radiological Environmental Operating Report submitted to the NRC (Reference: NRC Adams number ML22131A299). Figure 4.1-1 provides a graph of the airborne particulate annual average gross beta concentrations. A similar graph of historical drinking water gross beta concentrations is shown in Figure 4.2-1. Historical river water concentrations are not shown in this report, as section 4.3 notes that river water sample results collected both upstream and downstream of the plant all were below detection limits.

The Minnesota Department of Health monitoring program locations and results are available at Radioactive Materials Environmental Monitoring - EH: Minnesota Department of Health (state.mn.us)

10. What is the best, most up to date analysis of impacts due to an accidental release at the MNGP? The 2005 EIS cites the 2005 Environmental Report and a probabilistic risk assessment (page 39-40). What would the accident be? Releases? Estimated doses? The 2005 EIS says "similar to Three Mile Island."

    - What has been the response to Fukushima? NRC's response? Xcel's response? Any changes at MNGP in response?

Response:
The values shown in the 2005 EIS are the most up to date for these events, which were analyzed as part of the License Renewal process. An update is being prepared as part of the effort to prepare the application to the NRC for a Subsequent License Renewal. We expect these values to be available later this year.

In response to the Fukushima event the NRC issued a series of Orders and a Request for Information. The primary changes resulting from the NRC actions were a review of the site response relative to extreme external events (e.g. flood, earthquakes, etc) and implementation of several new capabilities to cope with a potential loss of AC power and ability to remove heat generated by the core. The new capabilities include mitigating strategies using portable equipment designed to restore reactor cooling and electrical power (NRC Order EA-12-049), enhanced ability to vent containment during a severe accident (NRC Order EA-13-109), and additional wide-range instrumentation to monitor the water level of the spent fuel pool (NRC Order EA-12-051). Consistent with NRC requirements compliance with the Mitigating Strategies Order was achieved in May 2017, the Containment Vent Order in April 2019, and the Spent Fuel Pool Instrumentation Order May 2017.

Monticello EIS – Additional Information
June 2022
Request #2

1. Does the city of Monticello provide emergency services for the MNGP? Is this text accurate:

   "As a nuclear power plant licensee, Xcel Energy is required to have an emergency response plan for the MNGP. The city of Monticello provides emergency services to the MNGP and its ISFSI including responding to any fire, a breach of containment resulting in radioactive release, and the treatment of any injuries resulting from emergency services."

   Does anyone else provide emergency services?

   Response:
   Several organizations in addition to the city of Monticello Fire Department provide emergency services to the Monticello plant.

   CentraCare Health Monticello
   CentraCare Health Monticello serves as the principal off-site medical facility for initial treatment of radiation complicated injury or illness. In addition, St. Cloud Hospital (CentraCare) and North Memorial Hospital (in Robbinsdale) have been designated as the definitive care center for injuries or illness that require services/facilities that the local hospital is unable to provide.

   Ambulance Service
   There are two ambulance services that are available to provide service to the Monticello Nuclear Generating Plant. CentraCare Health ambulance service will provide ambulatory services and be the lead Emergency Medical Service (EMS) agency for all emergencies at MNGP

   Local Law Enforcement
   The Wright County Sheriff's Office provides local law enforcement services to the Monticello plant.

2. Using the ISFSI to decommission the MNGP in 2040 is discussed in the scoping EAW (21.b.2 and 21.c.ii). Through 2040 there would be 44 canisters in the ISFSI; the EAW says 36 more canisters would be needed for decommissioning, making at total of 80. This is correct, yes?

   - The 36 canisters would most likely be placed: (1) into an expanded ISFSI at the current site, or (2) at a new ISFSI at the "alternative site." Yes?
   - What would be required to expand the existing ISFSI? Construction similar to current ISFSI?
   - What would be required to build a new ISFSI at the alternative site? The EAW says the alternative site was not selected because of distance, the need for backup generators, infrastructure extensions. Please say more about the infrastructure that would be needed for the alternative site.

   Response:
   Assuming future casks have the same 61 fuel assembly capacity as currently used at Monticello, it is correct that 80 casks would be in use following decommissioning.

Depending on the technology selected there are several possible locations for the casks necessary to decommission the plant. It is possible that all required casks could be placed in the existing ISFSI facility. An expansion of the current site would also be a likely location for the additional casks required for decommissioning. It is also possible that an alternate, stand-alone facility could be constructed, either within the existing plant Protected Area or elsewhere on the site. While a different site similar to the alternate identified in the 2005 CON might be used for decommissioning, Xcel Energy has not evaluated site layouts for decommissioning at this time so identifying any particular site as a preferred site at this time would be speculative. Final determination of where to locate the additional casks would be made through an engineering study made at the time of decommissioning.

Expanding the existing facility would involve construction of an additional concrete pad for the casks. This would likely be performed outside the existing facility to minimize traffic through the existing security perimeter. At completion of the pad construction the security perimeter would then be expanded to include the new pad.

Construction at an alternate site would require civil construction to properly grade the area, build a heavy haul access road, build a concrete pad(s) for the casks and provide electrical power for lighting and monitoring. Additional electrical construction would be required to tie the security system for the new facility to the plant security monitoring system.

3. In a "No Action" alternative, the MNGP would shut down in 2030. How many canisters would be needed to decommission the MNGP in 2030? The 30 in the ISFSI + Y more. What is Y? Where would these canisters go? The existing ISFSI would be expanded, and they would go there? Would a second (alternative) site be needed as well?

   Response:
   Assuming a 61 fuel assembly capacity 36 additional casks would be required to decommission the plant and remove the fuel from the reactor and spent fuel pool. These casks would be located on a second concrete pad constructed in the existing ISFSI footprint. An alternative site would not be required in this case.

   Note that a Certificate of Need would be required for the additional storage to support decommissioning in the "No Action" alternative.

4. Chapter 9 of the CN application discusses generation alternatives related to a "No Action" option.

   - PVSC – present value of societal cost, includes a societal cost for carbon, yes? What is this cost? Is it in $/CO2e?
   - For Tables 9-1 and 9-2, could I please get the carbon emissions data behind the tables, for the years 2030 – 2040? I would like to present in the EIS the differences in carbon emissions between the alternate plan and the replacement cases … with emissions numbers, not percentages. And provide a total for each replacement case – e.g., if we choose replacement case 1, then between 2030 and 2040 we will emit X million tons of CO2e more than if we had selected the alternate plan.

Response:

Yes, the PVSC values incorporate societal cost for emissions, according to the Minnesota Public Utilities Commission requirements. While there is a range of values approved for use, the Company utilizes the "High

Environmental/Regulatory Costs," which we believe provides a reasonable perspective on the potential cost of future emissions-limiting regulation. The stream of prices included in our modeling are shown in Table 2 below,

Table 1: High Environmental/Regulatory Costs Used in Modeling

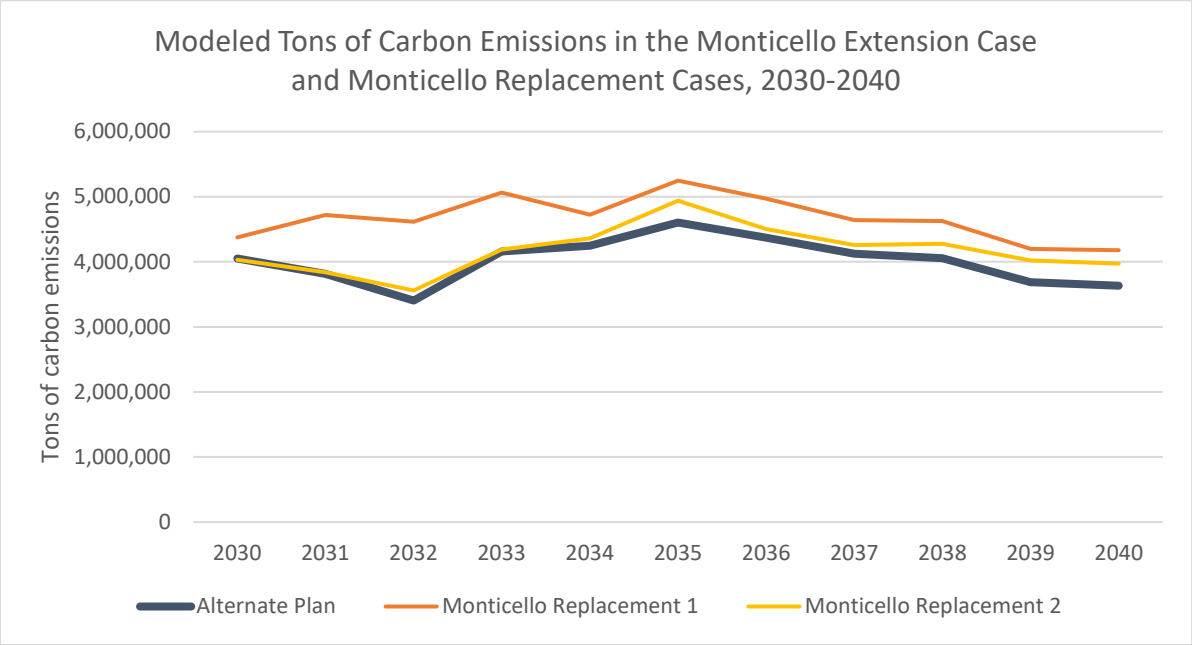
CO2 Costs - ($ per short ton)	
Year	PVSC - High Environmental/ Regulatory Costs
2030	$27.60
2031	$28.15
2032	$28.71
2033	$29.28
2034	$29.87
2035	$30.47
2036	$31.08
2037	$31.70
2038	$32.33
2039	$32.98
2040	$33.64

Please see Table 2 and Figure 1 below for the annual system-wide carbon emissions from the modeled cases presented in our application.

Table 2: Modeled Tons of Carbon Emissions in the Monticello Extension Case and Monticello Replacement Cases, 2030-2040

Year	IRP Alternate Plan (Extends Monticello to 2040)	Monticello Replacement 1	Monticello Replacement 2
2030	4,051,611	4,377,920	4,030,184
2031	3,815,490	4,721,370	3,839,791
2032	3,405,023	4,618,220	3,560,066
2033	4,159,886	5,063,810	4,190,585
2034	4,245,549	4,726,527	4,362,048
2035	4,603,999	5,247,524	4,939,397
2036	4,371,444	4,969,069	4,505,329
2037	4,124,715	4,640,214	4,258,441
2038	4,055,839	4,628,129	4,276,303
2039	3,685,889	4,196,495	4,022,472
2040	3,633,246	4,178,567	3,974,138
Total 2030-2040 carbon emissions projected	44,152,691	51,367,844	45,958,755
Difference from Monticello Extension Case	*0*	*7,215,153*	*1,806,064*

Figure 1: Modeled Tons of Carbon Emissions in the Monticello Extension Case and Monticello Replacement Cases, 2030-2040



Monticello EIS – Additional Information
July 2022
Request #3

1. The CN application notes that 14 spent fuel canisters will be need for operations through 2040. Further, the exact number of canisters will be determined by the amount of fuel needed to operate through 2040, how much fuel is loaded into the MNGP reactor each fuel cycle, and the number of fuel assemblies that can be stored in the canister that is ultimately selected by Xcel Energy for the project.

   Can we get an estimated number of fuel assemblies that will need to be stored? To facilitate operation from 2030 to 2040? Or an estimated range, e.g., 1,500 – 1,610 fuel assemblies?

   For example, and for Prairie Island, the Commission's 2009 CN order anticipated (though it didn't explicitly state) the storage of 2,560 spent fuel assemblies (64 TN-40 casks X 40 spent fuel assemblies per cask).

   Response:

   Based on current core operations, Monticello anticipates approximately 800 fuel assemblies will need to be stored to facilitate operation from 2030 to 2040. A range in number of storage containers was provided in the most recent CN application. This was to allow a change in technology as there are several welded canister licensed designs by the NRC. The last two sentences of Section 8.7 of CN-21-668 state, "These various designs have the capacity to store between 56 to 68 fuel assemblies similar to those used at the Plant. Based on the technology eventually selected, this would result in the need for between 12 to 15 additional storage modules." If Monticello continues to use the 61BTH casks, it is anticipated that 14 spent fuel canisters would be required based on current plant operations.