

Annual Radioactive Effluent Release Report

2025

Document Number: 0CAN10001

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1.0 LIST OF ACRONYMS AND DEFINITIONS

1. Alpha Particle (α): A charged particle emitted from the nucleus of an atom having a mass and charge equal in magnitude of a helium nucleus.
2. BWR: Boiling Water Reactor
3. Composite Sample: A series of single collected portions (aliquots) analyzed as one sample. The aliquots making up the sample are collected at time intervals that are very short compared to the composite period.
4. Control: A sampling station in a location not likely to be affected by plant effluents due to its distance and/or direction from the Plant.
5. Counting Error: An estimate of the two-sigma uncertainty associated with the sample results based on total counts accumulated.
6. Curie (Ci): A measure of radioactivity; equal to 3.7×10^{10} disintegrations per second, or 2.22×10^{12} disintegrations per minute.
7. Direct Radiation Monitoring: The measurement of radiation dose at various distances from the plant is assessed using thermoluminescent dosimeters (TLDs), optically stimulated luminescent dosimeters (OSLDs), and/or pressurized ionization chambers.
8. Grab Sample: A single discrete sample drawn at one point in time.
9. Indicator: A sampling location that is potentially affected by plant effluents due to its proximity and/or direction from the plant.
10. Ingestion Pathway: The ingestion pathway includes milk, fish, drinking water and garden produce. Also sampled (under special circumstances) are other media such as vegetation or animal products when additional information about particular radionuclides is needed.
11. ISFSI: Independent Spent Fuel Storage Installation
12. LLD: Lower Limit of Detection. An *a priori* measure of the detection capability of a radiochemistry measurement based on instrument setup, calibration, background, decay time, and sample volume. An LLD is expressed as an activity concentration. The MDA is used for reporting results. LLD are specified by a regulator, such as the NRC and are typically listed in the ODCM.
13. MDA: Minimum Detectable Activity. For radiochemistry instruments, the MDA is the *a posteriori* minimum concentration that a counting system detects. The smallest concentration or activity of radioactive material in a sample that will yield a net count above instrument background and that is detected with 95% probability, with only 5% probability of falsely concluding that a blank observation represents a true signal.

14. MDC: Minimum Detectable Concentration. Synonymous with MDA for the purposes of radiological monitoring.
15. Mean: The sum of all of the values in a distribution divided by the number of values in the distribution, synonymous with average.
16. Microcurie (μCi): 3.7×10^4 disintegrations per second, or 2.22×10^6 disintegrations per minute.
17. millirem (mrem): 1/1000 rem; a unit of radiation dose equivalent in tissue.
18. Milliroentgen (mR): 1/1000 Roentgen; a unit of exposure to X-Ray or gamma radiation.
19. N/A: Not Applicable
20. NEI: Nuclear Energy Institute
21. NRC: Nuclear Regulatory Commission
22. ODCM: Offsite Dose Calculation Manual
23. OSLD: Optically Stimulated Luminescence Dosimeter
24. Perimeter Well: A monitoring well that is intended for monitoring groundwater quality before off-site migration. Based on their intended purpose of monitoring off-site migration, perimeter wells are located downgradient of plant sources and are near the plant boundary. Detection of a contaminant in a perimeter well is indication the contamination has migrated off-site.
25. Protected Area: A 10 CFR 73 security term is an area encompassed by physical barriers and to which access is controlled for security purposes. The fenced area immediately surrounding the plant and around ISFSI are commonly classified by the licensee as "Protected areas." Access to the protected area requires a security badge or escort.
26. PWR: Pressurized Water Reactor
27. REC: Radiological Effluent Control
28. REMP: Radiological Environmental Monitoring Program
29. Restricted Area: A 10 CFR 20 defined term where access to which is limited by the licensee for the purpose of protecting individuals against undue risks from exposure to radiation and radioactive materials.
30. Sentinel Well: A groundwater monitoring well that is intended for early detection of new inadvertent leaks or spills to groundwater. Based on their intended purpose of early detection, a sentinel well is located downgradient of and as close as practical to the intended source (upgradient) to monitor.

Company: Xcel Energy**Plant: Monticello Nuclear Generating Plant**

31. TEDE: Total Effective Dose Equivalent (TEDE) means the sum of the effective dose equivalent (for external exposures) and the committed effective dose equivalent (for internal exposures).
32. TLD: Thermoluminescent Dosimeter
33. TRM: Technical Requirements Manual
34. TS: Technical Specification
35. Unrestricted Area: An area, access to which is neither limited nor controlled by the licensee.

2.0 EXECUTIVE SUMMARY

Monticello Nuclear Generating Plant (MNGP) Radiological Effluent Control (REC) Program was established to limit the quantities of radioactive material that may be released based on calculated radiation doses or dose rates. Dose to Members of the Public due to radioactive materials released from the plant is limited by Technical Specifications, 10 CFR 20, and by 40 CFR 190. Operational doses to the public during 2025 were calculated to be within the limits required by regulation and compared to other sources of radiation dose and pose no health hazard. These doses are summarized and compared to the regulatory limits in Section 2.1 Comparison to Regulatory Limits below.

The Annual Radioactive Effluent Release Report (ARERR) is published per REC requirements and provides data related to plant operation, including: quantities of radioactive materials released in liquid and gaseous effluents; radiation doses to members of the public; solid radioactive waste shipped offsite for processing or direct disposal; and other information as required by site licensing documents.

In 2025, the gaseous effluent dose assessments for locations from the Land Use Census showed that the critical receptor for Monticello Nuclear Generating Plant is Child, due to a garden, at 1.11 miles SE. The maximum Annual Organ Dose calculated for this receptor was $2.40E-02$ mrem, to the bone.

The maximum dose calculated to any organ due to radioactive liquid effluents was $4.03E-02$ mrem, for Child Whole Body or any Organ at the nearest drinking water uptake, the St. Paul Water Intake, 34.2 mi downstream of the plant.

Solid radioactive waste shipped offsite for processing or direct disposal included 412.85 Curies and $1,017 \text{ m}^3$, shipped in 21 shipments.

In addition to monitoring radioactive effluents, MNGP has a Radiological Environmental Monitoring Program (REMP) that monitors for levels of radiation and radioactive materials in the local environment. Data from the REMP is published in the Annual Radiological Environmental Operating Report (AREOR).

2.1 Comparison to Regulatory Limits

Compliance with 40 CFR 190, Environmental Radiation Protection Standards for Nuclear Power Operations, requires controlling dose to any member of the public due to all radiation sources from the Uranium fuel cycle below 25 mrem to the whole body, 75 mrem to the thyroid and 25 mrem to any other organ. These limits apply to dose in the general environment outside of the site boundary due to effluents in addition to other sources of dose from the Uranium fuel cycle that impact members of the public. In the case of Monticello Nuclear Generating Plant, no other nearby Uranium fuel cycle sources are present and only doses due to effluents, direct radiation from the reactor and steam turbines and direct radiation due to the ISFSI are included in the assessment. The summary of results for Monticello Nuclear Generating Plant in 2025 are reported in Table 1.

Table 1, Monticello Nuclear Generating Plant Dose Summary¹

		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Annual
Liquid Effluent Dose Limit, Total Body	Limit	1.5 mrem	1.5 mrem	1.5 mrem	1.5 mrem	3 mrem
	Total Body Dose	2.98E-02	4.70E-02	2.15E-02	9.27E-03	1.08E-01
	% of Limit	1.99	3.13	1.43	0.62	7.20
Liquid Effluent Dose Limit, Any Organ	Limit	5 mrem	5 mrem	5 mrem	5 mrem	10 mrem
	Max Organ Dose	2.98E-02	4.70E-02	2.15E-02	9.27E-03	1.08E-01
	% of Limit	0.60	0.94	0.43	0.19	1.08
Gaseous Effluent Dose Limit, Gamma Air (Noble Gas)	Limit	5 mrad	5 mrad	5 mrad	5 mrad	10 mrad
	Gamma Air Dose	4.84E-04	2.67E-04	1.51E-03	3.25E-04	2.59E-03
	% of Limit	0.01	0.01	0.03	0.01	0.03
Gaseous Effluent Dose Limit, Beta Air (Noble Gas)	Limit	10 mrad	10 mrad	10 mrad	10 mrad	20 mrad
	Beta Air Dose	1.31E-04	1.07E-04	2.37E-04	1.80E-04	6.55E-04
	% of Limit	0.001	0.001	0.002	0.002	0.003
Gaseous Effluent Organ Dose Limit (Iodine, Tritium, Particulates with > 8-day half-life)	Limit	7.5 mrem	7.5 mrem	7.5 mrem	7.5 mrem	15 mrem
	Max Organ Dose	5.05E-03	5.87E-03	1.58E-02	4.00E-03	2.27E-02
	% of Limit	0.07	0.08	0.21	0.05	0.15

¹ Table 1 demonstrates compliance with 10 CFR Part 50, App. I Limits.

In order to determine the maximum exposed individual, it is necessary to determine whether direct radiation dose due to plant operations has been detected outside of the site boundary. MNGP has analyzed the 2025 REMP TLD data using methodology based on ANSI/HPS N13.37-2014. A 2025 3rd Quarter REMP TLD was positive, M16B, but not believed to be due to facility dose. The vendor was contacted and confirmed the reading of 20.1 mrem (net dose of 7.5 mrem) was accurate. The vendor added that the TLD arrived wet and this can have an impact on the results. No other adjacent TLDs were positive. The 'B' ring of the TLDs is the outer ring and no 'A' inner ring TLDs were positive. The site had no abnormal gaseous discharges in 2025. This condition was captured in MNGP QIM 501000108865. The site has determined that facility related radiation dose was not detected for any REMP TLD during 2025. The full results of MNGP's REMP TLDs are provided in Attachment 3, Radiological Environmental Monitoring Program TLD Results. Complete results and analyses for MNGP REMP Sampling are available in the 2025 AREOR.

Therefore, the Likely Most-Exposed Member of the Public would be the Critical Receptor identified in the 2025 Land Use Census. Doses due to Iodines, Tritium, Carbon-14, Particulates with > 8-day half-life, and Noble Gases were summed to determine total dose due to gaseous effluents, and the results are reported in Table 2.

Table 2, Total Annual Offsite-Dose Comparison to 40 CFR 190 Limits for MNGP²

Dose Type	Organ	Dose	40 CFR 190 Limits	% of Limit
Direct Radiation Dose*	All	Not detected	-	0.00%
Noble Gases	Whole Body	1.29E-03 mrem	-	0.01%
	Skin	2.49E-03 mrem	-	0.01%
Particulates, Iodines, Tritium and Carbon-14	Whole Body	9.99E-03 mrem	-	0.04%
	Thyroid	2.19E-02 mrem	-	0.03%
	Max Other Organ (Bone)	3.39E-02 mrem	-	0.13%
Total Dose **	Whole Body	1.13E-02 mrem	25 mrem	0.05%
	Thyroid	2.32E-02 mrem	75 mrem	0.03%
	Max Other Organ (Bone)	2.40E-02 mrem	25 mrem	0.10%

* Based on REMP TLD Results, as discussed above.

** For the Critical Receptor identified in Table 5, 2025 Critical Receptor. Because Direct (TLD) dose is 0.0, then this represents the likely most-exposed individual. Doses in **bold** include contributions due to Iodines, Particulates, Tritium, Carbon-14, and Noble Gases.

² Table 2 is a summation of Units to show compliance with 40 CFR Part 190 Limits.

3.0 INTRODUCTION

3.1 About Nuclear Power

Commercial nuclear power plants are generally classified as either Boiling Water Reactors (BWRs) or Pressurized Water Reactors (PWRs), based on their design. A BWR includes a single coolant system where water used as reactor coolant boils as it passes through the core and the steam generated is used to turn the turbine generator for power production. A PWR, in contrast, includes two separate water systems: radioactive reactor coolant and a secondary system. Reactor coolant is maintained under high pressure, preventing boiling. The high-pressure coolant is passed through a heat exchanger called a steam generator where the secondary system water is boiled, and the steam is used to turn the turbine generator for power production.

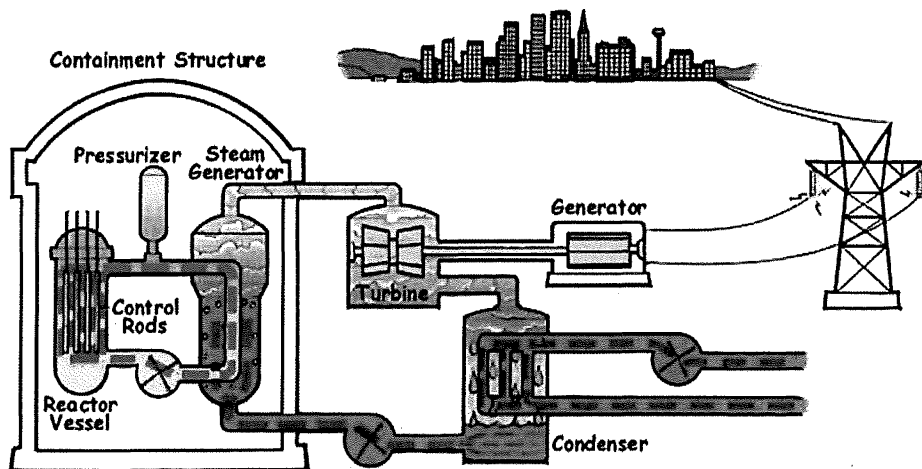


Figure 1, Pressurized Water Reactor (PWR) [1]

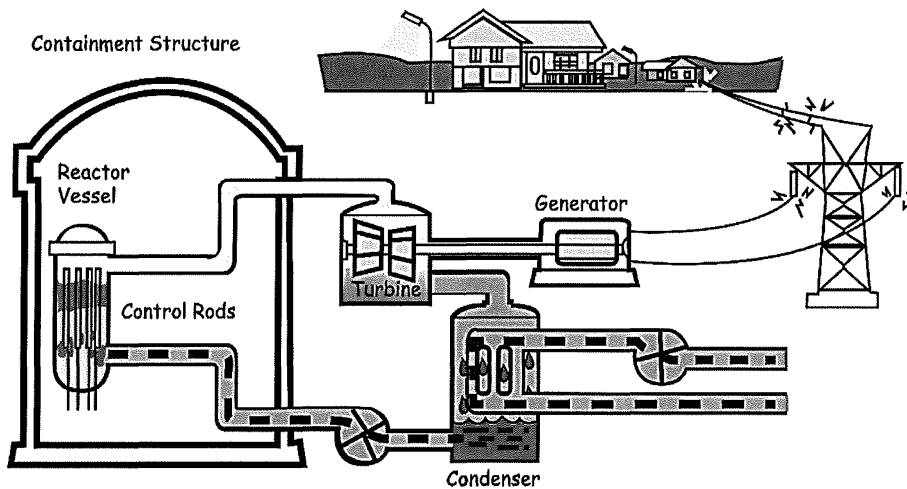


Figure 2, Boiling Water Reactor (BWR) [2]

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3.1 (Continued)

Electricity is generated by a nuclear power plant similarly to the way that electricity is generated at other conventional types of power plants, such as those powered by coal or natural gas. Water is boiled to generate steam; the steam turns a turbine that is attached to a generator and the steam is condensed back into water to be returned to the boiler. What makes nuclear power different from these other types of power plants is that the heat is generated by fission and decay reactions occurring within and around the core containing fissionable Uranium (U-235).

Nuclear fission occurs when certain nuclides (primarily U-233, U-235, or Pu-239) absorb a neutron and break into several smaller nuclides (called fission products) as well as producing some additional neutrons.

Fission results in production of radioactive materials including gases and solids that must be contained to prevent release or treated prior to release. These effluents are generally treated by filtration and/or hold-up prior to release. Releases are generally monitored by sampling and by continuously indicating radiation monitors. The effluent release data is used to calculate doses in order to ensure that dose to the public due to plant operation remains within required limits.

3.2 About Radiation Dose

Ionizing radiation, including alpha, beta, and gamma radiation from radioactive decay, has enough energy to break chemical bonds in tissues and result in damage to tissue or genetic material. The amount of ionization that will be generated by a given exposure to ionizing radiation is quantified as dose. Radiation dose is generally reported in units of millirem (mrem) in the US.

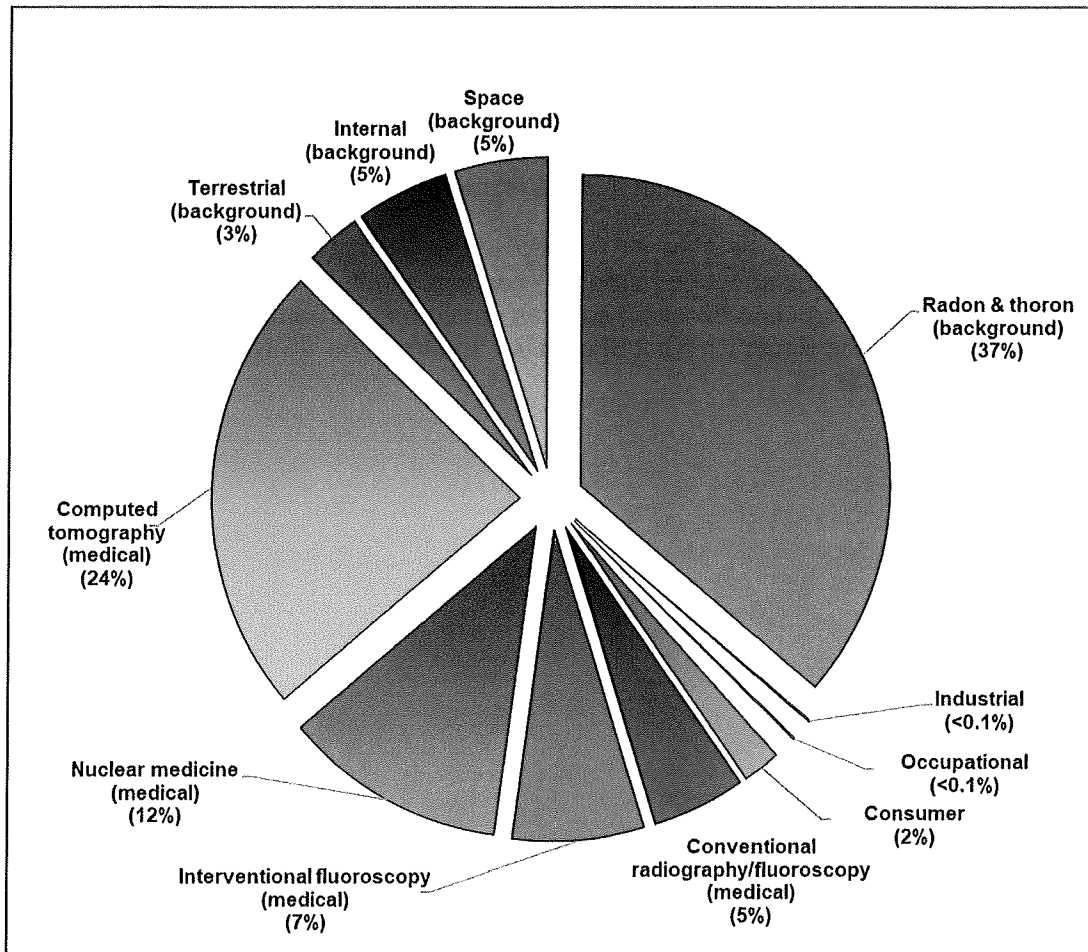


Figure 3, Sources of Radiation Exposure (NCRP Report No. 160) [3]

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3.2 (Continued)

The National Council on Radiation Protection (NCRP) has evaluated the population dose for the US and determined that the average individual is exposed to approximately 620 mrem per year [3]. There are many sources for radiation dose, ranging from natural background sources to medical procedures, air travel, and industrial processes. Approximately half (310 mrem) of the average exposure is due to natural sources of radiation including exposure to radon, cosmic radiation, and internal radiation and terrestrial due to naturally occurring radionuclides. The remaining 310 mrem of exposure is due to man-made sources of exposure, with the most significant contributors being medical (48% of total mrem per year) due to radiation used in various types of medical scans and treatments. Of the remaining 2% of dose, most is due to consumer activities such as air travel, smoking cigarettes, and building materials. A small fraction of this 2% is due to industrial activities including generation of nuclear power.

Readers that are curious about common sources and effects of radiation dose that they may encounter can find excellent sources of information from the Health Physics Society, including the Radiation Fact Sheets [4], and from the US Nuclear Regulatory Commission website [5].

3.3 About Dose Calculation

Concentrations of radioactive material in the environment resulting from plant operations are very small and it is not possible to determine doses directly using measured activities of environmental samples. To overcome this, dose calculations based on measured activities of effluent streams are used to model the dose impact for Members of the Public due to plant operation and effluents. There are several mechanisms that can result in dose to Members of the Public, including: Ingestion of radionuclides in food or water; Inhalation of radionuclides in air; Immersion in a plume of noble gases; and Direct Radiation from the ground, the plant or from an elevated plume.

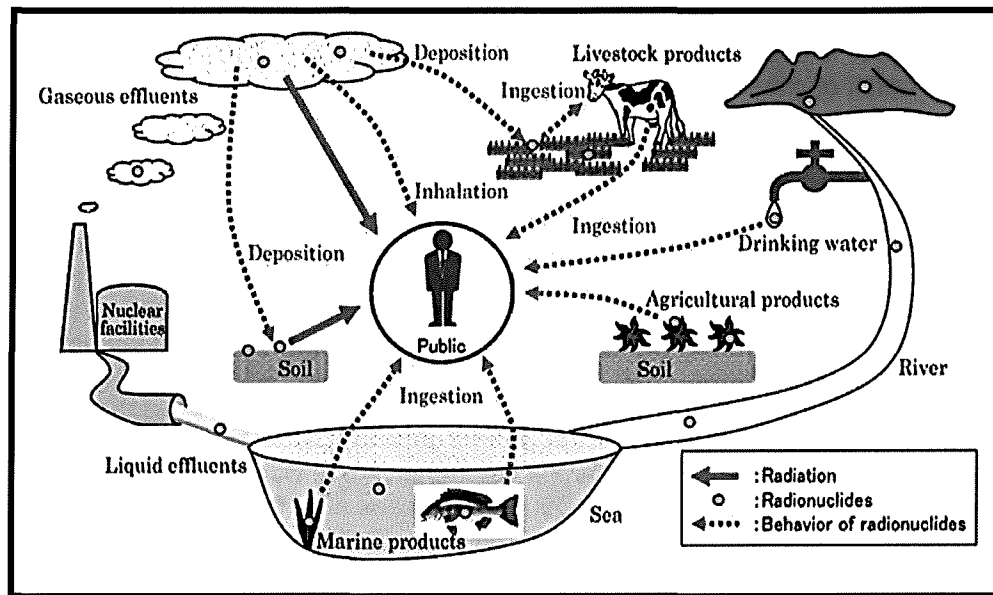


Figure 4, Potential exposure pathways to Members of the Public due to Plant Operations [6]

Each plant has an Offsite Dose Calculation Manual (ODCM) that specifies the methodology used to obtain the doses in the Dose Assessment section of this report. The dose assessment methodology in the ODCM is based on NRC Regulatory Guide 1.109 [7] and NUREG-0133 [8]. Doses are calculated by determining what the nuclide concentration will be in air, water, on the ground, or in food products based on plant effluent releases. Release points are continuously monitored to quantify what concentrations of nuclides are being released. For gaseous releases meteorological data is used to determine how much of the released activity will be present at a given location outside of the plant either deposited onto the ground or in gaseous form. Intake patterns and nuclide bio-concentration factors are used to determine how much activity will be transferred into animal milk or meat. Finally, human ingestion factors and dose factors are used to determine how much activity will be consumed and how much dose the consumer will receive. Inhalation dose is calculated by determining the concentration of nuclides and how much air is breathed by the individual.

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3.3 (Continued)

For liquid releases, dilution and mixing factors are used to model the environmental concentrations in water. Drinking water pathways are modeled by determining the concentration of nuclides in the water at the point where the drinking water is sourced (e.g., taken from wells, rivers, or lakes). Fish and invertebrate pathways are determined by using concentration at the release point, bioaccumulation factors for the fish or invertebrate and an estimate of the quantity of fish consumed.

Each year a Land Use Census is performed to determine what potential dose pathways currently exist within a five-mile radius around the plant, the area most affected by plant operations. The Annual Land Use Census identifies the locations of vegetable gardens, nearest residences, milk animals and meat animals. The data from the census is used to determine who is the likely to be most exposed to radiation dose as a result of plant operation.

There is significant uncertainty in dose calculation results, due to modeling dispersion of material released and bioaccumulation factors, as well as assumptions associated with consumption and land-use patterns. Even with these sources of uncertainty, the calculations do provide a reasonable estimate of the order of magnitude of the exposure. Conservative assumptions are made in the calculation inputs such as the number of various foods and water consumed, the amount of air inhaled, and the amount of direct radiation exposure from the ground or plume, such that the actual dose received are likely lower than the calculated dose. Even with the built-in conservatism, doses calculated for the maximum exposed individual due to plant operation are a very small fraction of the annual dose that is received due to other sources. The calculated doses due to plant effluents, along with REMP results, serve to provide assurance that radioactive effluents releases are not exceeding safety standards for the environment or people living near the plant.

4.0 DOSE ASSESSMENT FOR PLANT OPERATIONS

4.1 Regulatory Limits

Regulatory limits are detailed in station licensing documents such as the plant Technical Specifications and the Offsite Dose Calculation Manual (ODCM.) These documents contain the limits to which MNGP must adhere. MNGP drives to maintain the philosophy to keep dose “as low as is reasonably achievable” (ALARA) and actions are taken to reduce the amount of radiation released to the environment. Liquid and gaseous release data show that the dose from MNGP is well below the ODCM limits. The instantaneous concentration of liquid radioactive material released shall be limited to ten times the concentration specified in 10 CFR 20, Appendix B, Table 2, Column 2, for radionuclides other than dissolved or entrained noble gases. For dissolved or entrained noble gases, the total concentration released shall be limited to 2.0×10^{-4} microcuries/ml.

The annual whole body, skin and organ dose was computed using the 2025 source term using the dose calculation methodology provided in the ODCM. The calculated doses due to gaseous effluents are used to demonstrate compliance with offsite dose limits are presented in Table 1, Monticello Nuclear Generating Plant Dose Summary and Regulatory Limits for Gaseous Effluent Doses:

1. Fission and activation gases:
 - a. Noble gases dose rate due to radioactive materials released in gaseous effluents from the site to areas at and beyond the site boundary shall be limited to the following:
 - 1) Less than or equal to 500 mrem/year to the total body
 - 2) Less than or equal to 3000 mrem/year to the skin
 - b. Noble gas air dose due to noble gases released in gaseous effluents, from each reactor unit, to areas at and beyond the site boundary shall be limited to the following:
 - 1) Quarterly
 - a) Less than or equal to 5 mrad gamma
 - b) Less than or equal to 10 mrad beta
 - 2) Yearly
 - a) Less than or equal to 10 mrad gamma
 - b) Less than or equal to 20 mrad beta

4.2 (Continued)

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2. Iodine, tritium, and all radionuclides in particulate form with half-lives greater than 8 days.
 - a. The dose rate for iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released from the site to areas at and beyond the site boundary shall be limited to the following:
 - 1) Less than or equal to 1500 mrem/yr to any organ
 - b. The dose to a MEMBER OF THE PUBLIC from iodine-131, iodine-133, tritium, and all radionuclides in particulate form with half-lives greater than 8 DAYS in gaseous effluents released, from each reactor unit, to areas at and beyond the site boundary shall be limited to the following:
 - 1) Quarterly
 - a) Less than or equal to 7.5 mrem to any organ
 - 2) Yearly
 - a) Less than or equal to 15 mrem to any organ

4.2 Regulatory Limits for Liquid Effluent Doses

1. The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released, from each reactor unit, to unrestricted areas shall be limited to the following:
 - a. Quarterly
 - 1) Less than or equal to 1.5 mrem total body
 - 2) Less than or equal to 5 mrem critical organ
 - b. Yearly
 - 1) Less than or equal to 3 mrem total body
 - 2) Less than or equal to 10 mrem critical organ

4.3 40 CFR 190 Regulatory Dose Limits for a Member of the Public

1. Total Dose (40 CFR 190)
 - a. The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC in the unrestricted area due to releases of radioactivity and to radiation from Uranium fuel cycle sources shall be limited to the following:
 - 1) Less than or equal to 25 mrem, Total Body or any Organ except Thyroid.
 - 2) Less than or equal to 75 mrem, Thyroid.

4.4 Onsite Doses (Within Site Boundary)

MNGP classifies individuals within the site boundary as either occupationally exposed individuals or members of the public. This section evaluates dose to non-occupationally exposed workers and members of the public that may be onsite for various reasons. The report must include any other information as may be required by the Commission to estimate maximum potential annual radiation doses to the public resulting from effluent releases as required by 10 CFR 50.36a(a)(2). While within controlled or restricted areas, the limits from Sections 4.1 through 4.4 do not apply; however, 10 CFR 20.1301 dose limit of 100 mrem per year TEDE and dose rate limit of 2 mrem per hour from external sources continue to apply. Occupancy times within the controlled areas are generally sufficiently low to compensate for increase in the atmospheric dispersion factor above the site boundary. Groups of concern include working in the Site Admin Building and/or Sub Yard. Use of a conservative assumption of 40 hours/week spent inside the site boundary by these groups conservatively represents the most-exposed individual.

Table 3, Onsite Doses (Within Site Boundary)

Location	Sector	Approx. Distance (Meters)	X/Q (s/m ³)	D/Q (1/m ²)	Total Body Dose (mrem)		External Dose (mrem)	Total (mrem)
					Noble Gas	Iodine, Particulate, C-14 & H-3	TLD or OSLD	
Site Admin Building / Sub Yard	SSE (H)	100 m	2.10E-05	2.00E-07	3.90E-04	1.02E-02	0.00E+00	1.05E-02

5.0 SUPPLEMENTAL INFORMATION

5.1 Gaseous Batch Releases

5.1.1 MNGP

Number of batch releases	8
Total time period for a batch release	6185.0 minutes
Maximum time period for a batch release	1649.0 minutes
Average time period for a batch release	773.1 minutes
Minimum time period for a batch release	362.0 minutes

5.2 Liquid Batch Releases

5.2.1 MNGP

Number of batch releases	0
Total time period for a batch release	0 minutes
Maximum time period for a batch release	0 minutes
Average time period for a batch release	0 minutes
Minimum time period for a batch release	0 minutes
Average total flow during period of release	0 gpm

MNGP did not have any batch liquid releases in the 2025 reporting period.

5.3 Abnormal Releases

5.3.1 Gaseous Abnormal Releases

Number of releases	0
Total activity released	0 Ci

MNGP did not have any abnormal gaseous releases in the 2025 reporting period.

5.3.2 Liquid Abnormal Releases

Number of releases	24
Total activity released	6.00E-01 Ci

As part of Monticello Nuclear Generating Plant's ongoing response to the Abnormal Release to groundwater reported in 2022, MNGP has been monitoring the migration of the plume from that release. The plume reached MW-33A and MW-37A on July 27, 2023 and since that date MNGP has been reporting a modeled abnormal discharge to the Mississippi River. The groundwater vendor used the software MODFLOW to determine flux to the river from each respective monitoring well interface. The model assumed each interface extended half the distance to the adjacent monitoring wells in either direction. The flux was calculated daily using the developed model. Tritium concentrations at each well interface were determined daily by linearly interpolating between samples. The wells containing Tritium were considered part of the interface until a sample was taken that was below the minimum detectable concentration. These results were composited monthly and reported as an abnormal discharge. In 2025 this analysis resulted in a total of 9.97E-03 Ci being discharged from the 'A' horizon.

On April 11, 2025, samples taken from MW-26B and MW-28B were positive for tritium at concentrations of 13,400 pCi/L and 9,000 pCi/l respectively. These perimeter Wells were less than detectable for their last sample period on May 22, 2024. Tritium was detected at the nearest upgradient well, MW-15B, on May 23, 2024, at a concentration of 350 ± 167 pCi/l. This is due to the ongoing migration of the plume resulting from the 2022 release; this is not due to a new release. A new model was developed for the 'B' horizon using a similar methodology. A new model was required because the deeper 'B' wells monitor a different aquifer than the shallower 'A' wells. The model concluded that there was a discharge from the 'B' horizon to the Mississippi River. A total abnormal discharge of 5.90E-01 Ci was determined for the 2025 reporting period from the 'B' horizon. The total combined discharge from both horizons was 6.00E-01 Ci. The results of the analysis for the modeled abnormal discharge to the Mississippi River are given below in Table 4, Modeled Abnormal Discharge from MNGP to Mississippi River.

Table 4, Modeled Abnormal Discharge from MNGP to Mississippi River

Month	'A' Horizon ³ H Activity Discharged (Ci)	'B' Horizon ³ H Activity Discharged (Ci)
January 2025	1.49E-03	5.49E-02
February 2025	1.05E-03	5.39E-02
March 2025	1.14E-03	6.43E-02
April 2025	1.78E-03	7.16E-02
May 2025	1.39E-03	8.37E-02
June 2025	7.21E-04	8.16E-02
July 2025	6.69E-04	6.23E-02
August 2025	7.63E-04	4.12E-02
September 2025	3.89E-04	2.33E-02
October 2025	1.46E-04	1.48E-02
November 2025	2.37E-04	1.63E-02
December 2025	1.90E-04	2.22E-02
Total 2025	9.97E-03	5.90E-01

5.4 Land Use Census

In the 2025 Land Use Census there were 3 sectors where the highest meat animal receptor changed by more than 20%. These were due to new animals being identified in the H (SSE), N (W), and Q (NW) sectors. In the H (SSE) sector goats were identified at 5.10 miles, while outside of the required 5 mile radius, this pathway will be included and continued to be monitored. There were two new sets of cows identified in the N(W) and Q(NW) sectors that were closer than the previously identified Cows, resulting in an increase in the D/Q for each sector. The sector with the highest D/Q has remained the same for Meat animals.

For 2025, the Critical Receptor identified by the MNGP Land Use Census has remained the same since the last Land Use Census with a different max organ. The Critical Receptor was identified as a Child at a Garden in the SE Sector 1.1 miles away from the plant and the max organ being Bone.

Table 5, 2025 Critical Receptor

SECTOR	SE
DISTANCE	1.11 miles
PATHWAYS	Ground Plane, Inhalation, and Vegetable
Age Group	Child
Organ	Bone

Company: Xcel Energy**Plant: Monticello Nuclear Generating Plant**

Since 2019, one milk cow has been located in the NNE sector at 3.2 miles. The cow gave birth approximately five years ago and discussion with the owner confirmed they now milk the newer cow. Discussion with the owner indicates that when the cow is producing milk there is enough for the family to use, but not enough extra to provide samples in the quantity/frequency required for the site. There is also a beef cow and a garden at this location (Milk, Meat, and Vegetable exposure pathways present.) Due to the relatively low deposition parameter, the calculated dose at this location remains lower than other vegetable locations that are closer to the plant in high D/Q sectors. Milk samples are required for three locations within 1 mile or three locations where doses are calculated to be >1mRem/year per ODCM-07.01. The currently identified milk location is outside 3 miles and maximum calculated dose by all pathways was 0.0160 mRem to infant thyroid.

Milk samples were not available during 2025 due to the limited milk supply of the animals, as discussed above. The required compensatory vegetation samples were collected and analyzed (per ODCM-07.01, Table 1.)

Corn and Potato sampling was not required because no routine liquid discharges were made during the growing season. Additionally, the Land Use Census found that there are no water use permits for irrigation using water from the Mississippi River within 5 miles downstream of the plant.

5.5 Meteorological Data

MNGP accumulated 99.78% of meteorological data in 2025, satisfying the 90% requirement. Joint Frequency Distribution Tables are held onsite and available for review upon request.

5.6 Effluent Radiation Monitors Out of Service Greater Than 30 Days

There were no effluent monitors that did not have the required number of channels for a period greater than 30 days in 2025.

5.7 Offsite Dose Calculation Manual (ODCM) Changes

MNGP did not revise the ODCM during the 2025 reporting period.

5.8 Process Control Program (PCP) Changes

Monticello Nuclear Generating Plant did not revise the Process Control Program in 2025.

5.9 Radioactive Waste Treatment System Changes

Monticello Nuclear Generating Plant did not make any changes to any radioactive waste treatment systems in 2025.

Company: Xcel Energy**Plant: Monticello Nuclear Generating Plant**

5.9.1 Independent Spent Fuel Storage Installation (ISFSI) Monitoring Program

The ISFSI at Monticello Nuclear Generating Plant was constructed west of the plant in 2007. The initial loading campaign was completed in 2008 with 10 Horizontal Storage Modules (HSM's) loaded with spent fuel. In 2013 an additional five HSM's were loaded with spent fuel. In 2016 one additional HSM was loaded. In 2018 an ISFSI campaign loaded an additional 14 HSM's, bringing the total number of stored modules to 30.

5.9.2 Carbon-14

Carbon-14 (C-14) is a naturally occurring radionuclide with a 5,730-year half-life. Nuclear weapons testing in the 1950s and 1960s significantly increased the amount of C-14 in the atmosphere. Nuclear power plants also produce C-14, but the amount is infinitesimal compared to what has been distributed in the environment due to weapons testing and what is produced by natural cosmic ray interactions.

In accordance with Regulatory Guide 1.21, "Measuring, Evaluating, and Reporting Radioactive Material in Liquid and Gaseous Effluents and Solid Waste," the NRC recommended re-evaluating "principal radionuclides" and reporting C-14 as appropriate. Carbon-14 production and release estimates were calculated using active core coolant mass, average neutron flux by energy and reactor coolant nitrogen concentrations to determine Carbon-14 generation based upon an effective full power year. The estimated generation for Monticello Nuclear Generating Plant during 2025 was 6.28 Curies.

Public dose estimates were performed using methodology from the ODCM which is based on Regulatory Guide 1.109 methodology. C-14 dose is included in dose calculation results in Tables 1 and 2.

5.9.3 Errata/Corrections to Previous ARERRs

Included with this report are erratas to the 2023 and 2024 ARERRs.

For the 2023 and 2024 reports, the Water Storage Pond Level Monitor spreadsheet was updated following a survey performed by the vendor. This spreadsheet governed the level vs total gallons relationship in the ponds. The total level rise in the WSPs was used when quantifying the release of tritium via natural evaporation.

The 2023 errata corrects the reported dose in Q4 to the Critical Receptor given in Table 2 (page 8) and the amount of Tritium reported in Tables 11 (pg. 25) and 13 (pg. 27) for Summation of all Releases and Ground Level Releases, respectively. No limits or guidelines are challenged due to this errata.

In the errata to the 2024 report, the abnormal discharge previously mentioned in 5.3.2, Liquid Abnormal Releases from the 'B' horizon was determined by the model to have begun in May 2024. This additional abnormal discharge resulted in changes to the Executive Summary, page 5 with the updated number for liquid effluent dose. This also resulted in additions to Table 1 (pg 6), Monticello Nuclear Generating Plant Dose Summary in the Liquid Effluent Dose Limit, Total Body and Any Organ Rows for Quarters 2, 3, and 4 as well as the annual dose. While reviewing the 2024 report in

preparation for this errata, it was discovered in Table 2, (pg 7), Total Annual Offsite-Dose Comparison to 40 CFR 190 Limits for MNGP, the Total Whole Body dose was incorrectly reported to be the same as the dose to the thyroid, 3.08E-02 mrem. This errata corrects the number to 1.25E-02 mrem, lower than previously reported. Section 5.3.2, Liquid Abnormal Releases & Discharges, was updated with information on the results of the 'B' horizon modeling. This includes updates to Table 4 (pg ?), Modeled Abnormal Discharge to Mississippi River. The previously mentioned change to the WSP Level Monitor spreadsheet resulted in updates to Table 8 (pg 29) and 10 (pg 31), Gaseous Effluents Summation of All Releases and Ground Level Releases Continuous Mode, respectively.

The errata to the 2024 report includes an update to Table 7, (pg 25), Groundwater Monitoring Well Sample Frequencies. Due to the ongoing remediation and plant activities related to the 2022 leak event, the sample frequencies of each monitoring well were in constant flux throughout the reporting period. Due to plume migration, wells would be sampled more frequently and others less frequently throughout the year in order to properly characterize and monitor the plume. The decision was made to include the most current sampling plan as of time of writing, i.e. April 2025 and not the stated plan for the reporting year of 2024. If you were to compare the stated sampling plan in Table 7 with Attachment 5 (of the 2024 report) it would appear results were not included.

6.0 NEI 07-07 ONSITE RADIOLOGICAL GROUNDWATER MONITORING PROGRAM

Monticello Nuclear Generating Plant has developed a Groundwater Protection Initiative (GPI) program in accordance with NEI 07-07, Industry Ground Water Protection Initiative – Final Guidance Document [9]. The purpose of the GPI is to ensure timely detection and an effective response to situations involving inadvertent radiological releases to groundwater in order to prevent migration of licensed radioactive material off-site and to quantify impacts on decommissioning. During 2025, MNGP collected and analyzed groundwater samples in accordance with the requirements of FP-CY-GWPP-01.

This section is included in this report to communicate results of NEI 07-07 Radiological Groundwater Monitoring Program. Monitoring wells installed as part of GPI program are sampled and analyzed as summarized in Table 6, 2025 Groundwater Monitoring Well Sampling Frequencies. In addition to reporting results from NEI 07-07 monitoring wells, voluntary communications to offsite governmental agencies for onsite leaks or spills per NEI 07-07 Objective 2.2, are also reported as part of this report. It is important to note, samples and results taken in support of NEI 07-07 groundwater monitoring program are not part of the Radiological Environmental Monitoring Program (REMP) but should be reported as part of ARERR.

Due to the ongoing characterization and monitoring of the plume resulting from the abnormal release first reported in the 2022 ARERR, the 2024 groundwater sampling frequencies were a dynamic process. Our groundwater vendor would request certain wells be sampled more frequently than others depending on the information determined from their modeling. Qualitative samples were taken on a more frequent basis and analyzed at MNGP's in-house laboratory. These additional samples were taken for the aforementioned characterization and are not included with this report. These results are available upon request. The results included with this report are the results from our certified vendor laboratory. These samples were taken following current EPA standardized sampling guidance and were verified to be chemically stable (temperature, pH, etc) before a sample was drawn. The frequency of which certain wells were sent to the vendor laboratory was dependent upon the detection of Tritium within the well in the qualitative samples analyzed by the in-house laboratory at MNGP.

Deviations from the listed sampling frequencies listed in Table 6 are the following. The March 2025 sample of MW-103 arrived at the vendor in a cracked empty container and was therefore a missed sample. This was captured in MNGP QIM 501000097945. Monitoring Wells 26B, 27B, and 28B were sampled quarterly following their positive detection on 4/11/25, so there are no Q1 2025 sample results.

Table 6, 2025 Groundwater Monitoring Well Sampling Frequencies

Frequency	# of Wells	Wells
Quarterly	11	MW-1, MW-1B, MW-2, MW-3 , MW-11, MW-14 , MW-15B, MW-24, MW-26B¹, MW-27B¹, MW-28B¹
Monthly	13	MW-4, MW-9, MW-9B, MW-10 (PW-10A), MW-10B, MW-12A ² , MW-12B, MW-13B, MW-15A, MW-16A, MW-16B, MW-33A³, MW-37A
Annual	17	MW-4B (PW-4B), MW-5, MW-6 , MW-7, MW-8, MW-13A (PW-13A), MW-23A, MW-23B, MW-29B, MW-30A, MW-31A, MW-31B, MW-101R, MW-102, MW-103 ⁴ , MW-104, MW-105
Not Currently Sent to Vendor, Analyzed Qualitatively on Site	24	MW-17A, MW-17B, MW-19A, MW-19B, MW-20A, MW-21A, MW-26A, MW-27A, MW-28A , MW-29A, MW-30B, MW-33B, MW-37B, MW-48A, MW-48B, MW-50A, MW-58A, MW-66A , MW-67A, MW-67B, MW-68A, MW-69A , MW-70A, MW-71A

* Monitoring Wells in **BOLD** typeface are considered perimeter wells

¹ MW-26B, MW-27B, MW-28B were sampled quarterly following their positive detection on 4/11/25.

² MW-12A was not sent to the vendor in May 2025.

³ MW-33A was less than detectable in MNGP's in-house laboratory and was not sent to the vendor June 2025.

⁴ MW-103 March 2025 sample container arrived at the vendor cracked and empty, QIM 501000097945.

The current groundwater monitoring program includes 65 monitoring wells and 10 pumping wells at 45 different locations. 20 of the locations include a "nested" configuration, where one sample is taken at the level of the water table (GWPP locations ending with an A) while a second sample can be taken from deeper water (GWPP locations ending with a B). The site has also developed 3 Gradient Control Wells, wells that pump clean water from the ground and return it to the river. The purpose of these wells is to maintain a flat gradient on the water table to mitigate further migration of the plume offsite. The site's groundwater vendor recommends when to operate these wells based on the water table and water level measurements.

As a result of the ongoing migration of the plume from the Abnormal Release first reported in 2022, 25 monitoring wells had detectable Tritium in 2025. The results do not indicate any additional release has occurred. The highest result seen in 2025 was MW-15B's June sample with a concentration of $129,000 \pm 1,960$ pCi/L. As of the end of 2025, no wells are above the EPA drinking water standard Tritium concentration of 20,000 pCi/L. MNGP continues remediation activities.

There was one detectable gamma result in 2025. The May 22, 2025 MW-31B result had a positive detection of Ba-140 at 17.9 ± 16.2 pCi/l. Due to the high uncertainty, the lack of other detected nuclides, and following samples being less than minimum detectable concentration it is believed this result does not represent plant impact. The full Radiological Groundwater Monitoring Program sampling results are provided in Attachment 5, 2025 MNGP Groundwater Monitoring Program Results.

6.1 Voluntary Notification

During 2025, Monticello Nuclear Generating Plant did not make a voluntary NEI 07-07 notification to State/Local officials, NRC, and to other stakeholders required by site procedures.

7.0 BIBLIOGRAPHY

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- [17] "Regulatory Guide 4.13 - Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications, Revision 2," Nuclear Regulatory Commission, June, 2019.
- [18] "Regulatory Guide 4.15 - Quality Assurance for Radiological Monitoring Programs (Inception through Normal Operations to License Termination) -- Effluent Streams and the Environment," Nuclear Regulatory Commission, July, 2007.

Attachment 1, ARERR Release Summary Tables (RG-1.21 Tables)

1.0 GASEOUS EFFLUENTS

Table 7, Gaseous Effluents Summation of All Releases MNGP ³

A. Fission & Activation Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Release	Ci	1.61E+01	1.00E+01	4.64E+01	1.25E+01	5.00E+01
2. Average release rate for the period	μCi/sec	2.07E+00	1.27E+00	5.84E+00	1.58E+00	

B. Iodine	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Iodine – 131	Ci	5.20E-04	2.73E-04	4.05E-04	3.15E-04	3.20E+01
2. Average release rate for the period	μCi/sec	6.69E-05	3.48E-05	5.09E-05	3.97E-05	

C. Particulates	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Particulates with half-lives > 8 days	Ci	1.52E-04	1.85E-04	8.14E-05	6.60E-05	4.00E+01
2. Average release rate for the period	μCi/sec	1.96E-05	2.36E-05	1.02E-05	8.31E-06	

D. Tritium	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Release	Ci	5.28E+00	4.27E+00	7.78E+00	6.44E+00	3.30E+01
2. Average release rate for the period	μCi/sec	6.79E-01	5.43E-01	9.79E-01	8.11E-01	

E. Gross Alpha	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Release	Ci	3.12E-07	5.36E-07	3.12E-07	2.11E-07	5.00E+01

F. Carbon-14	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Release	Ci	1.81E+00	9.29E-01	1.67E+00	1.87E+00	

³ % of limit is provided in Table 1, Monticello Nuclear Generating Plant Dose Summary

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Table 8, Gaseous Effluents – Ground Level Release Batch Mode MNGP

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission Gases						
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines						
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates						
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
H-3	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon-14						
C-14	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Table 9, Gaseous Effluents – Ground Level Release Continuous Mode MNGP

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission Gases						
Ar-41	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.89E-01
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	2.90E-01	3.76E-01	3.07E-01	7.65E-01	1.74E+00
Xe-135m	Ci	6.09E-01	9.24E-02	1.40E+00	0.00E+00	2.10E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	9.00E-01	4.69E-01	1.71E+00	7.65E-01	3.84E+00
Iodines						
I-131	Ci	1.11E-04	9.09E-05	1.26E-04	1.31E-04	4.60E-04
I-133	Ci	8.78E-04	2.29E-04	1.01E-03	1.08E-03	3.20E-03
I-135	Ci	1.07E-03	0.00E+00	0.00E+00	0.00E+00	1.07E-03
Total for Period	Ci	2.06E-03	3.19E-04	1.13E-03	1.22E-03	4.73E-03
Particulates						
Ag-110m	Ci	0.00E+00	7.21E-06	0.00E+00	0.00E+00	7.21E-06
Ba-140	Ci	4.56E-06	0.00E+00	3.95E-06	3.60E-06	1.21E-05
Co-58	Ci	0.00E+00	1.18E-05	0.00E+00	0.00E+00	1.18E-05
Co-60	Ci	4.32E-05	5.64E-05	1.56E-05	2.83E-05	1.44E-04
Cs-137	Ci	7.95E-05	1.74E-05	0.00E+00	1.49E-06	9.84E-05
Mn-54	Ci	0.00E+00	5.75E-06	2.51E-06	0.00E+00	8.26E-06
Os-191	Ci	0.00E+00	3.62E-06	0.00E+00	0.00E+00	3.62E-06
Sb-124	Ci	0.00E+00	1.27E-05	0.00E+00	0.00E+00	1.27E-05
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	7.75E-06	0.00E+00	0.00E+00	7.75E-06
Total for Period	Ci	1.27E-04	1.23E-04	2.21E-05	3.34E-05	6.46E-04
Tritium						
H-3	Ci	4.05E+00	3.50E+00	6.15E+00	5.10E+00	1.88E+01
Carbon-14						
C-14	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Table 10, Gaseous Effluents – Elevated Level Release Batch Mode MNGP

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission Gases						
Ar-41	Ci	0.00E+00	2.48E-02	1.73E-02	0.00E+00	4.21E-02
Kr-85m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-87	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Kr-88	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-133	Ci	0.00E+00	1.62E-03	0.00E+00	0.00E+00	1.62E-03
Xe-133m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	3.42E-03	1.02E-03	0.00E+00	4.44E-03
Xe-135m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-138	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	3.35E-02	1.83E-02	0.00E+00	4.82E-02
Iodines						
I-131	Ci	0.00E+00	7.71E-08	4.21E-08	0.00E+00	1.19E-07
I-132	Ci	0.00E+00	1.31E-07	1.05E-07	0.00E+00	2.36E-07
I-133	Ci	0.00E+00	1.38E-06	1.44E-07	0.00E+00	1.52E-06
I-134	Ci	0.00E+00	2.38E-07	0.00E+00	0.00E+00	2.38E-07
I-135	Ci	0.00E+00	4.06E-07	1.83E-07	0.00E+00	5.89E-07
Total for Period	Ci	0.00E+00	2.23E-06	4.75E-07	0.00E+00	2.71E-07
Particulates						
Mn-54	Ci	0.00E+00	1.32E-08	1.43E-08	0.00E+00	2.75E-08
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Ci	0.00E+00	8.14E-08	8.17E-09	0.00E+00	8.96E-08
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ba-140	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Os-191	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	9.46E-08	2.24E-08	0.00E+00	1.17E-07

Table 10, Gaseous Effluents – Elevated Level Release Batch Mode MNGP (cont.)

Tritium						
H-3	Ci	0.00E+00	1.37E-02	1.75E-02	0.00E+00	3.12E-02
Carbon-14						
C-14	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Table 11, Gaseous Effluents – Elevated Level Release Continuous Mode MNGP

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission Gases						
Ar-41	Ci	8.71E-02	1.34E-02	1.12E+00	5.60E-03	1.23E+00
Kr-85m	Ci	6.74E-02	5.63E-02	2.19E+00	7.99E-03	2.32E+00
Kr-87	Ci	1.38E-01	8.13E-02	3.27E+00	0.00E+00	3.49E+00
Kr-88	Ci	2.12E-01	1.45E-01	5.62E+00	2.28E-02	6.00E+00
Xe-133	Ci	5.79E+00	8.16E+00	7.89E+00	7.20E+00	2.90E+01
Xe-133m	Ci	8.79E-02	1.92E-01	1.07E-01	8.04E-02	4.67E-01
Xe-135	Ci	7.56E-01	1.24E+00	8.25E-01	8.16E-01	3.64E+00
Xe-135m	Ci	1.88E+00	2.34E+00	2.22E+00	2.00E+00	8.44E+00
Xe-137	Ci	2.61E+00	3.89E+00	3.54E+00	6.09E+00	1.61E+01
Xe-138	Ci	3.56E+00	3.84E+00	3.85E+00	3.37E+00	1.46E+01
Total for Period	Ci	1.52E+01	1.99E+01	1.84E+01	1.96E+01	8.53E+01
Iodines						
I-131	Ci	4.09E-04	5.54E-04	6.32E-04	4.25E-04	2.02E-03
I-132	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	3.00E-03	4.59E-03	5.23E-03	3.21E-03	1.60E-02
I-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-135	Ci	5.04E-03	7.56E-03	8.41E-03	5.13E-03	2.61E-02
Total for Period	Ci	8.45E-03	1.27E-02	1.43E-02	8.77E-03	4.41E-02

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Table 11, Gaseous Effluents – Elevated Level Release Continuous Mode MNGP (cont.)

Particulates						
Ba-140	Ci	1.81E-05	1.91E-05	3.04E-05	2.36E-05	9.12E-05
Co-58	Ci	0.00E+00	2.67E-06	2.18E-07	0.00E+00	2.89E-06
Co-60	Ci	7.60E-07	1.40E-05	3.56E-06	1.41E-06	1.97E-05
Cr-51	Ci	0.00E+00	1.10E-05	4.91E-07	0.00E+00	1.15E-05
Cs-137	Ci	2.87E-07	7.27E-07	0.00E+00	6.57E-07	1.67E-06
Fe-59	Ci	0.00E+00	1.35E-06	0.00E+00	0.00E+00	1.35E-06
Hg-203	Ci	1.19E-07	0.00E+00	1.35E-07	0.00E+00	2.54E-07
Mn-54	Ci	7.44E-08	2.81E-06	5.20E-07	0.00E+00	3.40E-06
Nb-95	Ci	0.00E+00	6.78E-07	0.00E+00	0.00E+00	6.78E-07
Os-191	Ci	0.00E+00	9.64E-08	5.76E-07	0.00E+00	6.72E-07
Sb-124	Ci	0.00E+00	3.26E-07	0.00E+00	0.00E+00	3.26E-07
Sr-89	Ci	6.13E-06	7.86E-06	2.26E-05	7.01E-06	4.36E-05
Sr-90	Ci	0.00E+00	0.00E+00	1.19E-07	7.22E-09	1.26E-07
Ta-182	Ci	0.00E+00	7.57E-08	0.00E+00	0.00E+00	7.57E-08
Zn-65	Ci	0.00E+00	1.66E-06	2.08E-07	0.00E+00	1.87E-06
Zr-95	Ci	0.00E+00	3.99E-07	0.00E+00	0.00E+00	3.99E-07
Total for Period	Ci	2.52E-05	6.27E-05	5.93E-05	3.26E-05	1.80E-04
Tritium						
H-3	Ci	1.23E+00	7.52E-01	1.61E+00	1.35E+00	4.94E+00
Carbon-14						
C-14	Ci	1.81E+00	9.29E-01	1.67E+00	1.87E+00	6.28E+00

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

2.0 LIQUID EFFLUENTSTable 12, Liquid Effluents – Summation of All Releases MNGP ⁴

A.	Fission & Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+01
2.	Average diluted concentration	μCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
B. Tritium							
1.	Total Release	Ci	1.71E-01	2.41E-01	1.29E-01	5.39E-02	2.50E+01
2.	Average diluted concentration	μCi/mL	6.08E-06	1.00E-05	4.58E-06	1.91E-06	
C. Dissolved & Entrained Gases							
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+01
2.	Average diluted concentration	μCi/mL	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
D. Gross Alpha Activity							
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+01
E. Volume of Waste Released (prior to dilution)							
		Liters	2.91E+07	2.40E+07	2.81E+07	2.82E+07	
F. Volume of Dilution Water Used During Period							
		Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

⁴ % of limit is provided in Table 1, Monticello Nuclear Generating Plant Dose Summary

Table 13, Batch Mode Liquid Effluents {Monticello Nuclear Generating Plant}

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission and Activation Products						
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-55	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
H-3	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Entrained Gases						
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Table 14, Continuous Mode Liquid Effluents MNGP

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission and Activation Products						
Cr-51	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Mn-54	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-55	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Fe-59	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-57	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-58	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Co-60	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-89	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Sr-90	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Nb-95	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ag-110m	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
I-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-134	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cs-137	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
H-3	Ci	1.77E-01	2.41E-01	1.29E-01	5.39E-02	6.01E-01
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Entrained Gases						
Xe-133	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Xe-135	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Attachment 2, Solid Waste Information

1.0 SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (NOT IRRADIATED FUEL)

Table 15, Types of Solid Waste Summary MNGP

Types of Waste	Total Volume (m ³)	Total Activity (Ci)	Est. Total Error (%)
a. Spent resins, filter sludges, evaporator bottoms, etc.	1.47E+01	4.04E+02	25
b. Dry compressible waste, contaminated equip, etc.	9.661E+02	8.46E+00	25
c. Irradiated components, control rods, etc.	0.00E+00	0.00E+00	25
d. Other (describe)	3.62E+01	7.37E-04	25

2.0 ESTIMATE OF MAJOR NUCLIDE COMPOSITION (BY WASTE TYPE) ONLY >1% ARE REPORTED. [NOTE 1]

Table 16, Major Nuclides MNGP

Major Nuclide Composition	Nuclide	% Abundance	Curies
a. Spent resins, filter sludges, evaporator bottoms, etc.	Mn-54	7.76	3.14E+01
	Fe-55	30.44	1.23E+02
	Co-58	1.66	6.69E+00
	Co-60	52.75	2.13E+02
	Zn-65	4.99	2.02E+01
b. Dry compressible waste, contaminated equip, etc.	Fe-55	16.21	1.37+00
	Co-60	62.73	5.31E+00
	Ni-63	2.41	2.04E-01
	Cs-137	14.88	1.26E+00
c. Irradiated components, control rods, etc.	N/A	N/A	0.00E+00
d. Other (describe)	Cr-51	2.52	1.86E-05
	Mn-54	8.84	6.51E-05
	Fe-55	11.23	8.28E-04
	Fe-59	1.02	7.49E-06
	Co-58	2.84	2.09E-05
	Co-60	55.78	4.11E-04
	Zn-65	5.12	3.78E-05
	Zr-95	3.42	2.52E-05
	Nb-95	6.21	4.58E-05

3.0 SOLID WASTE DISPOSITION

Table 17, Solid Waste Disposition MNGP

Number of Shipments	Mode of Transportation	Destination
1	Hittman Transport	Energy Solutions (Clive Waste facility) 2235 South Saltbush Rd Clive, UT 84029
4	Hittman Transport	Energy Solutions (Memphis Processing Facility) 1790 Dock Street Memphis, TN 38109
3	Interstate Ventures, Inc.	Waste Control Specialists LLC Compact Waste Facility 9998 West, TX-176 Andrews TX, 79714
1	Xcel Energy Trucking	Energy Solutions (Bear Creek DAWL) 1560 Bear Creek Road Oak Ridge, TN 37830
12	Xcel Energy Trucking	UniTech Services Group, Inc. (TN) Oak Ridge Service Center 2323 Zirconium Rd Oak Ridge, TN 37830

4.0 IRRADIATED FUEL DISPOSITION

Table 18, Irradiated Fuel Shipments Disposition MNGP

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

There were no shipments of irradiated fuel from MNGP in 2025.

Attachment 3, Radiological Environmental Monitoring Program TLD Results

Dose Determination for Monticello Nuclear Generating Plant Operations in 2025.

	Quarterly Baseline, B _Q (mrem)		Normalized Quarterly Monitoring Data, M _Q (mrem per standard quarter)				Quarterly Facility Dose, F _Q = M _Q -B _Q (mrem)				Annual Baseline, B _A (mrem)	Annual Monitoring Data, M _A (mrem)	Annual Facility Dose, F _A = M _A -B _A (mrem)	
	Q1	Q2-Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4				
	Inner Ring													
M01A	13.2	15.1	14.7	16.3	17.9	17.1	ND	ND	ND	ND	58.5	66.0	ND	
M02A	14.2	16.1	13.9	14.8	16.7	15.9	ND	ND	ND	ND	62.6	61.0	ND	
M03A	13.9	15.7	13.4	14.8	16.3	15.9	ND	ND	ND	ND	61.0	60.4	ND	
M04A	13.1	15.6	11.9	13.3	15.1	14.3	ND	ND	ND	ND	59.8	54.5	ND	
M05A	13.2	15.9	12.2	13.5	15.9	14.7	ND	ND	ND	ND	60.6	56.2	ND	
M06A	14.1	16.1	13.4	15.0	16.6	15.5	ND	ND	ND	ND	62.4	60.6	ND	
M07A	13.9	15.9	13.1	13.1	16.1	15.7	ND	ND	ND	ND	61.4	58.0	ND	
M08A	13.9	15.8	12.7	14.8	16.1	15.5	ND	ND	ND	ND	61.5	59.1	ND	
M09A	14.3	15.6	13.2	14.3	16.4	15.2	ND	ND	ND	ND	61.5	59.1	ND	
M10A	14.3	16.4	13.2	13.9	16.1	15.0	ND	ND	ND	ND	63.4	58.2	ND	
M11A	15.4	16.9	13.5	14.9	16.8	16.0	ND	ND	ND	ND	66.0	61.2	ND	
M12A	15.5	17.1	13.0	14.4	15.9	15.2	ND	ND	ND	ND	66.5	58.5	ND	
M13A	13.6	14.6	10.4	12.2	13.282	13.1	ND	ND	ND	ND	57.3	49.1	ND	
M14A	14.3	16.3	13.7	15.7	16.2	16.6	ND	ND	ND	ND	63.4	62.2	ND	
Outer Ring														
M01B	14.3	15.4	12.4	13.8	15.5	15.2	ND	ND	ND	ND	60.7	56.8	ND	
M02B	14.6	15.4	12.5	14.2	14.9	14.7	ND	ND	ND	ND	60.8	56.3	ND	
M03B	12.2	12.9	11.2	12.3	12.8	13.2	ND	ND	ND	ND	50.9	49.4	ND	
M04B	12.9	14.4	12.4	13.6	14.2	14.6	ND	ND	ND	ND	56.1	54.9	ND	
M05B	14.8	16.0	13.4	13.9	14.9	15.6	ND	ND	ND	ND	62.5	57.9	ND	
M06B	12.8	15.4	12.4	14.4	15.3	*	ND	ND	ND	*	58.8	56.0	ND	
M07B	15.3	16.1	12.5	13.8	15.4	15.2	ND	ND	ND	ND	63.5	56.9	ND	
M08B	13.6	14.6	11.8	13.5	14.7	14.7	ND	ND	ND	ND	58.0	54.6	ND	
M09B	14.2	16.7	13.4	15.1	16.0	16.4	ND	ND	ND	ND	64.3	60.8	ND	
M10B	14.5	16.0	12.1	14.3	15.4	15.6	ND	ND	ND	ND	62.5	57.4	ND	
M11B	13.9	16.0	13.1	15.4	16.2	16.0	ND	ND	ND	ND	61.8	60.7	ND	
M12B	13.5	15.6	12.3	14.6	16.4	15.4	ND	ND	ND	ND	60.3	58.8	ND	
M13B	13.5	14.4	13.1	15.2	16.0	15.8	ND	ND	ND	ND	56.6	60.1	ND	
M14B	13.4	15.5	13.2	15.1	16.6	16.6	ND	ND	ND	ND	59.9	61.5	ND	
M15B	13.5	15.0	11.6	13.3	15.0	14.7	ND	ND	ND	ND	58.4	54.6	ND	
M16B	13.0	13.5	12.2	14.1	20.9	15.0	ND	ND	7.5	ND	53.4	62.3	ND	
Spec. Interest														
M01S	12.1	13.3	11.1	13.0	14.0	*	ND	ND	ND	*	51.7	50.9	ND	
M02S	11.5	12.7	11.2	12.8	14.0	13.9	ND	ND	ND	ND	49.7	52.0	ND	
M03S	13.6	15.3	12.6	14.0	15.8	15.7	ND	ND	ND	ND	59.4	58.1	ND	
M04S	14.3	16.8	12.7	14.6	16.0	15.5	ND	ND	ND	ND	61.7	58.9	ND	
M05S	14.1	15.3	12.8	14.3	16.0	14.9	ND	ND	ND	ND	60.1	58.0	ND	
M06S	15.9	16.9	11.7	14.5	16.3	16.1	ND	ND	ND	ND	66.6	58.5	ND	
Control														
M01C	14.0	14.8	11.5	12.7	14.7	14.6	ND	ND	ND	ND	58.4	53.5	ND	
M02C	14.0	15.6	11.5	12.3	13.8	13.3	ND	ND	ND	ND	60.9	50.7	ND	
M03C	15.3	16.3	12.0	13.5	15.7	14.7	ND	ND	ND	ND	64.3	55.9	ND	
M04C	14.1	14.8	11.3	13.0	14.5	14.1	ND	ND	ND	ND	58.7	52.9	ND	
MDD _Q		4.7												
MDD _A		11.2												

* TLD was missing in the field.
MDD_Q and MDD_A were determined using ten years of REMP TLD Data from 2001 through 2010.

Discussion of the M16B Q3 positive result is located in Section 2.1 Comparison to Regulatory Limits.

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Attachment 4, MNGP Groundwater Supplemental Information

Well ID	Date Installed	Unique Number	Plant Data (ft)		UTM Zone 15, (m)		Surface Elevation (ft)	Top of Riser Elevation (ft)	Bottom of Well Elevation (ft)	Screen Interval Elev - Elev	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)
			Easting	Northing	Easting	Northing						
MW-1	8/10/1994	547747	4847.19	10248.69	433407.38	5020424.14	930.4	930.19	902.4	902.4 - 912.4	18	28
MW-1B	1/26/2023	870184	4857.61	10247.41	433410.44	5020425.10	930.2	929.96	873.2	973.2 - 878.2	52	57
PW-1	2/21/2023	870167	5081.98	10055.39	433496.59	5020399.96	927.9	930.41	898.7	898.7 - 903.7	24	29
MW-2	8/10/1994	547748	4843.43	10326.78	433396.55	5020445.36	921.8	923.82	897.5	897.5 - 907.5	14	24
MW-3	8/10/1994	547749	4889.37	10319.18	433410.26	5020449.01	919.9	921.91	901.2	901.2 - 911.2	9	19
MW-4	10/8/2007	747055	5281.42	10320.84	433518.94	5020498.60	925.4	927.86	898.7	898.7 - 908.7	17	27
PW-4B*	6/17/2025	870185	5289.31	10321.02	433521.11	5020499.64	925.8	927.4	915.8	915.8 - 925.8	44	54
MW-5	9/6/2007	747056	4549.88	9757.05	433386.42	5020250.34	943.0	942.75	901.7	901.7 - 911.7	31	41
MW-6	9/7/2007	747057	5035.29	9563.03	433545.55	5020257.29	930.7	933.24	899.9	899.9 - 909.9	21	31
MW-7	9/5/2007	747058	6205.26	9609.17	433864.70	5020416.73	920.0	922.49	898.1	898.1 - 908.1	12	22
MW-8	9/5/2007	747059	5393.93	8251.55	433809.51	5019938.00	931.5	934.00	900.1	900.1 - 910.1	21	31
MW-9	9/4/2009	725274	5074.19	10064.31	433493.53	5020401.38	927.9	927.58	901.2	901.2 - 911.2	17	27
MW-9B	11/17/2009	772326	5075.65	10054.35	433495.19	5020398.80	927.9	927.75	883.5	883.5 - 888.5	39	44
PW-9	2/6/2023	870166	5074.80	10059.10	433494.36	5020400.01	927.9	928.08	892.4	892.4 - 897.4	31	36
PW-10A*	5/30/2023	725272	4885.31	10045.19	433443.47	5020372.40	934.9	936.36	895.9	895.9 - 910.9	24	39
MW-10B	12/29/2022	870161	4887.86	10037.95	433445.13	5020370.70	934.9	934.41	875.9	875.9 - 880.9	54	59
MW-11	9/2/2009	725273	4886.97	9931.96	433458.12	5020341.16	934.9	934.51	899.7	899.7 - 909.7	25	35
MW-12A	10/29/2009	772328	5191.46	10105.31	433520.96	5020427.47	932.4	932.14	898.7	898.7 - 908.7	24	34
MW-12B	11/2/2009	772329	5195.51	10106.27	433521.97	5020428.24	932.4	932.13	884.4	884.4 - 889.4	43	48
PW-13A*	5/31/2023	772330	5059.49	10210.49	433471.13	5020440.14	931.3	932.95	891.3	891.3 - 906.3	25	40
MW-13B	11/1/2009	772331	5062.00	10212.53	433471.57	5020441.02	931.2	933.71	873.4	873.4 - 878.4	56	61
MW-14	9/13/2010	778176	4829.02	10402.98	433383.00	5020464.72	908.7	912.42	902.1	902.1 - 905.1	4	7
MW-15A	6/25/2012	789990	5126.35	10352.88	433471.86	5020488.07	919.0	918.67	903.0	903.0 - 913.0	6	16
MW-15B	6/26/2012	789991	5131.93	10352.93	433473.40	5020488.78	919.1	918.79	869.5	869.5 - 874.5	45	50
MW-16A	12/28/2022	870162	5191.47	10214.97	433507.22	5020457.91	930.6	930.07	899.6	899.6 - 909.6	21	31
MW-16B	12/28/2022	870163	5188.29	10223.72	433505.24	5020459.96	930.7	930.34	877.7	877.7 - 882.7	48	53
PW-16A	2/20/2023	870218	5188.48	10213.12	433506.63	5020457.04	930.5	932.85	892.5	892.5 - 902.5	28	38
MW-17A	12/21/2022	870164	5146.25	9802.99	433546.33	5020337.79	933.6	935.37	900.6	900.6 - 910.6	23	33
MW-17B	12/20/2022	870165	5141.41	9803.31	433544.90	5020337.36	933.5	934.90	858.5	858.5 - 863.5	70	75
MW-19A	1/11/2023	870186	5368.46	10141.08	433565.64	5020459.58	930.5	930.31	900.5	900.5 - 910.5	20	30
MW-19B	1/11/2023	870187	5378.46	10141.03	433568.42	5020460.82	930.5	930.24	880.5	880.5 - 885.5	45	50
MW-20A	1/27/2023	870188	5561.85	10201.21	433611.82	5020500.52	921.7	923.36	897.7	897.7 - 907.7	14	24
MW-21A	1/27/2023	870189	5701.37	9721.49	433710.68	5020384.77	923.6	926.28	897.6	897.6 - 907.6	16	26
PW-22A	1/25/2023	870190	5223.69	10132.39	433526.52	5020439.03	931.6	933.47	892.6	892.6 - 902.6	29	39
MW-23A	3/17/2023	870250	5225.01	10332.11	433501.86	5020494.66	921.6	923.25	898.6	898.6 - 908.6	13	23

Company: Xcel Energy

Plant: Monticello Nuclear Generating Plant

Well ID	Date Installed	Unique Number	Plant Data (ft)		UTM Zone 15, (m)		Surface Elevation (ft)	Top of Riser Elevation (ft)	Bottom of Well Elevation (ft)	Screen Interval Elev - Elev	Depth to Top of Screen (ft)	Depth to Bottom of Screen (ft)
			Easting	Northing	Easting	Northing						
MW-23B	3/17/2023	870251	5225.56	10338.94	433501.16	5020496.63	921.3	923.86	876.3	876.3 - 881.3	40	45
MW-24A	6/8/2023	872351	4804.67	10025.59	433423.53	5020356.85	934.8	936.54	901.8	901.8 - 911.8	23	33
MW-26A	6/15/2023	872374	5150.93	10419.40	433470.35	5020509.62	917.5	919.27	899.5	899.5-909.5	8	18
MW-26B	6/15/2023	872375	5160.96	10420.68	433472.97	5020511.23	917.4	919.56	869.4	869.4-874.4	43	48
MW-27A	6/15/2023	872372	5253.84	10424.64	433498.27	5020523.97	917.5	919.78	899.5	899.5-909.5	8	18
MW-27B	6/15/2023	872373	5262.43	10424.86	433500.63	5020525.11	917.6	919.91	871.6	871.6-876.6	41	46
MW-28A	7/5/2023	872321	5324.84	10423.67	433518.11	5020532.60	918.4	920.51	898.4	898.4-908.4	10	20
MW-28B	7/5/2023	872322	5332.78	10423.44	433520.34	5020533.53	918.8	920.64	878.8	878.8-883.8	35	40
MW-29A	6/30/2023	872323	5391.03	10387.72	433541.00	5020530.91	920.6	922.79	898.6	898.6-908.6	13	23
MW-29B	6/29/2023	872324	5398.64	10384.23	433543.55	5020530.90	920.6	922.73	877.6	877.6-882.6	38	43
MW-30A	7/6/2023	872325	5465.99	10360.20	433565.27	5020532.66	920.0	921.33	899.0	899.0-909.0	11	21
MW-30B	7/6/2023	872326	5473.21	10357.95	433567.55	5020532.94	919.9	921.78	880.9	880.9-885.9	34	39
MW-31A	7/6/2023	872328	5320.18	10236.12	433540.32	5020479.93	929.0	930.86	894.0	894.0-909.0	20	35
MW-31B	7/6/2023	872327	5328.12	10236.47	433542.48	5020481.02	928.8	930.63	878.8	878.8-883.8	45	50
MW-33A	7/19/2023	872414	5456.44	10424.99	433554.49	5020549.46	919.0	920.87	897.0	897.0-907.0	12	22
MW-33B	7/18/2023	872415	5464.23	10422.71	433556.94	5020549.80	919.1	920.39	879.1	879.1-884.1	35	40
MW-37A	7/21/2023	872416	5562.59	10450.69	433580.75	5020569.90	913.0	914.96	896.0	896.0-906.0	7	17
MW-37B	7/21/2023	872417	5571.69	10450.91	433583.26	5020571.10	913.9	916.20	875.9	875.9-880.9	33	38
MW-48A	7/26/2023	872437	5711.40	10444.22	433622.90	5020586.75	919.6	921.62	897.6	897.6-907.6	12	22
MW-48B	7/26/2023	872438	5703.61	10444.65	433620.68	5020585.90	920.8	922.59	868.8	868.8-873.8	47	52
MW-50A	7/24/2023	872439	5700.59	10313.03	433636.33	5020548.96	919.4	921.70	897.4	897.4-907.4	12	22
MW-58A	7/25/2023	872440	5836.28	10432.11	433659.10	5020599.04	920.1	922.87	899.1	899.1-909.1	11	21
MW-66A	10/11/2023	880250	5732.81	9949.96	433690.78	5020452.16	919.5	920.89	891.5	891.5-901.5	18	28
MW-67A	10/12/2023	880251	5435.28	9970.07	433605.63	5020420.47	930.6	932.47	895.6	895.6-905.6	25	35
MW-67B	10/12/2023	880252	5443.78	9969.50	433608.06	5020421.37	930.6	932.83	875.6	875.6-880.6	50	55
MW-68A	10/11/2023	880253	4870.85	9585.16	433497.11	5020242.83	936.8	936.80	902.8	902.8-912.8	24	34
MW-69A	6/27/2025	889760	5274.19	9658.68	433599.91	5020313.79	932.5	932.07	900.5	900.5-910.5	22	32
MW-70A	6/23/2025	889761	5420.48	6817.58	433620.63	5020376.26	931.9	931.63	901.9	901.9-911.9	20	30
MW-71A	6/27/2025	889762	5146.36	9878.47	433536.87	5020358.82	934.7	936.63	899.7	899.7-909.7	25	35
MW-101R	10/18/2024	885501	6216.72	7670.02	434110.90	5019879.60	926.1	928.15	901.1	901.1-911.1	15	25
MW-102	7/28/2023	872428	6713.15	7546.16	434264.30	5019907.42	926.4	928.59	989.4	989.4-999.4	18	28
MW-103	7/28/2023	872429	6606.53	7219.23	434275.66	5019803.26	935.2	937.55	903.3	903.3-913.3	22	32
MW-104	10/10/2024	885502	5803.15	7592.18	434005.80	5019806.16	929.9	932.40	901.9	901.9-911.9	18	28
MW-105	10/18/2024	885503	5899.16	7038.11	434101.90	5019664.31	927.0	929.07	908.00	908.0-918.0	9	19

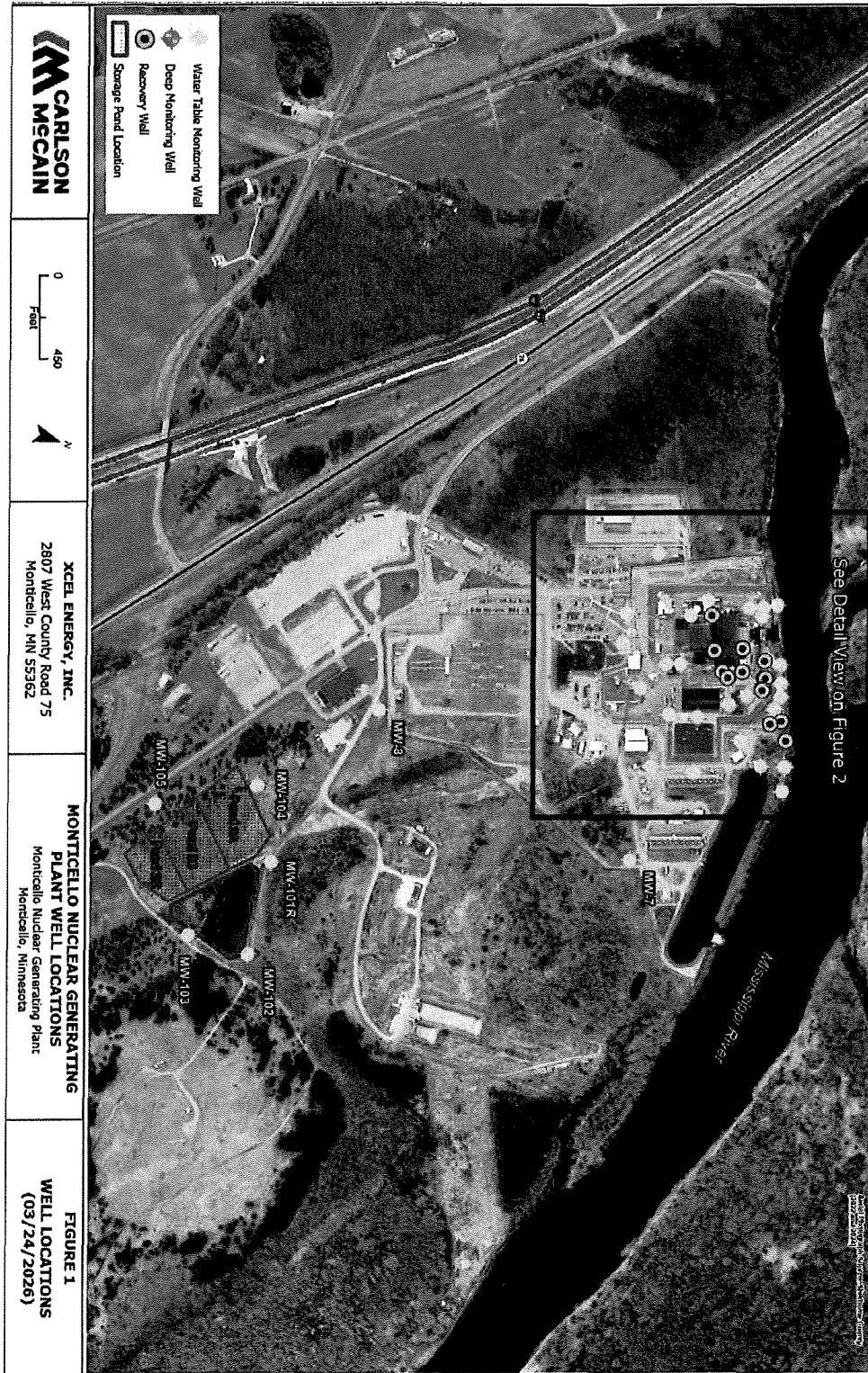


Figure 5, Monticello Nuclear Generating Plant Well Locations

Lab ID	Collect Date	Concentration (pCi/L)										
		³ H	⁵⁴ Mn	⁵⁸ Co	⁵⁹ Fe	⁶⁰ Co	⁶⁵ Zn	⁹⁵ Zr	⁹⁵ Nb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ Ba- ¹⁴⁰ La
Monitoring Well 10 (MW-10)												
708125003	1/31/2025	965 ± 226										
712912003	2/25/2025	669 ± 167										
717284004	3/20/2025	683 ± 231	< 1.37	< 1.58	< 3.57	< 1.62	< 3.42	< 2.78	< 1.62	< 1.46	< 1.54	< 13.6
722119003	4/23/2025	508 ± 167										
726814022	5/23/2025	492 ± 189	< 1.04	< 1.21	< 2.44	< 1.05	< 2.17	< 2.35	< 1.23	< 1.21	< 1.12	< 11.0
731776006	6/24/2025	241 ± 135										
738468005	7/24/2025	728 ± 192										
745034006	9/9/2025	416 ± 157	< 1.15	< 1.37	< 2.86	< 1.13	< 2.59	< 2.66	< 1.58	< 1.45	< 1.22	< 12.7
745780005	9/23/2025	274 ± 141										
752688006	10/27/2025	571 ± 182										
755950005	11/18/2025	283 ± 161	< 1.19	< 1.57	< 3.98	< 1.47	< 2.87	< 2.64	< 1.55	< 1.37	< 1.27	< 21.4
759669005	12/30/2025	613 ± 167										
Monitoring Well 10B (MW-10B)												
716735005	3/20/2025	< 249	< 1.48	< 1.64	< 3.44	< 1.51	< 3.40	< 2.68	< 1.52	< 1.64	< 1.72	< 10.8
726459005	5/20/2025	< 183	< 1.76	< 1.97	< 3.87	< 1.88	< 4.03	< 3.39	< 2.07	< 2.07	< 1.89	< 10.5
745034007	9/9/2025	519 ± 164	< 1.89	< 2.13	< 4.72	< 2.33	< 3.83	< 4.16	< 2.46	< 2.30	< 3.06	< 18.0
745780006	9/23/2025	394 ± 159										
752688007	10/27/2025	395 ± 168	< 0.956	< 1.04	< 2.57	< 1.09	< 1.80	< 2.16	< 1.25	< 0.943	< 0.905	< 15.7
Monitoring Well 11 (MW-11)												
716735006	3/20/2025	< 248	< 1.56	< 1.59	< 3.47	< 1.40	< 2.65	< 2.73	< 2.73	< 1.66	< 1.47	< 9.90
726459006	5/20/2025	< 184	< 1.35	< 1.30	< 2.56	< 1.29	< 2.52	< 2.33	< 1.44	< 1.52	< 1.40	< 8.11
742812007	9/8/2025	< 162	< 1.75	< 1.67	< 4.06	< 1.93	< 3.30	< 3.19	< 1.98	< 1.83	< 1.65	< 11.1
750986003	10/24/2025	< 126	< 0.926	0.967	< 2.37	0.968	< 1.84	< 1.88	< 1.22	< 1.04	< 0.846	< 13.0

Lab ID	Collect Date	Concentration (pCi/L)										
		³ H	⁵⁴ Mn	⁵⁸ Co	⁵⁹ Fe	⁶⁰ Co	⁶⁵ Zn	⁹⁵ Zr	⁹⁵ Nb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ Ba- ¹⁴⁰ La
Monitoring Well 37A (MW-37A)												
708125012	1/24/2025	1200 ± 249										
712912017	2/25/2025	2530 ± 362										
717284016	3/24/2025	1730 ± 237	< 1.26	< 1.37	< 3.12	< 1.46	< 2.74	< 2.45	< 1.40	< 1.51	< 1.41	< 10.9
722119018	4/25/2025	1600 ± 221										
726814021	5/19/2025	1460 ± 239	< 1.37	< 1.59	< 3.35	< 1.44	< 3.17	< 2.81	< 1.51	< 1.57	< 1.43	< 14.5
731776021	6/23/2025	872 ± 187										
738468020	7/23/2025	847 ± 202										
745034021	9/9/2025	1130 ± 208	< 1.35	< 1.60	< 3.85	< 1.56	< 3.16	< 2.98	< 1.82	< 1.61	< 1.36	< 17.5
745780022	9/24/2025	542 ± 168										
752688021	10/24/2025	396 ± 184	< 1.12	< 1.29	< 3.44	< 1.08	< 2.25	< 2.52	< 1.42	< 1.20	< 1.01	< 24.5
755950020	11/19/2025	390 ± 148										
759669020	1/2/2026	346 ± 173										
Monitoring Well 101R (MW-101R)												
716735007	3/25/2025	< 242	< 2.35	< 1.93	< 3.78	< 2.60	< 5.23	< 4.49	< 2.58	< 2.68	< 2.30	< 12.0
726459007	5/19/2025	< 183	< 1.55	< 2.00	< 3.46	< 2.04	< 3.98	< 3.09	< 1.86	< 2.11	< 1.85	< 10.9
742812010	9/5/2025	< 161	< 1.61	< 1.80	< 3.76	< 1.81	< 4.04	< 3.20	< 1.92	< 1.79	< 1.89	< 13.1
750986005	10/23/2025	< 125	< 0.893	< 1.12	< 2.31	< 1.05	< 2.02	< 2.12	< 1.14	< 1.06	< 0.993	< 14.0
Monitoring Well 102 (MW-102)												
716735008	3/25/2025	< 251	< 2.45	< 2.24	< 5.77	< 2.79	< 5.46	< 4.11	< 2.76	< 2.47	< 1.99	< 14.7
726459008	5/19/2025	< 184	< 1.55	< 1.65	< 3.43	< 1.72	< 2.99	< 2.52	< 1.90	< 1.94	< 1.73	< 11.0
742812011	9/5/2025	< 161	< 1.36	< 1.38	< 2.79	< 1.54	< 2.67	< 2.42	< 1.58	< 1.61	< 1.51	< 9.71
750986006	10/23/2025	< 125	< 0.953	0.954	< 2.81	< 0.929	< 2.05	< 1.92	< 1.24	0.911	< 0.922	< 14.3
Monitoring Well 103 (MW-103)												
5												
726459009	5/19/2025	< 183	< 1.27	< 1.50	< 3.06	< 1.30	< 2.74	< 2.97	< 1.56	< 1.59	< 1.58	< 9.30
742812012	9/5/2025	< 161	< 1.48	< 1.23	< 3.35	< 1.43	< 2.90	< 2.60	< 1.52	< 1.47	< 1.42	< 9.90
750986007	10/23/2025	< 125	< 0.985	< 1.03	< 2.38	< 0.917	< 2.06	< 1.97	< 1.19	0.976	< 1.00	< 12.9
Monitoring Well 104 (MW-104)												
716735010	3/25/2025	< 254	< 2.59	< 2.51	< 5.15	< 2.80	< 3.62	< 4.34	< 2.38	< 2.58	< 2.54	< 11.8
726459010	5/19/2025	< 184	< 1.38	< 1.69	< 2.79	< 1.48	< 2.78	< 2.74	< 2.74	< 1.72	< 1.52	< 10.4
742812013	9/5/2025	< 162	< 1.11	< 1.23	< 2.95	< 1.13	< 2.29	< 2.34	< 1.19	< 1.36	< 1.25	< 9.00
750986008	10/23/2025	< 125	< 0.924	< 1.02	< 2.48	< 0.895	< 2.15	< 1.92	< 1.22	0.992	< 0.843	< 13.6

⁵ Sample container arrived at vendor broken, QIM 501000097945

Lab ID	Collect Date	Concentration (pCi/L)											
		³ H	⁵⁴ Mn	⁵⁸ Co	⁵⁹ Fe	⁶⁰ Co	⁶⁵ Zn	⁹⁵ Zr	⁹⁵ Nb	¹³⁴ Cs	¹³⁷ Cs	¹⁴⁰ Ba- ¹⁴⁰ La	
Monitoring Well 105 (MW-105)													
716735011	3/25/2025	< 253		< 1.88	< 2.21	< 4.32	< 2.43	< 3.94	< 3.67	< 2.34	< 2.44	< 2.04	< 12.1
726459011	5/19/2025	< 183		< 1.95	< 1.80	< 4.42	< 1.59	< 3.52	< 3.36	< 1.97	< 1.76	< 1.89	< 12.4
742812014	9/5/2025	< 161		< 1.35	< 1.60	< 3.39	< 1.47	< 3.18	< 3.06	< 1.70	< 1.69	< 1.45	< 10.5
750986009	10/23/2025	< 126		< 0.902	< 1.05	< 2.54	< 0.913	< 1.99	< 1.96	< 1.16	0.912	< 0.981	< 13.5
Storm Drain SD006													
734546005	7/16/2025	< 151	< 0.756	< 0.822	< 2.19	< 0.886	< 1.64	< 1.73	< 0.915	< 0.833	< 0.747	< 13.3	
752687001	10/28/2025	< 222	< 1.05	< 1.24	< 2.57	< 1.12	< 2.29	< 2.19	< 1.31	< 1.21	< 0.988	< 13.7	