HOLTEC DECOMMISSIONING INTERNATIONAL

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10 CFR 50.36a (a)(2)
10 CFR 72.44 (d)(3)

April 30, 2025

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Indian Point Energy Center
Provisional Operating License No. DPR-05
Facility License No. DPR-26 and DPR-64
NRC Docket Nos. 50-03, 50-247, and 50-286

Subject: 2024 Annual Radioactive Effluent Release Report

In accordance with the requirements of Title 10 of the Code of Federal Regulations (CFR), Part 50 Section 36a (a)(2) and Part 72 Section 44 (d)(3), Holtec Decommissioning International, LLC (HDI), on behalf of Indian Point Nuclear Generating Station Units 1, 2, and 3 (IPEC), hereby submits the Annual Radioactive Effluent Release Report for 2024. The report includes effluent information from Indian Point Units 1, 2, and 3 and dose from the Independent Spent Fuel Storage Facility.

This letter contains no new regulatory commitments.

If you have any questions or need further information, please contact Mr. Walter Wittich, IPEC Licensing at 914-254-7212.

Sincerely,

William Noval

Digitally signed by William Noval
DN: cn=William Noval, o=HDI, ou=Regulatory Affairs, email=w.noval@holtec.com
Date: 2025.04.30 13:48:26 -04'00'

William Noval
Director, Regulatory Affairs
Holtec Decommissioning International, LLC

Enclosures:
2024 Annual Radioactive Effluent Release Report

cc: NRC Senior Project Manager, NRC NMSS
NRC Region I Regional Administrator
NRC Senior Regional Inspector, Indian Point Energy Center
New York State Liaison Officer Designee, NYSERDA
New York State (NYS) Public Service Commission

HDI-IPEC-25-016

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ENCLOSURE TO HDI-IPEC-25-016

2024 Annual Radioactive Effluent Release Report

Facility: Indian Point Energy Center	Page 1 of 41 YEAR: 2024
Indian Point Units 1, 2 and 3	
Docket Nos.: 50-3, 50-247, & 50-286	
Holtec Decommissioning International	
Annual Radioactive Effluent Release Report	

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1.0 INTRODUCTION

This information is provided in accordance with the requirements of Regulatory Guide 1.21. This report includes effluent information from Indian Point Units 1, 2, and 3. Units 1 and 2 share effluent processing equipment and Technical Specifications. In this site report, releases from Unit 1 are included with Unit 2, while Unit 3 releases are calculated and shown separately. Liquid and gaseous effluents are released in accordance with the Offsite Dose Calculation Manual (ODCM). Unit 2 permanently shut down on April 30th, 2020. Unit 3 permanently shut down on April 30th, 2021.

2.0 SUPPLEMENTAL INFORMATION

2.1 Regulatory Limits

Indian Point Energy Center (IPEC) is subject to limits on radioactive waste releases that are set forth in the Offsite Dose Calculation Manual (ODCM), Parts I and II, as defined in the Defueled Safety Analysis Report (DSAR). ODCM Part I, also known as Radiological Effluent Controls (or RECS), contains the specific requirements and controls, while ODCM Part II (calculation methodologies) contains the details necessary to perform offsite dose calculations from the sampling and monitoring outlined in the RECS. The following are the limits required by the ODCM:

1. Fission and activation gases: With Units 2 and 3 permanently shut down, defueled, and all the spent fuel in dry casks on the Independent Spent Fuel Storage Installation (ISFSI), the generation of fission and activation gases is no longer possible. The limits for fission and activation gases were removed from the ODCM.

2. Tritium and all radionuclides in particulate form (with half-lives > 8 days).

   a. The dose rate for Tritium and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released to areas at and beyond the site boundary shall be limited to the following:
      - Less than or equal to 1500 mrem/yr to any organ

   b. The dose to a MEMBER OF THE PUBLIC from Tritium and all radionuclides in particulate form with half-lives greater than 8 days in gaseous effluents released to areas at and beyond the site boundary shall be limited to the following:
      - Quarterly: Less than or equal to 7.5 mrem to any organ
      - Yearly: Less than or equal to 15 mrem to any organ

3. Liquid Effluents Dose

   The dose or dose commitment to a MEMBER OF THE PUBLIC from radioactive materials in liquid effluents released to unrestricted areas shall be limited to the following:

   - Quarterly: Less than or equal to 1.5 mrem total body
     Less than or equal to 5 mrem critical organ
   - Yearly: Less than or equal to 3 mrem total body
     Less than or equal to 10 mrem critical organ

4. Total Dose (40CFR190)

   The annual (calendar year) dose or dose commitment to any MEMBER OF THE PUBLIC due to releases of radioactivity and to radiation from uranium fuel cycle sources shall be limited to the following:

   - Less than or equal to 25 mrem, Total Body or any Organ except Thyroid.
   - Less than or equal to 75 mrem, Thyroid

2.2 Maximum Permissible Concentrations

1. Gaseous Effluents

   Maximum concentrations and compliance with 10CFR20 release rate limits are controlled by plant design, preliminary grab sampling, and conservative procedural guidance for continuous releases. These measures preclude approaching release rate limits, per the ODCM.

2. Liquid Effluents

   Proximity to release rate and total release limits is controlled through the application of a calculated Allowed Diluted Concentration (ADC) and ALARA guidance regarding dilution flow and maximum tank concentration. The ADC is used to determine a Radiation Monitor setpoint associated with an estimated amount of non-gamma activity (H-3, Ni-63, Fe-55, Sr-89, Sr-90), as well as the measured gamma activity. ADC is defined in the station ODCM as a means of assuring compliance with the release rate limits of 10CFR20, as defined by the application of ten times the Effluent Concentrations of the 10CFR20.

   Liquid effluents are further controlled by the application of proceduralized ALARA limits such as a MINIMUM dilution flow of 80,000 gpm required for batch discharges, a maximum gamma concentration of 5.0E-05 uCi/ml (without gas) for routine effluents, and procedural guidance for optimizing decay and treatment of liquid waste.

2.3 Measurements & Approximations of Total Radioactivity

The following provides the methods used to measure or approximate the total radioactivity in effluents and how radionuclide composition is determined.

1. Fission & activation gases

   Both units are permanently shut down and the respective Spent Fuel Pools are empty of spent fuel. All spent fuel assemblies are now stored in dry casks in the Independent Spent Fuel Storage Installation (ISFSI).

   Sampling for fission and activation gases is no longer required based on the above statement.

2. Particulates

   Unit 2 and Unit 3 airborne particulate releases are quantified by collecting a continuous sample of ventilation air on a glass-fiber filter paper. These samples are changed weekly as required in the RECS. The concentration of isotopes found by analysis of these samples is combined with the volume of air discharged during the sampling period to calculate the quantity of activity discharged. A compositing method of analyzing gross alpha, Sr-89, and Sr-90, is used per station ODCM. Absence of any positive activity is identified as "- ".

   Iodine is no longer sampled at the site. All spent fuel was moved to the ISFSI, and any remaining iodine in plant systems has decayed away.

3. Tritium

   Airborne tritium is collected by passing a known volume of the sample stream through a silica gel column. The collected samples are distilled and analyzed by liquid scintillation. The tritium release was calculated for each release point from the measured tritium concentration, the volume of the sample, the tritium collection efficiency, and the respective ventilation exhaust flow rates.

4. Liquid Effluents

   A sample of each batch discharge is taken, and an isotopic analysis is performed in compliance with requirements specified in the ODCM. Proportional composite samples of continuous discharges are taken and analyzed per the ODCM, as well. Isotopic concentration data are combined with the information on volume discharged to determine the amount of each isotope discharged.

   A compositing method of analyzing for non-gamma emitters is used per the station ODCM (Gross Alpha, Sr-89, Sr-90, Fe-55, and Ni-63). When there has been no positive activity, "- "is entered.

   Fission and activation products identified in the liquid effluents are listed in the Liquid Effluent Tables in Section 4. In addition, the gross beta results are added to the identified radionuclides to determine the total activity released. Although this will overestimate the curies and result in additional conservatism in the calculated dose to the public, the increase is minimal when compared to the overall dose to the public from the site.

   Liquid Effluent volumes of waste released on Tables 4-1 and 4-4 (Section 4) are differentiated between processed fluids (routine liquid waste and Unit 1's North Curtain Drain), and water discharged through monitored pathways identified in the ODCM, but NOT processed (Unit 1's Sphere Foundation Drain Sump). Unprocessed water may still contain trace levels of contamination (generally only tritium) and as such, is identified as liquid waste. Curie and dose data from unprocessed fluid is included in the following tables, along with all other liquid effluent, continuous or batch, processed or not. Processed and unprocessed water is differentiated only to prevent confusion regarding measures undertaken to convert liquid to solid waste (resin cleanup). Therefore, volumes of processed and unprocessed liquid waste are reported separately on Tables 4-1 and 4-4.

5. Estimated Total Error Present

   Estimates of measurement and analytical error for gaseous and liquid effluents are calculated as follows:

$$= . \overline{[(\ _1)^2 + (\ _2)^2 + \ldots (\quad)^2]}$$

Where: E_T = total percent error
$E_1 \ldots E_n$ = percent error due to calibration standards,
Laboratory analysis, instruments, sample flow, etc.

2.4 Batch Releases:

1. Airborne **Table 2.5-1 - Airborne Batch Releases**

Batch Airborne Releases are no longer performed at IPEC.

2. Liquid **Table 2.5-2 – Liquid Batch Releases**

Unit 1 and 2 Liquid Releases		Qtr 1	Qtr 2	Qtr 3	Qtr 4	2024
Number of Batch Releases		0	0	0	0	0
Total Time Period	(min)	0	0	0	0	0
Maximum Time Period	(min)	0	0	0	0	0
Average Time Period	(min)	0	0	0	0	0
Minimum Time Period	(min)	0	0	0	0	0

Unit 3 Liquid Releases		Qtr 1	Qtr 2	Qtr 3	Qtr 4	2024
Number of Batch Releases		0	0	0	0	0
Total Time Period	(min)	0	0	0	0	0
Maximum Time Period	(min)	0	0	0	0	0
Average Time Period	(min)	0	0	0	0	0
Minimum Time Period	(min)	0	0	0	0	0

Average Stream Flow:

Regulatory Guide 1.21 includes a section to report average stream flows. This data, for some plants, is used to determine dilution volume. However, at IPEC, the Hudson River stream flow is not applied to dilution calculations, in favor of the more conservative method of using only the dilution in the discharge canal, running north to south, parallel to the river, and servicing the plant.

This conservative dilution volume is determined quarterly, applied to liquid offsite dose calculations (and all other determinations of diluted effluent), and reported on Tables 4-1 and 4-4, in Section 4 of this report. Hudson River flow information remains available, however, from the Department of the Interior, United States Geological Survey (USGS), or from web sites such as:

https://www.usgs.gov/centers/ny-water/data-tools

2.5 Abnormal Releases

1. Liquid

None

2. Gaseous

None

2.6 Non-routine, Planned Discharges

None

2.7 Radioactive Waste Treatment System Changes

None

2.8 Land Use Census Changes

No changes or modifications affecting receptors, receptor location or new (or changed) routes of exposure were identified.

2.9 Effluent Monitor Instrument Inoperability

1. Effluent Monitoring Equipment Inoperable > 30 Days

   None.

2. Effluent Monitoring Equipment Sample Deviation

   None.

2.10 Offsite Dose Calculation Manual Changes

There were no ODCM changes in 2024.

2.11 Process Control Program (PCP) Changes

There were no PCP changes during 2024.

2.12 Groundwater Monitoring and Program (NEI 07-07)

The Groundwater Monitoring Program is a voluntary program set up to assure timely effective management of situations involving inadvertent releases of licensed material to ground water. A major part of the IPEC's program is a groundwater quantification model that involves verification/calibration such that the annual release to the environment remains a function of the annual precipitation and source term.

No abnormal releases occurred in 2024, and conservative assessments of legacy events have determined that the doses resulting from these events were negligible. The groundwater monitoring program provides additional confirmation of these assessments. The groundwater monitoring program also includes a storm water monitoring program. Together these programs provide data for offsite dose evaluation. The subsurface water flow directions and rates are used to estimate the transport of abnormal releases of liquid effluents in groundwater.

The offsite dose associated with the groundwater pathway remains extremely small. The 2024 total routine liquid effluent dose inclusive of the groundwater pathway contributes < 1 % of the annual limit. Groundwater and storm water effluent flow rates and source term data are further described in Attachment 1 of this report. A breakdown of the total dose from the groundwater and storm water pathways and detailed results from the samples obtained as part of this program are also provided in Attachment 1. Section 6 (Radiological Impact on Man) of this report provides a comparison of the groundwater and storm water doses to the other dose pathways.

2.13 Outside Tanks

During this period, no curie limits in outdoor tanks were exceeded.

2.14 Errata/Corrections to Previous ARERRs

2023 ARERR, Attachment 7 – While correcting the Unit 3 Radiological Impact on Man Table, a new transposition error was introduced under Section A, Liquid Doses section of the table. The Percent of Limit could not be calculated due to the double negative sign inadvertently applied to the exponent in the Organ Dose value. Verified values from RETDAS printouts. Report tables were corrected. The correction did not change the reported 40CFR190 Total Dose for Indian Point Energy Center. The original and corrected pages are in Attachment 3 of this report.

3.0 GASEOUS EFFLUENTS

Table 3-1 Gaseous Effluents - Summation of All Releases - Units 1 and 2

A. Fission & Activation Gases

	Units			
1. Total Release	Ci	No longer produced on site		
2. Average release rate	uCi/sec			

B. Iodines

1. Total Iodine-131	Ci	No longer produced on site		
2. Average release rate	uCi/sec			

C. Particulates

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
1. Total Release, with half-life >8 days	Ci	1.56E-06	1.39E-05	5.47E-06	4.95E-06	2.59E-05	
2. Average release rate	uCi/sec	1.99E-07	1.77E-06	6.88E-07	6.22E-07	8.20E-07	
3. Gross Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

D. Tritium

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
1. Total release	Ci	4.70E-01	3.80E-01	1.42E+00	1.82E+00	4.09E+00	
2. Average release rate	uCi/sec	5.98E-02	4.83E-02	1.78E-01	2.29E-01	1.29E-01	

Table 3-2 Gaseous Effluents - Batch Mode - Units 1 and 2

Nuclides Released

1) Fission & Activation Gases

Fission and Activation Gases are no longer produced on site.

2) Iodines

Iodine is no longer produced on site.

3) Particulates

Batch releases are no longer performed on site.

4) Tritium

Batch releases are no longer performed on site.

Table 3-3 Gaseous Effluents - Continuous Mode - Units 1 and 2

1) Fission & Activation Gases

Fission and Activation Gases are no longer produced on site.

2) Iodines

Iodine is no longer produced on site.

3) Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
Cs-137	Ci	4.50E-11	9.76E-11	1.25E-10	1.90E-10	4.58E-10	
Gross Beta	Ci	1.56E-06	1.39E-05	5.47E-06	4.95E-06	2.59E-05	
Total for Period	Ci	1.56E-06	1.39E-05	5.47E-06	4.95E-06	2.59E-05	

4) Tritium	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
H-3	Ci	4.70E-01	3.80E-01	1.42E+00	1.82E+00	4.09E+00	

Table 3-4 Gaseous Effluents - Summation of All Releases - Unit 3

A. Fission & Activation Gases

	Units			
1. Total Release	Ci	No longer produced on site		
2. Average release rate	uCi/sec			

B. Iodines

1. Total Iodine-131	Ci	No longer produced on site		
2. Average release rate	uCi/sec			

C. Particulates

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
1. Total Release, with half-life >8 days	Ci	0.00E+00	0.00E+00	6.58E-07	2.19E-06	2.85E-06	
2. Average release rate	uCi/sec	0.00E+00	0.00E+00	8.28E-08	2.75E-07	8.95E-08	
3. Gross Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

D. Tritium

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
1. Total release	Ci	6.34E-01	9.56E-01	2.16E+00	1.46E+00	5.21E+00	
2. Average release rate	uCi/sec	8.06E-02	1.22E-01	2.71E-01	1.84E-01	1.64E-01	

Table 3-5 Gaseous Effluents - Batch Mode - Unit 3

Nuclides Released

1) Fission & Activation Gases

Fission and Activation Gases are no longer produced on site.

2) Iodines

Iodine is no longer produced on site.

3) Particulates

Batch releases are no longer performed on site.

4) Tritium

Batch releases are no longer performed on site.

Table 3-6 Gaseous Effluents - Continuous Mode - Unit 3

1) Fission & Activation Gases

Fission and Activation Gases are no longer produced on site.

2) Iodines

Iodine is no longer produced on site.

3) Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
Gross Beta	Ci	0.00E+00	0.00E+00	6.58E-07	2.19E-06	2.85E-06	
Total for Period	Ci	0.00E+00	0.00E+00	6.58E-07	2.19E-06	2.85E-06	

4) Tritium	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
H-3	Ci	6.34E-01	9.56E-01	2.16E+00	1.46E+00	5.21E+00	
Total for Period	Ci	6.34E-01	9.56E-01	2.16E+00	1.46E+00	5.21E+00	

4.0 LIQUID EFFLUENTS

Table 4-1 Liquid Effluents - Summation of All Releases – Units 1 and 2

A. Fission & Activation Products	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
1. Total Release (not including Tritium, Gr Alpha, & Gases)	Ci	2.98E-03	3.22E-03	4.74E-03	5.81E-04	1.15E-02	
2. Average Diluted Conc	uCi/ml	5.44E-10	6.46E-10	9.95E-10	1.41E-10	5.96E-10	

B. Tritium							
1. Total Release	Ci	4.43E-03	7.04E-03	5.78E-03	2.40E-03	1.97E-02	
2. Average Diluted Conc	uCi/ml	8.09E-10	1.41E-09	1.21E-09	5.83E-10	1.02E-09	

C. Dissolved & Entrained Gases							
1. Total Release	Ci	-	-	-	-	-	
2. AverageDiluted Conc	uCi/ml	-	-	-	-	-	

D. Gross Alpha							
1. Total Release	Ci	-	-	-	-	-	
2. AverageDiluted Conc	uCi/ml	-	-	-	-	-	

E. Volume of Waste Released							
1. Processed Fluids	liters	4.33E+06	1.34E+06	1.39E+06	5.79E+05	7.64E+06	
2. Unprocessed Fluids	liters	1.24E+07	7.99E+06	7.29E+06	5.16E+06	3.28E+07	

F. Volume of Dilution Water	liters	5.47E+09	4.98E+09	4.77E+09	4.12E+09	1.93E+10	

Table 4-2 Liquid Effluents – Batch Mode - Units 1 and 2

Nuclides Released

1) Fission and Activation Products

There were no Batch liquid releases this reporting period.

2) Tritium

There were no Batch liquid releases this reporting period.

3) Dissolved and Entrained Gases

There were no Batch liquid releases this reporting period.

4) Gross Alpha Activity

There were no Batch liquid releases this reporting period.

Table 4-3 Liquid Effluents – Continuous Mode - Units 1 and 2

Nuclides Released

1) Fission and Activation Products

	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year
Sr-90	Ci	4.75E-05	0.00E+00	3.23E-05	0.00E+00	7.98E-05
Cs-137	Ci	1.59E-03	1.86E-03	2.66E-03	3.35E-04	6.45E-03
Gross Beta	Ci	1.34E-03	1.36E-03	2.05E-03	2.46E-04	5.00E-03
Total for Period	Ci	2.98E-03	3.22E-03	4.74E-03	5.81E-04	1.15E-02

2) Tritium

	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year
H-3 (only)	Ci	4.43E-03	7.04E-03	5.78E-03	2.40E-03	1.97E-02

3) Dissolved and Entrained Gases

No Nuclides Found

4) Gross Alpha Activity

No Nuclides Found

Table 4-4 Liquid Effluents -Summation of All Releases – Unit 3

A. Fission & Activation Products

	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Year	
1. Total Release (not including Tritium, Gr Alpha, & Gases)	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average Diluted Conc	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

B. Tritium

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Average Diluted Conc	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

C. Dissolved & Entrained Gases

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. AverageDiluted Conc	uCi/ml	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

D. Gross Alpha

1. Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

E. Volume of Waste Released

1. Processed Fluids (Mon Tanks)	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
2. Unprocessed Fluids	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

F. Volume of Dilution Water	liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

There were no liquid releases from Unit 3 in 2024.

% limit is located in Section 6, Tables 6-2 and 6-3

Table 4-5 Liquid Effluents - Batch and Continuous Modes – Unit 3

There were no liquid releases, Batch or Continuous, in 2024 from Unit 3.

5.0 SOLID WASTE SUMMARY

5.1 Units 1 & 2 and Unit 3 Types of Solid Waste – Summary

Waste Stream: Resins, Filters, and Evap Bottoms

Waste Class	Volume ft^3	Volume m^3	Curies Shipped
A	3.54E+02	1.00E+01	1.45E+02
B	1.77E+02	5.00E+00	2.12E+02
C	0.00E+00	0.00E+00	0.00E+00
All	5.31E+02	1.50E+01	3.57E+02

Waste Stream : Dry Active Waste

Waste Class	Volume ft^3	Volume m^3	Curies Shipped
A	8.07E+04	2.29E+03	4.07E+01
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	8.07E+04	2.29E+03	4.07E+01

Waste Stream : Irradiated Components

Waste Class	Volume ft^3	Volume m^3	Curies Shipped
A	1.16E+03	3.29E+01	3.52E+01
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	1.16E+03	3.29E+01	3.52E+01

Waste Stream: Other Waste

Waste Class	Volume ft^3	Volume m^3	Curies Shipped
A	0.00E+00	0.00E+00	0.00E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	0.00E+00	0.00E+00	0.00E+00

Waste Stream: Sum of All 4 Categories

Waste Class	Volume ft^3	Volume m^3	Curies Shipped
A	8.22E+04	2.33E+03	2.21E+02
B	1.77E+02	5.00E+00	2.12E+02
C	0.00E+00	0.00E+00	0.00E+00
All	8.24E+04	2.33E+03	4.33E+02

5.2 Units 1 & 2 and Unit 3 Solid Waste – Major Nuclides by Waste Class and Stream

NRC Regulatory Guide 1.21 Activity Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Shipment, Package, and Category

During Period From: 01/01/2024 to 12/31/2024 Percent Cutoff: 1.0%

Dry Active Waste

Waste Class A

Nuclide Name	Abundance	Activity (Ci)
C-14	3.29%	1.34E+00
Fe-55	10.36%	4.21E+00
Co-60	12.92%	5.25E+00
Ni-63	70.27%	2.86E+01
Cs-137	1.88%	7.65E-01

Total Combined

Nuclide Name	Abundance	Activity (Ci)
C-14	3.29%	1.34E+00
Fe-55	10.36%	4.21E+00
Co-60	12.92%	5.25E+00
Ni-63	70.27%	2.86E+01
Cs-137	1.88%	7.65E-01

Irradiated Components

Waste Class A

Nuclide Name	Abundance	Activity (Ci)
Fe-55	43.86%	1.54E+01
Co-60	42.58%	1.50E+01
Ni-63	12.49%	4.39E+00

Total Combined

Nuclide Name	Abundance	Activity (Ci)
Fe-55	43.86%	1.54E+01
Co-60	42.58%	1.50E+01
Ni-63	12.49%	4.39E+00

Units 1 & 2 and Unit 3 Solid Waste – Major Nuclides by Waste Class and Stream

NRC Regulatory Guide 1.21 Activity Report

Solid Waste Shipped Offsite for Disposal and Estimates of Major Nuclides by Shipment, Package, and Category

During Period From: 01/01/2024 to 12/31/2024 Percent Cutoff: 1.0%

Resins, Filters, and Evap Bottoms

Waste Class A

Nuclide Name	Abundance	Activity (Ci)
Fe-55	45.34%	6.57E+01
Co-60	41.98%	6.08E+01
Ni-63	12%	1.74E+01

Waste Class B

Nuclide Name	Abundance	Activity (Ci)
Fe-55	45.35%	9.63E+01
Co-60	41.98%	8.91E+01
Ni-63	11.99%	2.55E+01

Total Combined

Nuclide Name	Abundance	Activity (Ci)
Fe-55	45.35%	1.62E+02
Co-60	41.98%	1.50E+02
Ni-63	11.99%	4.28E+01

Sum of All 4 Categories

Waste Class A

Nuclide Name	Abundance	Activity (Ci)
Fe-55	38.66%	8.53E+01
Co-60	36.72%	8.10E+01
Ni-63	22.81%	5.03E+01

Waste Class B

Nuclide Name	Abundance	Activity (Ci)
Fe-55	45.35%	9.63E+01
Co-60	41.98%	8.91E+01
Ni-63	11.99%	2.55E+01

Total Combined

Nuclide Name	Abundance	Activity (Ci)
Fe-55	41.94%	1.82E+02
Co-60	39.3%	1.70E+02
Ni-63	17.51%	7.58E+01

6.0 RADIOLOGICAL IMPACT TO MAN

The Radiological Impact on Man due to radioactive effluent from the site is determined from NRC approved modeling, per Regulatory Guide 1.109 and NUREG 0133. Calculations are divided into 3 categories: Noble Gases, Particulates and Iodine, and Liquid Releases (fish and invertebrate consumption). This modeling involves conservative dose calculations in Adult, Teen, Child, and Infant age groups. Furthermore, dose modeling is performed for six separate organs as well as the total body dose. This well-established industry model provides doses (because of plant effluent) to a hypothetical maximally exposed individual offsite. While all age groups and organs are considered, it is this maximum value that is provided in the tables that follow.

An approved computer code is used to perform liquid and gaseous dose calculations according to the models and parameters presented in the Indian Point Offsite Dose Calculation Manual (ODCM). This information is stored in a database on site to enhance dose tracking and information management. Site airborne effluent dose calculations include annual average dispersion and deposition factors, averaged from data collected over approximately ten-year periods. Liquid offsite dose calculations involve fish and invertebrate consumption pathways only, as determined appropriate in the ODCM. While the ODCM identified some site-specific dose factors, the bulk of this information is obtained directly from Regulatory Guide 1.109 and NUREG 0133. Details of the calculations, site-specific data, and their bases are presented in the ODCM. See the tables at the end of this section for the 10CFR50 Appendix I Dose Assessments.

6.1 Dose to Members of the Public Inside the Site Boundary

Members of the public visiting the site receive minimal dose because of onsite releases due to the relatively insignificant total amount of time they are on site, as well as the immeasurably low levels of dose at the critical receptors. Their doses can be calculated from standard ODCM methodology, with typical occupancy factors employed. These factors are determined by comparing a conservative assumption for their expected hours on site, to 8760 hours (the number of hours in a year, used in calculations in the ODCM).

Example 1: Several students visit the site for 8-hour tour.
Their occupancy factor is: 8 / 8760 or **0.0009**

Example 2: A man drives his wife to work and drops her off at the security gate each morning, with a stay time of 2 minutes per day. His occupancy factor is calculated as follows:
2 min/day * 250 days/year / 60 min/hr / 8760 hr/year = **0.0010**

6.2 Dose to a Member of the Public due to Release of Radioactive Material in Groundwater

Curies and dose contribution from activity discovered in onsite groundwater and storm drain pathways during the year are discussed in more detail in Attachment 1. The offsite dose calculation involves multiple source term measurements, as well as computations for release and dilution flow. A summary of the quantification methodology, and the resulting calculated doses, is also provided in Attachment 1. The Summation of Dose Assessments (Table 6-1) below provides a means to compare ground water doses with those of other components making up the total offsite dose.

6.3 40CFR Part 190 Dose to Individual in the Unrestricted Area

Unit and pathway-specific dose data can be found on the Radiological Impact on Man tables following this discussion. For simplicity and to demonstrate compliance with 40CFR190, the following table indicates the maximum hypothetical Total Dose to an individual from operation of the facility, including any measured direct shine component from the site property.

Table 6-1 Summation of Dose Assessments

Year: 2024		Total Body	Thyroid	Max Organ
40 CFR 190 limit ===➔	IPEC	25 mrem	75 mrem	25 mrem
Routine Airborne Effluents[1]	Units 1 and 2	6.84E-04	6.84E-04	6.84E-04
Routine Liquid Effluents	Units 1 and 2	2.66E-02	4.65E-07	4.18E-02
Routine Airborne Effluents[1]	Unit 3	8.61E-04	8.61E-04	8.61E-04
Routine Liquid Effluents	Unit 3	0.00E+00	0.00E+00	0.00E+00
Ground Water & Storm Drain Totals	IPEC[2]	1.07E-04	3.67E-07	4.35E-04
Direct Shine from areas such as dry cask storage, radwaste storage, SG Mausoleum, etc.	IPEC[3]	2.00E-01	2.00E-01	2.00E-01
Indian Point Energy Center Total Dose, per 40 CFR 190	IPEC	2.28E-01	2.02E-01	2.44E-01

Note 1: Routine airborne dose in this table is conservatively represented as a sum of Particulate and Tritium dose from site releases. Doses by type of release and comparison to the specific limits of 10CFR50 Appendix I are summarized on the following pages.

Note 2: Groundwater curie and dose calculations are provided in Attachment 1.

Note 3: 40CFR190 requires the reporting of total dose, including that of direct shine. Direct shine dose from sources other than dry cask are indistinguishable from background. Direct shine dose is determined from TLDs near the dry cask area and site boundary, compared with REMP TLDs and historical values, and corrected with occupancy factors to determine a bounding, worst-case assessment of direct shine dose to a real individual. Details of each year's dose evaluation are available on site.

Table 6-2 Unit 2 Appendix I Dose Assessment

A. LIQUID DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Organ Dose	(mrem)	1.09E-02	1.12E-02	1.65E-02	3.90E-03	4.18E-02
Applicable Limit	(mrem)	5	5	5	5	10
Percent of Limit	(%)	0.22	0.22	0.33	0.08	0.42
Age Group		Child	Teenager	Child	Teenager	Child
Critical Organ		Bone	Liver	Bone	Liver	Bone

Adult Total Body	(mrem)	6.62E-03	7.05E-03	1.05E-02	2.45E-03	2.66E-02
Applicable Limit	(mrem)	1.5	1.5	1.5	1.5	3.0
Percent of Limit	(%)	0.44	0.47	0.70	0.16	0.89

Note: Liquid Annual dose is the Dose Analysis for the year, it is not a sum of the quarters

B. AIRBORNE NOBLE GAS DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Gamma Air	(mrad)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrad)	5	5	5	5	10
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

Beta Air	(mrad)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrad)	10	10	10	10	20
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

C. AIRBORNE PARTICULATE and TRITIUM DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Particulate	(mrem)	7.88E-05	6.36E-05	2.37E-04	2.89E-04	6.84E-04
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	0.0011	0.0008	0.0032	0.0038	0.0046
Age Group		Child	Child	Child	Child	Child
Critical Organ		Liver	Liver	Liver	Liver	Liver

D. AIRBORNE PARTICULATE and TRITIUM DOSES

Child TB Dose	(mrem)	7.88E-05	6.36E-05	2.37E-04	2.89E-04	6.84E-04
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	0.0011	0.0008	0.0032	0.0038	0.0046
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Child Bone Dose	(mrem)	3.68E-10	7.99E-10	7.99E-10	3.65E-05	3.74E-09
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

Table 6-3 Unit 3 Appendix I Dose Assessment

A. LIQUID DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Organ Dose	(mrem)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrem)	5	5	5	5	10
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00
Age Group		-	-	-	-	-
Critical Organ		-	-	-	-	-

Adult Total Body	(mrem)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrem)	1.5	1.5	1.5	1.5	3.0
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

Note: Liquid Annual dose is the Dose Analysis for the year, it is not a sum of the quarters

B. AIRBORNE NOBLE GAS DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Gamma Air	(mrad)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrad)	5	5	5	5	10
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

Beta Air	(mrad)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrad)	10	10	10	10	20
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

C. AIRBORNE PARTICULATE and TRITIUM DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Particulate	(mrem)	1.05E-04	1.58E-04	3.56E-04	1.70E-04	8.61E-04
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	0.0014	0.0021	0.0048	0.0023	0.0057
Age Group		Child	Child	Child	Child	Child
Critical Organ		Liver	Liver	Liver	Liver	Liver

D. AIRBORNE PARTICULATE and TRITIUM DOSES

Child TB Dose	(mrem)	1.05E-04	1.58E-04	3.56E-05	1.70E-04	8.61E-04
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	0.0014	0.0021	0.0005	0.0023	0.0057
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Child Bone Dose	(mrem)	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	0.00	0.00	0.00	0.00	0.00

7.0 METEOROLOGICAL DATA

The site meteorological data is maintained on-site and available for review.

Attachment 1 – Groundwater Monitoring Program Results

Summary of IPEC Groundwater and Storm Water Activity, 2024

The precipitation mass balance model applied in previous years was applied for offsite dose calculations in 2024, with some minor calibration updates performed in 2009 by the contractor regarding the distribution of groundwater flow through the site. Groundwater elevation readings continued to validate the model throughout the year.

As defined in the ODCM, a conservative method of source term selection is used for determining offsite dose from Groundwater and Storm Water. If a result is *below MDC* (whether positive or negative) it is *not* included in the computed average. This computed average is therefore biased high (more conservative from a dose computation perspective) relative to an average computed using all the data (many of which indicate no activity). In cases where all the sampling locations assigned to a given stream tube provided results below the MDC, then an average activity value of zero was assigned to the effected portion of the stream tube. (This mathematically allows the calculation to proceed in the absence of positive detections).

Historical average precipitation at IPEC has been approximately 3 feet per year. In 2024, precipitation was measured at 4.27 feet per year (or inches per month, as an average). Doses from Groundwater/Storm water are dependent on two factors: source term and precipitation during the effected year.

Results of 2024 Groundwater and Storm water offsite dose evaluation

The results of the assessment are shown below. These dose values are a small portion of the annual limits (<0.1%) and were added to the Total Dose table in the opening summary of the Radiological Impact to Man section of this report (Section 6).

Groundwater (GW) and storm water tritium released from IPEC in 2024 totaled approximately 0.04 curies, resulting in a total body dose of significantly less than 0.1 mrem. It is evident that tritium alone, whether from ground water or routine effluents, does not arithmetically contribute to integrated offsite dose.

Sampling near the effluent points identified only trace levels of Tritium and Strontium-90. These data, as part of the Monitored Natural Attenuation analyses, show a continuation of the decreasing trends established with the termination of the identified Unit 2 SFP leaks (tritium plume) and the defueling and draining of Unit 1 SFPs (strontium plume). Strontium-90, a legacy isotope from Unit 1, contributed approximately 0.000036 curies to site effluent from the groundwater pathway. Combined GW releases from IPEC in 2024 (all radionuclides) resulted in a calculated annual dose of less than 0.0044 % of the annual limits for whole body and critical organ:

IPEC Groundwater and Storm Water Effluent Dose, 2024

0.000107 mrem to the total body	(0.0036% limit)
0.000435 mrem to the critical organ, adult bone	(0.0044% limit)

The annual dose from combined groundwater and storm water pathways remains well below applicable limits. When combined with routine liquid effluents (Section 6), the total dose also remains significantly below ALARA limits of 3 mrem total body, and 10 mrem to the critical organ.

IPEC Summary for Storm & Ground Water Releases

2024

Northern Clean Zone

Adult Doses, in mrem

ISOTOPE	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*uCi*
H-3	0.00E+00	5.61E-09	5.61E-09	5.61E-09	5.61E-09	5.61E-09	5.61E-09	*5.02E+02*
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Ni-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sr-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Cs-137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sb-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
totals	0.00E+00	5.61E-09	5.61E-09	5.61E-09	5.61E-09	5.61E-09	5.61E-09	***5.02E+02***

Unit 2 North

ISOTOPE	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*uCi*
H-3	0.00E+00	4.31E-08	4.31E-08	4.31E-08	4.31E-08	4.31E-08	4.31E-08	*4.99E+03*
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Ni-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sr-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Cs-137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sb-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
totals	0.00E+00	4.31E-08	4.31E-08	4.31E-08	4.31E-08	4.31E-08	4.31E-08	***4.99E+03***

Unit 1/2

ISOTOPE	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*uCi*
H-3	0.00E+00	1.47E-07	1.47E-07	1.47E-07	1.47E-07	1.47E-07	1.47E-07	*1.66E+04*
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Ni-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sr-90	2.95E-04	0.00E+00	7.22E-05	0.00E+00	0.00E+00	0.00E+00	8.48E-06	*2.30E+01*
Cs-137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sb-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Totals	2.95E-04	1.47E-07	7.24E-05	1.47E-07	1.47E-07	1.47E-07	8.63E-06	***1.66E+04***

Unit 3 North

ISOTOPE	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*uCi*
H-3	0.00E+00	1.07E-07	1.07E-07	1.07E-07	1.07E-07	1.07E-07	1.07E-07	*1.03E+04*
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Ni-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sr-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Cs-137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sb-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Totals	0.00E+00	1.07E-07	1.07E-07	1.07E-07	1.07E-07	1.07E-07	1.07E-07	***1.03E+04***

Unit 3 South

ISOTOPE	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*uCi*
H-3	0.00E+00	6.40E-08	6.40E-08	6.40E-08	6.40E-08	6.40E-08	6.40E-08	*1.20E+04*
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Ni-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sr-90	1.41E-04	0.00E+00	3.45E-05	0.00E+00	0.00E+00	0.00E+00	4.05E-06	*1.29E+01*
Cs-137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sb-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Totals	1.41E-04	6.40E-08	3.46E-05	6.40E-08	6.40E-08	6.40E-08	4.11E-06	***1.20E+04***

Southern Clean Zone

ISOTOPE	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*uCi*
H-3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Ni-63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sr-90	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Cs-137	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Sb-125	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	*0.00E+00*
Totals	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	***0.00E+00***

Totals: Adult Doses, in mrem

								Total uCis	
H-3 only	0.00E+00	1.92E-07	1.92E-07	1.92E-07	1.92E-07	1.92E-07	1.92E-07		
	BONE	LIVER	TOT BODY	THYROID	KIDNEY	LUNG	GI-LLI	*4.43E+04*	H3
all isotopes	**4.35E-04**	3.67E-07	**1.07E-04**	3.67E-07	3.67E-07	3.67E-07	1.29E-05	*0.00E+00*	Co
								0.00E+00	Ni
Adult Doses								*3.59E+01*	Sr
% Annual Limit	***0.00435***	*0.000*	***0.00357***	*0.000*	*0.000*	*0.000*	*0.000*	*0.00E+00*	Cs
								0.00E+00	Sb

Attachment 2 – Laboratory Analytical Results

The following pages list the results of the 2024 groundwater samples. Note that the positive results are shown in bold print.

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
B-1	5/23/2024	**1.04E+03**	3.54E+02	-0.6	1.4	0.0	13.0	0.8	8.3		
MH-5 VCFD	1/8/2024	**3.66E+02**	3.57E+02	0.0	0.9	-0.7	4.4	-1.8	5.5		
MH-5 VCFD	3/4/2024	**1.12E+03**	5.52E+02	0.8	1.0	1.9	6.1	1.4	7.0		
MH-5 VCFD	5/20/2024	2.63E+02	4.05E+02	-0.5	0.9	0.0	5.3	2.0	5.2		
MH-5 VCFD	8/12/2024	**1.06E+03**									
MH-5 VCFD	10/21/2024	<464		0.6	1.5	-1.0	4.1	-0.6	5.1		
MW-107	8/15/2024	<483		0.2	0.9	0.5	6.4	-1.3	9.4	-0.2	16.4
MW-111	5/13/2024	**8.17E+02**	4.56E+02	-1.0	1.4	0.0	13.2	4.7	7.5		
MW-111	10/22/2024	**8.94E+02**									
MW-30-69	3/4/2024	**2.07E+04**									
MW-30-69	5/20/2024	**2.66E+04**									
MW-30-69	8/20/2024	**4.51E+04**									
MW-30-82	11/4/2024	**1.01E+05**									
MW-30-82	11/18/2024	**1.00E+05**									
MW-30-84	3/4/2024	**2.60E+04**	1.94E+03	-0.3	1.2	-2.4	6.8	4.2	8.8		
MW-30-84	5/20/2024	**2.62E+04**	1.70E+03	-0.6	0.9	2.3	5.0	-1.8	5.2		
MW-30-84	8/20/2024	**2.26E+04**				-1.2	6.2	-0.9	9.0		
MW-31-49	3/11/2024	-5.01E+00	3.48E+02	-0.2	1.1	5.0	9.9	3.5	6.2		
MW-31-49	5/21/2024	**1.12E+03**	4.56E+02	0.0	0.7	-0.9	6.0	1.0	7.1		
MW-31-49	8/19/2024	<483				-2.7	7.1	3.7	7.0		
MW-31-49	10/23/2024	<484		0.7	1.3	-0.2	5.7	0.6	5.5		
MW-31-49	11/18/2024	<452									
MW-31-63	3/11/2024	**3.09E+03**	7.98E+02	0.8	0.9	0.2	4.7	-0.3	4.4		
MW-31-63	5/21/2024	**4.55E+03**	6.51E+02	0.1	1.1	1.3	12.1	4.1	6.2		
MW-31-63	8/19/2024	**1.93E+03**				2.3	6.4	2.1	7.3		
MW-31-63	10/23/2024	**2.97E+03**		-0.3	1.2	-1.2	5.6	1.9	5.0		
MW-31-63	11/18/2024	**2.11E+03**									
MW-31-85	3/11/2024	1.19E+02	3.75E+02	-0.4	1.2	1.7	4.5	-1.5	5.4		
MW-31-85	5/21/2024	**8.70E+02**	4.56E+02	0.0	1.1	2.2	5.0	0.9	10.2		
MW-31-85	8/19/2024	<463				0.5	4.4	4.0	5.2		
MW-31-85	10/23/2024	<484		-0.3	1.2	0.7	5.5	0.0	4.6		
MW-32-149	3/4/2024	1.58E+02	4.32E+02	0.2	1.5	-4.8	10.3	3.1	6.5		
MW-32-149	5/20/2024	2.23E+02	4.35E+02	-0.9	0.9	5.9	10.3	-0.3	8.3		
MW-32-149	8/20/2024	<463				-2	6	-0.3	5.4		
MW-32-149	10/21/2024	<464		-0.5	1.1	0.6	5.5	1.6	7.4		
MW-32-173	3/4/2024	1.78E+02	4.35E+02	1.1	1.1	3.1	6.4	2.0	5.5		
MW-32-173	5/20/2024	-5.12E+01	3.72E+02	0.7	1.3	0.0	8.9	5.3	9.5		
MW-32-173	8/20/2024	<463				-1	5	-0.3	5.6		
MW-32-173	10/21/2024	<464		-0.5	1.1	-0.6	4.2	0.1	5.1		
MW-32-190	3/4/2024	-1.93E+01	3.99E+02	0.7	1.4	-8.9	8.2	4.6	7.5		
MW-32-190	5/20/2024	-6.36E+00	3.66E+02	-0.2	0.6	0.2	4.2	1.1	4.2		
MW-32-190	8/20/2024	<463				4.7	13.2	-0.1	7.1		
MW-32-190	10/21/2024	<464		0.7	1.6	1.3	6.7	-0.9	9.0		
MW-32-59	1/8/2024	**5.64E+02**	3.81E+02	-0.7	1.1	1.0	5.5	-1.0	6.4		
MW-32-59	2/8/2024	1.87E+02	4.17E+02	0.9	1.3	-0.8	5.0	0.3	4.7		
MW-32-59	3/4/2024	**7.94E+02**	5.07E+02	0.4	0.9	-2.1	5.3	1.4	5.0		
MW-32-59	4/22/2024	**5.93E+03**	5.28E+02	0.1	1.2	-1.4	5.6	1.6	5.5		
MW-32-59	5/20/2024	**4.17E+03**	7.41E+02	-0.2	1.1	-1.1	6.0	-2.2	10.0		

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
MW-32-59	6/17/2024	**3.69E+03**	5.28E+02	-0.9	1.2	0.3	6.2	0.9	4.4		
MW-32-59	7/22/2024	**6.47E+02**	3.87E+02	-0.9	1.2	0.8	3.8	0.5	3.8		
MW-32-59	8/20/2024	<461				2.2	6.2	4.8	6.2		
MW-32-59	9/16/2024	**3.93E+03**									
MW-32-59	10/21/2024	**4.42E+03**		0.3	1.3	3.2	6.4	0.3	10.0		
MW-32-59	11/18/2024	**8.27E+03**		-0.9	1.3	2.3	6.7	2.1	6.6		
MW-32-59	12/16/2024	**2.80E+03**		1.3	1.7	0.8	4.3	-0.4	5.3		
MW-32-85	1/8/2024	**7.85E+03**	9.36E+02	0.8	1.2	7.2	6.7	-0.9	5.9		
MW-32-85	2/8/2024	**6.73E+03**	1.07E+03	0.7	1.3	-0.3	5.3	0.1	6.5		
MW-32-85	3/4/2024	**6.53E+03**	1.09E+03	1.3	1.8	1.4	10.5	-1.3	6.2		
MW-32-85	4/22/2024	**1.98E+03**	5.34E+02	0.1	1.1	-1.2	10.1	2.8	7.7		
MW-32-85	5/20/2024	**5.35E+03**	8.31E+02	-0.3	0.9	1.0	7.5	1.4	6.8		
MW-32-85	6/17/2024	**5.47E+03**	6.48E+02	0.4	1.6	-5.9	7.5	2.7	6.0		
MW-32-85	7/22/2024	**4.54E+03**	5.94E+02	0.5	1.6	-0.6	3.2	-0.7	3.6		
MW-32-85	8/20/2024	**5.72E+03**				-0.4	6.0	2.6	6.2		
MW-32-85	9/16/2024	**5.42E+03**		0.3	1.5	-2.6	6.4	1.2	5.1		
MW-32-85	10/21/2024	**4.90E+03**		0.1	0.9	-1.4	8.4	-3.9	6.9		
MW-32-85	11/18/2024	**5.88E+03**		1.2	1.7	3.8	6.7	-0.8	4.4		
MW-32-85	12/16/2024	**4.60E+03**		0.1	1.6	0.3	7.7	4.4	10.2		
MW-33	3/11/2024	**3.62E+03**	8.13E+02	0.5	1.2	0.0	10.3	-0.9	5.1		
MW-33	5/13/2024	**3.69E+03**	7.41E+02	-0.7	1.2	2.4	5.1	0.6	3.4		
MW-33	8/12/2024	**2.53E+03**									
MW-33	10/22/2024	**1.80E+03**		-0.1	1.0	0.0	8.0	2.5	6.9		
MW-35	3/11/2024	-1.52E+02	3.69E+02	0.4	0.8	-1.3	4.6	0.0	5.2		
MW-35	5/13/2024	**6.66E+02**	4.20E+02	0.0	1.0	-1.1	5.0	2.8	4.8		
MW-35	8/12/2024	<463		0.4	1.3	3.8	9.6	-0.4	5.2		
MW-35	10/22/2024	<464		-0.4	1.5						
MW-36-24	3/7/2024	1.48E+02	4.11E+02	0.7	1.3	3.2	12.2	-3.1	7.6		
MW-36-24	5/16/2024	9.55E+01	3.96E+02	-0.1	1.0	-0.8	5.6	6.6	10.7		
MW-36-24	8/12/2024	<463		0.0	1.2						
MW-36-24	10/23/2024	<464		0.3	1.3						
MW-36-41	3/7/2024	**2.86E+03**	6.18E+02	**3.8**	1.6	-0.3	5.8	-4.6	6.9		
MW-36-41	5/16/2024	**3.58E+03**	1.16E+03	**1.8**	1.4	2.1	4.0	0.7	6.0		
MW-36-41	8/12/2024	**1.73E+03**		**1.6**	1.6						
MW-36-41	10/23/2024	**1.62E+03**		**2.7**	2.0						
MW-36-52	3/7/2024	**4.77E+02**	4.35E+02	1.2	1.6	-0.1	6.7	0.1	5.2		
MW-36-52	5/16/2024	6.27E+01	3.39E+02	-0.3	1.0	0.6	4.6	1.7	6.5		
MW-36-52	8/12/2024	<463		1.0	1.4						
MW-36-52	10/23/2024	**2.63E+03**		**1.7**	1.5						
MW-37-22	5/15/2024	**1.93E+03**	6.03E+02	1.2	1.6	2.4	5.9	2.3	7.0		
MW-37-32	5/15/2024	**1.17E+03**	5.19E+02	**3.4**	1.9	2.0	4.8	-1.7	5.6		
MW-37-40	5/15/2024	**1.15E+03**	5.43E+02	**6.7**	2.5	-1.1	4.8	-0.2	4.3		
MW-37-57	5/15/2024	**9.15E+02**	5.01E+02	**6.1**	2.4	-2.2	6.8	4.8	11.2		
MW-39-102	5/22/2024	9.78E+01	2.83E+02	0.4	1.5	6.0	7.6	-2.3	6.1		
MW-39-183	5/22/2024	1.58E+01	2.71E+02	-0.6	1.1	-1.1	4.1	-0.5	8.1		
MW-39-195	5/22/2024	1.34E+02	2.88E+02	0.8	1.5	1.7	5.2	2.5	5.5		
MW-39-67	5/22/2024	8.90E+01	2.82E+02	0.2	1.1	0.0	10.4	1.2	4.5		
MW-39-84	5/22/2024	1.17E+02	2.85E+02	0.3	0.8	7.7	9.2	-0.3	3.5		
MW-40-100	3/13/2024	1.41E+02	3.81E+02	0.7	1.0	-3.5	7.2	-10.5	8.5		

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
MW-40-100	5/9/2024	1.22E+02	3.72E+02	-0.6	1.0	1.5	8.4	0.0	6.1		
MW-40-100	8/14/2024	<463		-0.2	1.4	1.5	5.3	-2.9	9.0		
MW-40-127	3/13/2024	-1.61E+01	3.48E+02	-0.3	0.9	-2.0	6.7	1.0	6.5		
MW-40-127	5/9/2024	1.44E+02	3.51E+02	0.2	0.9	-3.5	7.3	2.6	7.2		
MW-40-127	8/14/2024	<463		-0.4	1.4	-0.7	7.6	4.7	8.6		
MW-40-162	3/13/2024	-8.20E+00	3.48E+02	-0.1	1.0	5.3	15.3	-3.1	7.7		
MW-40-162	5/9/2024	2.14E+02	3.81E+02	-0.1	1.3	1.1	5.6	1.8	7.9		
MW-40-162	8/14/2024	<463		0.1	1.5	1.8	6.5	-0.6	7.7		
MW-40-27	3/13/2024	5.72E+01	3.63E+02	1.2	1.4	-1.4	4.9	1.7	5.5		
MW-40-27	5/9/2024	2.82E+01	3.39E+02	0.0	1.6	-0.4	6.2	4.6	6.7		
MW-40-27	8/14/2024	<463		0.6	1.5	0.1	5.8	-0.6	5.9		
MW-40-46	3/13/2024	1.19E+02	3.75E+02	-0.3	1.2	0.9	8.3	-1.9	5.5		
MW-40-46	5/9/2024	-1.58E+01	3.27E+02	-0.4	0.8	-0.4	4.8	0.8	5.9		
MW-40-46	8/14/2024	<463		0.4	1.4	1.6	5.7	1.2	6.5		
MW-40-81	3/13/2024	6.60E+01	3.66E+02	-0.8	1.4	-0.7	4.9	0.9	5.2		
MW-40-81	5/9/2024	1.27E+02	3.45E+02	0.4	1.4	-1.3	5.0	1.5	4.4		
MW-40-81	8/14/2024	<463		0.4	1.6	0.5	4.4	2.3	5.4		
MW-41-40	5/29/2024	8.19E+01	2.43E+02	-0.1	0.9	0.6	7.2	1.8	7.7		
MW-41-40	10/24/2024	<464									
MW-41-63	5/29/2024	**5.14E+02**	3.09E+02	0.3	1.4	0.0	6.8	-0.5	8.2		
MW-41-63	10/24/2024	<464									
MW-42-49	1/8/2024	2.65E+02	3.36E+02	-0.3	0.9	**7830.0**	147.0	1.7	8.4	**90.1**	23.3
MW-42-49	2/8/2024	2.58E+02	4.35E+02	**1.0**	0.9	**6190.0**	138.6	2.9	7.4	**125.0**	21.6
MW-42-49	3/6/2024	1.46E+01	3.81E+02	**7.1**	2.2	**14900.0**	175.8	-0.8	5.2	**219.0**	26.4
MW-42-49	4/22/2024	1.79E+02	2.63E+02	1.2	1.3	**5950.0**	115.2	2.2	5.3	**105.0**	21.8
MW-42-49	5/21/2024	3.80E+02	3.78E+02	**10.3**	2.7	**16400.0**	110.4	-1.5	3.1	**297.0**	33.3
MW-42-49	6/17/2024	-8.69E+01	3.21E+02	**10.0**	2.6	**15200.0**	198.9	3.7	5.6	**272.0**	30.9
MW-42-49	7/22/2024	**3.77E+02**	3.57E+02	**2.7**	1.6	**10400.0**	88.8	0.0	2.8	**106.0**	22.2
MW-42-49	8/15/2024	<463		0.8	1.6	**5810.0**	116.7	2.7	4.6	**199.0**	29.6
MW-42-49	9/16/2024	<461		**7.1**	2.4	**12800.0**	163.5	0.0	4.8	**186.0**	23.5
MW-42-49	10/28/2024	<464		**7.7**	2.5	**11200.0**	163.2	-0.2	4.2	**172.0**	24.4
MW-42-49	11/18/2024	<452		**3.4**	2.1	**8880.0**	136.5	1.3	4.9	**145.0**	24.8
MW-42-49	12/16/2024	<453		**11.6**	3.2	**20400.0**	229.8	-1.4	7.6	**184.0**	25.0
MW-42-78	3/6/2024	6.05E+01	3.93E+02	1.0	1.3	0.0	12.8	3.5	7.2	2.4	14.0
MW-42-78	5/21/2024	2.01E+02	3.57E+02	1.2	1.8	0.6	8.0	1.0	4.2	0.7	15.2
MW-42-78	8/15/2024	<463		0.2	1.1	1.4	5.0	0.6	5.8	4.3	15.0
MW-42-78	10/28/2024	<484		0.8	1.3	0.0	3.5	1.9	5.1	6.3	15.0
MW-43-28	5/23/2024	1.29E+02	2.89E+02	-0.1	0.9	-1.5	3.3	-0.8	3.2		
MW-43-62	5/23/2024	1.25E+02	2.95E+02	1.5	1.7	0.1	3.0	-0.7	3.1		
MW-44-102	5/22/2024	6.64E+01	2.75E+02	-0.2	1.4	0.8	2.7	1.4	3.1		
MW-44-66	5/22/2024	1.31E+02	2.79E+02	-0.6	1.2	-0.5	5.5	5.4	4.4		
MW-45-42	1/8/2024	**8.86E+02**									
MW-45-42	3/6/2024	**8.82E+02**	5.37E+02	0.3	0.9	0.9	5.6	-1.2	4.7		
MW-45-42	5/28/2024	**9.66E+02**	3.60E+02	-0.7	0.8	4.3	5.0	0.4	4.4		
MW-45-42	8/19/2024	<461									
MW-45-42	10/24/2024	**8.36E+02**		0.1	1.0	0.1	0.6	0.4	0.5		
MW-45-61	1/8/2024	**8.02E+02**									
MW-45-61	3/6/2024	**7.94E+02**	4.44E+02	0.8	1.2	-0.6	4.1	-0.2	5.3		
MW-45-61	5/28/2024	**7.87E+02**	3.39E+02	-0.3	0.8	1.0	10.7	2.5	6.2		

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
MW-45-61	8/19/2024	<461									
MW-45-61	10/24/2024	**6.04E+02**		0.5	1.2	0.3	0.5	-0.2	0.5		
MW-46	3/5/2024	**8.02E+02**	4.68E+02	**1.7**	1.1	-3.8	5.5	1.7	5.5		
MW-46	5/7/2024	**7.46E+02**	4.59E+02	-0.5	1.2	1.9	6.1	2.0	7.0		
MW-46	8/21/2024	**6.18E+02**									
MW-46	10/31/2024	**7.20E+02**		0.1	1.4	-0.4	4.7	0.9	4.9		
MW-49-26	5/8/2024	**2.47E+03**	5.88E+02	**9.7**	2.2	0.2	5.5	-5.2	9.5	-0.7	15.8
MW-49-42	5/8/2024	**2.26E+03**	5.76E+02	**8.9**	2.8	0.6	6.6	-1.2	4.5	-1.8	16.3
MW-49-65	5/8/2024	**1.69E+03**	5.43E+02	**6.9**	2.0	1.8	4.5	-3.3	5.1	5.1	16.8
MW-50-42	3/7/2024	**7.48E+02**	4.59E+02	**3.9**	1.6	-0.1	5.8	0.4	5.9	0.8	13.4
MW-50-42	5/14/2024	**6.44E+02**	3.09E+02	1.5	1.5	-0.1	5.5	-1.4	9.6	5.1	16.6
MW-50-42	8/12/2024	<461		**2.9**	2.0						
MW-50-42	10/23/2024	<464		**3.0**	1.7						
MW-50-66	3/7/2024	**1.28E+03**	5.04E+02	**8.8**	2.1	-4.1	7.6	-3.6	7.1	-5.4	13.7
MW-50-66	5/14/2024	**1.39E+03**	4.02E+02	**13.3**	3.1	2.8	7.0	0.8	7.0	-1.6	16.3
MW-50-66	8/12/2024	**1.28E+03**		**9.2**	2.9						
MW-50-66	10/23/2024	**1.22E+03**		**9.8**	2.7						
MW-51-104	3/13/2024	2.53E+01	3.57E+02	0.9	1.1	1.4	5.0	-1.3	5.4		
MW-51-104	5/9/2024	4.95E+01	3.30E+02	-0.5	0.8	1.1	6.2	2.6	6.2		
MW-51-104	8/14/2024	<461		-0.7	1.3	1.8	4.8	0.5	4.7		
MW-51-135	3/13/2024	9.40E+01	3.72E+02	-0.6	1.6	1.4	6.5	-3.4	8.7		
MW-51-135	5/9/2024	4.40E+01	3.48E+02	0.5	1.7	1.2	5.3	-4.2	10.4		
MW-51-135	8/14/2024	<461		-0.5	1.3	1.1	5.7	2.0	4.9		
MW-51-163	3/13/2024	3.40E+01	3.63E+02	0.3	1.0	-1.9	8.8	0.1	7.0		
MW-51-163	5/9/2024	-1.75E+01	3.39E+02	0.7	1.7	0.0	14.0	4.4	7.6		
MW-51-163	8/14/2024	<461		0.4	1.7	0.0	6.7	-4.1	6.3		
MW-51-189	3/13/2024	-9.26E+00	3.51E+02	0.3	1.0	1.3	6.0	1.6	8.6		
MW-51-189	5/9/2024	7.05E+01	3.57E+02	-0.1	1.0	2.8	5.6	0.6	8.3		
MW-51-189	8/14/2024	<461		-0.3	1.3	-1.1	5.1	3.0	7.5		
MW-51-40	3/13/2024	9.83E+01	3.72E+02	0.5	1.1	-1.7	10.5	-4.5	6.8		
MW-51-40	5/9/2024	2.47E+02	3.90E+02	-0.6	1.2	1.0	5.3	-0.1	6.9		
MW-51-40	8/14/2024	<461		-0.2	1.3	-0.2	5.4	5.6	6.5		
MW-51-79	3/13/2024	1.82E+02	3.90E+02	0.3	1.1	-2.5	5.4	-0.7	8.3		
MW-51-79	5/9/2024	8.53E+01	3.63E+02	0.1	1.2	2.1	6.2	5.0	9.0		
MW-51-79	8/14/2024	<461		1.1	1.5	-1.1	5.0	3.6	5.1		
MW-52-118	5/6/2024	1.31E+02	3.69E+02	-0.6	1.2	0.1	6.6	-1.2	7.3		
MW-52-162	5/6/2024	3.69E+02	3.57E+02	-0.6	0.8	5.2	9.5	10.3	8.9		
MW-52-18	5/6/2024	3.95E+02	3.84E+02	0.1	0.8	-1.4	5.0	-0.6	4.3		
MW-52-181	5/6/2024	2.54E+02	3.81E+02	0.3	1.5	2.0	5.5	0.2	6.8		
MW-52-48	5/6/2024	1.75E+02	3.48E+02	0.3	1.0	1.5	4.1	3.3	4.1		
MW-52-64	5/6/2024	1.60E+02	3.90E+02	-0.2	1.0	1.6	5.2	0.9	4.2		
MW-53-120	3/6/2024	**2.96E+03**	7.35E+02	**20.6**	3.1	3.3	8.1	2.5	6.4	0.8	13.9
MW-53-120	5/21/2024	**2.94E+03**	5.79E+02	**19.6**	3.6	0.4	3.0	0.2	3.2	-3.3	15.0
MW-53-120	8/15/2024	**3.12E+03**		**11.6**	2.8	2.5	6.1	0.8	5.8	2.9	15.0
MW-53-120	10/28/2024	**2.58E+03**		**12.2**	3.2	0.1	4.3	-0.8	4.9	0.0	21.1
MW-53-82	5/21/2024	1.66E+02	3.63E+02	0.2	1.0	1.6	3.3	-1.3	2.8	-1.6	17.6
MW-53-82	10/28/2024	**7.62E+02**		0.8	1.6	2.0	6.8	4.0	6.2	3.9	16.0
MW-54-123	5/15/2024	**1.01E+03**	4.68E+02	0.9	1.6	0.8	7.1	2.2	6.5	-5.9	17.1
MW-54-123	10/30/2024	**8.82E+02**		-0.3	1.0						

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
MW-54-144	5/15/2024	**8.01E+02**	4.50E+02	**2.0**	1.6	-0.8	5.0	-2.3	6.4	1.1	17.2
MW-54-144	10/30/2024	**6.00E+02**		**2.0**	1.5						
MW-54-173	5/15/2024	**2.02E+03**	6.12E+02	**5.7**	2.4	-3.0	5.4	3.4	6.2	-6.3	18.1
MW-54-173	10/30/2024	**1.81E+03**		**2.1**	1.8						
MW-54-190	5/15/2024	**8.90E+02**	5.70E+02	**6.6**	2.5	2.7	4.7	-1.2	5.6	-6.2	18.0
MW-54-190	10/30/2024	**6.73E+02**		**6.5**	2.3						
MW-54-37	5/15/2024	4.34E+02	4.59E+02	**3.8**	2.1	-0.4	5.8	0.0	6.6	-10.8	18.3
MW-54-37	10/30/2024	<464		0.7	1.3						
MW-54-58	5/15/2024	**9.45E+02**	5.16E+02	0.4	1.1	3.1	9.9	1.5	7.7	3.5	17.9
MW-54-58	10/30/2024	**8.36E+02**		-0.1	1.3						
MW-55-24	5/13/2024	3.19E+02	3.81E+02	**2.9**	1.6	-1.8	5.4	-3.6	9.5	0.3	17.7
MW-55-24	10/22/2024	<464		**3.8**	2.1						
MW-55-35	5/13/2024	2.70E+02	3.84E+02	**2.4**	1.3	-2.4	4.8	1.8	4.8	4.3	18.3
MW-55-35	10/22/2024	<464		**2.0**	1.5						
MW-55-54	5/13/2024	**1.39E+03**	5.07E+02	**2.9**	1.9	-2.1	4.8	0.6	3.8	-3.3	17.6
MW-55-54	10/22/2024	**7.97E+02**		**3.5**	2.0						
MW-56-53	5/28/2024	1.03E+02	2.47E+02	-0.4	0.7	-1.5	4.7	0.7	4.8		
MW-56-53	10/30/2024	<464									
MW-56-83	5/28/2024	**5.06E+02**	3.03E+02	0.3	0.9	-0.2	5.4	-3.7	10.0		
MW-56-83	10/30/2024	**5.07E+02**									
MW-57-11	5/15/2024	4.30E+02	4.56E+02	0.1	1.3	2.9	5.2	-1.6	4.9	-7.2	17.3
MW-57-20	5/15/2024	**6.75E+02**	4.50E+02	0.8	1.6	0.4	8.9	-0.3	7.2	-6.1	20.2
MW-57-45	5/15/2024	**6.26E+02**	4.50E+02	**3.0**	2.1	6.2	8.8	4.3	6.3	1.7	18.2
MW-58-26	5/14/2024	2.64E+02	2.67E+02	-0.7	0.9	-1.6	6.5	0.4	7.0		
MW-58-65	5/14/2024	**2.81E+02**	2.69E+02	0.3	0.8	0.3	8.7	-2.1	7.2		
MW-60-135	5/6/2024	**8.05E+02**	4.56E+02	-0.7	1.0	0.3	5.2	1.4	6.9		
MW-60-154	5/6/2024	**5.75E+02**	3.66E+02	-1.0	1.3	0.9	3.4	0.5	3.6		
MW-60-176	5/6/2024	**1.10E+03**	3.93E+02	0.0	0.9	0.6	6.2	0.6	5.7		
MW-60-35	5/6/2024	-1.57E+01	3.30E+02	-0.8	1.3	-0.5	6.4	1.7	7.4		
MW-60-53	5/6/2024	-1.84E+01	3.48E+02	0.1	1.6	0.3	4.8	-0.3	4.6		
MW-60-72	5/6/2024	-1.12E+02	3.21E+02	-0.4	1.1	2.3	4.5	-0.2	5.0		
MW-62-138	5/8/2024	4.36E+02	4.47E+02	0.7	1.6	0.3	11.5	2.7	5.0		
MW-62-138	10/29/2024	<484									
MW-62-18	5/8/2024	-1.29E+02	3.69E+02	-0.3	1.5	1.6	5.1	0.2	5.5		
MW-62-18	10/29/2024	<464									
MW-62-182	5/8/2024	**9.30E+02**	4.77E+02	-1.7	1.4	2.3	4.8	4.3	7.1		
MW-62-182	10/29/2024	**6.00E+02**									
MW-62-37	5/8/2024	**5.45E+02**	4.53E+02	-0.8	1.5	2.7	4.4	0.5	4.8		
MW-62-37	10/29/2024	**6.23E+02**									
MW-62-53	5/8/2024	**8.07E+02**	4.71E+02	0.5	1.2	-1.6	4.6	2.2	3.8		
MW-62-53	10/29/2024	**6.19E+02**									
MW-62-71	5/8/2024	4.32E+02	4.29E+02	1.5	1.7	-2.4	4.7	-2.2	5.9		
MW-62-71	10/29/2024	<464									
MW-62-92	5/8/2024	**9.21E+02**	4.92E+02	-0.7	1.4	-0.9	5.3	-0.2	4.8		
MW-62-92	10/29/2024	**1.31E+03**									
MW-63-112	5/16/2024	**6.08E+02**	5.73E+02	-0.1	1.2	0.3	4.4	0.0	4.5		
MW-63-112	10/29/2024	**6.23E+02**									
MW-63-121	5/16/2024	4.03E+02	4.47E+02	0.7	0.7	2.6	4.9	2.8	5.1		
MW-63-121	10/29/2024	**6.27E+02**									

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
MW-63-163	5/16/2024	**3.25E+02**	2.89E+02	0.0	1.1	-0.8	4.5	-0.8	4.6		
MW-63-163	10/29/2024	**5.61E+02**									
MW-63-174	5/16/2024	2.92E+02	2.98E+02	-0.6	1.0	-0.5	5.0	-0.6	6.1		
MW-63-174	10/29/2024	**5.80E+02**									
MW-63-18	5/16/2024	1.99E+02	4.44E+02	-0.1	0.9	-1.7	4.1	-0.3	4.5		
MW-63-18	10/29/2024	<467									
MW-63-34	5/16/2024	3.08E+02	4.35E+02	-0.2	1.4	7.8	11.4	3.8	7.4		
MW-63-34	10/29/2024	**5.06E+02**									
MW-63-50	5/16/2024	1.70E+02	4.14E+02	-0.4	0.9	1.2	5.0	0.8	6.5		
MW-63-50	10/29/2024	**5.29E+02**									
MW-63-93	5/16/2024	**5.34E+02**	5.04E+02	0.5	1.4	-2.3	6.5	0.6	5.0		
MW-63-93	10/29/2024	**5.53E+02**									
MW-66-21	3/7/2024	-9.00E+01	3.60E+02	0.6	1.3	3.3	5.7	-2.9	6.2	-1.1	14.2
MW-66-21	5/13/2024	2.34E+02	3.72E+02	0.4	1.5	-4.5	6.2	0.2	5.3	2.0	18.5
MW-66-21	8/13/2024	<461		0.0	1.4						
MW-66-21	10/29/2024	<467		0.3	0.8						
MW-66-36	3/7/2024	**2.21E+03**	6.78E+02	**3.6**	1.5	-0.4	5.7	-0.2	5.7	2.3	14.0
MW-66-36	5/13/2024	**2.23E+03**	5.73E+02	**3.0**	1.7	0.8	6.2	1.7	9.3	-3.3	18.9
MW-66-36	8/13/2024	**1.63E+03**		**1.5**	1.2						
MW-66-36	10/29/2024	**2.24E+03**		**3.0**	2.1	1.1	5.2	-0.2	5.5	0.3	20.6
MW-67-105	3/12/2024	**9.78E+02**	5.34E+02	1.3	1.5	2.6	6.5	-0.4	5.0	1.3	16.0
MW-67-105	5/14/2024	**1.09E+03**	3.54E+02	0.8	1.0	0.7	4.4	1.0	5.6	-1.0	16.4
MW-67-105	8/13/2024	**6.07E+02**		-0.9	1.3						
MW-67-105	11/4/2024	**1.08E+03**		-0.1	1.2						
MW-67-173	3/12/2024	**5.93E+02**	5.13E+02	-0.3	1.0	2.5	12.5	-2.1	6.8	11.1	17.0
MW-67-173	5/14/2024	**7.31E+02**	3.12E+02	-0.4	1.0	-0.5	6.1	-2.9	7.3	-1.7	16.6
MW-67-173	8/13/2024	**5.60E+02**		-0.2	1.1						
MW-67-173	11/4/2024	**5.84E+02**		1.3	1.6						
MW-67-219	3/12/2024	**9.43E+02**	5.34E+02	0.2	1.5	-1.3	6.3	-1.3	4.8	15.6	18.4
MW-67-219	5/14/2024	**1.07E+03**	3.54E+02	0.0	1.0	1.5	14.2	-1.2	11.4	4.1	16.9
MW-67-219	8/13/2024	**5.65E+02**		1.1	1.6						
MW-67-219	11/4/2024	**1.32E+03**		-0.3	1.2						
MW-67-276	3/12/2024	**7.29E+02**	5.25E+02	1.1	1.7	-1.0	4.9	-2.3	4.4	12.4	18.0
MW-67-276	5/14/2024	**7.81E+02**	3.09E+02	0.4	1.1	1.3	8.4	1.8	7.6	0.0	16.3
MW-67-276	8/13/2024	**8.52E+02**		-0.5	1.5						
MW-67-276	11/4/2024	**8.76E+02**		0.6	1.2						
MW-67-340	3/12/2024	2.55E+02	4.50E+02	1.3	1.5	2.9	9.8	-0.9	5.4	1.7	17.1
MW-67-340	5/14/2024	**4.31E+02**	2.90E+02	0.1	0.9	1.6	7.1	0.1	7.2	3.8	17.1
MW-67-340	8/13/2024	<461		-0.6	1.4						
MW-67-340	11/4/2024	**2.38E+03**		-0.7	1.2						
MW-67-39	3/12/2024	**1.92E+03**	6.63E+02	1.0	1.6	-0.5	6.1	-0.3	5.2	4.9	17.0
MW-67-39	5/14/2024	**1.97E+03**	4.44E+02	**2.5**	1.4	4.0	7.0	1.2	9.5	-2.1	16.9
MW-67-39	8/13/2024	**1.92E+03**		**2.2**	1.6						
MW-67-39	11/4/2024	**1.97E+03**		**2.8**	1.9						
MW-68-103	3/5/2024	4.32E+02	4.32E+02	0.9	1.2	0.0	5.2	0.8	3.9		
MW-68-103	5/7/2024	**5.00E+02**	4.26E+02	0.1	1.0	0.2	4.9	0.1	5.8		
MW-68-103	8/21/2024	**5.87E+02**									
MW-68-103	10/31/2024	<467									
MW-68-132	3/5/2024	4.65E+02	4.41E+02	0.9	1.3	-0.2	6.4	2.3	5.7		

Well ID	Sample Date	2024 Laboratory Analytical Results									
		H-3 Result (pCi/L)	H-3 3 Sigma (Std. Dev.)	Sr-90 Result (pCi/L)	Sr-90 3 Sigma (Std. Dev.)	Cs-137 Result (pCi/L)	Cs-137 3 Sigma (Std. Dev.)	Co-60 Result (pCi/L)	Co-60 3 Sigma (Std. Dev.)	Ni-63 Result (pCi/L)	Ni-63 3 Sigma (Std. Dev.)
MW-68-132	5/7/2024	2.84E+02	4.20E+02	0.4	1.2	2.6	5.0	0.5	5.1		
MW-68-132	8/21/2024	**5.18E+02**									
MW-68-132	10/31/2024	**5.10E+02**									
MW-68-19	3/5/2024	**7.99E+02**	4.74E+02	**1.6**	1.4	0.1	6.5	3.0	5.9		
MW-68-19	5/7/2024	**5.81E+02**	4.29E+02	0.2	1.2	-0.8	6.9	2.6	7.2		
MW-68-19	8/21/2024	<461									
MW-68-19	11/4/2024	<467									
MW-68-29	3/5/2024	**1.06E+03**	4.74E+02	0.5	1.2	-2.5	8.9	0.2	6.6		
MW-68-29	5/7/2024	**8.15E+02**	4.74E+02	0.1	1.1	2.8	6.5	3.0	6.3		
MW-68-29	8/21/2024	<461									
MW-68-57	3/5/2024	**6.62E+02**	4.71E+02	**1.1**	0.9	-0.7	5.2	2.4	3.5		
MW-68-57	5/7/2024	**5.95E+02**	4.47E+02	0.5	1.1	-0.4	5.4	-1.8	6.0		
MW-68-57	8/21/2024	<461									
MW-68-57	10/31/2024	<452									
U1-CSS	5/15/2024	3.12E+02	3.99E+02	0.2	1.4	5.4	8.4	3.6	6.9	-8.7	17.5
U1-NCD	3/4/2024	-5.50E+01	3.72E+02	**8.5**	2.5	**6000.0**	136.5	0.4	7.4	**271.0**	28.6
U1-NCD	5/27/2024	3.04E+02	3.27E+02	**7.7**	2.4	**5890.0**	114.3	0.5	4.6	**196.0**	27.6
U1-NCD	8/26/2024	3.52E+02	3.63E+02	**8.7**	2.1	**7160.0**	81.0	-0.6	3.0	**249.0**	30.6
U1-SFDS	1/31/2024	6.68E+01	3.06E+02	1.1	1.5	2.6	6.7	1.5	7.5	-6.7	16.0
U1-SFDS	4/24/2024	-1.92E+01	2.47E+02	0.7	1.6	1.7	4.9	0.4	4.6	-6.1	19.7
U1-SFDS	7/17/2024	1.71E+02	3.57E+02	**2.8**	1.8	**7.1**	4.7	1.2	2.8	11.4	16.1
U1-SFDS	10/9/2024			1.8	1.9	**11.1**	9.3	0.6	6.5	-5.3	16.8
U1-SFDS	12/15/2024	<452									
U1-SFDS	12/31/2024			1.2	1.7	8.5	9.8	2.4	6.2	-7.4	18.7
U3-4D	3/5/2024	3.78E+02	4.35E+02	0.1	0.9	-0.5	4.7	0.5	5.4		
U3-4D	5/7/2024	2.67E+02	2.93E+02	0.4	0.9	0.9	4.8	-1.1	4.9		
U3-4D	8/21/2024	<461									
U3-4D	10/30/2024	**5.54E+02**									
U3-4S	5/7/2024	6.31E+01	2.67E+02	1.3	1.3	1.9	4.9	0.0	4.8		
U3-4S	10/30/2024	<452									
U3-T1	5/23/2024	-6.92E+01	2.76E+02	0.1	0.7	-0.7	3.6	1.9	3.9		
U3-T1	10/30/2024	**5.39E+02**									
U3-T2	5/23/2024	2.03E+02	2.99E+02	0.0	1.1	2.8	4.2	0.8	2.6		
U3-T2	10/30/2024	<452									

Attachment 3 – 2023 ARERR original page. **Page 1 of 2**

Attachment 7 - 2016 ARERR corrected pages. **Page 4 of 4**

INDIAN POINT 3 NUCLEAR POWER PLANT

RADIOLOGICAL IMPACT ON MAN

JANUARY - DECEMBER 2016

Maximum exposed individual doses in mrem or mrad

Rev 1
10/23

A. LIQUID DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Organ Dose	(mrem)	1.23E--04	3.29E-04	7.07E-05	1.26E-04	**4.98E-04**
Applicable Limit	(mrem)	5	5	5	5	10
Percent of Limit	(%)	#VALUE!	6.58E-03	1.41E-03	2.52E-03	4.98E-03
Age Group		Child	Adult	Child	Child	Child
Critical Organ		Bone	GiLLi	Bone	Bone	Bone

Adult Total Body	(mrem)	2.66E-05	1.11E-04	1.12E-05	3.50E-05	**1.55E-04**
Applicable Limit	(mrem)	1.5	1.5	1.5	1.5	3.0
Percent of Limit	(%)	1.77E-03	7.40E-03	7.47E-04	2.33E-03	5.17E-03

B. AIRBORNE NOBLE GAS DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Gamma Air	(mrad)	1.50E-05	1.64E-05	1.87E-05	1.78E-05	**6.79E-05**
Applicable Limit	(mrad)	5	5	5	5	10
Percent of Limit	(%)	3.00E-04	3.28E-04	3.74E-04	3.56E-04	6.79E-04

Beta Air	(mrad)	1.77E-05	1.96E-05	2.38E-05	2.25E-05	**8.36E-05**
Applicable Limit	(mrad)	10	10	10	10	20
Percent of Limit	(%)	1.77E-04	1.96E-04	2.38E-04	2.25E-04	4.18E-04

C. AIRBORNE IODINE, PARTICULATE, & TRITIUM DOSES (excluding C-14, for info only)

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Iodine/Part	(mrem)	5.96E-04	7.59E-04	7.76E-04	4.96E-04	**2.63E-03**
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	7.95E-03	1.01E-02	1.03E-02	6.61E-03	1.75E-02
Age Group		Child	Child	Child	Child	Child
Critical Organ		Liver	Liver	Liver	Liver	Liver

D. AIRBORNE IODINE, PARTICULATE, TRITIUM, and CARBON-14 DOSES

Child TB Dose	(mrem)	1.74E-02	1.76E-02	1.76E-02	1.73E-02	**7.00E-02**
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	2.33E-01	2.35E-01	2.35E-01	2.31E-01	4.67E-01
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Child Bone Dose	(mrem)	8.45E-02	8.45E-02	8.45E-02	8.45E-02	**3.38E-01**
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	1.13E+00	1.13E+00	1.13E+00	1.13E+00	2.25E+00

Attachment 3 – 2023 ARERR corrected pages. **Page 2 of 2**

Attachment 7 - 2016 ARERR corrected pages. **Page 4 of 4**

INDIAN POINT 3 NUCLEAR POWER PLANT

RADIOLOGICAL IMPACT ON MAN

JANUARY - DECEMBER 2016

Maximum exposed individual doses in mrem or mrad

A. LIQUID DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Organ Dose	(mrem)	1.23E-04	3.29E-04	7.07E-05	1.26E-04	**4.98E-04**
Applicable Limit	(mrem)	5	5	5	5	10
Percent of Limit	(%)	2.46E-03	6.58E-03	1.41E-03	2.52E-03	4.98E-03
Age Group		Child	Adult	Child	Child	Child
Critical Organ		Bone	GiLLi	Bone	Bone	Bone
Adult Total Body	(mrem)	2.66E-05	1.11E-04	1.12E-05	3.50E-05	**1.55E-04**
Applicable Limit	(mrem)	1.5	1.5	1.5	1.5	3.0
Percent of Limit	(%)	1.77E-03	7.40E-03	7.47E-04	2.33E-03	5.17E-03

B. AIRBORNE NOBLE GAS DOSES

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Gamma Air	(mrad)	1.50E-05	1.64E-05	1.87E-05	1.78E-05	**6.79E-05**
Applicable Limit	(mrad)	5	5	5	5	10
Percent of Limit	(%)	3.00E-04	3.28E-04	3.74E-04	3.56E-04	6.79E-04
Beta Air	(mrad)	1.77E-05	1.96E-05	2.38E-05	2.25E-05	**8.36E-05**
Applicable Limit	(mrad)	10	10	10	10	20
Percent of Limit	(%)	1.77E-04	1.96E-04	2.38E-04	2.25E-04	4.18E-04

C. AIRBORNE IODINE, PARTICULATE, & TRITIUM DOSES (excluding C-14, for info only)

		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Iodine/Part	(mrem)	5.96E-04	7.59E-04	7.76E-04	4.96E-04	**2.63E-03**
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	7.95E-03	1.01E-02	1.03E-02	6.61E-03	1.75E-02
Age Group		Child	Child	Child	Child	Child
Critical Organ		Liver	Liver	Liver	Liver	Liver

D. AIRBORNE IODINE, PARTICULATE, TRITIUM, and CARBON-14 DOSES

Child TB Dose	(mrem)	1.74E-02	1.76E-02	1.76E-02	1.73E-02	**7.00E-02**
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	2.33E-01	2.35E-01	2.35E-01	2.31E-01	4.67E-01
		Qtr 1	Qtr 2	Qtr 3	Qtr 4	ANNUAL
Child Bone Dose	(mrem)	8.45E-02	8.45E-02	8.45E-02	8.45E-02	**3.38E-01**
Applicable Limit	(mrem)	7.5	7.5	7.5	7.5	15
Percent of Limit	(%)	1.13E+00	1.13E+00	1.13E+00	1.13E+00	2.25E+00

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