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504-739-6747

W3F1-2025-0014 10 CFR 50.36a

April 30, 2025

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

Subject: Annual Radioactive Effluent Release Report (ARERR) 2024

Waterford Steam Electric Station, Unit 3
Docket No. 50-382
Renewed Facility Operating License No. NPF-38

Attached is the Annual Radioactive Effluent Release Report for the period of January 1 through December 31, 2024. This report is submitted pursuant to the requirements of Waterford 3 Technical Specification Sections 6.9.1.8 and 6.14.2.c.

There are no commitments contained in this submittal.

If you have any questions, please contact John Twarog, Manager, Regulatory Assurance, at 504-739-6747.

Respectfully,

John R. Twarog

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Enclosure: Annual Radioactive Effluent Release Report – 2024

cc: NRC Region IV Regional Administrator
NRC Senior Resident Inspector – Waterford Steam Electric Station, Unit 3
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Entergy Legal, General Sr Counsel

Enclosure to

W3F1-2025-0014

Annual Radioactive Effluent Release Report CY 2024

(50 pages follow)

2024 Annual Radioactive Effluent Release Report
Waterford 3
Document Number: 50-382

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Waterford 3

Annual Radioactive Effluent Release Report

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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. Essentially 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 x 10^4 disintegrations per second, or 2.22 x10^6 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- 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. 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.

25. PWR: Pressurized Water Reactor

26. REC: Radiological Effluent Control

27. REMP: Radiological Environmental Monitoring Program

28. Restricted Area: A 10 CFRR 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.

29. 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).

30. TLD: Thermoluminescent Dosimeter

31. TRM: Technical Requirements Manual

32. TS: Technical Specification

33. Unrestricted Area: An area, access to which is neither limited nor controlled by the licensee.

2.0 EXECUTIVE SUMMARY

Waterford 3 (WF3), license number 50-382, 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 2024 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 2024, the gaseous effluent dose assessments for locations from the Land Use Census showed that the critical receptor for Waterford 3 is child, due to vegetation, at PIT Receptor Location 1.45 km NW. The maximum Annual Organ Dose calculated for this receptor was 2.54E-04 mrem to the liver.

The maximum dose calculated to any organ due to radioactive liquid effluents was 2.54E-04 mrem, for adult Gastrointestinal-Lower Left Intestine organ due to drinking water pathway.

Solid radioactive waste shipped offsite for processing or direct disposal included 58.6 Curies and 1.12E+2 m^3, shipped in 5 shipments.

In addition to monitoring radioactive effluents, WF3 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

During 2024 all solid, liquid, and gaseous radioactive effluents from Waterford 3 were well below regulatory limits, as summarized in Table 1 and Table 2.

Table 1, Waterford 3 Dose Summary[1]

		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	4.57E-05	3.86E-05	2.00E-05	2.37E-05	1.28E-04
	% of Limit	3.05E-03	2.57E-03	1.33E-03	1.58E-03	4.27E-03
Liquid Effluent Dose Limit, Any Organ	Limit	5 mrem	5 mrem	5 mrem	5 mrem	10 mrem
	Max Organ Dose	6.26E-05	9.71E-05	2.93E-05	6.47E-05	2.54E-04
	% of Limit	1.25E-03	1.94E-03	5.86E-04	1.29E-03	2.54E-03
Gaseous Effluent Dose Limit, Gamma Air (Noble Gas)	Limit	5 mrad	5 mrad	5 mrad	5 mrad	10 mrad
	Gamma Air Dose	9.39E-07	9.67E-07	0.00E+00	6.71E-04	6.73E-04
	% of Limit	1.88E-05	1.93E-05	0.00E+00	1.34E-02	6.73E-03
Gaseous Effluent Dose Limit, Beta Air (Noble Gas)	Limit	10 mrad	10 mrad	10 mrad	10 mrad	20 mrad
	Beta Air Dose	2.79E-06	2.88E-06	0.00E+00	2.44E-04	2.50E-04
	% of Limit	2.79E-05	2.88E-05	0.00E+00	2.44E-03	1.25E-03
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	8.61E-03	2.85E-02	8.56E-03	2.65E-03	4.83E-02
	% of Limit	1.15E-01	3.80E-01	1.14E-01	3.53E-02	3.22E-01

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

Table 2, Total Annual Offsite-Dose Comparison to 40 CFR 190 Limits for WF3[2]

	Whole Body	**Thyroid**	**Max Other Organ**
Gaseous[3] (mrem)	6.39E-4	4.83E-2	4.83E-2
Carbon-14 (mrem)	4.13E-01	4.13E-01	2.07E+00
Liquid (mrem)	1.28E-4	1.18E-4	2.54E-4
Groundwater and Storm Drain Total (mrem)	0.00E+0	0.00E+0	0.00E+0
Direct Shine from areas such as dry cask storage, radwaste storage, Equipment Mausoleums (mrem)	4.83E-1	4.83E-1	4.83E-1
Total Site Dose (mrem)	8.97E-01	9.44E-01	2.60E+00
Total w/Other Nearby Facility[4]	0.00E+0	0.00E+0	0.00E+0
Limit	**25 mrem**	**75 mrem**	**25 mrem**
% of Limit	3.59E+00	1.26E+00	1.04E+01

[2] Table 2 is a summation of Units to show compliance with 40 CFR Part 190 Limits.
[3] Gaseous dose values in Table 2 include organ dose from Noble Gas, Iodine, Tritium, and particulates.
[4] Other fuel cycle sources within 5 miles of the site are considered in this analysis.

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.

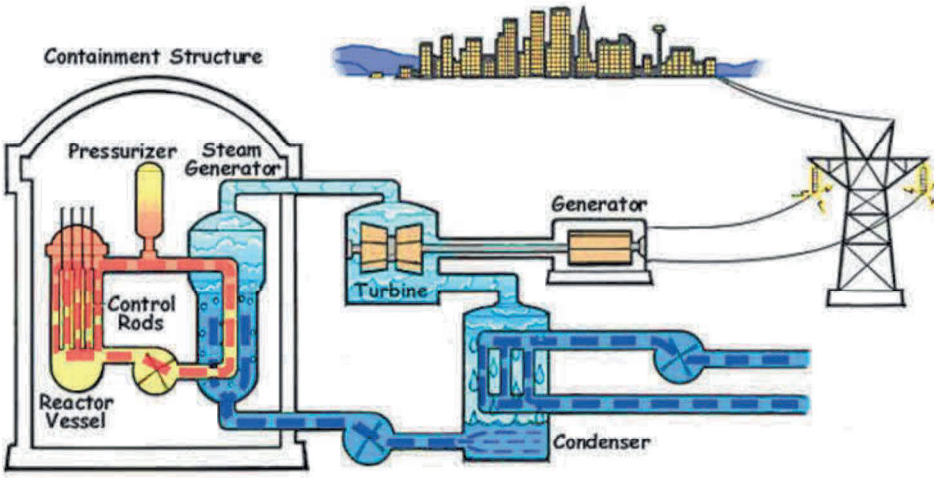

Figure 1, Pressurized Water Reactor (PWR) **[1]**

3.1 (Continued)

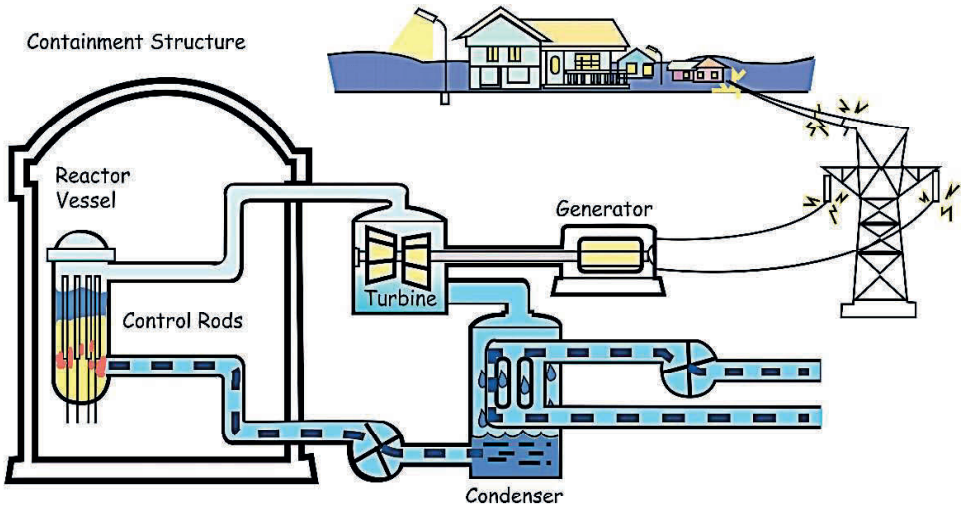

Figure 2, Boiling Water Reactor (BWR) **[2]**

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.

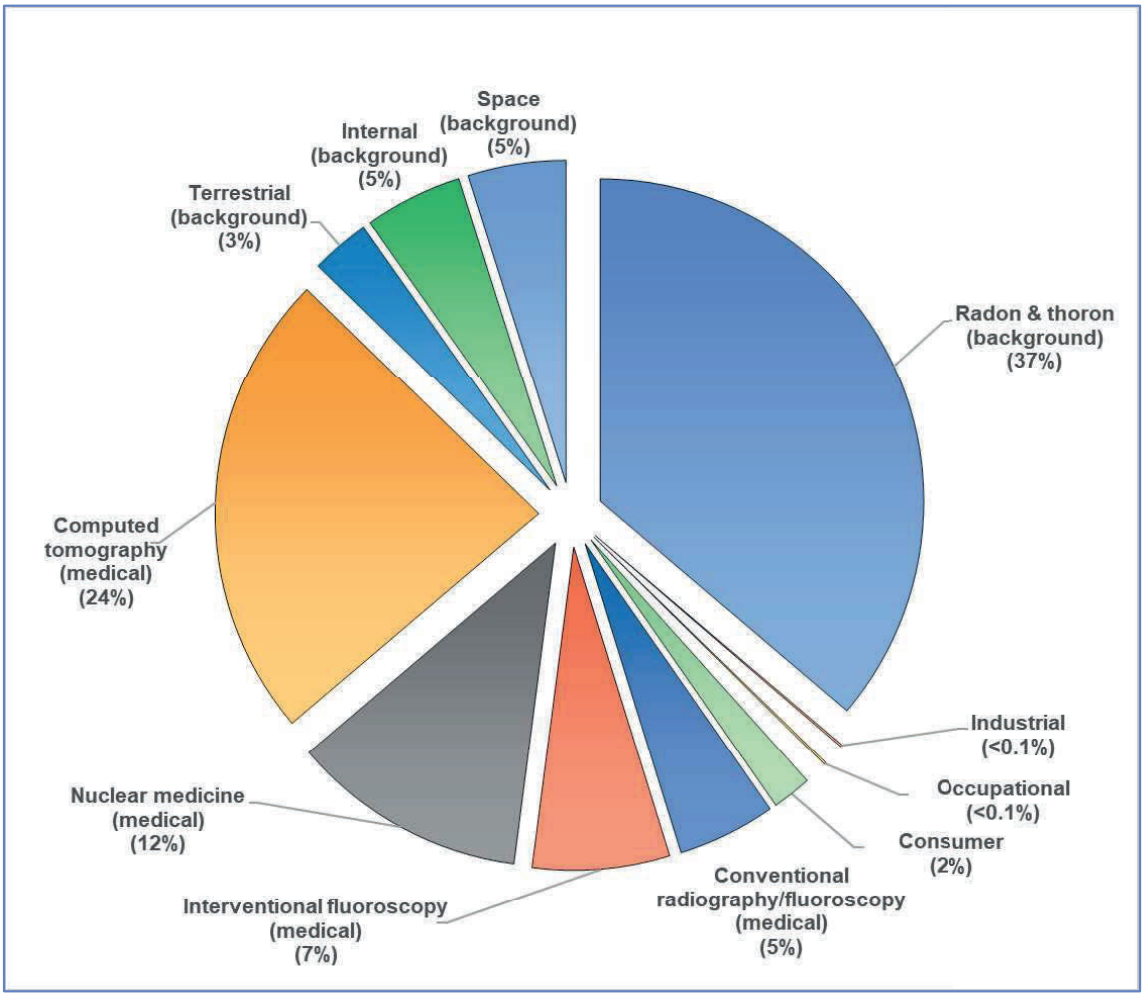

Figure 3, Sources of Radiation Exposure (NCRP Report No. 160) **[3]**

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.

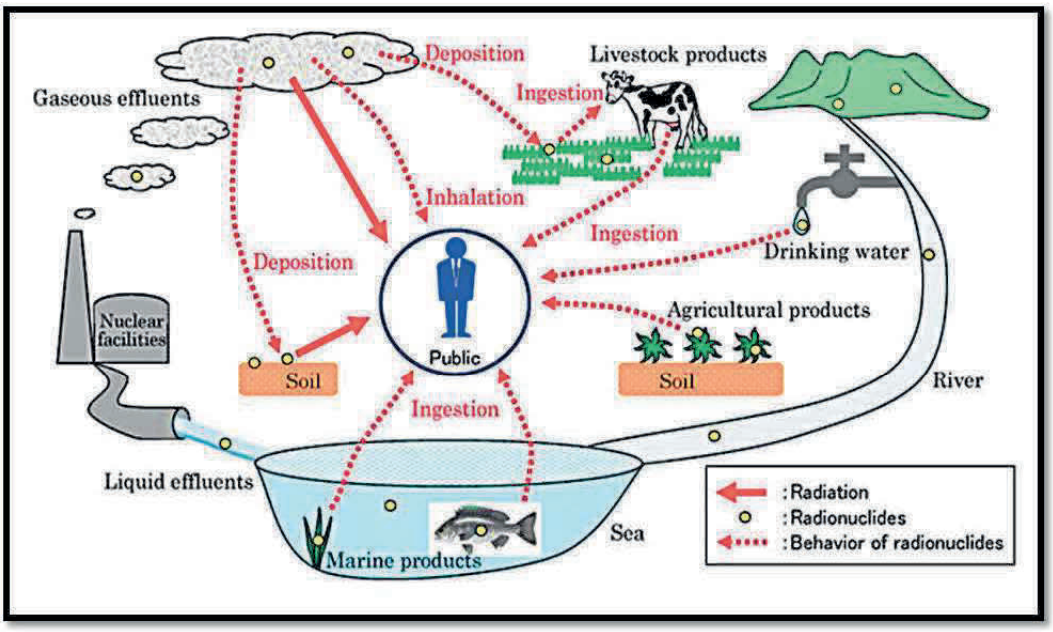

Figure 4, Potential exposure pathways to Members of the Public due to Plant Operations **[6]**

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.

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.

Biennially, 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: Technical Requirements Manual (TRM) and the Offsite Dose Calculation Manual (ODCM). These documents contain the limits to which WF3 must adhere. WF3 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 WF3 is well below the ODCM/TRM 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 2024 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, Waterford 3 Dose Summary and Table 2, Total Annual Offsite-Dose Comparison to 40 CFR 190 Limits for WF3.

4.2 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 mrads gamma

         b) Less than or equal to 10 mrads beta

      2) Yearly

         a) Less than or equal to 10 mrads gamma

         b) Less than or equal to 20 mrads beta

4.2 (Continued)

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 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

4.3 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 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

4.4 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.

4.5 Onsite Doses (Within Site Boundary)

WF3 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 airborne effluents, carbon-14, and direct shine 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 an employee at the Waterford 1 and 2 fossil fuel plants, located in the NW sector at a distance of approximately 670 meters (0.42 miles) from the reactor building. 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	Total
					Noble Gas	Iodine, Particulate, C-14 & H-3	TLD or OSLD	
Waterford 1 and 2 fossil fuel plants	NW	670	9.80E-06	6.40E-08	1.60E-04	2.06E+01	0.00E+00	2.06E+01

5.0 SUPPLEMENTAL INFORMATION

5.1 Gaseous Batch Releases

5.1.1 WF3

Number of batch releases	4
Total time period for a batch release	368 minutes
Maximum time period for a batch release	368 minutes
Average time period for a batch release	368 minutes
Minimum time period for a batch release	368 minutes

5.2 Liquid Batch Releases

5.2.1 WF3

Number of batch releases	94
Total time period for a batch release	27618 minutes
Maximum time period for a batch release	348 minutes
Average time period for a batch release	293.8 minutes
Minimum time period for a batch release	1 minute
Average total flow during period of release	2.04E+8 gpm

5.3 Abnormal Releases

5.3.1 Gaseous Abnormal Releases

There were no abnormal releases during the reporting period.

Number of releases	0
Total activity released	None

5.3.2 Liquid Abnormal Releases

There were no abnormal releases during the reporting period.

Number of releases	0
Total activity released	None

5.4 Land Use Census Changes

A land use census performed in 2024 did not identify the need for any changes to locations being used for effluent dose calculations or radiological environmental sampling.

5.5 Meteorological Data

The USNRC Regulatory Guide 1.23 Revision 1 specifies that for each parameter collected, a 90 percent data recovery rate should be achieved for an annual collection cycle. Also, a joint recovery rate for parameters used in classifying atmospheric transport and diffusion values should be 90 percent. The Primary and Backup Towers provided 94.7% data recovery in 2024. This meets the greater than 90% requirement. An Annual Meteorological Monitoring Program Report is maintained on site and is available for review upon request. Attachment 3, Meteorological Data, provides information on the 2024 Joint Frequency Distributions and Classification of Atmospheric Stability.

5.6 Effluent Radiation Monitors Out of Service Greater Than 30 Days

Technical Requirements Manual (TRM) Specifications 3.3.3.10 and 3.3.3.11 require reporting in the Annual Radioactive Effluent Release Report of why designated inoperable effluent monitoring instrumentation was not restored to operability within the time specified in the Action Statement. Waterford 3 had multiple effluent radiation monitors inoperable greater than the 30 days specified in the action statement of the TRM 3.3.3.10 and 3.3.3.11; however, not all monitors that were inoperable greater than 30 days had TRM entries greater than 30 days. All Waterford 3 effluent radiation monitors that were inoperable for 30 days are more are listed below.

Effluent Radiation Monitor Name	Number of Days Out of Service	Date Range Out of Service	Reason Out of Service >30 Days	Additional Notes (ODCM or TS)
PRM-IRE-0100.1 Plant Stack (PS) Particulate Iodine and Gas (PIG) A	328	9/22/2023 – 8/15/2024	Plank Stack A was taken apart to use parts for the restoration of Containment PIG radiation monitor	EOS 23-0425: Unplanned TRM entry documentation: CR-WF3-2023-15874, CR-WF3-2023-17087, EOS 23-0476, EOS 23-0510, EOS-23-0533, EOS-24-0009 Planned TRM entry documentation: EOS 23-0494, EOS 24- 0168 Multiple planned TRM entries were made for weekly filter replacement on PS B. PS B and/or PS WRGM remained in service during other times of PS A periods of inoperability; therefore, no TRM entry was made greater than 30 days.

Effluent Radiation Monitor Name	Number of Days Out of Service	Date Range Out of Service	Reason Out of Service >30 Days	Additional Notes (ODCM or TS)
PRM-IRE-0100.2 Plant Stack PIG B	54	1/5/2024 – 2/28/2024	The particulate monitor lost flow and Iodine monitor was spiking.	EOS 24-0009: Multiple planned TRM entries were made for weekly filter replacement on PS B. PS WRGM remained in service during other times of PS B periods of inoperability; therefore, no TRM entry was made greater than 30 days.
PRM-IRE-6778 Turbine Building Industrial Waste Sump (TBIWS) PIG	30	1/23/2024 – 2/22/2024	Inoperable due to detector alignment	EOS 24-0038: Entered the TRM for the full time of TBIWS PIG inoperability. Needed to restore in 30 days. This monitor was restored on day 30.
PRM-IRE-0100.2 Plant Stack PIG B	49	4/17/2024 – 6/5/2024	Board failure	EOS 24-0168: Secured CVA train A to comply with TRM 3.3.3.11. Containment purge is not allowed with both Plant Stacks inoperable. Alternate sampling on Plant Stack WRGM.
PRM-IRE-6778 Turbine Building Industrial Waste Sump (TBIWS) PIG	30	9/13/2024 – 10/13/2024	Routed hoses from Industrial Waste Sump #1 to the Oil Separator Sump, bypassing the TBIWS Radiation Monitor	EOS 24-0369: Entered the TRM for the full time of TBIWS PIG inoperability. Needed to restore in 30 days. This monitor was restored on day 30.
PRM-IRE-0648 Gaseous Waste Monitor PIG	587 as of 4/8/2025	8/30/2023 – Current	PMI calibration	EOS 23-0369: TRM is only applicable during releases. Permit numbers documenting releases that occurred during the period of inoperability: W3GB2023-160, W3GB2023-163, W3GB2024-037, W3GB2024-042
PRM-IRE-6776 Dry Cooling Tower Sump (DCTS) 2 PIG	254 as of 4/8/2025	7/28/2024 – Current	Broken Filter Housing	EOS 24-0307: Entered the TRM for the full time of DCTS PIG inoperability.

5.7 Offsite Dose Calculation Manual (ODCM) Changes

There were no changes to the Offsite Dose Calculation Manual, UNT-005-014, in 2024.

5.8 Process Control Program (PCP) Changes

There were no changes to the Process Control Program, EN-RW-105, in 2024.

5.9 Radioactive Waste Treatment System Changes

During the reporting period, no major changes were made to any Radioactive Waste Systems. All major changes to Radioactive Waste Systems are included in Waterford 3's FSAR updates.

5.10 Other Supplemental Information

5.10.1 Unprotected Outside Storage Tank Radioactivity Limit

Technical Specification 3/4.11.1.4 specifies that the quantity of radioactivity contained in each unprotected outdoor storage tank be maintained less than or equal to 7.85E-04 Curies (excluding tritium and dissolved and entrained noble gases). At no time during the reporting period was this value exceeded.

5.10.2 Gaseous Storage Tank Total Radioactivity Limit

Technical Specification 3/4.11.2.6 specifies that the quantity of radioactivity contained in each gas storage tank be maintained less than or equal to 8.5E+04 Curies noble gas (considered as Xe-133 equivalent). At no time during the reporting period was this value exceeded.

5.10.3 Non-Routine Planned Discharges

There were no non-routine planned discharges for the reporting period.

5.10.4 Unavailability of REMP Milk Samples

Due to the unavailability of three milk sampling locations within five kilometers of the plant, Broad Leaf sampling is performed in accordance with Technical Requirements Manual (TRM) Table 3.12-1. The collection of milk occurred until 6/15/2021 when revision 308 of the ODCM became effective at WF3 after the owner of the cows at location MKE-3 got rid of all milking cows and after the 2020 land use census was performed. Before 6/15/2021, milk was collected, when available, from the control location and one identified sampling location as indicated in UNT-005-014, Offsite Dose Calculation Manual, Attachment 13.

5.10.5 Activity Released Via Secondary Pathways

The following secondary release paths were continuously monitored for radioactivity:

- The Hot Machine Shop Exhaust (AH-35)
- Decontamination Shop Exhaust (AH-34)
- The RAB H&V Equipment Room Ventilation System Exhaust (E-41A and E-41B)
- The Switchgear/Cable Vault Area Ventilation System (AH-25)

Continuous sampling for these areas is maintained to demonstrate the operability of installed treatment systems and to verify integrity of barriers separating primary and secondary ventilation systems. Sampling for these areas was limited to continuous particulate and iodine sampling and monthly noble gas grab sampling. The activity released via these secondary pathways resulted from routine operations and remained below significant levels.

5.10.6 Missed or Late for Radioactive Effluent Program Samples or Analysis

There were no missed Radioactive Effluent Program samples or analysis during the calendar year 2024.

5.10.7 Reactor Coolant System Average Energy (E-Bar)

Reactor Coolant System E-Bar calculations were performed on 2/28/2024 and 8/21/2024 with values of 0.5631 and 0.1045 MeV/disintegration, respectively. Reactor Coolant System E-Bar is supplied for information only and is not used for effluent dose calculations.

5.10.8 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 Waterford 3 during 2024 was 9.53E+00 Curies.

Public dose estimates were performed using methodology from the ODCM which is based on Regulatory Guide 1.109 methodology.

5.10.9 Errata/Corrections to Previous ARERRs

Through investigation from a Pre-NRC Assessment (tracked through LO-WLO-2021-00018), Waterford 3 found that Tellurium–123m (Te-123m) was being mislabeled as Nickel-56 (Ni-56). The correction to Table 5 of the 2021 ARERR was shown in the 2023 ARERR. Through rechecking the calculations during the 2024 ARERR submittal, it was found that Table 4 was also affected by the change in nuclide. The 2021 ARERR, Table 4, Liquid Effluents-Summation of All Releases – Waterford 3 had an error in the A.1 quarter 2 Fission & Activation Products. The previous number was 7.11E-4 Ci. The correct number is 7.12E-4 Ci. A snip of page 15 of the 2021 ARERR in its entirety is shown below.

Through investigation from a Pre-NRC Assessment (tracked through LO-WLO-2021-00018), Waterford 3 found that Tellurium–123m (Te-123m) was being mislabeled as Nickel-56 (Ni-56). The correction 2023 ARERR Table 5 was made during preparation of the report. Through rechecking the calculations during the 2024 ARERR submittal, it was found that Table 4 was also affected by the change in nuclide. In the 2023 ARERR, Table 4, Liquid Effluents-Summation of All Releases – Waterford 3 had an error in the A.1 quarter 4 Fission & Activation Products. The previous number was 6.27E-3 Ci. The correct number is 6.28E-3 Ci. A snip of page 21 of the 2023 ARERR in its entirety is shown below.

4.0 LIQUID EFFLUENTS

4.1 Liquid Effluent and Waste Disposal Report

Table 4, Liquid Effluents-Summation of All Releases – Waterford 3

A.	Fission & Activation Products	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1.	Total Release (not including tritium, gases or alpha)	Ci	5.02E-03	7.12E-04	1.28E-03	6.58E-04	2.50E+01
2	Average diluted concentration during period	µCi/mL	1.83E-10	1.96E-11	2.77E-11	2.63E-11	
B.	**Tritium**						
1.	Total Release	Ci	2.95E+01	7.27E+01	1.35E+02	2.15E+02	2.50E+01
2.	Average diluted concentration during period.	µCi/mL	1.07E-06	2.00E-06	2.91E-06	8.60E-06	
C.	**Dissolved & Entrained Gases**						
1.	Total Release	Ci	3.78E-05	0.00E+00	2.45E-05	9.31E-05	2.50E+01
2.	Average diluted concentration during period	µCi/mL	1.37E-12	0.00E+00	5.29E-13	3.73E-12	
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	8.27E+06	1.05E+07	1.40E+07	6.59E+06	
F.	Volume Of Dilution Water Used During Period	Liters	2.75E+10	3.63E+10	4.62E+10	2.50E+10	

% of limit is on the Radiological Impact on Man Table

4.0 LIQUID EFFLUENTS

4.1 Liquid Effluent and Waste Disposal Report

Table 4, Liquid Effluents-Summation of All Releases – Waterford 3

A.	Fission & Activation Products	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1.	Total Release (not including tritium, gases or alpha)	Ci	1.02E-03	4.86E-03	2.23E-03	6.28E-03	2.50E+01
2	Average diluted concentration during period	µCi/mL	4.51E-11	1.66E-10	5.67E-11	1.45E-10	
B.	Tritium						
1.	Total Release	Ci	2.27E+01	1.21E+02	3.99E+02	5.36E+02	2.50E+01
2.	Average diluted concentration during period.	µCi/mL	1.01E-06	4.19E-06	1.01E-05	1.24E-05	
C.	Dissolved & Entrained Gases						
1.	Total Release	Ci	2.16E-04	1.46E-05	8.66E-05	2.14E-03	2.50E+01
2.	Average diluted concentration during period	µCi/mL	9.58E-12	5.03E-13	2.20E-12	4.95E-11	
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	1.00E+07	7.23E+06	6.76E+06	9.26E+06	
F.	Volume Of Dilution Water Used During Period	Liters	2.25E+10	2.90E+10	3.93E+10	4.32E+10	

% of limit is on the Radiological Impact on Man Table

6.0 NEI 07-07 ONSITE RADIOLOGICAL GROUNDWATER MONITORING PROGRAM

Waterford 3 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 2024, WF3 collected and analyzed groundwater samples in accordance with the requirements of EN-CY-111, Radiological Groundwater Protection Program.

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 4, Groundwater Protection Program Monitoring Well Sample Schedule. 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.

Table 4, Groundwater Protection Program Monitoring Well Sample Schedule

Well Name	Tritium	Gamma	HTD	Alpha Emitters
Monitoring Well #3	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #4	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #5	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #6	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #7	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #8	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #9	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #10	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #11	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present
Monitoring Well #12	Quarterly	Quarterly	If tritium or plant-related gamma activity is present	If tritium or plant-related gamma activity is present

The 2024 Radiological Groundwater Monitoring Program results are summarized in Table 5, Groundwater Protection Program Monitoring Well Results. All results were less than minimum detectable activity for gamma emitters and tritium during 2024.

Table 5, Groundwater Protection Program Monitoring Well Results[5]

(all results reported in pCi/L)

Monitoring Well #3														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/21/2024 10:35	0	< 532	**< 8.86**	< 6.86	**< 15.20**	< 7.86	< 16.20	< 7.80	< 12.30	**< 11.90**	< 7.26	< 7.57	< 34.20	< 11.90
2/21/2024 10:55 DUP	0	< 529	< 5.54	**< 8.65**	< 13.70	< 8.83	**< 19.90**	< 7.02	**< 14.60**	< 11.20	< 6.01	< 8.23	**< 37.80**	**< 12.90**
4/9/2024 11:55	0	< 541	< 6.43	< 6.75	< 13.30	< 7.80	< 14.50	**< 8.57**	< 13.70	< 8.64	< 7.14	**< 8.91**	< 26.40	< 9.21
8/1/2024 12:35	0	< 548	< 6.00	< 8.32	< 13.50	< 7.57	< 14.60	< 6.93	< 13.40	< 7.66	< 5.27	< 7.18	< 22.90	< 10.80
10/23/2024 14:40	0	**< 573**	< 5.51	< 7.65	< 14.50	**< 9.51**	< 16.70	< 6.32	< 14.10	< 10.10	**< 7.45**	< 7.76	< 25.80	< 10.70
Monitoring Well #4														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/21/2024 11:45	0	< 542	**< 7.36**	< 6.65	< 14.60	**< 9.92**	< 14.60	< 6.78	**< 13.90**	**< 12.90**	**< 8.86**	< 6.02	< 30.40	< 10.40
4/9/2024 13:15	0	< 567	< 6.48	< 6.44	< 16.80	< 8.43	< 8.78	< 7.88	< 11.10	< 7.08	< 5.89	< 7.29	< 29.70	< 7.71
4/9/2024 13:55 DUP	0	< 550	< 6.88	< 6.17	< 13.80	< 7.69	< 12.30	< 6.69	< 9.10	< 8.70	< 7.16	< 7.43	< 27.40	< 9.45
8/1/2024 11:00	0	< 546	< 6.88	**< 7.87**	< 12.80	< 7.26	< 15.30	< 7.20	< 8.67	< 9.72	< 8.16	< 7.29	< 31.10	**< 10.60**
10/23/2024 13:25	0	**< 571**	< 6.90	< 7.27	**< 17.50**	< 8.97	**< 22.40**	**< 8.47**	< 12.10	< 11.80	< 7.76	**< 7.56**	**< 31.90**	< 9.60
Monitoring Well #5														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/20/2024 15:40	0	< 533	< 7.12	< 7.52	< 15.50	< 8.63	< 15.50	< 8.42	< 10.70	**< 14.00**	< 7.93	< 8.31	**< 35.70**	< 10.40
4/9/2024 16:25	0	< 543	< 6.12	< 5.20	< 12.40	< 5.40	< 11.40	< 6.11	< 10.70	< 8.26	< 7.72	< 7.52	< 22.50	< 8.02
8/1/2024 10:15	0	< 557	**< 8.50**	**< 7.80**	**< 17.70**	**< 11.2**	**< 16.80**	< 7.46	< 12.60	< 10.90	**< 9.47**	**< 9.58**	< 32.80	< 5.21
10/23/2024 12:20	0	**< 568**	< 7.84	< 6.68	< 14.60	< 6.94	**< 16.80**	**< 8.80**	**< 14.20**	< 11.30	< 7.88	< 7.26	< 28.10	**< 12.40**

[5] Maximum concentrations for each well are **BOLDED** throughout the table.

Table 5, Groundwater Protection Program Monitoring Well Results[5]

(all results reported in pCi/L)

Monitoring Well #6														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/20/2024 16:25	0	< 535	< 6.07	< 6.64	< 13.90	< 5.43	< 15.70	< 6.50	< 12.00	< 10.80	< 7.40	< 6.43	< 32.90	< 10.60
4/9/2024 15:20	0	< 543	< 6.68	< 8.24	< 13.90	< 6.30	**< 16.80**	< 7.18	< 12.70	< 9.26	< 6.82	< 6.35	< 28.20	< 10.30
8/1/2024 8:00	0	< 554	< 5.32	< 6.02	< 14.80	< 7.93	< 9.30	< 7.15	< 8.15	< 7.18	< 5.84	< 6.49	< 22.00	< 10.80
8/1/2024 8:40 DUP	0	< 557	< 6.32	< 6.56	< 12.40	< 6.09	< 13.40	< 6.13	< 9.65	< 9.05	< 7.57	< 6.50	< 24.90	< 10.40
10/23/2024 11:10	0	**< 579**	**< 8.10**	**< 8.56**	**< 19.60**	**< 7.97**	< 13.50	**< 8.51**	**< 13.90**	**< 11.70**	**< 8.35**	**< 7.67**	**< 33.20**	**< 10.90**
Monitoring Well #7														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/21/2024 7:30	0	< 540	< 7.00	< 6.63	< 13.80	< 8.21	< 12.80	**< 7.84**	**< 12.10**	< 8.72	< 8.28	< 7.18	**< 32.60**	< 9.17
4/10/2024 15:05	0	< 544	< 5.66	< 5.41	< 13.30	< 6.59	< 12.10	< 6.89	< 10.50	< 7.48	< 6.31	< 6.39	< 23.90	< 7.77
7/31/2024 14:25	0	< 548	< 5.67	< 6.64	**< 14.60**	< 9.28	**< 15.30**	< 5.88	< 10.90	< 8.44	< 5.78	< 7.27	< 29.40	< 9.17
10/22/2024 16:50	0	**< 567**	**< 7.76**	**< 7.84**	< 13.10	**< 10.4**	< 14.30	< 6.96	< 10.50	**< 12.10**	**< 8.76**	**< 7.75**	< 32.20	**< 13.70**
Monitoring Well #8														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/21/2024 8:45	0	< 537	**< 7.94**	< 6.19	< 14.00	< 9.51	**< 16.40**	**< 7.38**	**< 14.30**	**< 12.60**	< 7.57	**< 7.96**	< 28.20	**< 11.40**
4/10/2024 16:10	0	< 534	< 6.54	**< 6.55**	**< 14.20**	**< 10.2**	< 14.30	< 6.73	< 12.70	< 9.61	**< 8.69**	< 7.76	< 28.50	< 9.36
7/31/2024 15:50	0	< 549	< 6.95	< 5.36	< 11.20	< 4.83	< 12.80	< 5.30	< 9.61	< 8.36	< 7.29	< 6.42	< 22.90	< 9.28
10/22/2024 15:40	0	**< 578**	< 4.97	< 5.15	< 11.60	< 6.54	< 10.20	< 5.33	< 9.72	< 8.94	< 5.88	< 6.08	< 22.50	< 7.27
10/22/2024 16:00 DUP	0	< 568	< 7.20	< 6.15	< 14.10	< 6.96	< 15.80	< 7.23	< 12.30	< 11.20	< 6.95	< 6.95	**< 34.20**	< 9.32

Table 6, Groundwater Protection Program Monitoring Well Results[5]

(all results reported in pCi/L)

Monitoring Well #9														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/21/2024 9:35	0	< 544	< 6.14	< 6.49	< 13.30	**< 8.01**	**< 17.40**	**< 6.79**	< 13.20	**< 10.10**	< 6.78	< 7.14	< 30.50	< 9.62
4/10/2024 17:05	0	< 555	< 6.62	**< 6.59**	< 14.20	< 4.86	< 13.90	< 5.95	**< 14.10**	< 8.71	< 7.78	**< 8.17**	< 28.00	< 6.56
7/31/2024 16:55	0	< 555	**< 6.88**	< 5.59	**< 15.70**	< 6.33	< 12.20	< 6.29	< 11.70	< 8.47	< 7.39	< 7.95	< 25.90	< 8.25
10/22/2024 14:50	0	**< 560**	< 6.30	< 6.32	< 13.00	< 6.66	< 13.50	< 6.36	< 11.30	< 9.54	**< 7.83**	< 6.60	**< 31.10**	**< 10.50**
Monitoring Well #10														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/20/2024 12:50	0	< 537	< 7.06	< 6.25	< 15.70	**< 11.2**	**< 18.30**	< 8.25	< 11.40	**< 13.00**	< 7.84	**< 9.25**	**< 36.40**	< 10.80
4/10/2024 14:05	0	< 542	**< 8.39**	< 7.35	< 12.70	< 8.03	< 8.46	< 7.82	< 12.40	< 9.43	**< 8.65**	< 6.81	< 24.60	< 8.56
8/1/2024 13:35	0	< 556	< 7.18	**< 7.70**	**< 17.40**	< 10.1	< 15.70	**< 8.68**	**< 14.30**	< 10.40	< 8.47	< 8.30	< 34.90	< 10.00
10/22/2024 12:50	0	**< 574**	< 5.81	< 5.15	< 12.60	< 7.21	< 13.60	< 6.61	< 11.60	< 9.99	< 6.50	< 6.99	< 29.30	**< 12.40**
Monitoring Well #11														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/20/2024 13:45	0	< 531	< 7.27	**< 7.10**	**< 17.20**	< 8.28	< 15.80	**< 8.52**	< 12.80	**< 12.60**	< 6.93	< 7.02	**< 37.40**	< 8.25
4/10/2024 10:05	0	< 551	**< 9.69**	< 6.76	< 12.90	**< 11.2**	**< 17.40**	< 8.04	< 11.80	< 8.63	< 7.25	**< 8.80**	< 29.40	< 9.22
7/31/2024 17:45	0	< 551	< 5.69	< 6.15	< 13.00	< 7.52	< 13.40	< 6.20	< 10.90	< 9.46	< 6.13	< 6.54	< 28.80	< 7.97
10/22/2024 12:10	0	**< 569**	< 8.44	< 6.67	< 11.70	< 9.00	< 13.30	< 6.33	**< 13.80**	< 10.20	**< 9.16**	< 6.92	< 29.70	**< 9.75**

Table 7, Groundwater Protection Program Monitoring Well Results[5]

(all results reported in pCi/L)

Monitoring Well #12														
Sample Date and Time	Number of Positive Detections	Tritium	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
2/20/2024 11:20	0	< 534	< 6.59	**< 7.29**	< 13.20	**< 8.04**	< 11.90	< 7.07	< 11.60	< 11.30	**< 8.29**	< 7.65	**< 32.50**	**< 13.50**
4/9/2024 9:45	0	< 551	< 5.84	< 6.62	< 13.30	< 6.71	< 14.40	< 6.74	**< 13.60**	< 7.63	< 5.54	< 6.49	< 24.10	< 8.17
7/31/2024 12:40	0	< 556	< 7.10	< 6.66	**< 15.30**	< 3.98	**< 15.30**	< 8.31	**< 13.60**	< 9.94	< 7.87	**< 7.74**	< 32.20	< 8.20
10/22/2024 10:05	0	**< 579**	**< 7.49**	< 6.86	< 14.10	< 7.43	< 14.70	**< 8.66**	< 12.60	**< 11.90**	< 7.17	< 6.85	< 30.80	< 9.48

6.1 Voluntary Notification

During 2024, Waterford 3 did not make a voluntary NEI 07-07 notification to State/Local officials, NRC, and to other stakeholders required by site procedures.

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

1.0 GASEOUS EFFLUENTS

Table 8, Gaseous Effluents Summation of All Releases WF3[6]

A.	Fission & Activation Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1.	Total Release	Ci	5.25E-03	5.40E-03	0.00E+00	1.58E-01	2.50E+01
2.	Average release rate for the period	μCi/sec	6.67E-04	6.87E-04	0.00E+00	1.98E-02	
B.	Iodine						
1.	Total Iodine – 131	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+01
2.	Average release rate for the period	μCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
C.	Particulates						
1.	Particulates with half-lives > 8 days	Ci	0.00E+00	5.91E-08	0.00E+00	0.00E+00	2.50E+01
2.	Average release rate for the period	μCi/sec	0.00E+00	7.52E-09	0.00E+00	0.00E+00	
D.	Tritium						
1.	Total Release	Ci	1.47E+01	4.87E+01	1.46E+01	4.52E+00	2.50E+01
2.	Average release rate for the period	μCi/sec	1.87E+00	6.19E+00	1.84E+00	5.69E-01	
E.	Gross Alpha						
1.	Total Release	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.50E+01
2.	Average release rate for the period	μCi/sec	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
F.	Carbon-14						
1.	Total Release	Ci	1.70E+00	4.80E-01	3.71E+00	3.63E+00	
2.	Average release rate for the period	μCi/sec	2.17E-01	6.11E-02	4.67E-01	4.56E-01	

[6] % of limit is provided in Table 1, Waterford 3 Dose Summary

Table 9, Gaseous Effluents – Ground Level Release Batch Mode WF3

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	1.42E-01	1.42E-01
Xe-133	Ci	5.25E-03	5.40E-03	0.00E+00	1.59E-02	2.66E-02
Total for Period	**Ci**	5.25E-03	5.40E-03	0.00E+00	1.58E-01	1.69E-01
Iodines						
Total for Period	**Ci**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates						
Total for Period	**Ci**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
H-3	Ci	4.02E-01	0.00E+00	0.00E+00	2.40E-01	6.42E-01
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table 10, Gaseous Effluents – Ground Level Release Continuous Mode WF3

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission Gases						
Total for Period	**Ci**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Iodines						
Total for Period	**Ci**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Particulates						
Cs-137	Ci	0.00E+00	5.91E-08	0.00E+00	0.00E+00	5.91E-08
Total for Period	**Ci**	0.00E+00	5.91E-08	0.00E+00	0.00E+00	5.91E-08
Tritium						
H-3	Ci	1.43E+01	4.87E+01	1.46E+01	4.28E+00	8.19E+01
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Carbon-14						
C-14	Ci	1.70E+00	4.80E-01	3.71E+00	3.63E+00	9.53E+00

2.0 LIQUID EFFLUENTS

Table 11, Liquid Effluents – Summation of All Releases WF3 [7]

A.	Fission & Activation Products	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1.	Total Release	Ci	6.48E-03	2.60E-03	4.51E-04	1.53E-03	2.50E+01
2.	Average diluted concentration	μCi/mL	1.49E-10	5.80E-11	6.99E-12	6.46E-11	
B.	Tritium						
1.	Total Release	Ci	5.21E+01	3.58E+01	2.66E+01	2.67E+01	2.50E+01
2.	Average diluted concentration	μCi/mL	1.20E-06	7.97E-07	4.13E-07	1.13E-06	
C.	Dissolved & Entrained Gases						
1.	Total Release	Ci	3.30E-04	3.03E-04	4.78E-04	1.64E-05	2.50E+01
2.	Average diluted concentration	μCi/mL	7.59E-12	6.74E-12	7.41E-12	6.90E-13	
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	1.48E+07	1.75E+07	1.74E+07	6.36E+06	
F.	Volume of Dilution Water Used During Period	Liters	4.35E+10	4.48E+10	6.45E+10	2.37E+10	

[7] % of limit is provided in Table 1, Waterford 3 Dose Summary

Table 12, Batch Mode Liquid Effluents WF3

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission and Activation Products						
Ag-110m	Ci	4.34E-06	0.00E+00	0.00E+00	2.19E-05	2.62E-05
Co-58	Ci	3.67E-04	2.35E-04	5.17E-05	1.08E-04	7.62E-04
Co-60	Ci	2.61E-04	6.87E-04	2.49E-04	1.10E-03	2.30E-03
Cr-51	Ci	3.71E-05	1.11E-03	2.45E-05	0.00E+00	1.17E-03
Mn-54	Ci	5.96E-06	5.51E-05	3.32E-06	6.65E-05	1.31E-04
Na-24	Ci	5.68E-06	0.00E+00	0.00E+00	0.00E+00	5.68E-06
Nb-95	Ci	2.93E-05	2.99E-04	4.38E-05	7.24E-05	4.45E-04
Sb-124	Ci	6.56E-04	6.97E-07	0.00E+00	0.00E+00	6.57E-04
Sb-125	Ci	5.10E-03	2.50E-05	4.26E-05	1.27E-04	5.29E-03
Sb-127	Ci	0.00E+00	8.20E-07	0.00E+00	0.00E+00	8.20E-07
Sn-113	Ci	1.22E-06	0.00E+00	0.00E+00	0.00E+00	1.22E-06
Te-123m	Ci	6.96E-06	2.82E-05	1.27E-05	2.25E-06	4.74E-05
Zn-65	Ci	0.00E+00	0.00E+00	0.00E+00	3.92E-06	3.92E-06
Zr-95	Ci	8.02E-06	1.58E-04	2.32E-05	3.00E-05	2.19E-04
Total for Period	Ci	6.48E-03	2.60E-03	4.51E-04	1.53E-03	1.11E-02
Tritium						
H-3	Ci	5.20E+01	3.57E+01	2.66E+01	2.67E+01	1.41E+02
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Entrained Gases						
Xe-133	Ci	3.06E-04	3.03E-04	4.26E-04	1.64E-05	1.05E-03
Xe-135	Ci	2.38E-05	0.00E+00	5.23E-05	0.00E+00	7.61E-05
Total for Period	Ci	3.30E-04	3.03E-04	4.78E-04	1.64E-05	1.13E-03

Table 13, Continuous Mode Liquid Effluents WF3

Radionuclide Released	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total for year
Fission and Activation Products						
Total for Period	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Tritium						
H-3	Ci	1.39E-02	5.25E-03	3.37E-02	2.19E-02	7.48E-02
Gross Alpha						
Alpha	Ci	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Entrained Gases						
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 14, Types of Solid Waste Summary WF3

Types of Waste	Total Volume (m3)	Total Activity (Ci)	Est. Total Error (%)
a. Spent resins, filter sludges, evaporator bottoms, etc.	2.00E+01	5.85E+01	25
Waste Class A	1.71E+01	1.57E+00	
Waste Class B	2.83E+00	5.70E+01	
Waste Class C	0.00E+00	0.00E+00	
Unclassified	0.00E+00	0.00E+00	
b. Dry compressible waste, contaminated equip, etc.	8.50E+01	5.24E-02	25
Waste Class A	8.50E+01	5.24E-02	
Waste Class B	0.00E+00	0.00E+00	
Waste Class C	0.00E+00	0.00E+00	
Unclassified	0.00E+00	0.00E+00	
c. Irradiated components, control rods, etc.	0.00E+00	0.00E+00	25
Waste Class A	0.00E+00	0.00E+00	
Waste Class B	0.00E+00	0.00E+00	
Waste Class C	0.00E+00	0.00E+00	
Unclassified	0.00E+00	0.00E+00	
d. Other (describe)	6.80E+00	7.47E-03	25
Waste Class A	6.80E+00	7.47E-03	
Waste Class B	0.00E+00	0.00E+00	
Waste Class C	0.00E+00	0.00E+00	
Unclassified	0.00E+00	0.00E+00	

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

Table 15, Major Nuclides WF3

Major Nuclide Composition	%	Curies
a. Spent resins, filter sludges, evaporator bottoms, etc.		
Cr-51	1.08%	1.77E-02
Mn-54	1.35%	2.20E-02
Fe-55	47.01%	7.68E-01
Co-58	7.08%	1.16E-01
Co-60	22.1%	3.61E-01
Ni-63	12.08%	1.97E-01
Cs-137	6.98%	1.14E-01
b. Dry compressible waste, contaminated equip, etc.		
Mn-54	8.63%	4.92E+00
Fe-55	1.52%	8.69E-01
Co-58	12.45%	7.09E+00
Co-60	32.22%	1.83E+01
Ni-63	32.78%	1.87E+01
Zn-65	1.37%	7.81E-01
Sb-125	2.14%	1.22E+00
Cs-137	7.9%	4.50E+00
c. Irradiated components, control rods, etc.		
N/A	N/A	N/A
d. Other (describe)		
N/A	N/A	N/A

3.0 SOLID WASTE DISPOSITION

Table 16, Solid Waste Disposition WF3

Number of Shipments	Mode of Transportation	Destination
4	Hittman Transport	Energy Solutions Bear Creek Processing 1560 Bear Creek Road
1	Landstar Express America	Energy Solutions-Memphis 1790 Dock Street

4.0 IRRADIATED FUEL DISPOSITION

Table 17, Irradiated Fuel Shipments Disposition WF3

Number of Shipments	Mode of Transportation	Destination
None	N/A	N/A

Attachment 3, Meteorological Data

1.0 METEOROLOGICAL DATA SUMMARY

1.1 Joint Frequency Distributions

1. Period of Record: 2024
2. Stability Class: All
    a. Periods of calm (hours): 29
    b. Hours of missing data: 463
    c. Meteorological data are reported in number of hours for all stability classes.
3. Elevation: 10m

Hours of Each Wind Speed and Direction -Stability A												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	0	0	0	0	4	9	11	4	0	0	0	28
NNE	0	0	0	0	10	36	9	0	0	0	0	55
NE	0	0	0	0	13	69	18	0	0	0	0	100
ENE	0	0	0	0	3	14	1	0	0	0	0	18
E	0	0	0	1	3	7	0	0	0	0	0	11
ESE	0	0	0	1	1	12	3	0	0	0	0	17
SE	0	0	0	0	4	11	12	0	0	0	0	27
SSE	0	0	0	0	8	35	24	2	0	0	0	69
S	0	0	0	0	5	36	17	0	0	0	0	58
SSW	0	0	0	3	5	10	6	0	0	0	0	24
SW	0	0	0	1	12	6	4	0	0	0	0	23
WSW	0	0	0	0	5	5	0	0	0	0	0	10
W	0	0	0	0	3	6	2	0	0	0	0	11
WNW	0	0	0	0	2	9	1	0	0	0	0	12
NW	0	0	0	0	7	11	0	0	0	0	0	18
NNW	0	0	0	2	5	11	8	0	0	0	0	26
Total	0	0	0	8	90	287	116	6	0	0	0	507

Hours of Each Wind Speed and Direction -Stability B												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	0	0	0	2	6	18	9	1	0	0	0	36
NNE	0	0	1	1	14	14	3	0	0	0	0	33
NE	0	0	0	0	26	45	4	1	0	0	0	76
ENE	0	0	0	0	3	11	0	1	0	0	0	15
E	0	0	0	1	2	4	0	0	0	0	0	7
ESE	0	0	1	1	2	4	5	0	0	0	0	13
SE	0	0	0	0	5	9	3	3	0	0	0	20
SSE	0	0	0	0	6	31	23	0	0	0	0	60
S	0	0	0	4	5	34	18	0	0	0	0	61
SSW	0	0	1	5	6	13	11	3	0	0	0	39
SW	0	0	1	4	8	4	2	0	0	0	0	19
WSW	0	0	1	2	6	7	0	0	0	0	0	16
W	0	0	1	1	6	9	0	1	0	0	0	18
WNW	0	0	1	1	1	8	4	1	0	0	0	16
NW	0	0	0	2	6	5	0	1	0	0	0	14
NNW	0	0	0	3	11	1	2	0	0	0	0	17
Total	0	0	7	27	113	217	84	12	0	0	0	460

Hours of Each Wind Speed and Direction -Stability C												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	0	0	2	4	11	20	11	3	0	0	0	51
NNE	0	1	1	3	24	11	2	1	0	0	0	43
NE	0	1	2	2	40	47	4	0	0	0	0	96
ENE	0	0	1	0	8	13	3	0	0	0	0	25
E	0	0	0	0	3	1	2	0	0	0	0	6
ESE	0	0	0	6	4	5	1	0	0	0	0	16
SE	0	0	0	1	1	11	12	1	0	0	0	26
SSE	0	0	2	6	5	32	18	2	0	0	0	65
S	0	0	6	4	8	29	11	2	0	0	0	60
SSW	0	0	3	2	4	8	7	2	0	0	0	26
SW	0	0	1	1	12	7	1	1	0	0	0	23
WSW	0	0	3	8	16	12	0	0	0	0	0	39
W	0	0	1	2	16	5	0	1	0	0	0	25
WNW	0	0	0	2	1	7	3	1	0	0	0	14
NW	0	0	2	3	8	10	2	0	0	0	0	25
NNW	0	0	0	12	15	12	4	0	0	0	0	43
Total	0	2	24	56	176	230	81	14	0	0	0	583

Hours of Each Wind Speed and Direction -Stability D												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	1	3	13	20	49	72	56	9	0	0	0	223
NNE	1	2	9	23	54	83	35	6	0	0	0	213
NE	1	2	13	29	80	142	12	1	0	0	0	280
ENE	0	4	7	6	35	110	30	8	1	2	0	203
E	0	0	2	1	13	46	15	0	0	1	0	78
ESE	0	0	1	1	12	31	18	3	1	0	0	67
SE	1	1	3	2	18	81	67	18	0	0	0	191
SSE	0	1	0	3	27	131	50	15	0	0	0	227
S	1	1	5	9	34	93	29	12	0	0	0	184
SSW	3	0	5	11	24	53	28	6	0	0	0	130
SW	0	5	11	9	27	26	11	0	0	0	0	89
WSW	0	3	8	17	18	20	5	0	0	0	0	71
W	1	2	9	5	18	17	5	4	0	0	0	61
WNW	0	0	7	6	11	22	15	2	0	0	0	63
NW	2	3	5	19	28	40	23	0	0	0	0	120
NNW	0	3	17	16	39	36	20	0	0	0	0	131
Total	11	30	115	177	487	1003	419	84	2	3	0	2331

Hours of Each Wind Speed and Direction -Stability E												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	3	6	24	31	60	60	12	0	0	0	0	196
NNE	2	6	24	26	76	69	15	1	0	0	0	219
NE	5	6	15	29	118	76	9	0	0	0	0	258
ENE	4	3	12	17	69	121	15	0	0	0	0	241
E	7	3	6	13	48	123	15	1	0	0	0	216
ESE	2	1	10	14	51	101	16	1	0	0	0	196
SE	1	2	12	18	54	90	26	1	0	0	0	204
SSE	5	3	12	35	115	56	6	0	0	0	0	232
S	1	7	37	46	110	41	2	0	0	0	0	244
SSW	8	11	29	32	41	31	3	0	0	0	0	155
SW	1	7	32	36	23	12	0	0	0	0	0	111
WSW	5	9	35	19	30	8	0	0	0	0	0	106
W	9	7	23	19	19	6	0	0	0	0	0	83
WNW	6	10	14	12	15	10	1	0	0	0	0	68
NW	6	12	13	15	35	11	3	0	0	0	0	95
NNW	4	5	15	13	53	22	1	0	0	0	0	113
Total	69	98	313	375	917	837	124	4	0	0	0	2737

Hours of Each Wind Speed and Direction -Stability F												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	16	3	16	13	7	1	0	0	0	0	0	56
NNE	6	2	9	11	28	1	0	0	0	0	0	57
NE	5	4	8	19	25	2	1	0	0	0	0	64
ENE	4	8	9	5	13	3	0	0	0	0	0	42
E	1	5	6	6	8	1	0	0	0	0	0	27
ESE	7	7	12	8	8	0	0	0	0	0	0	42
SE	5	3	4	5	11	1	0	0	0	0	0	29
SSE	6	8	19	23	40	2	0	0	0	0	0	98
S	14	17	63	47	24	1	0	0	0	0	0	166
SSW	10	22	44	21	6	1	0	0	0	0	0	104
SW	17	21	49	20	2	0	0	0	0	0	0	109
WSW	16	17	32	8	4	0	0	0	0	0	0	77
W	13	19	34	10	6	0	0	0	0	0	0	82
WNW	7	12	22	10	2	0	0	0	0	0	0	53
NW	13	19	12	9	5	0	0	0	0	0	0	58
NNW	7	5	16	12	8	2	0	0	0	0	0	50
Total	147	172	355	227	197	15	1	0	0	0	0	1114

Hours of Each Wind Speed and Direction -Stability G												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	12	9	5	3	0	0	0	0	0	0	0	29
NNE	2	2	4	0	0	0	0	0	0	0	0	8
NE	4	1	2	1	1	0	0	0	0	0	0	9
ENE	3	2	1	1	0	0	0	0	0	0	0	7
E	2	0	1	1	0	0	0	0	0	0	0	4
ESE	4	4	13	0	0	0	0	0	0	0	0	21
SE	4	5	2	1	0	0	0	0	0	0	0	12
SSE	3	7	13	7	13	1	0	0	0	0	0	44
S	2	4	37	28	3	1	0	0	0	0	0	75
SSW	15	17	24	14	1	0	0	0	0	0	0	71
SW	18	22	22	5	0	0	0	0	0	0	0	67
WSW	23	18	10	2	0	0	0	0	0	0	0	53
W	29	21	14	7	0	0	0	0	0	0	0	71
WNW	17	9	9	2	0	0	0	0	0	0	0	37
NW	23	4	4	1	0	0	0	0	0	0	0	32
NNW	7	5	6	2	0	0	0	0	0	0	0	20
Total	168	130	167	75	18	2	0	0	0	0	0	560

Hours of Each Wind Speed and Direction -Stability ALL												
Wind Speed (m/s)												
Wind Direction	0.21-0.75	0.76-1.00	1.01-1.50	1.51-2.0	2.01-3.00	3.01-5.00	5.01-7.00	7.01-10.0	10.01-13.0	13.01-18.0	>18.00	Total
N	32	21	60	73	137	180	99	17	0	0	0	619
NNE	11	13	48	64	206	214	64	8	0	0	0	628
NE	15	14	40	80	303	381	48	2	0	0	0	883
ENE	11	17	30	29	131	272	49	9	1	2	0	551
E	10	8	15	23	77	182	32	1	0	1	0	349
ESE	13	12	37	31	78	153	43	4	1	0	0	372
SE	11	11	21	27	93	203	120	23	0	0	0	509
SSE	14	19	46	74	214	288	121	19	0	0	0	795
S	18	29	148	138	189	235	77	14	0	0	0	848
SSW	36	50	106	88	87	116	55	11	0	0	0	549
SW	36	55	116	76	84	55	18	1	0	0	0	441
WSW	44	47	89	56	79	52	5	0	0	0	0	372
W	52	49	82	44	68	43	7	6	0	0	0	351
WNW	30	31	53	33	32	56	24	4	0	0	0	263
NW	44	38	36	49	89	77	28	1	0	0	0	362
NNW	18	18	54	60	131	84	35	0	0	0	0	400
Total	395	432	981	945	1998	2591	825	120	2	3	0	8292

1.2 Stability class

Table 18, Classification of Atmospheric Stability

Stability Condition	Pasquill Categories	Percentage
Extremely Unstable	A	5.77%
Moderately Unstable	B	5.24%
Slightly Unstable	C	6.64%
Neutral	D	26.54%
Slightly Stable	E	31.16%
Moderately Stable	F	12.68%
Extremely Stable	G	6.38%