Constellation

Constellation Energy Generation, LLC (CEG)
Byron Station
4450 N. German Church Road
Byron, IL 61010-9794

www.constellationenergy.com

May 4, 2023

LTR: BYRON 2023-0022
File: 1D.101
2C.111

United States Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

Byron Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-37 and NPF-66
NRC Docket Nos. STN 50-454 and STN 50-455

Subject: 2022 Annual Radiological Environmental Operating Report (AREOR)

In accordance with Technical Specification 5.6.2, "Annual Radiological Environmental Operating Report," we are submitting the Annual Radiological Environmental Operating Report (AREOR) for Byron Station, Units 1 and 2. This report is required to be submitted to the NRC by May 15th of each year and contains the results of the radiological environmental and meteorological monitoring programs. The Radioactive Effluent Release Report was submitted under separate cover.

Also included are the results of groundwater monitoring conducted in accordance with Constellation's Radiological Groundwater Protection Program (RGPP), which is a voluntary program implemented in 2006. This information is being reported in accordance with a nuclear industry initiative.

If you have any questions regarding this information, please contact Ms. Zoe Cox, Regulatory Assurance Manager, at (815) 406-2800.

Respectfully,

Harris Welt
Site Vice President
Byron Generating Station

HW/AH/JA/hh

Attachment: AREOR Report

cc: Regional Administrator – NRC Region III

NRC Docket No: 50-454
50-455

BYRON NUCLEAR GENERATING STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2022

Prepared By

Teledyne Brown Engineering
Environmental Services

Byron Nuclear Generating Station
Byron, IL 61010

April 2023

Intentionally left blank

Table Of Contents

Appendices

I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Byron Nuclear Generating Station by Constellation covers the period 1 January 2022 through 31 December 2022. During that time period, 1,426 analyses were performed on 1,268 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of BNGS had no adverse radiological impact on the environment.

Surface water samples were analyzed for concentrations of gross beta, tritium (H-3), nickel-63 (Ni-63), and gamma-emitting nuclides. Ground water samples were analyzed for concentrations of tritium and gamma-emitting nuclides. Gross beta activities detected were consistent with those detected in previous years. All surface water samples analyzed for Ni-63 were less than the minimum detectable concentration. Tritium detected in downstream surface water was well below reportable limits and consistent with expected levels as a result of permitted liquid discharges.

Fish (commercially and/or recreationally important species) and sediment samples were analyzed for concentrations of Ni-63 and gamma-emitting nuclides. Cesium-137 (Cs-137) was detected in one sediment sample. No other fission or activation products were detected in fish or in sediment samples.

Air particulate samples were analyzed for concentrations of gross beta and gamma-emitting nuclides. No fission or activation products were detected.

High sensitivity iodine-131 (I-131) analyses were performed on weekly air samples. All results were less than the minimum detectable concentration for I-131.

Cow milk samples were analyzed for concentrations of I-131 and gamma-emitting nuclides. All I-131 results were below the minimum detectable activity. No fission or activation products were found.

Food Product samples were analyzed for concentrations of gamma-emitting nuclides. No fission or activation products were detected.

Environmental gamma radiation measurements were performed quarterly using Optically Stimulated Luminescence Dosimeters (OSLD). Beginning in 2012, Exelon Nuclear changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry were deployed, and Thermoluminescent Dosimetry (TLD) were discontinued. This change may have resulted in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation).

II. Introduction

Byron Station, a two-unit PWR station, is located about two miles east of the Rock River and approximately three miles southwest of Byron in Ogle County, Illinois. The reactors are designed to have capacities of 1,268 and 1,241 MW gross, respectively. Unit One loaded fuel in November 1984 and went online February 2, 1985. Unit Two went online January 9, 1987. The station has been designed to keep releases to the environment at levels below those specified in the codes of federal regulations.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Landauer on samples collected during the period 1 January 2022 through 31 December 2022.

A. Objectives of the REMP

The objectives of the REMP are to:

1. Provide data on measurable levels of radiation and radioactive materials in the site environs.
2. Evaluate the relationship between quantities of radioactive material released from the plant and resultant radiation doses to individuals from principal pathways of exposure.

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways
2. Establishing baseline radiological data of media within those pathways
3. Continuously monitoring those media before and during Station operation to assess Station radiological effects (if any) on man and the environment

III. Program Description

A. Sample Collection

Samples for the BNGS REMP were collected for Constellation by Environmental Inc. (Midwest Labs). This section describes the general collection methods used by Environmental Inc. to obtain environmental samples for the BNGS REMP in 2022. Sample locations and descriptions can be found in Table B–1 and Figures B–1 through B–5, Appendix B.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, ground water, fish and sediment. Two gallon water samples were collected weekly from two surface water locations (BY-12 and BY-29 [Control location]) and quarterly from six ground water locations (BY-14-1, BY-18-1, BY-32, BY-35, BY-37 and BY-38). All samples were collected in new unused plastic bottles, which were rinsed with source water prior to collection. Fish samples comprising the flesh of freshwater drum, golden redhorse, smallmouth redhorse, silver redhorse and common carp were collected semiannually at two locations, BY-29 (control) and BY-31. Sediment samples composed of recently deposited substrate were collected at two locations semiannually, BY-12 and BY-34 (control).

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate, and airborne iodine. Airborne iodine and particulate samples were collected and analyzed weekly at eight locations (BY-01, BY-04, BY-06, BY-08, BY-21, BY-22, BY-23 and BY-24). The control location was BY-08. Airborne iodine and air particulate samples were obtained at each location, using a vacuum pump with charcoal and glass fiber filters attached. The pumps ran continuously and sampled air at the rate of approximately one cubic foot per minute. The air filters and air iodine samples were replaced weekly and sent to the laboratory for analysis.

Terrestrial Environment

The terrestrial environment was evaluated by performing radiological analyses on samples of milk and food products. Milk samples were collected monthly from January through April and November through December, and biweekly May through October. The control location was BY-26-2 and the indicator location was BY-20-1. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite and shipped promptly to the laboratory.

Food products were collected annually in July, August and October at five locations (BY-Control, BY-Quad 1, BY-Quad 2, BY-Quad 3 and BY-Quad 4). Various types of samples were collected and placed in new unused plastic bags and sent to the laboratory for analysis.

Ambient Gamma Radiation

Beginning in 2012, Exelon Nuclear changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry (OSLD) were deployed, and Thermoluminescent Dosimetry (TLD) were discontinued. This change may result in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation).

In recent years, the industry recognized the need for a standard method of reporting environmental dosimetry results. In 2018, Exelon Nuclear began assessing facility-related dose in accordance with ANSI N13.37-2014, Environmental Dosimetry – Criteria for System Design and Implementation. This standard is applicable to passive environmental dosimetry systems used to monitor areas surrounding radiological facilities to assess potential facility-related radiation doses and to verify compliance with public dose limits. Such environmental dosimetry systems include dosimeters which accumulate radiation dose and any readout device required to process the dosimeters. Passive dosimeters include optically stimulated luminescence (OSL) dosimeters which are deployed at field locations around a facility and exchanged periodically (e.g., quarterly). Facility-related dose is calculated using a statistical model that uses baseline historical data and accounts for transit and deploy dose. In 2022, none of the Byron Station field locations listed in this report exhibited facility-related dose as calculated in accordance with this standard.

Each location consisted of 2 OSLD sets. The OSLDs were exchanged quarterly and sent to Landauer for analysis. The OSLDs were placed at locations on and around the BNGS Station site as follows:

An inner ring consisting of 16 locations (BY-101, BY-102, BY-103, BY-104, BY-105, BY-106, BY-107, BY-108, BY-109, BY-110, BY-111, BY-112, BY-113, BY-114, BY-115 and BY-116) near and within the site perimeter representing fence post doses (i.e., at locations where the doses will be potentially greater than maximum annual off–site doses) from BNGS releases.

An outer ring consisting of 16 locations (BY-201, BY-202, BY-203, BY-204, BY-205, BY-206, BY-207, BY-208, BY-209, BY-210, BY-211, BY-212, BY-213, BY-214, BY-215 and BY-216) extending to approximately 5 miles from the site designed to measure possible exposures to close-in population.

A special interest set consisting of seven locations (BY-301-1, BY-301-2, BY-309-1, BY-309-2, BY-309-3, BY-309-4, and BY-314-2) to measure possible exposures from on-site storage facilities.

An other set consisting of seven locations (BY-01, BY-04, BY-06, BY-21, BY-22, BY-23 and BY-24) at locations where air samplers are present.

The balance of one location (BY-08) representing the control area.

The specific OSLD locations were determined by the following criteria:

1. The presence of relatively dense population;
2. Site meteorological data taking into account distance and elevation for each of the sixteen–22 1/2 degree sectors around the site, where estimated annual dose from BNGS, if any, would be most significant;
3. On hills free from local obstructions and within sight of the vents (where practical);
4. And near the closest dwelling to the vents in the prevailing downwind direction if applicable.

Two OSLDs were placed at each location above ground level. The OSLDs were exchanged quarterly and sent to Landauer for analysis.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the BNGS REMP in 2022. The analytical procedures used by the laboratory are listed in Table B-2.

In order to achieve the stated objectives, the current program includes the following analyses:

1. Concentrations of beta emitters in surface water and air particulates
2. Concentrations of gamma emitters in ground and surface water, air particulates, milk, fish, sediment and vegetation
3. Concentrations of tritium in ground and surface water
4. Concentrations of iodine-131 in air and milk
5. Concentrations of nickel-63 in surface water, fish and sediment
6. Ambient gamma radiation levels at various site environs

C. Data Interpretation

The radiological and direct radiation data collected prior to Byron Nuclear Generating Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Byron Nuclear Generating Station was considered operational at initial criticality. In addition, data were compared to previous years' operational data for consistency and trending. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

The lower limit of detection (LLD) was defined as the smallest concentration of radioactive material in a sample that would yield a net count (above background) that would be detected with only a 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD was intended as a before-the-fact estimate of a system (including instrumentation, procedure and sample type) and not as an after-the-fact criteria for the presence of activity. All analyses were designed to achieve the required BNGS detection capabilities for environmental sample analysis.

The minimum detectable concentration (MDC) is defined above with the exception that the measurement is an after-the-fact estimate of the presence of activity.

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity, effecting a negative number. An MDC was reported in all cases where positive activity was not detected.

Gamma spectroscopy results for each type of sample were grouped as follows:

For surface water, ground water, milk and vegetation, twelve nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For fish, sediment, and air particulates, eleven nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

Means and standard deviations of the results were calculated. The standard deviations represent the variability of measured results for different samples rather than single analysis uncertainty.

D. Program Exceptions

For 2022, the BNGS REMP had a sample recovery rate in excess of 99%. Sample anomalies and missed samples are listed in the tables below:

TABLE D-1 LISTING OF SAMPLE ANOMALIES

Sample Type	Location Code	Collection Date	Reason
AP/AI	BY-23	06/28/22	Sample holder was found not fully latched to the pump; filter light in color
AP/AI	BY-22	10/25/22	Pump found with low flow rate and no pressure; pump exchanged
OSLD	BY-22 BY-213-1 BY-213-4	4th Qtr. 2022	One OSLD missing with high wind possible reason; premises searched unsuccessfully.

TABLE D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
SW	BY-29	01/04/22 - 03/01/22	Unable to collect water; river frozen
AP/AI	BY-04	02/22/22	Power outage at the station; sample too small to collect
OSLD	BY-204-2	3rd Qtr. 2022	OSLD missing; the pole removed together with the samples

Each program exception was reviewed to understand the causes of the program exception. Sampling and maintenance errors were reviewed with the personnel involved to prevent recurrence. Occasional equipment breakdowns and power outages were unavoidable.

The overall sample recovery rate indicates that the appropriate procedures and equipment are in place to assure reliable program implementation.

E. Program Changes

There were no program changes in 2022.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly and composited monthly at two locations (BY-12 and BY-29). Of these locations only BY-12 located downstream, could be affected by Byron Nuclear Generating Station's effluent releases. The following analyses were performed:

Gross Beta

Samples from both locations were analyzed for concentrations of gross beta (Table C–I.1, Appendix C). The values ranged from 3.0 to 6.1 pCi/L. Concentrations detected were consistent with those detected in previous years (Figure C–1, Appendix C).

Tritium

Quarterly composites of weekly collections were analyzed for tritium activity (Table C–I.2, Appendix C). Tritium was detected in two samples. (Figure C–2, Appendix C). The concentrations ranged from 492 to 1,360 pCi/L. Tritium detected in downstream surface water was well below reportable limits and consistent with expected levels as a result of permitted liquid discharges.

Nickel

Samples from both locations were analyzed for concentrations of Ni-63 (Table C–I.3, Appendix C). All results were less than the minimum detectable concentration.

Gamma Spectrometry

Samples from both locations were analyzed for gamma-emitting nuclides (Table C–I.4, Appendix C). No nuclides were detected, and all required LLDs were met.

2. Ground Water

Quarterly grab samples were collected at six locations (BY-14-1, BY-18-1, BY-32, BY-35, BY-37 and BY-38). These locations could be affected by Byron Nuclear Generating Station's effluent releases. The following analyses were performed:

Tritium

Quarterly grab samples from the locations were analyzed for tritium activity (Table C–II.1, Appendix C). No tritium was detected, and the required LLD was met (Figures C–3 through C–7, Appendix C).

Gamma Spectrometry

Samples from all locations were analyzed for gamma-emitting nuclides (Table C–II.2 Appendix C). No nuclides were detected, and all required LLDs were met.

3. Fish

Fish samples comprised of freshwater drum, golden redhorse, smallmouth redhorse, silver redhorse and common carp were collected at two locations (BY-29 and BY-31) semiannually. Location BY-31 could be affected by Byron Nuclear Generating Station's effluent releases. The following analyses were performed:

Nickel

The edible portion of fish samples from both locations was analyzed for Ni-63 (Table C–III.1, Appendix C). Nickel-63 was not detected and the required LLD was met.

Gamma Spectrometry

The edible portion of fish samples from both locations was analyzed for gamma-emitting nuclides (Table C–III.1, Appendix C). No nuclides were detected, and all required LLDs were met.

4. Sediment

Aquatic sediment samples were collected at two locations (BY-12 and BY-34) semiannually. BY-12, located downstream, could be affected by Byron Nuclear Generating Station's effluent releases. The following analyses were performed:

Nickel

Sediment samples from both locations were analyzed for Ni-63 (Table C–IV.1, Appendix C). Ni-63 was not detected and the required LLD was met.

Gamma Spectrometry

Sediment samples from both locations were analyzed for gamma-emitting nuclides (Table C–IV.1, Appendix C). Cesium-137 (Cs-137) was detected in one sample at a concentration of 70 pCi/L. This nuclide is found occasionally in sediment at very low levels (just above LLD) and is not distinguishable from background levels. No other fission or activation products were detected and all required LLDs were met.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from eight locations on a weekly basis. The eight locations were separated into three groups: Nearsite samplers within 4 km of the site (BY-21, BY-22, BY-23 and BY-24), Far Field samplers between 4 and 10 km of the site (BY-01, BY-04 and BY-06) and the Control sampler between 10 and 30 km from the site (BY-08). The following analyses were performed:

Gross Beta

Weekly samples were analyzed for concentrations of beta emitters (Table C–V.1 and C–V.2, Appendix C). Detectable gross beta activity was observed at all locations. Comparison of results among the three groups aid in determining the effects, if any, resulting from the operation of BNGS.

The results from the Nearsite locations (Group I) ranged from 6 to 46E–3 pCi/m^3 with a mean of 20E–3 pCi/m^3. The results from the Far Field locations (Group II) ranged from 7 to 46E–3 pCi/m^3 with a mean of 20E–3 pCi/m^3. The results from the Control location (Group III) ranged from 9 to 39E–3 pCi/m^3 with a mean of 20E–3 pCi/m^3. Comparison of the 2022 air particulate data with previous year's data indicate no effects from the operation of BNGS. In addition, a comparison of the weekly mean values for 2022 indicate no notable differences among the three groups. (Figures C–8 through C-12, Appendix C)

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma-emitting nuclides (Table C–V.3, Appendix C). No nuclides were detected, and all required LLDs were met.

b. Airborne Iodine

Continuous air samples were collected from eight locations (BY-01, BY-04, BY-06, BY-08, BY-21, BY-22, BY-23 and BY-24) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). All results were less than the minimum detectable concentration for I-131.

2. Terrestrial

a. Milk

Samples were collected from two locations (BY-20-1 and BY-26-2) monthly from January to April and November through December, and biweekly May through October. The following analyses were performed:

Iodine-131

Milk samples from all locations were analyzed for concentrations of I-131 (Table C–VII.1, Appendix C). No nuclides were detected, and all required LLDs were met.

Gamma Spectrometry

Each milk sample was analyzed for concentrations of gamma-emitting nuclides (Table C–VII.2, Appendix C). No nuclides were detected, and all required LLDs were met.

b. Vegetation

Vegetation samples were collected at five locations (BY-Control, BY-Quad 1, BY-Quad 2, BY-Quad 3 and BY-Quad 4). Four locations (BY-Quad 1, BY-Quad 2, BY-Quad 3 and BY-Quad 4) could be affected by Byron Nuclear Generating Station's effluent releases. The following analysis was performed:

Gamma Spectrometry

Samples from all locations were analyzed for gamma- emitting nuclides (Table C–VIII.1, Appendix C). No nuclides were detected, and all required LLDs were met.

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing OSLDs. Ninety-one OSLD locations were established around the site. Results of OSLD measurements are listed in Tables C–IX.1 to C–IX.3, Appendix C.

All OSLD measurements were below 29 mR/standard quarter, with a range of 15 to 29 mR/standard quarter. A comparison of the Inner Ring, Outer Ring, Special Interest, Other and Control Location data indicate that the ambient gamma radiation levels were comparable among the groups.

D. Land Use Survey

A Land Use Survey conducted during August 2022 around the Byron Nuclear Generating Station (BNGS) was performed by Environmental Inc. (Midwest Labs) for Constellation to comply with the Byron Nuclear Generating Station's Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident, livestock, and milk producing animals in each of the sixteen 22 ½ degree sectors. The results of this survey are summarized as follows:

Distance in Miles from the BNGS Vent Stacks				
Sector		Residence Miles	Livestock Miles	Milk Farm Miles
A	N	1.2	5.9	-
B	NNE	1.6	6.2	-
C	NE	1.1	2.0	-
D	ENE	1.4	3.7	-
E	E	1.0	4.2	-
F	ESE	1.5	1.5	-
G	SE	1.7	3.5	-
H	SSE	0.7	3.3	-
J	S	0.6	0.7	-
K	SSW	0.7	0.7	-
L	SW	0.8	2.0	-
M	WSW[(a)]	1.6	0.8	4.5
N	W	1.8	3.2	-
P	WNW	1.6	1.6	11.5
Q	NW	0.8	1.5	-
R	NNW	0.9	1.4	-

[(a)] *Denotes the nearest industrial facility located at 1.5 miles*

E. Errata Data

Please see Appendix G for 2021 ARERR errata data. There was no other errata data for 2022.

F. Summary of Results – Inter-Laboratory Comparison Program

The TBE Laboratory analyzed Performance Evaluation (PE) samples of air particulate, air iodine (charcoal), milk, soil, vegetation and water (including fish) matrices (Appendix D). The PE sample matrices were chosen based on the types of samples submitted to the primary laboratory for analysis. The selected parameters for the PE samples are based on the appropriate matrices, methodologies and geometries, which include geometries that are comparable. The PE samples, supplied by Analytics Inc., Environmental Resource Associates (ERA) and DOE's Mixed Analyte Performance Program (MAPEP) were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

   Analytics' evaluation report provides a ratio of laboratory results and Analytics' known value. Since flag values are not assigned by Analytics, TBE-ES evaluates the reported ratios based on internal QC requirements, which are based on the DOE MAPEP criteria.

2. ERA Evaluation Criteria

   ERA's evaluation report provides an acceptance range for control and

warning limits with associated flag values. ERA's acceptance limits are established per the USEPA, NELAC, state specific PT program requirements or ERA's SOP for the Generation of Performance Acceptance Limits, as applicable. The acceptance limits are either determined by a regression equation specific to each analyte or a fixed percentage limit promulgated under the appropriate regulatory document.

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values. MAPEP defines three levels of performance:

   - Acceptable (flag = "A") - result within ± 20% of the reference value
   - Acceptable with Warning (flag = "W") - result falls in the ± 20% to ± 30% of the reference value
   - Not Acceptable (flag = "N") - bias is greater than 30% of the reference value

   Note: The Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP) samples are created to mimic conditions found at DOE sites which do not resemble typical environmental samples obtained at commercial nuclear power facilities. .

For the TBE laboratory, 142 out of 150 analyses performed met the specified acceptance criteria. Eight analyses did not meet the specified acceptance criteria and were addressed through the TBE Corrective Action Program. *NOTE: Two analyses (soil for Tc-99 and U-238) that did not meet acceptance criteria was performed for TBE information and is not on the list of required ICP analyses.* A summary is found below:

1. The Analytics March 2022 AP Ce-141 result was evaluated as *Not Acceptable*. The reported value for Ce-141 was 60.9 pCi and the known result was 42.0 pCi/L (1.45 ratio of reported result vs. known; TBE's internal acceptance range is 0.70 - 1.30). This sample was used as the workgroup duplicate with a result of 45.7 (109% of known) and was also counted on a different detector with a result of 50.9 (121% of known). This was TBE's first failure for AP Ce-141. (NCR 22-04)
2. The MAPEP February 2022 Urine U-234 & U-238 results were evaluated as *Not Acceptable*. TBE's reported values of 0.142 and 0.0254 were above the known upper ranges of 0.0096 and 0.0134 respectively for U-234 and U-238. These spiked values were below TBE's typical MDC for urine client samples. The samples were re-prepped using a larger sample aliquot and counted for 60 hours as opposed to 48 hours. The recount results were 0.00732 for U-234 and 0.0119 for U-238 (both within acceptable range). MAPEP urine

samples will be flagged to use a larger sample aliquot and counting time than typical client samples. MAPEP did not include any urine cross-check samples in August. (NCR 22-05)

3. The ERA MRAD September 2022 AP Pu-238 was evaluated as *Not Acceptable*. The reported value was 38.8 pCi and the known result was 29.9 (acceptance range 22.6 – 36.7). The AP filter was cut in half prior to digestion (shared with Fe-55) but should have been complete digested together and aliquotted afterwards like typical client samples. This is the first failure for AP Pu-238. (NCR 22-19)
4. The ERA October 2022 water Uranium result was evaluated as *Not Acceptable*. The reported value was 10.54 pCi/L and the known was 8.53 (acceptance range 6.60 – 9.88) or 124% of the known (acceptable for TBE QC). The 2-sigma error was 3.2, placing the reported result well within the acceptable range. This sample was used as the workgroup duplicate with a result of 8.2 +/- 2.9 pCi/L (also within the acceptable range). All other QA was reviewed with no anomalies. (NCR 22-20)
5. The Analytics AP Co-60 result was evaluated as *Not Acceptable*. The reported value was 207 pCi and the known was 147 (141% of the known). TBE's internal QC acceptance is 70 - 130%. All QA was reviewed with no anomalies. This sample was used as the workgroup duplicate and counted on a different detector with a result of 167 pCi (114% of the known). This is the first failure for AP Co-60 – average result ratio compared to the known is 109%. (NCR 22-21)
6. The MAPEP August 2022 water Tc-99 result was evaluated as *Not Acceptable*. The reported value was 1.86 +/- 0.414 Bq/L for this "false positive" test. The evaluation of the submitted result to the 3 times the uncertainty indicated a slight positive. This sample was used as the workgroup duplicate with a result of 0.88 +/- 0.374 Bq/L. All QC was reviewed, and no anomalies found. This is the first unacceptable since the resumption of reporting water Tc-99 for the 3rd quarter of 2020. TBE to known ratios have ranged from 94-109% during this time. (NCR 22-22)

The Inter-Laboratory Comparison Program provides evidence of "in control" counting systems and methods, and that the laboratories are producing accurate and reliable data.

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

Intentionally left blank

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BYRON NUCLEAR GENERATING STATION, 2022

NAME OF FACILITY: BYRON NUCLEAR GENERATING STATION | **DOCKET NUMBER:** 50-454 & 50-455

LOCATION OF FACILITY: BYRON, IL | **REPORTING PERIOD:** 2022

MEDIUM OR PATHWAY SAMPLED (Uint of Measurement)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	**GR-B**	22	**4**	5.2 (10/12) *4.1 - 6.1*	4.6 (8/10) *3.0 - 6.0*	5.2 (10/12) *4.1 - 6.1*	BY-12 INDICATOR OREGON POOL OF ROCK RIVER - DOWNSTREAM 4.5 MILES SSW OF SITE	0
	H-3	8	**200**	926 (2/4) *492 - 1360*	<LLD	1360 (2/4) *492 - 1360*	BY-12 INDICATOR OREGON POOL OF ROCK RIVER - DOWNSTREAM 4.5 MILES SSW OF SITE	0
	NI-63	22	**30**	<LLD	<LLD	-		0
	GAMMA	22						
	MN-54		**15**	<LLD	<LLD	-		0
	CO-58		**15**	<LLD	<LLD	-		0
	FE-59		**30**	<LLD	<LLD	-		0
	CO-60		**15**	<LLD	<LLD	-		0
	ZN-65		**30**	<LLD	<LLD	-		0
	NB-95		**15**	<LLD	<LLD	-		0
	ZR-95		**30**	<LLD	<LLD	-		0
	I-131		**15**	<LLD	<LLD	-		0
	CS-134		**15**	<LLD	<LLD	-		0
	CS-137		**18**	<LLD	<LLD	-		0
	BA-140		**60**	<LLD	<LLD	-		0
	LA-140		**15**	<LLD	<LLD	-		0
GROUND WATER (PCI/LITER)	**H-3**	24	**200**	<LLD	NA	-		0
	GAMMA	24						
	MN-54		**15**	<LLD	NA	-		0
	CO-58		**15**	<LLD	NA	-		0
	FE-59		**30**	<LLD	NA	-		0
	CO-60		**15**	<LLD	NA	-		0
	ZN-65		**30**	<LLD	NA	-		0
	NB-95		**15**	<LLD	NA	-		0
	ZR-95		**30**	<LLD	NA	-		0
	I-131		**15**	<LLD	NA	-		0
	CS-134		**15**	<LLD	NA	-		0
	CS-137		**18**	<LLD	NA	-		0
	BA-140		**60**	<LLD	NA	-		0
	LA-140		**15**	<LLD	NA	-		0

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BYRON NUCLEAR GENERATING STATION, 2022

NAME OF FACILITY: BYRON NUCLEAR GENERATING STATION **DOCKET NUMBER:** 50-454 & 50-455

LOCATION OF FACILITY: BYRON, IL **REPORTING PERIOD:** 2022

MEDIUM OR PATHWAY SAMPLED (Uint of Measurement)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FISH	**NI-63**	8	**260**	<LLD	<LLD	-		0
(PCI/LITER)	**GAMMA**	8						
	MN-54		**130**	<LLD	<LLD	-		0
	CO-58		**130**	<LLD	<LLD	-		0
	FE-59		**260**	<LLD	<LLD	-		0
	CO-60		**130**	<LLD	<LLD	-		0
	ZN-65		**260**	<LLD	<LLD	-		0
	NB-95		*NA*	<LLD	<LLD	-		0
	ZR-95		*NA*	<LLD	<LLD	-		0
	CS-134		**130**	<LLD	<LLD	-		0
	CS-137		**150**	<LLD	<LLD	-		0
	BA-140		*NA*	<LLD	<LLD	-		0
	LA-140		*NA*	<LLD	<LLD	-		0
SEDIMENT	**NI-63**	4	**260**	<LLD	<LLD	-		0
(PCI/KG DRY)	**GAMMA**	4				-		
	MN-54		*NA*	<LLD	<LLD			0
	CO-58		*NA*	<LLD	<LLD	-		0
	FE-59		*NA*	<LLD	<LLD	-		0
	CO-60		*NA*	<LLD	<LLD	-		0
	ZN-65		*NA*	<LLD	<LLD	-		0
	NB-95		*NA*	<LLD	<LLD	-		0
	ZR-95		*NA*	<LLD	<LLD	-		0
	CS-134		**150**	<LLD	<LLD	-		0
	CS-137		**180**	70 (1/2)	<LLD	70 (1/2)	BY-12 INDICATOR OREGON POOL OF ROCK RIVER - DOWNSTREAM	0
	BA-140		*NA*	<LLD	<LLD	-	4.5 MILES SSW OF SITE	0
	LA-140		*NA*	<LLD	<LLD	-		0
AIR PARTICULATE	**GR-B**	415	**10**	20 (362/363) *6 - 46*	20 (52/52) *9 - 39*	21 (51/51) *7 - 46*	BY-04 INDICATOR PAYNES POINT 5.0 MILES SE OF SITE	0
(E-3 PCI/CU.METER)	**GAMMA**	32						
	MN-54		*NA*	<LLD	<LLD	-		0
	CO-58		*NA*	<LLD	<LLD	-		0
	FE-59		*NA*	<LLD	<LLD	-		0
	CO-60		*NA*	<LLD	<LLD	-		0
	ZN-65		*NA*	<LLD	<LLD	-		0
	NB-95		*NA*	<LLD	<LLD	-		0
	ZR-95		*NA*	<LLD	<LLD	-		0
	CS-134		**15**	<LLD	<LLD	-		0
	CS-137		**18**	<LLD	<LLD	-		0
	BA-140		*NA*	<LLD	<LLD	-		0
	LA-140		*NA*	<LLD	<LLD	-		0

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BYRON NUCLEAR GENERATING STATION, 2022

NAME OF FACILITY: BYRON NUCLEAR GENERATING STATION **DOCKET NUMBER:** 50-454 & 50-455

LOCATION OF FACILITY: BYRON, IL **REPORTING PERIOD:** 2022

MEDIUM OR PATHWAY SAMPLED (Uint of Measurement)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSES PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
AIR IODINE	**GAMMA**	415						
(E-3 PCI/CU.METER)	*I-131 (GELI)*		**70**	<LLD	<LLD	-		0
MILK	**I-131 (LOW LVL)**	38	**1**	<LLD	<LLD	-		0
(PCI/LITER)								
	GAMMA							
	MN-54	38	*NA*	<LLD	<LLD	-		0
	CO-58		*NA*	<LLD	<LLD	-		0
	FE-59		*NA*	<LLD	<LLD	-		0
	CO-60		*NA*	<LLD	<LLD	-		0
	ZN-65		*NA*	<LLD	<LLD	-		0
	NB-95		*NA*	<LLD	<LLD	-		0
	ZR-95		*NA*	<LLD	<LLD	-		0
	CS-134		**15**	<LLD	<LLD	-		0
	CS-137		**18**	<LLD	<LLD	-		0
	BA-140		**60**	<LLD	<LLD	-		0
	LA-140		**15**	<LLD	<LLD	-		0
VEGETATION	**GAMMA**	11						
(PCI/KG WET)	*MN-54*		*NA*	<LLD	<LLD	-		0
	CO-58		*NA*	<LLD	<LLD	-		0
	FE-59		*NA*	<LLD	<LLD	-		0
	CO-60		*NA*	<LLD	<LLD	-		0
	ZN-65		*NA*	<LLD	<LLD	-		0
	NB-95		*NA*	<LLD	<LLD	-		0
	ZR-95		*NA*	<LLD	<LLD	-		0
	I-131		**60**	<LLD	<LLD	-		0
	CS-134		**60**	<LLD	<LLD	-		0
	CS-137		**80**	<LLD	<LLD	-		0
	BA-140		*NA*	<LLD	<LLD	-		0
	LA-140		*NA*	<LLD	<LLD	-		
DIRECT RADIATION	**OSLD-QUARTERLY**	331	*NA*	23.2	20.0	26.0	BY-107-2 INDICATOR	0
(MILLIREM/QTR.)				(327/327)	(4/4)	(4/4)		
				15 - 30	*17 - 22*	*24 - 28*	1.4 MILES SE	

(M) The Mean Values are calculated using the positive values. (F) Fraction of detectable measurement are indicated in parentheses.

Intentionally left blank

Intentionally left blank

APPENDIX B

LOCATION DESIGNATION, DISTANCE & DIRECTION, AND SAMPLE COLLECTION & ANALYTICAL METHODS

Intentionally Left Blank

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Byron Nuclear Generating Station, 2022

Location	Location Description	Distance & Direction From Site
A. Surface Water		
BY-12	Oregon Pool of Rock River, Downstream	4.5 miles SSW
BY-29	Byron, Upstream (control)	3.0 miles N
B. Ground/Well Water		
BY-14-1	3200 North German Church Road	1.0 miles SSE
BY-18-1	Calhoun	0.7 miles SSW
BY-32	Krueger Well	1.9 miles W
BY-35	Vancko Well	1.9 miles WNW
BY-37	Cavage Well	2.0 miles WNW
BY-38	Steve Storz Well	2.0 miles WNW
C. Milk		
BY-20-1	Ron Snodgrass Farm	4.8 miles WSW
BY-26-2	Joseph Akins Farm (control)	12.2 miles WNW
D. Air Particulates / Air Iodine		
BY-01	Byron	3.0 miles N
BY-04	Paynes Point	5.0 miles SE
BY-06	Oregon	4.7 miles SSW
BY-08	Leaf River (control)	7.0 miles WNW
BY-21	Byron Nearsite North	0.3 miles N
BY-22	Byron Nearsite Southeast	0.4 miles SE
BY-23	Byron Nearsite South	0.6 miles S
BY-24	Byron Nearsite Southwest	0.7 miles SW
E. Fish		
BY-29	Byron, Upstream (control)	3.0 miles N
BY-31	Byron, Discharge	2.6 miles WNW
F. Sediment		
BY-12	Oregon Pool of Rock River, Downstream	4.6 miles SSW
BY-34	Rock River, Upstream of Discharge (control)	2.6 miles WNW
G. Vegetation		
Quadrant 1	5186 Cox Road, Stillman Valley	4.6 miles E
Quadrant 2	4834 Brick Road, Oregon	4.9 miles SE
Quadrant 3	555 Park Rd, Oregon	3.7 miles SW
Quadrant 4	4615 N Razorville Road., Byron	2.7 miles SW
Quadrant 4	8547 Hedge Road, Byron	4.4 miles NNW
Control	2327 Route 251, Rochelle	20.7 miles SE
H. Environmental Dosimetry - OSLD		
Inner Ring		
BY-101-1 and -2		0.3 miles N
BY-102-1		1.0 miles NNE
BY-102-2		1.0 miles NNE
BY-103-1 and -2		1.7 miles NE
BY-103-3		0.4 miles NE
BY-104-1 and -2		1.4 miles ENE
BY-104-3		0.3 miles ENE
BY-105-1 and -2		1.3 miles E
BY-106-1 and -2		1.4 miles ESE
BY-107-1 and -2		1.4 miles SE
BY-107-3		0.4 miles SE
BY-108-1		0.7 miles SSE
BY-108-2		0.6 miles SSE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Byron Nuclear Generating Station, 2022

Location	Location Description	Distance & Direction From Site
BY-109-1 and -2		0.6 miles S
BY-110-1 and -2		0.7 miles SSW
BY-111-3		0.8 miles SW
BY-111-4		0.9 miles SW
BY-112-3 and -4		0.8 miles WSW
BY-113-1 and -2		0.7 miles W
BY-114-1 and -2		0.8 miles WNW
BY-115-1 and -2		1.0 miles NW
BY-116-1 and -2		1.4 miles NNW
BY-116-3		0.9 miles NNW
Outer Ring		
BY-201-3		4.4 miles N
BY-201-4		4.4 miles N
BY-202-1		4.4 miles NNE
BY-202-2		4.8 miles NNE
BY-203-1		4.8 miles NE
BY-203-2		4.7 miles NE
BY-204-1		4.1 miles ENE
BY-204-2		4.0 miles ENE
BY-205-1 and -2		3.8 miles E
BY-206-1		4.0 miles ESE
BY-206-2		4.3 miles ESE
BY-207-1		4.2 miles SE
BY-207-2		3.9 miles SE
BY-208-1		4.0 miles SSE
BY-208-2		3.8 miles SSE
BY-209-1 and -4		4.0 miles S
BY-210-3 and -4		3.9 miles SSW
BY-211-1 and -4		4.9 miles SW
BY-212-1 and -4		4.7 miles WSW
BY-213-1		4.7 miles W
BY-213-4		4.7 miles W
BY-214-1		4.7 miles WNW
BY-214-4		4.6 miles WNW
BY-215-1		4.2 miles NW
BY-215-4		4.2 miles NW
BY-216-1		4.5 miles NNW
BY-216-2		4.7 miles NNW
Special Interest		
BY-301-1		0.3 miles N
BY-301-2		0.2 miles N
BY-309-1		0.3 miles S
BY-309-2		0.4 miles S
BY-309-3		0.4 miles S
BY-309-4		0.4 miles SSW
BY-314-2		0.3 miles WNW
Other		
BY-01-1 and -2		3.0 miles N
BY-04-1 and -2		5.0 miles SE
BY-06-1 and -2		4.7 miles SSW
BY-21-1 and -2		0.3 miles N
BY-22-1 and -2		0.4 miles SE
BY-23-1 and -2		0.6 miles S
BY-24-1 and -2		0.7 miles SW
Control		
BY-08-1 and -2		7.0 miles WNW

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Byron Nuclear Generating Station, 2022

Sample Medium	Analysis	Sampling Method	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from weekly grab samples.	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Surface Water	Gross Beta	Monthly composite from weekly grab samples.	TBE, TBE-2008 Gross Alpha and/or Gross Beta Activity in Various Matrices
Surface Water	Nickel-63	Monthly composite from weekly grab samples.	TBE, TBE-2013 Radionickel Activity in Various Matrices
Surface Water	Tritium	Quarterly composite from weekly grab samples.	TBE, TBE-2011 Tritium Analysis in Drinking Water by Liquid Scintillation
Ground Water	Gamma Spectroscopy	Quarterly grab samples.	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Ground Water	Tritium	Quarterly grab samples.	TBE, TBE-2011 Tritium Analysis in Drinking Water by Liquid Scintillation
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Fish	Nickel-63	Semi-annual samples collected via electroshocking or other techniques	TBE, TBE-2013 Radionickel Activity in Various Matrices
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Sediment	Nickel-63	Semi-annual grab samples	TBE, TBE-2013 Radionickel Activity in Various Matrices
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	TBE, TBE-2008 Gross Alpha and/or Gross Beta Activity in Various Matrices
Air Particulates	Gamma Spectroscopy	Quarterly composite of continuous air sapling through glass fiber filter paper	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Air Iodine	Gamma Spectroscopy	One-week composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2012 Radioiodine in Various Matrices
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
Vegetation	Gamma Spectroscopy	Annual grab samples.	TBE, TBE-2007 Gamma-Emitting Radioisotope Analysis
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements.	Landauer Incorporated

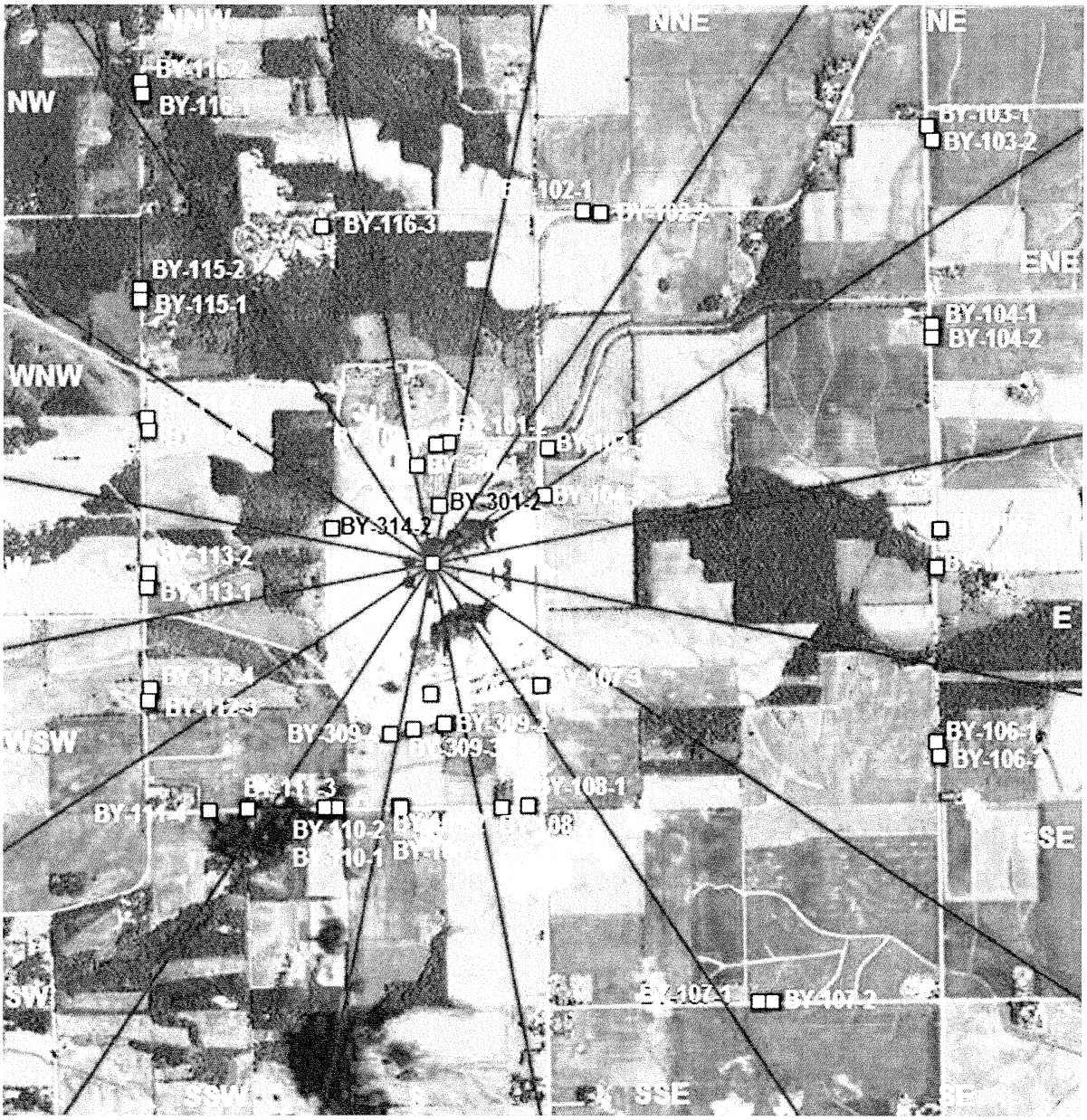


Figure B-1
Inner Ring and Special Interest OSLD Locations of the
Byron Nuclear Generating Station, 2022

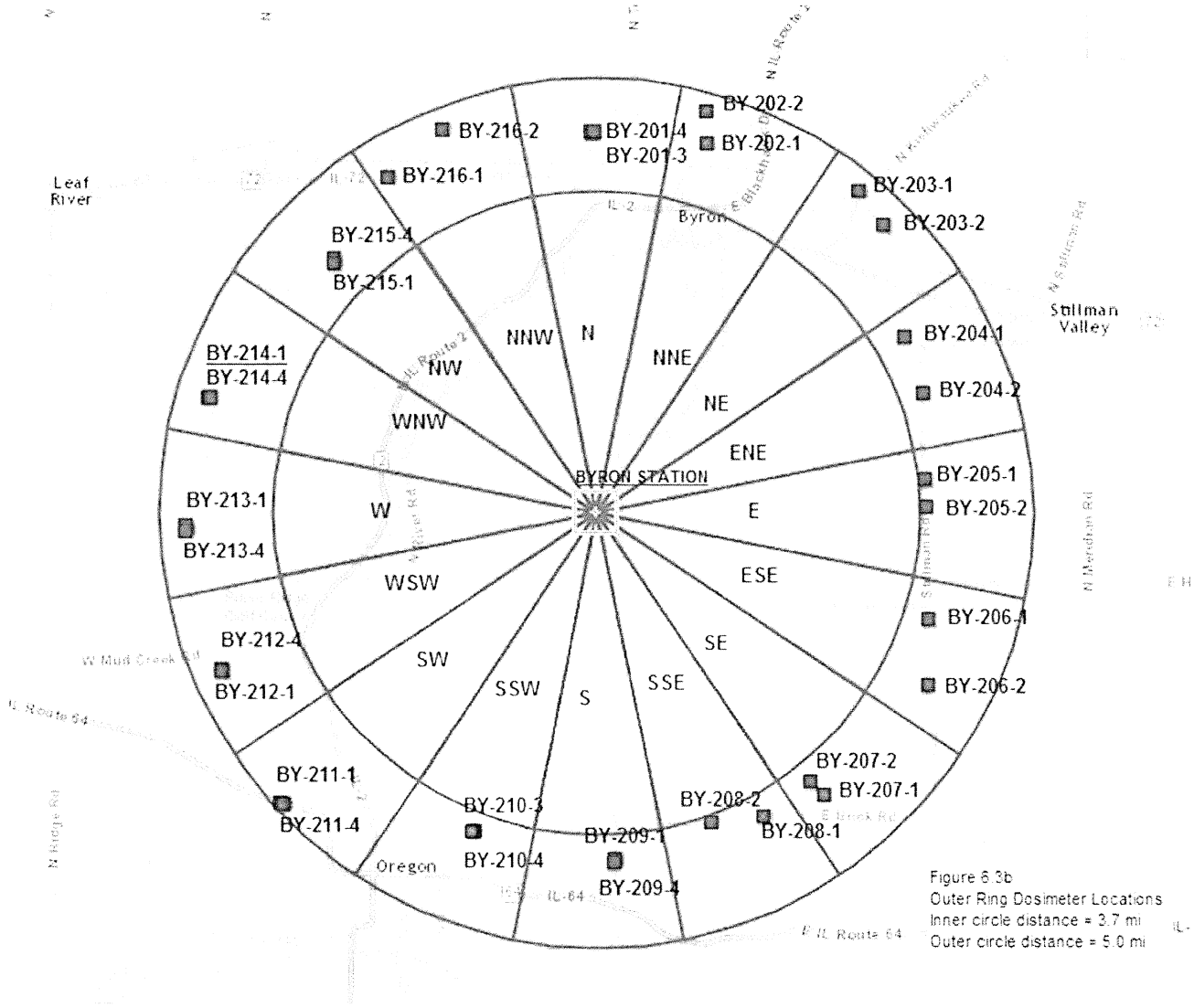


Figure 6.3b
Outer Ring Dosimeter Locations
Inner circle distance = 3.7 mi
Outer circle distance = 5.0 mi

Figure B-2
Outer Ring OSLD Locations of the
Byron Nuclear Generating Station, 2022

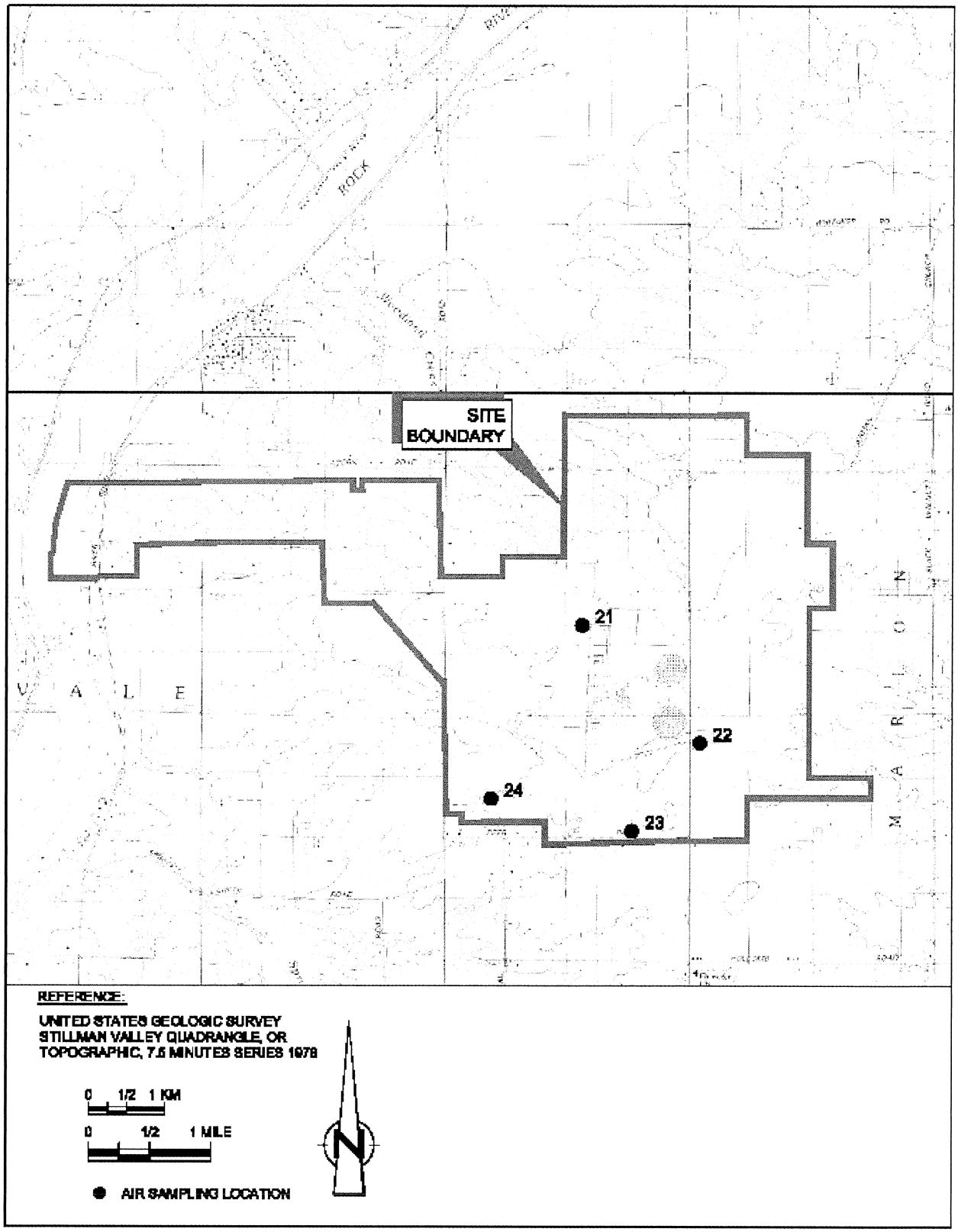


Figure B-3
Onsite Air Sampling Locations of the
Byron Nuclear Generating Station, 2022

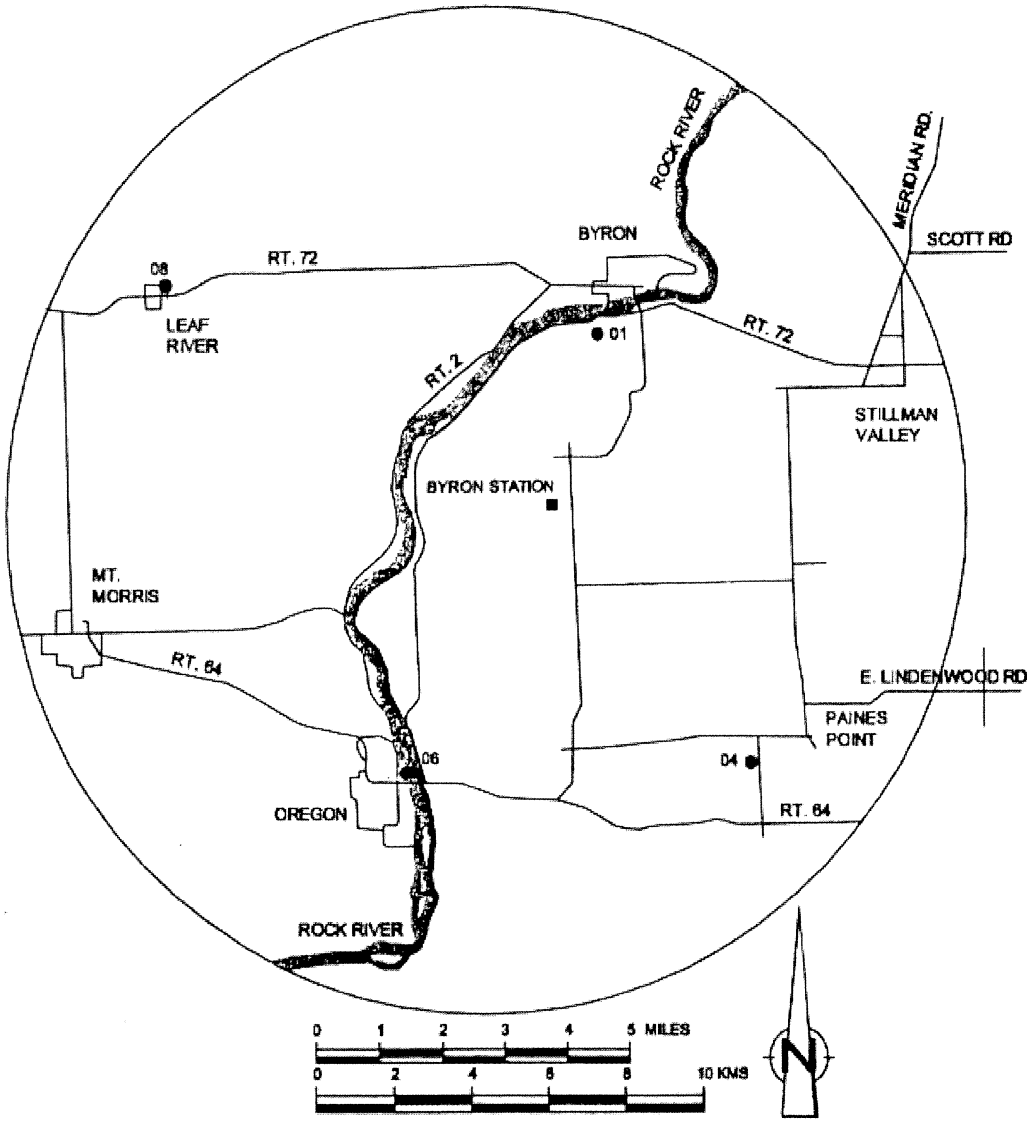


Figure B-4
Offsite Air Sampling Locations of the
Byron Nuclear Generating Station, 2022

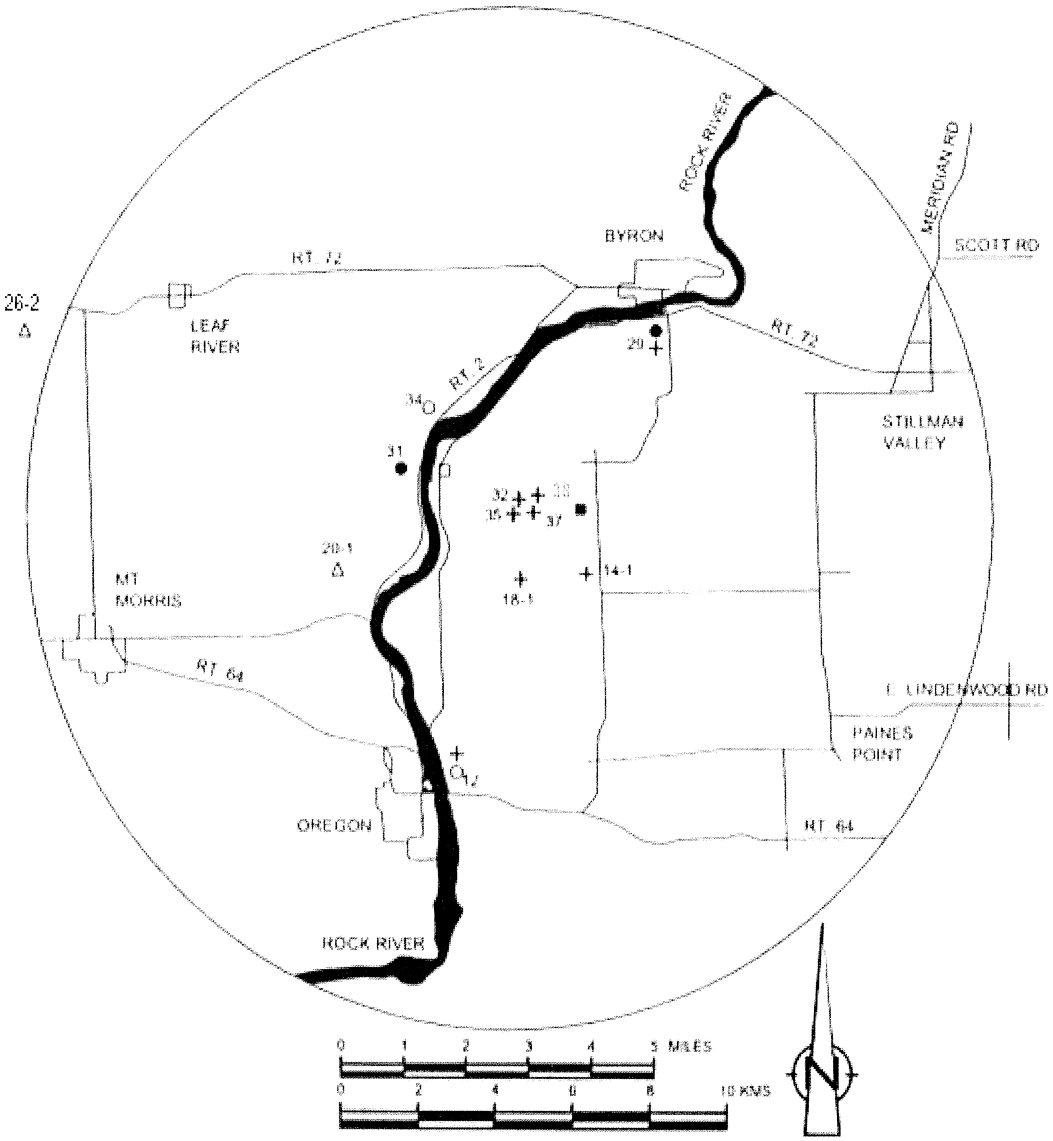


Figure B-5
Ingestion and Waterborne Exposure Pathway Sampling Locations
of the Byron Nuclear Generating Station, 2022

Intentionally left blank

APPENDIX C

DATA TABLES AND FIGURES

Intentionally left blank

Table C-I.1 **CONCENTRATIONS OF GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-12	BY-29
01/04/22 - 01/25/22	6.1 ± 2.3	*(1)*
02/01/22 - 02/22/22	< 2.9	*(1)*
03/01/22 - 03/29/22	5.4 ± 2.2	4.7 ± 2.2
04/05/22 - 04/26/22	5.5 ± 2.0	4.3 ± 1.9
05/03/22 - 05/31/22	4.6 ± 2.2	6.0 ± 2.3
06/07/22 - 06/28/22	4.6 ± 2.6	< 3.7
07/05/22 - 07/26/22	< 2.1	3.0 ± 1.6
08/02/22 - 08/30/22	4.8 ± 2.6	4.0 ± 2.5
09/06/22 - 09/27/22	5.9 ± 2.6	5.0 ± 2.6
10/04/22 - 10/25/22	4.1 ± 2.2	< 3.0
11/01/22 - 11/29/22	5.8 ± 2.1	5.6 ± 2.1
12/06/22 - 12/20/22	5.4 ± 1.8	4.7 ± 1.7
MEAN ± 2 STD DEV	5.2 ± 1.3	4.6 ± 1.8

Table C-I.2 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-12	BY-29
01/04/22 - 03/29/22	< 186	< 187
04/05/22 - 06/28/22	1360 ± 205	< 178
07/05/22 - 09/27/22	< 174	< 183
10/04/22 - 12/20/22	492 ± 136	< 182
MEAN ± 2 STD DEV	926 ± 1228	-

Table C-I.3 **CONCENTRATIONS OF NI-63 IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-12	BY-29
01/04/22 - 01/25/22	< 25	*(1)*
02/01/22 - 02/22/22	< 23	*(1)*
03/01/22 - 03/29/22	< 26	< 24
04/05/22 - 04/26/22	< 18	< 18
05/03/22 - 05/31/22	< 22	< 21
06/07/22 - 06/28/22	< 20	< 21
07/05/22 - 07/26/22	< 23	< 26
08/02/22 - 08/30/22	< 26	< 25
09/06/22 - 09/27/22	< 21	< 21
10/04/22 - 10/25/22	< 13	< 14
11/01/22 - 11/29/22	< 23	< 17
12/06/22 - 12/20/22	< 22	< 21
MEAN	-	-

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-I.4

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BY-12	01/04/22 - 01/25/22	< 2	< 2	< 5	< 2	< 5	< 3	< 4	< 7	< 2	< 2	< 16	< 5
	02/01/22 - 02/22/22	< 1	< 2	< 3	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 10	< 3
	03/01/22 - 03/29/22	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 7	< 2	< 2	< 18	< 5
	04/05/22 - 04/26/22	< 2	< 3	< 6	< 3	< 5	< 3	< 5	< 7	< 3	< 3	< 15	< 6
	05/03/22 - 05/31/22	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 7	< 2	< 2	< 14	< 5
	06/07/22 - 06/28/22	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 15	< 5
	07/05/22 - 07/26/22	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 2	< 2	< 15	< 5
	08/02/22 - 08/30/22	< 2	< 2	< 5	< 2	< 3	< 2	< 3	< 10	< 2	< 2	< 19	< 7
	09/06/22 - 09/27/22	< 2	< 3	< 5	< 3	< 5	< 3	< 5	< 7	< 3	< 2	< 15	< 5
	10/04/22 - 10/25/22	< 3	< 3	< 6	< 2	< 5	< 3	< 6	< 8	< 3	< 3	< 20	< 5
	11/01/22 - 11/29/22	< 4	< 4	< 9	< 4	< 8	< 4	< 9	< 14	< 4	< 4	< 33	< 8
	12/06/22 - 12/29/22	< 2	< 2	< 5	< 2	< 5	< 2	< 5	< 11	< 3	< 2	< 21	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-29	01/04/22 - 01/25/22 *(1)*												
	02/01/22 - 02/22/22 *(1)*												
	03/08/22 - 03/29/22	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 9	< 3	< 3	< 18	< 6
	04/05/22 - 04/26/22	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 6	< 2	< 2	< 13	< 6
	05/03/22 - 05/31/22	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 7	< 2	< 2	< 14	< 5
	06/07/22 - 06/28/22	< 3	< 3	< 6	< 2	< 5	< 3	< 5	< 7	< 3	< 3	< 17	< 5
	07/05/22 - 07/26/22	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 9	< 2	< 2	< 15	< 5
	08/02/22 - 08/30/22	< 1	< 1	< 4	< 2	< 3	< 2	< 3	< 9	< 1	< 1	< 15	< 5
	09/06/22 - 09/27/22	< 2	< 3	< 5	< 3	< 5	< 3	< 5	< 7	< 3	< 3	< 17	< 5
	10/04/22 - 10/25/22	< 4	< 4	< 8	< 4	< 8	< 5	< 7	< 12	< 4	< 4	< 27	< 9
	11/01/22 - 11/29/22	< 3	< 4	< 8	< 3	< 7	< 4	< 7	< 13	< 4	< 3	< 25	< 9
	12/06/22 - 12/20/22	< 2	< 2	< 5	< 3	< 5	< 3	< 5	< 8	< 3	< 2	< 17	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-II.1 **CONCENTRATIONS OF TRITIUM IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BY-14-1	BY-18-1	BY-32	BY-35	BY-37	BY-38
01/11/22 - 01/18/22	< 183	< 165	< 167	< 181	< 198	< 178
04/12/22 - 04/12/22	< 173	< 175	< 181	< 189	< 197	< 176
07/12/22 - 07/12/22	< 179	< 174	< 177	< 176	< 172	< 181
10/11/22 - 10/11/22	< 180	< 183	< 176	< 181	< 195	< 194
MEAN	-	-	-	-	-	-

Table C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BY-14-1	01/11/22 - 01/11/22	< 9	< 6	< 11	< 8	< 17	< 9	< 11	< 8	< 9	< 8	< 32	< 12
	04/12/22 - 04/12/22	< 4	< 5	< 10	< 4	< 10	< 6	< 9	< 9	< 5	< 5	< 24	< 8
	07/12/22 - 07/12/22	< 8	< 7	< 15	< 10	< 17	< 7	< 12	< 9	< 8	< 6	< 33	< 7
	10/11/22 - 10/11/22	< 7	< 8	< 17	< 7	< 16	< 8	< 13	< 11	< 9	< 7	< 29	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-18-1	01/11/22 - 01/11/22	< 8	< 8	< 16	< 7	< 18	< 9	< 13	< 9	< 9	< 8	< 31	< 11
	04/12/22 - 04/12/22	< 4	< 8	< 12	< 3	< 7	< 5	< 11	< 11	< 5	< 5	< 31	< 10
	07/12/22 - 07/12/22	< 6	< 6	< 10	< 9	< 10	< 5	< 9	< 7	< 7	< 7	< 36	< 7
	10/11/22 - 10/11/22	< 6	< 5	< 10	< 7	< 15	< 9	< 10	< 11	< 8	< 7	< 32	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-32	01/11/22 - 01/11/22	< 6	< 6	< 10	< 8	< 9	< 6	< 9	< 7	< 6	< 6	< 24	< 8
	04/12/22 - 04/12/22	< 7	< 7	< 13	< 6	< 11	< 7	< 10	< 12	< 7	< 8	< 42	< 8
	07/12/22 - 07/12/22	< 8	< 8	< 15	< 8	< 13	< 8	< 10	< 12	< 10	< 7	< 31	< 7
	10/11/22 - 10/11/22	< 6	< 7	< 11	< 10	< 15	< 9	< 13	< 10	< 7	< 7	< 37	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-35	01/11/22 - 01/11/22	< 5	< 8	< 13	< 6	< 10	< 8	< 10	< 7	< 8	< 8	< 26	< 8
	04/12/22 - 04/12/22	< 3	< 5	< 9	< 4	< 10	< 4	< 5	< 6	< 4	< 5	< 16	< 6
	07/12/22 - 07/12/22	< 6	< 7	< 13	< 6	< 14	< 7	< 11	< 9	< 6	< 6	< 22	< 13
	10/11/22 - 10/11/22	< 6	< 7	< 12	< 8	< 14	< 7	< 12	< 12	< 8	< 7	< 26	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-37	01/18/22 - 01/18/22	< 9	< 9	< 15	< 6	< 15	< 6	< 15	< 10	< 10	< 7	< 33	< 10
	04/12/22 - 04/12/22	< 6	< 4	< 10	< 6	< 9	< 5	< 10	< 7	< 5	< 5	< 21	< 10
	07/12/22 - 07/12/22	< 5	< 5	< 11	< 5	< 11	< 7	< 11	< 10	< 6	< 5	< 34	< 12
	10/11/22 - 10/11/22	< 6	< 8	< 18	< 7	< 12	< 6	< 13	< 11	< 7	< 6	< 35	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-38	01/18/22 - 01/18/22	< 6	< 4	< 11	< 6	< 11	< 6	< 10	< 6	< 6	< 6	< 18	< 6
	04/12/22 - 04/12/22	< 6	< 5	< 11	< 5	< 12	< 5	< 9	< 8	< 6	< 6	< 24	< 10
	07/12/22 - 07/12/22	< 6	< 6	< 12	< 10	< 14	< 7	< 12	< 10	< 6	< 6	< 30	< 9
	10/11/22 - 10/11/22	< 6	< 6	< 15	< 7	< 14	< 6	< 10	< 10	< 8	< 7	< 28	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-III.1

CONCENTRATIONS OF NICKEL-63 AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Ni-63	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BY-29													
Freshwater Drum	05/25/22 - 05/25/22	< 140	< 40	< 45	< 99	< 62	< 86	< 53	< 91	< 55	< 47	< 269	< 73
Golden Redhorse	05/25/22 - 05/25/22	< 219	< 63	< 86	< 147	< 57	< 156	< 82	< 146	< 67	< 78	< 317	< 93
Freshwater Drum	10/24/22 - 10/24/22	< 197	< 45	< 47	< 70	< 50	< 101	< 55	< 94	< 52	< 52	< 234	< 57
Smallmouth Redhorse	10/24/22 - 10/24/22	< 104	< 62	< 47	< 119	< 77	< 133	< 61	< 109	< 80	< 69	< 293	< 96
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-31													
Freshwater Drum	05/25/22 - 05/25/22	< 128	< 28	< 60	< 109	< 48	< 119	< 52	< 110	< 54	< 52	< 275	< 134
Silver Redhorse	05/25/22 - 05/25/22	< 170	< 81	< 62	< 144	< 53	< 159	< 73	< 114	< 72	< 59	< 350	< 114
Common Carp	10/24/22 - 10/24/22	< 144	< 46	< 47	< 95	< 67	< 109	< 56	< 87	< 55	< 56	< 220	< 94
Silver Redhorse	10/24/22 - 10/24/22	< 142	< 46	< 53	< 112	< 76	< 112	< 61	< 108	< 43	< 49	< 249	< 98
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IV.1

CONCENTRATIONS OF NICKEL-63 AND GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

SITE	COLLECTION PERIOD	Ni-63	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BY-12	05/17/22 - 05/17/22	< 256	< 68	< 53	< 123	< 58	< 114	< 71	< 108	< 79	70 ± 54	< 250	< 79
	10/25/22 - 10/25/22	< 243	< 68	< 63	< 145	< 64	< 121	< 68	< 117	< 70	< 73	< 339	< 69
	MEAN	-	-	-	-	-	-	-	-	-	70 ± 0	-	-
BY-34	05/17/22 - 05/17/22	< 243	< 28	< 38	< 46	< 46	< 71	< 33	< 60	< 42	< 33	< 131	< 40
	10/25/22 - 10/25/22	< 230	< 87	< 60	< 121	< 82	< 155	< 72	< 100	< 72	< 87	< 274	< 90
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-V.1 **CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION	GROUP I				GROUP II			GROUP III
PERIOD	BY-21	BY-22	BY-23	BY-24	BY-01	BY-04	BY-06	BY-08
12/28/21 - 01/04/22	35 ± 6	32 ± 5	37 ± 6	30 ± 5	35 ± 6	31 ± 5	37 ± 6	39 ± 6
01/04/22 - 01/11/22	33 ± 5	27 ± 5	30 ± 5	27 ± 5	28 ± 5	29 ± 5	28 ± 5	23 ± 5
01/11/22 - 01/18/22	27 ± 5	24 ± 5	24 ± 5	25 ± 5	29 ± 5	24 ± 5	31 ± 6	29 ± 5
01/18/22 - 01/25/22	20 ± 4	24 ± 5	27 ± 5	24 ± 5	24 ± 5	26 ± 5	25 ± 5	19 ± 4
01/25/22 - 02/01/22	24 ± 5	27 ± 5	24 ± 5	20 ± 4	18 ± 4	21 ± 5	23 ± 5	20 ± 4
02/01/22 - 02/08/22	28 ± 5	27 ± 5	27 ± 5	28 ± 5	26 ± 5	25 ± 5	26 ± 5	24 ± 5
02/08/22 - 02/15/22	23 ± 5	30 ± 7	22 ± 5	19 ± 4	17 ± 4	19 ± 5	18 ± 4	16 ± 4
02/15/22 - 02/22/22	24 ± 5	32 ± 7	25 ± 5	20 ± 4	23 ± 5	*(1)*	24 ± 5	21 ± 4
02/22/22 - 03/01/22	24 ± 5	24 ± 5	19 ± 4	18 ± 4	19 ± 4	20 ± 5	20 ± 5	20 ± 5
03/01/22 - 03/08/22	21 ± 5	19 ± 4	21 ± 4	20 ± 5	20 ± 5	21 ± 5	22 ± 5	20 ± 5
03/08/22 - 03/15/22	20 ± 5	19 ± 5	15 ± 4	17 ± 4	16 ± 4	17 ± 4	17 ± 4	17 ± 4
03/15/22 - 03/22/22	15 ± 4	20 ± 5	17 ± 4	18 ± 5	20 ± 5	14 ± 4	20 ± 5	17 ± 5
03/22/22 - 03/29/22	6 ± 3	9 ± 4	8 ± 4	11 ± 4	8 ± 4	11 ± 4	9 ± 4	13 ± 4
03/29/22 - 04/05/22	10 ± 4	10 ± 4	11 ± 4	12 ± 4	12 ± 4	12 ± 4	12 ± 4	11 ± 4
04/05/22 - 04/12/22	10 ± 4	12 ± 4	9 ± 3	11 ± 4	9 ± 4	12 ± 4	10 ± 4	9 ± 4
04/12/22 - 04/19/22	10 ± 4	13 ± 4	13 ± 4	12 ± 4	11 ± 4	11 ± 4	9 ± 4	13 ± 5
04/19/22 - 04/26/22	9 ± 4	13 ± 4	9 ± 4	11 ± 4	8 ± 4	9 ± 4	9 ± 4	12 ± 4
04/26/22 - 05/03/22	12 ± 4	11 ± 4	16 ± 4	12 ± 4	12 ± 4	19 ± 5	12 ± 4	12 ± 4
05/03/22 - 05/10/22	12 ± 4	10 ± 4	11 ± 4	10 ± 4	9 ± 4	14 ± 4	15 ± 4	11 ± 4
05/10/22 - 05/17/22	23 ± 5	22 ± 5	26 ± 5	26 ± 5	25 ± 5	21 ± 5	22 ± 5	21 ± 5
05/17/22 - 05/24/22	13 ± 4	11 ± 4	13 ± 4	12 ± 4	11 ± 4	10 ± 4	14 ± 4	15 ± 4
05/24/22 - 05/31/22	14 ± 4	11 ± 4	13 ± 4	18 ± 4	16 ± 4	13 ± 4	13 ± 4	9 ± 4
05/31/22 - 06/07/22	15 ± 4	16 ± 4	16 ± 4	15 ± 4	16 ± 4	16 ± 4	14 ± 4	13 ± 4
06/07/22 - 06/14/22	13 ± 4	17 ± 4	19 ± 4	15 ± 4	19 ± 4	19 ± 4	16 ± 4	20 ± 4
06/14/22 - 06/21/22	14 ± 4	16 ± 4	12 ± 4	13 ± 4	16 ± 4	12 ± 4	14 ± 4	16 ± 4
06/21/22 - 06/28/22	15 ± 4	10 ± 4	< 4	12 ± 4	12 ± 4	15 ± 4	12 ± 4	12 ± 4
06/28/22 - 07/05/22	15 ± 4	16 ± 4	19 ± 4	15 ± 4	17 ± 4	16 ± 4	17 ± 4	19 ± 4
07/05/22 - 07/12/22	11 ± 4	11 ± 4	11 ± 4	12 ± 4	13 ± 4	7 ± 4	10 ± 4	12 ± 4
07/12/22 - 07/19/22	15 ± 4	13 ± 4	11 ± 4	12 ± 4	17 ± 4	16 ± 5	15 ± 4	13 ± 4
07/19/22 - 07/26/22	21 ± 4	18 ± 4	13 ± 4	19 ± 4	20 ± 4	22 ± 5	20 ± 4	19 ± 4
07/26/22 - 08/02/22	13 ± 4	11 ± 4	14 ± 4	14 ± 4	16 ± 5	15 ± 4	10 ± 4	17 ± 5
08/02/22 - 08/09/22	9 ± 4	13 ± 4	10 ± 4	14 ± 4	11 ± 4	12 ± 4	10 ± 4	13 ± 4
08/09/22 - 08/16/22	16 ± 4	14 ± 4	15 ± 4	15 ± 4	16 ± 4	36 ± 9	13 ± 4	13 ± 4
08/16/22 - 08/23/22	21 ± 4	18 ± 4	26 ± 5	18 ± 4	19 ± 4	26 ± 5	21 ± 4	22 ± 4
08/23/22 - 08/30/22	16 ± 4	23 ± 4	23 ± 4	20 ± 4	22 ± 4	46 ± 9	24 ± 4	27 ± 5
08/30/22 - 09/06/22	12 ± 4	16 ± 4	17 ± 4	18 ± 4	17 ± 4	27 ± 8	13 ± 4	17 ± 4
09/06/22 - 09/13/22	21 ± 4	19 ± 4	17 ± 4	26 ± 5	19 ± 4	20 ± 4	19 ± 4	24 ± 4
09/13/22 - 09/20/22	27 ± 5	26 ± 5	28 ± 5	30 ± 5	24 ± 5	25 ± 5	26 ± 5	32 ± 5
09/20/22 - 09/27/22	21 ± 4	18 ± 4	19 ± 4	23 ± 4	19 ± 4	17 ± 4	19 ± 4	20 ± 4
09/27/22 - 10/04/22	13 ± 4	12 ± 4	11 ± 4	12 ± 4	16 ± 4	13 ± 4	11 ± 4	14 ± 4
10/04/22 - 10/11/22	23 ± 5	18 ± 5	23 ± 5	20 ± 5	22 ± 5	24 ± 5	19 ± 5	22 ± 5
10/11/22 - 10/19/22	16 ± 4	28 ± 8	16 ± 4	18 ± 4	14 ± 4	16 ± 4	16 ± 4	13 ± 4
10/19/22 - 10/25/22	35 ± 6	33 ± 7	34 ± 6	34 ± 6	39 ± 6	29 ± 6	33 ± 6	38 ± 6
10/25/22 - 11/01/22	23 ± 4	28 ± 5	27 ± 5	30 ± 5	28 ± 5	24 ± 5	23 ± 5	32 ± 5
11/01/22 - 11/08/22	32 ± 5	33 ± 5	33 ± 5	40 ± 5	36 ± 5	34 ± 5	31 ± 5	29 ± 5
11/08/22 - 11/15/22	16 ± 4	11 ± 4	13 ± 4	15 ± 4	17 ± 4	18 ± 4	19 ± 4	17 ± 4
11/15/22 - 11/22/22	21 ± 4	19 ± 4	23 ± 4	20 ± 4	22 ± 5	21 ± 4	15 ± 4	23 ± 5
11/22/22 - 11/29/22	37 ± 5	42 ± 6	46 ± 6	45 ± 6	44 ± 6	35 ± 5	38 ± 5	38 ± 6
11/29/22 - 12/06/22	23 ± 5	24 ± 5	26 ± 5	26 ± 5	26 ± 5	27 ± 5	25 ± 5	28 ± 5
12/06/22 - 12/13/22	31 ± 5	35 ± 5	34 ± 5	33 ± 5	32 ± 5	36 ± 5	31 ± 5	31 ± 5
12/13/22 - 12/20/22	25 ± 5	23 ± 4	28 ± 5	20 ± 4	21 ± 4	25 ± 5	23 ± 5	25 ± 5
12/20/22 - 12/27/22	25 ± 4	20 ± 4	26 ± 4	27 ± 5	23 ± 4	26 ± 4	23 ± 4	25 ± 4
MEAN ± 2 STD DEV	19 ± 15	20 ± 16	20 ± 17	20 ± 16	20 ± 16	21 ± 16	19 ± 15	20 ± 15

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-V.2 **MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

GROUP I - NEARSITE LOCATIONS				GROUP II - FAR FIELD LOCATIONS				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
12/28/21 - 02/01/22	20	37	27 ± 9	12/28/21 - 02/01/22	18	37	27 ± 10	12/28/21 - 02/01/22	19	39	26 ± 17
02/01/22 - 03/01/22	18	32	24 ± 8	02/01/22 - 03/01/22	17	26	22 ± 7	02/01/22 - 03/01/22	16	24	20 ± 6
03/01/22 - 03/29/22	6	21	16 ± 10	03/01/22 - 03/29/22	8	22	16 ± 9	03/01/22 - 03/29/22	13	20	17 ± 6
03/29/22 - 05/03/22	9	16	11 ± 3	03/29/22 - 05/03/22	8	19	11 ± 5	03/29/22 - 05/03/22	9	13	12 ± 3
05/03/22 - 05/31/22	10	26	15 ± 11	05/03/22 - 05/31/22	9	25	15 ± 10	05/03/22 - 05/31/22	9	21	14 ± 11
05/31/22 - 06/28/22	10	19	15 ± 4	05/31/22 - 06/28/22	12	19	15 ± 5	05/31/22 - 06/28/22	12	20	15 ± 7
06/28/22 - 08/02/22	11	21	14 ± 6	06/28/22 - 08/02/22	7	22	15 ± 8	06/28/22 - 08/02/22	12	19	16 ± 7
08/02/22 - 08/30/22	9	26	17 ± 9	08/02/22 - 08/30/22	10	46	21 ± 22	08/02/22 - 08/30/22	13	27	19 ± 14
08/30/22 - 10/04/22	11	30	19 ± 12	08/30/22 - 10/04/22	11	27	19 ± 10	08/30/22 - 10/04/22	14	32	21 ± 13
10/04/22 - 11/01/22	16	35	25 ± 13	10/04/22 - 11/01/22	14	39	24 ± 15	10/04/22 - 11/01/22	13	38	26 ± 22
11/01/22 - 11/29/22	11	46	28 ± 24	11/01/22 - 11/29/22	15	44	28 ± 20	11/01/22 - 11/29/22	17	38	27 ± 18
11/29/22 - 12/27/22	20	35	27 ± 9	11/29/22 - 12/27/22	21	36	27 ± 9	11/29/22 - 12/27/22	25	31	27 ± 6
12/28/21 - 12/27/22	6	46	20 ± 16	12/28/21 - 12/27/22	7	46	20 ± 16	12/28/21 - 12/27/22	9	39	20 ± 15

Table C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BY-01	12/28/21 - 03/29/22	< 4	< 5	< 10	< 4	< 7	< 6	< 8	< 3	< 3	< 156	< 90
	03/29/22 - 06/28/22	< 3	< 6	< 13	< 4	< 8	< 5	< 11	< 4	< 4	< 212	< 99
	06/28/22 - 09/27/22	< 3	< 4	< 10	< 4	< 5	< 3	< 6	< 2	< 2	< 151	< 48
	09/27/22 - 12/27/22	< 3	< 4	< 15	< 3	< 9	< 6	< 9	< 3	< 3	< 245	< 110
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-04	12/28/21 - 03/29/22	< 2	< 3	< 11	< 3	< 5	< 3	< 5	< 3	< 2	< 111	< 49
	03/29/22 - 06/28/22	< 2	< 2	< 10	< 2	< 6	< 3	< 6	< 2	< 2	< 155	< 57
	06/28/22 - 09/27/22	< 3	< 4	< 16	< 4	< 8	< 5	< 9	< 3	< 3	< 235	< 99
	09/27/22 - 12/27/22	< 2	< 4	< 9	< 2	< 5	< 3	< 7	< 3	< 2	< 148	< 70
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-06	12/28/21 - 03/29/22	< 2	< 3	< 11	< 3	< 5	< 3	< 5	< 2	< 2	< 136	< 13
	03/29/22 - 06/28/22	< 2	< 3	< 8	< 2	< 6	< 3	< 6	< 2	< 2	< 149	< 67
	06/28/22 - 09/27/22	< 3	< 4	< 12	< 3	< 4	< 4	< 6	< 2	< 2	< 163	< 57
	09/27/22 - 12/27/22	< 2	< 3	< 7	< 3	< 5	< 4	< 7	< 2	< 2	< 171	< 48
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-08	12/28/21 - 03/29/22	< 3	< 3	< 9	< 3	< 3	< 5	< 7	< 3	< 3	< 116	< 50
	03/29/22 - 06/28/22	< 2	< 3	< 7	< 2	< 4	< 3	< 6	< 3	< 2	< 125	< 85
	06/28/22 - 09/27/22	< 4	< 4	< 15	< 4	< 10	< 6	< 8	< 3	< 3	< 256	< 105
	09/27/22 - 12/27/22	< 1	< 3	< 7	< 2	< 3	< 3	< 5	< 2	< 2	< 186	< 58
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BY-21	12/28/21 - 03/29/22	< 2	< 2	< 8	< 2	< 6	< 3	< 4	< 2	< 2	< 117	< 28
	03/29/22 - 06/28/22	< 3	< 6	< 13	< 3	< 7	< 6	< 11	< 5	< 3	< 256	< 127
	06/28/22 - 09/27/22	< 2	< 4	< 8	< 3	< 7	< 3	< 6	< 2	< 2	< 160	< 54
	09/27/22 - 12/27/22	< 2	< 4	< 10	< 2	< 4	< 2	< 5	< 2	< 2	< 139	< 58
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-22	12/28/21 - 03/29/22	< 2	< 4	< 9	< 2	< 6	< 3	< 5	< 2	< 2	< 106	< 53
	03/29/22 - 06/28/22	< 4	< 5	< 16	< 4	< 9	< 5	< 9	< 3	< 3	< 269	< 108
	06/28/22 - 09/27/22	< 3	< 5	< 11	< 3	< 5	< 4	< 6	< 3	< 2	< 226	< 57
	09/27/22 - 12/27/22	< 3	< 5	< 14	< 3	< 9	< 5	< 9	< 3	< 3	< 261	< 121
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-23	12/28/21 - 03/29/22	< 3	< 4	< 8	< 2	< 7	< 4	< 6	< 3	< 3	< 153	< 69
	03/29/22 - 06/28/22	< 3	< 5	< 14	< 4	< 9	< 4	< 9	< 3	< 3	< 223	< 106
	06/28/22 - 09/27/22	< 2	< 4	< 7	< 2	< 4	< 4	< 6	< 2	< 2	< 134	< 78
	09/27/22 - 12/27/22	< 3	< 4	< 13	< 3	< 8	< 5	< 8	< 2	< 2	< 272	< 57
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-24	12/28/21 - 03/29/22	< 2	< 3	< 7	< 2	< 7	< 4	< 6	< 2	< 2	< 113	< 73
	03/29/22 - 06/28/22	< 2	< 4	< 7	< 3	< 6	< 3	< 7	< 2	< 2	< 143	< 52
	06/28/22 - 09/27/22	< 3	< 5	< 14	< 4	< 8	< 6	< 10	< 4	< 3	< 227	< 108
	09/27/22 - 12/27/22	< 2	< 3	< 9	< 1	< 6	< 4	< 8	< 2	< 2	< 155	< 61
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VI.1 **CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF E-3 PCI/CU METER ± 2 SIGMA

COLLECTION	GROUP I				GROUP II			GROUP III
PERIOD	BY-21	BY-22	BY-23	BY-24	BY-01	BY-04	BY-06	BY-08
12/28/21 - 01/04/22	< 62	< 57	< 57	< 58	< 62	< 63	< 68	< 63
01/04/22 - 01/11/22	< 68	< 67	< 67	< 67	< 50	< 50	< 50	< 21
01/11/22 - 01/18/22	< 30	< 30	< 30	< 30	< 55	< 56	< 59	< 56
01/18/22 - 01/25/22	< 35	< 36	< 36	< 36	< 44	< 44	< 44	< 44
01/25/22 - 02/01/22	< 56	< 56	< 56	< 56	< 58	< 58	< 58	< 58
02/01/22 - 02/08/22	< 32	< 32	< 32	< 32	< 36	< 36	< 36	< 36
02/08/22 - 02/15/22	< 30	< 42	< 30	< 20	< 29	< 14	< 29	< 29
02/15/22 - 02/22/22	< 38	< 33	< 41	< 41	< 37	*(1)*	< 37	< 31
02/22/22 - 03/01/22	< 36	< 36	< 36	< 36	< 54	< 63	< 54	< 54
03/01/22 - 03/08/22	< 52	< 49	< 48	< 50	< 52	< 51	< 54	< 53
03/08/22 - 03/15/22	< 28	< 34	< 34	< 34	< 33	< 33	< 33	< 33
03/15/22 - 03/22/22	< 22	< 49	< 50	< 50	< 49	< 48	< 48	< 48
03/22/22 - 03/29/22	< 33	< 33	< 33	< 33	< 14	< 29	< 29	< 28
03/29/22 - 04/05/22	< 40	< 39	< 40	< 39	< 45	< 44	< 45	< 47
04/05/22 - 04/12/22	< 66	< 67	< 67	< 66	< 57	< 57	< 56	< 62
04/12/22 - 04/19/22	< 29	< 29	< 29	< 14	< 28	< 28	< 28	< 31
04/19/22 - 04/26/22	< 52	< 54	< 54	< 54	< 43	< 44	< 43	< 43
04/26/22 - 05/03/22	< 56	< 57	< 56	< 58	< 66	< 33	< 65	< 65
05/03/22 - 05/10/22	< 23	< 56	< 56	< 55	< 65	< 65	< 65	< 64
05/10/22 - 05/17/22	< 50	< 51	< 51	< 51	< 48	< 48	< 49	< 49
05/17/22 - 05/24/22	< 65	< 65	< 65	< 65	< 60	< 60	< 60	< 60
05/24/22 - 05/31/22	< 37	< 35	< 35	< 35	< 55	< 55	< 55	< 55
05/31/22 - 06/07/22	< 25	< 52	< 52	< 52	< 59	< 59	< 59	< 59
06/07/22 - 06/14/22	< 54	< 68	< 68	< 68	< 54	< 54	< 54	< 36
06/14/22 - 06/21/22	< 39	< 39	< 39	< 39	< 52	< 52	< 52	< 52
06/21/22 - 06/28/22	< 36	< 37	< 33	< 38	< 63	< 65	< 64	< 67
06/28/22 - 07/05/22	< 56	< 56	< 56	< 38	< 56	< 56	< 56	< 54
07/05/22 - 07/12/22	< 50	< 50	< 49	< 50	< 62	< 62	< 61	< 61
07/12/22 - 07/19/22	< 29	< 29	< 29	< 30	< 37	< 42	< 41	< 40
07/19/22 - 07/26/22	< 44	< 45	< 45	< 45	< 63	< 63	< 25	< 64
07/26/22 - 08/02/22	< 61	< 61	< 62	< 63	< 66	< 65	< 62	< 68
08/02/22 - 08/09/22	< 36	< 36	< 37	< 37	< 42	< 44	< 42	< 44
08/09/22 - 08/16/22	< 64	< 64	< 64	< 66	< 64	< 54	< 62	< 59
08/16/22 - 08/23/22	< 38	< 38	< 38	< 39	< 38	< 48	< 39	< 40
08/23/22 - 08/30/22	< 63	< 50	< 48	< 22	< 66	< 65	< 67	< 65
08/30/22 - 09/06/22	< 54	< 55	< 55	< 57	< 52	< 51	< 51	< 50
09/06/22 - 09/13/22	< 52	< 52	< 21	< 54	< 61	< 61	< 59	< 59
09/13/22 - 09/20/22	< 27	< 28	< 27	< 28	< 62	< 66	< 65	< 64
09/20/22 - 09/27/22	< 40	< 41	< 41	< 42	< 48	< 48	< 47	< 48
09/27/22 - 10/04/22	< 53	< 52	< 52	< 54	< 59	< 64	< 60	< 58
10/04/22 - 10/11/22	< 21	< 54	< 54	< 57	< 49	< 50	< 49	< 47
10/11/22 - 10/19/22	< 55	< 50	< 57	< 60	< 51	< 55	< 53	< 53
10/19/22 - 10/25/22	< 41	< 52	< 20	< 42	< 62	< 59	< 58	< 59
10/25/22 - 11/01/22	< 60	< 64	< 25	< 63	< 63	< 65	< 64	< 64
11/01/22 - 11/08/22	< 54	< 42	< 40	< 40	< 55	< 56	< 24	< 55
11/08/22 - 11/15/22	< 40	< 42	< 39	< 42	< 34	< 35	< 35	< 35
11/15/22 - 11/22/22	< 55	< 56	< 37	< 56	< 51	< 51	< 50	< 58
11/22/22 - 11/29/22	< 37	< 41	< 41	< 43	< 37	< 15	< 36	< 38
11/29/22 - 12/06/22	< 56	< 54	< 54	< 59	< 59	< 59	< 57	< 29
12/06/22 - 12/13/22	< 33	< 32	< 33	< 34	< 41	< 41	< 40	< 43
12/13/22 - 12/20/22	< 24	< 25	< 26	< 27	< 24	< 25	< 24	< 13
12/20/22 - 12/27/22	< 36	< 36	< 36	< 37	< 42	< 43	< 41	< 43
MEAN	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	CONTROL FARM BY-26-2	INDICATOR FARM BY-20-1
01/04/22	< 0.9	< 0.8
02/01/22	< 0.8	< 0.8
03/01/22	< 0.8	< 0.9
04/05/22	< 0.9	< 0.8
05/03/22	< 0.8	< 0.9
05/17/22	< 0.9	< 0.9
05/31/22	< 0.8	< 0.7
06/14/22	< 0.9	< 0.9
06/28/22	< 0.8	< 0.9
07/12/22	< 0.9	< 0.9
07/26/22	< 1.0	< 0.9
08/09/22	< 0.9	< 0.9
08/23/22	< 0.9	< 0.9
09/06/22	< 0.8	< 0.9
09/20/22	< 0.8	< 0.9
10/04/22	< 0.7	< 0.8
10/19/22	< 0.9	< 0.9
11/01/22	< 0.9	< 0.9
12/06/22	< 0.8	< 0.8
MEAN	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VII.2 **CONCENTRATIONS OF GAMMA EMMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BY-20-1	01/04/22	< 9	< 11	< 22	< 11	< 19	< 9	< 16	< 10	< 9	< 48	< 11
	02/01/22	< 8	< 9	< 15	< 4	< 16	< 9	< 13	< 10	< 10	< 40	< 8
	03/01/22	< 7	< 6	< 19	< 7	< 15	< 7	< 13	< 8	< 8	< 31	< 9
	04/05/22	< 7	< 7	< 16	< 8	< 17	< 8	< 13	< 9	< 9	< 27	< 8
	05/03/22	< 9	< 8	< 15	< 9	< 22	< 9	< 13	< 10	< 8	< 31	< 11
	05/17/22	< 10	< 8	< 18	< 10	< 21	< 8	< 14	< 11	< 9	< 43	< 12
	05/31/22	< 8	< 7	< 14	< 10	< 14	< 8	< 10	< 8	< 9	< 23	< 10
	06/14/22	< 8	< 9	< 19	< 9	< 18	< 6	< 13	< 9	< 7	< 29	< 9
	06/28/22	< 5	< 6	< 13	< 7	< 16	< 6	< 10	< 7	< 6	< 21	< 7
	07/12/22	< 8	< 8	< 18	< 10	< 17	< 11	< 15	< 9	< 11	< 28	< 13
	07/26/22	< 7	< 7	< 18	< 8	< 16	< 7	< 13	< 8	< 7	< 37	< 12
	08/09/22	< 7	< 7	< 17	< 8	< 16	< 7	< 13	< 9	< 8	< 26	< 9
	08/23/22	< 9	< 8	< 19	< 8	< 18	< 7	< 12	< 10	< 7	< 34	< 9
	09/06/22	< 8	< 9	< 21	< 12	< 23	< 9	< 15	< 10	< 8	< 38	< 12
	09/20/22	< 8	< 8	< 17	< 9	< 20	< 10	< 15	< 9	< 8	< 38	< 10
	10/04/22	< 8	< 9	< 16	< 7	< 19	< 8	< 16	< 5	< 10	< 32	< 11
	10/19/22	< 7	< 6	< 13	< 8	< 22	< 9	< 13	< 9	< 6	< 30	< 6
	11/01/22	< 6	< 5	< 16	< 7	< 14	< 8	< 11	< 8	< 7	< 27	< 5
	12/06/22	< 8	< 7	< 16	< 10	< 18	< 7	< 13	< 9	< 7	< 30	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BY-26-2	01/04/22	< 7	< 10	< 15	< 9	< 19	< 8	< 15	< 10	< 10	< 50	< 12
	02/01/22	< 7	< 8	< 20	< 9	< 18	< 9	< 16	< 11	< 8	< 34	< 10
	03/01/22	< 5	< 7	< 13	< 7	< 11	< 6	< 12	< 7	< 7	< 30	< 10
	04/05/22	< 10	< 11	< 18	< 8	< 20	< 10	< 16	< 10	< 10	< 42	< 13
	05/03/22	< 6	< 9	< 20	< 7	< 20	< 8	< 13	< 9	< 8	< 37	< 8
	05/17/22	< 8	< 7	< 18	< 8	< 17	< 8	< 13	< 8	< 8	< 33	< 10
	05/31/22	< 9	< 9	< 11	< 5	< 24	< 8	< 16	< 10	< 10	< 37	< 10
	06/14/22	< 8	< 7	< 16	< 11	< 16	< 9	< 13	< 7	< 8	< 34	< 7
	06/28/22	< 6	< 7	< 13	< 6	< 18	< 5	< 12	< 8	< 6	< 25	< 6
	07/12/22	< 7	< 8	< 14	< 5	< 19	< 7	< 11	< 9	< 9	< 35	< 11
	07/26/22	< 8	< 6	< 17	< 9	< 16	< 7	< 11	< 6	< 7	< 34	< 10
	08/09/22	< 8	< 8	< 17	< 8	< 19	< 6	< 14	< 8	< 8	< 29	< 10
	08/23/22	< 6	< 7	< 14	< 8	< 20	< 8	< 12	< 8	< 8	< 21	< 10
	09/06/22	< 7	< 6	< 19	< 8	< 18	< 7	< 13	< 8	< 8	< 39	< 10
	09/20/22	< 8	< 10	< 18	< 9	< 20	< 8	< 15	< 8	< 8	< 31	< 12
	10/04/22	< 8	< 6	< 17	< 9	< 20	< 9	< 12	< 9	< 7	< 31	< 9
	10/19/22	< 6	< 6	< 20	< 10	< 14	< 8	< 14	< 9	< 9	< 38	< 10
	11/01/22	< 7	< 7	< 13	< 7	< 19	< 6	< 11	< 7	< 7	< 27	< 11
	12/06/22	< 8	< 7	< 15	< 9	< 15	< 7	< 10	< 6	< 6	< 24	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VIII.1

CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BY-CONTROL													
Broccoli	07/23/22	< 19	< 18	< 35	< 22	< 33	< 18	< 35	< 25	< 22	< 18	< 77	< 21
Potatoes/Carrots	07/23/22	< 34	< 30	< 69	< 32	< 80	< 25	< 74	< 44	< 37	< 38	< 144	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 1													
Red/White Potatoes	07/23/22	< 20	< 18	< 42	< 20	< 48	< 19	< 35	< 21	< 24	< 23	< 71	< 23
Broccoli/Kale	07/23/22	< 41	< 37	< 89	< 47	< 95	< 34	< 58	< 43	< 42	< 37	< 145	< 42
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 2													
Potatoes	08/06/22	< 22	< 21	< 46	< 21	< 39	< 20	< 37	< 25	< 24	< 22	< 81	< 29
Lettuce	08/06/22	< 37	< 33	< 40	< 46	< 77	< 35	< 56	< 34	< 36	< 38	< 113	< 32
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 3													
Potatoes	07/23/22	< 25	< 26	< 61	< 26	< 55	< 26	< 49	< 35	< 34	< 31	< 112	< 33
Lettuce/Zucchini	07/23/22	< 20	< 21	< 42	< 19	< 40	< 20	< 37	< 24	< 21	< 20	< 71	< 31
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BY-QUAD 4													
Lettuce/Peppers	08/06/22	< 33	< 32	< 66	< 37	< 69	< 31	< 58	< 38	< 38	< 32	< 126	< 46
Squash/Zucchini	08/06/22	< 15	< 13	< 38	< 17	< 28	< 17	< 33	< 19	< 19	< 20	< 65	< 13
Red Beets	10/04/22	< 20	< 23	< 43	< 27	< 31	< 18	< 37	< 19	< 19	< 19	< 61	< 31
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IX.1 QUARTERLY OSLD RESULTS FOR BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
BY-01-1	21 ± 3	19	21	20	22
BY-04-1	23 ± 5	20	25	22	26
BY-06-1	20 ± 5	18	21	17	23
BY-08-1 (Ctrl)	20 ± 5	17	21	18	22
BY-21-1	18 ± 3	17	19	16	20
BY-22-1	24 ± 5	22	24	22	27
BY-23-1	23 ± 6	20	24	23	27
BY-24-2	22 ± 5	19	23	20	24
BY-101-1	18 ± 4	17	18	16	21
BY-101-2	18 ± 4	17	18	15	20
BY-102-1	24 ± 6	23	26	21	27
BY-102-2	24 ± 3	22	26	24	24
BY-103-1	23 ± 5	21	25	22	26
BY-103-2	25 ± 5	22	26	23	27
BY-103-3	23 ± 6	22	24	20	27
BY-104-1	24 ± 5	21	25	23	27
BY-104-2	25 ± 5	23	26	23	28
BY-104-3	22 ± 4	20	23	21	24
BY-105-1	24 ± 5	21	27	24	25
BY-105-2	25 ± 6	23	26	23	29
BY-106-1	23 ± 5	22	26	21	25
BY-106-2	24 ± 7	20	26	22	27
BY-107-1	26 ± 3	25	28	25	27
BY-107-2	26 ± 4	24	27	27	28
BY-107-3	22 ± 4	20	23	20	24
BY-108-1	25 ± 4	22	27	24	27
BY-108-2	23 ± 4	21	25	22	24
BY-109-1	24 ± 5	21	25	22	27
BY-109-2	22 ± 3	21	23	21	24
BY-110-1	22 ± 5	20	24	20	25
BY-110-2	22 ± 3	20	24	21	23
BY-111-3	26 ± 6	22	27	24	29
BY-111-4	23 ± 4	22	26	22	24
BY-112-3	24 ± 5	21	25	22	26
BY-112-4	23 ± 5	21	25	22	26
BY-113-1	25 ± 6	22	26	23	28
BY-113-2	21 ± 4	20	21	19	23
BY-114-1	20 ± 5	18	20	18	23
BY-114-2	23 ± 2	22	24	22	22
BY-115-1	24 ± 6	22	24	21	28
BY-115-2	23 ± 5	20	23	22	26
BY-116-1	21 ± 7	17	23	20	25
BY-116-2	21 ± 3	20	23	20	23
BY-116-3	22 ± 3	21	23	20	23
BY-201-3	24 ± 5	21	25	22	26
BY-201-4	25 ± 5	22	26	24	27
BY-202-1	24 ± 6	23	26	21	27
BY-202-2	26 ± 5	23	28	24	27
BY-203-1	19 ± 5	18	20	17	23
BY-203-2	22 ± 4	20	24	21	23
BY-204-1	21 ± 5	20	23	19	24

Table C-IX.1 QUARTERLY OSLD RESULTS FOR BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
BY-204-2	25 ± 5	21	26	*(1)*	26
BY-205-1	25 ± 6	23	26	22	29
BY-205-2	23 ± 4	21	24	21	25
BY-206-1	25 ± 6	21	27	24	28
BY-206-2	26 ± 6	22	28	26	29
BY-207-1	25 ± 4	23	26	23	27
BY-207-2	24 ± 5	21	24	22	26
BY-208-1	25 ± 7	21	27	23	28
BY-208-2	25 ± 6	23	26	23	28
BY-209-1	25 ± 5	22	27	24	28
BY-209-4	25 ± 5	23	27	23	27
BY-210-3	23 ± 4	22	23	22	26
BY-210-4	23 ± 6	19	25	22	26
BY-211-1	25 ± 5	22	26	24	27
BY-211-4	24 ± 3	22	26	24	25
BY-212-1	25 ± 6	23	27	22	29
BY-212-4	26 ± 5	23	28	25	28
BY-213-1	24 ± 7	20	25	26	27
BY-213-4	26 ± 5	23	27	24	28
BY-214-1	23 ± 5	20	24	23	26
BY-214-4	24 ± 7	21	27	21	26
BY-215-1	24 ± 5	21	27	23	25
BY-215-4	25 ± 7	23	26	23	30
BY-216-1	26 ± 7	22	28	25	30
BY-216-2	24 ± 7	21	26	22	29
BY-301-1	18 ± 4	17	19	16	21
BY-301-2	20 ± 4	19	21	18	23
BY-309-1	23 ± 5	20	24	21	26
BY-309-2	23 ± 4	21	25	21	25
BY-309-3	23 ± 4	21	24	22	24
BY-309-4	21 ± 4	18	22	20	24
BY-314-2	19 ± 5	17	20	17	22

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.2 MEAN QUARTERLY OSLD RESULTS FOR THE INNER RING, OUTER RING, SPECIAL INTEREST, OTHER AND CONTROL LOCATIONS FOR BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF MILLIREM/STD. QUARTER ± 2 STANDARD DEVIATION

COLLECTION PERIOD	INNER RING ± 2 S.D.	OUTER RING ± 2 S.D.	SPECIAL INTEREST ± 2 S.D.	OTHER ± 2 S.D.	CONTROL ± 2 S.D.
JAN-MAR	21 ± 4	21 ± 3	19 ± 4	19 ± 3	17 ± 0
APR-JUN	24 ± 5	26 ± 4	22 ± 5	22 ± 4	21 ± 0
JUL-SEP	21 ± 5	22 ± 4	19 ± 5	20 ± 5	18 ± 0
OCT-DEC	25 ± 5	27 ± 4	23 ± 4	24 ± 5	22 ± 0

TABLE C-IX.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF MILLIREM/STD. QUARTER ± 2 STANDARD DEVIATION

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
INNER RING	144	15	29	23 ± 6
OUTER RING	127	17	30	24 ± 6
SPECIAL INTEREST	28	16	26	21 ± 6
OTHER	28	16	27	21 ± 6
CONTROL	4	17	22	20 ± 5

INNER RING STATIONS - BY-101-1, BY-101-2, BY-102-1, BY-102-2, BY-103-1, BY-103-2, BY-103-3, BY-104-1, BY-104-2, BY-104-3, BY-105-1, BY-105-2, BY-106-1, BY-106-2, BY-107-1, BY-107-2, BY-107-3, BY-108-1, BY-108-2, BY-109-1, BY-109-2, BY-110-1, BY-110-2, BY-111-3, BY-111-4, BY-112-3, BY-112-4, BY-113-1, BY-113-2, BY-114-1, BY-114-2, BY-115-1, BY-115-2, BY-116-1, BY-116-2, BY-116-3

OUTER RING STATIONS - BY-201-3, BY-201-4, BY-202-1, BY-202-2, BY-203-1, BY-203-2, BY-204-1, BY-204-2, BY-205-1, BY-205-2, BY-206-1, BY-206-2, BY-207-1, BY-207-2, BY-208-1, BY-208-2, BY-209-1, BY-209-4, BY-210-3, BY-210-4, BY-211-1, BY-211-4, BY-212-1, BY-212-4, BY-213-1, BY-213-4, BY-214-1, BY-214-4, BY-215-1, BY-215-4, BY-216-1, BY-216-2

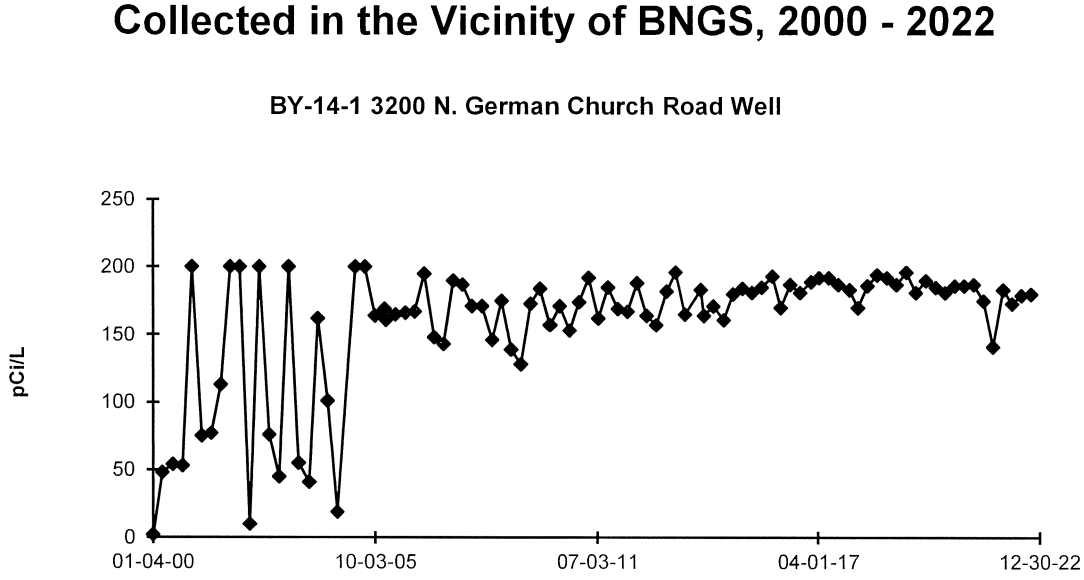
SPECIAL INTEREST STATIONS - BY-301-1, BY-301-2, BY-309-1*, BY-309-2*, BY-309-3*, BY-309-4*, BY-314-2

OTHER STATIONS - BY-01-1, BY-04-1, BY-06-1, BY-21-1, BY-22-1,BY-23-1, BY-24

CONTROL STATION - BY-08-1

**For ISFSI Monitoring*

FIGURE C-3
Ground Water - Tritium - Station BY-14-1
Collected in the Vicinity of BNGS, 2000 - 2022



DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

FIGURE C-4
Ground Water - Tritium - Station BY-18-1
Collected in the Vicinity of BNGS, 2010 - 2022

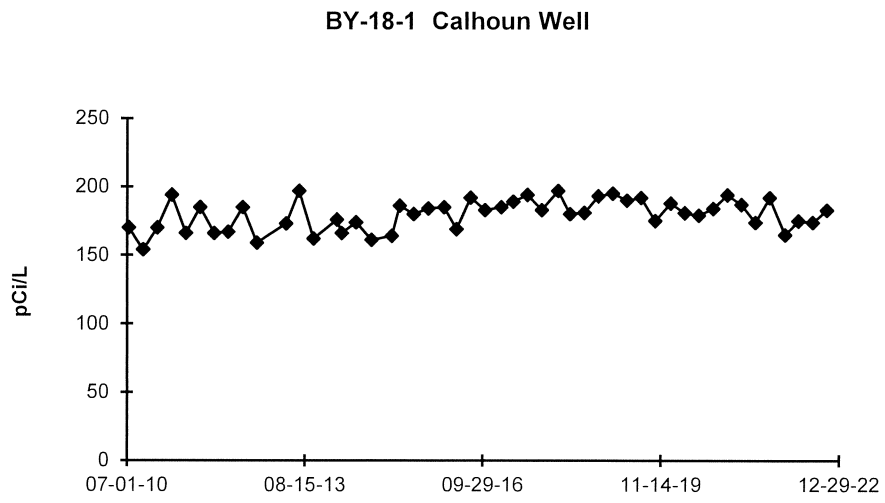
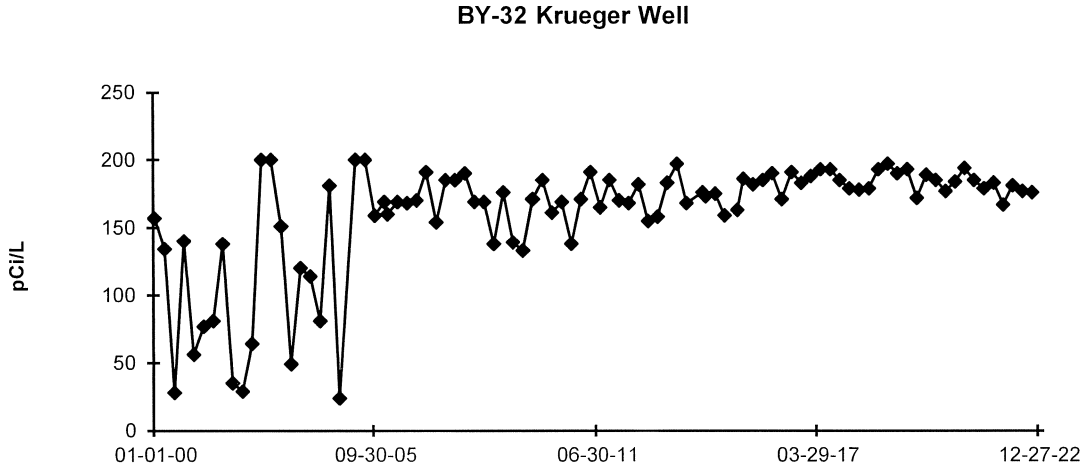


FIGURE C-5
Ground Water - Tritium - Station BY-32
Collected in the Vicinity of BNGS, 2000 - 2022



DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

FIGURE C-6
Ground Water - Tritium - Station BY-35
Collected in the Vicinity of BNGS, 2006 - 2022

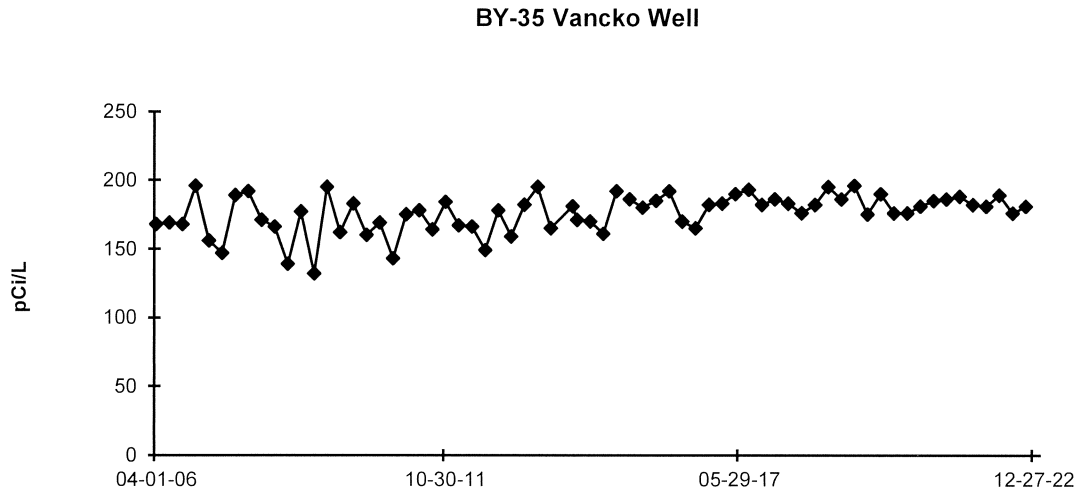
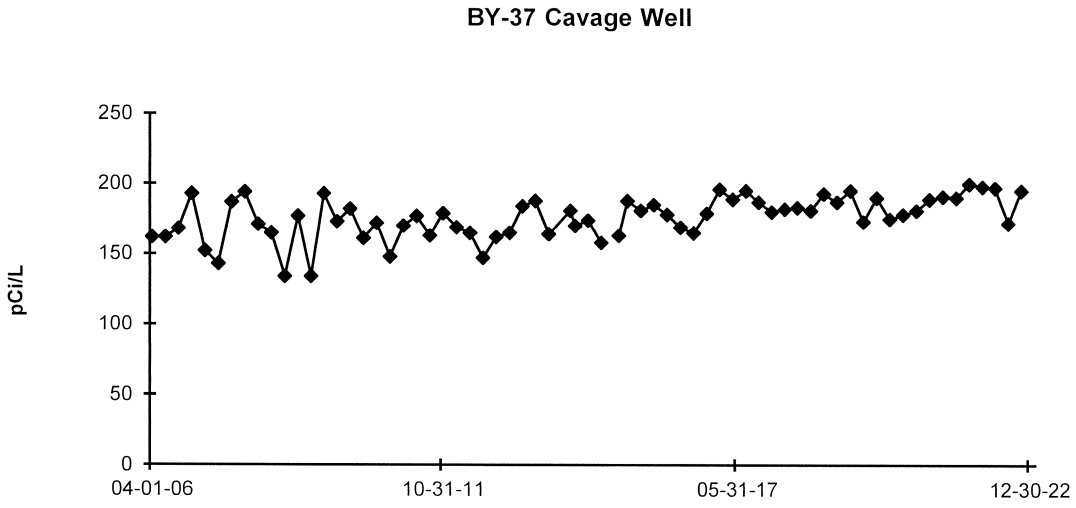


FIGURE C-7
Ground Water - Tritium - Station BY-37
Collected in the Vicinity of BNGS, 2006 - 2022



Ground Water - Tritium - Station BY-38
Collected in the Vicinity of BNGS, 2006 - 2022

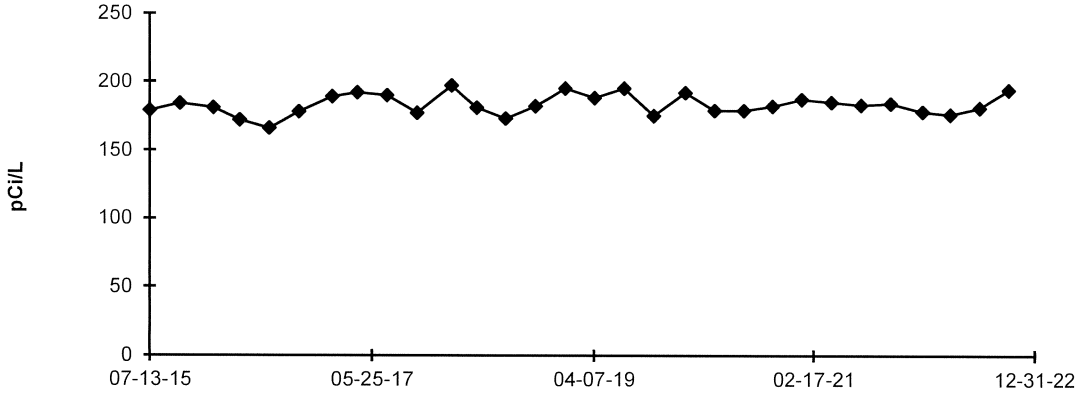
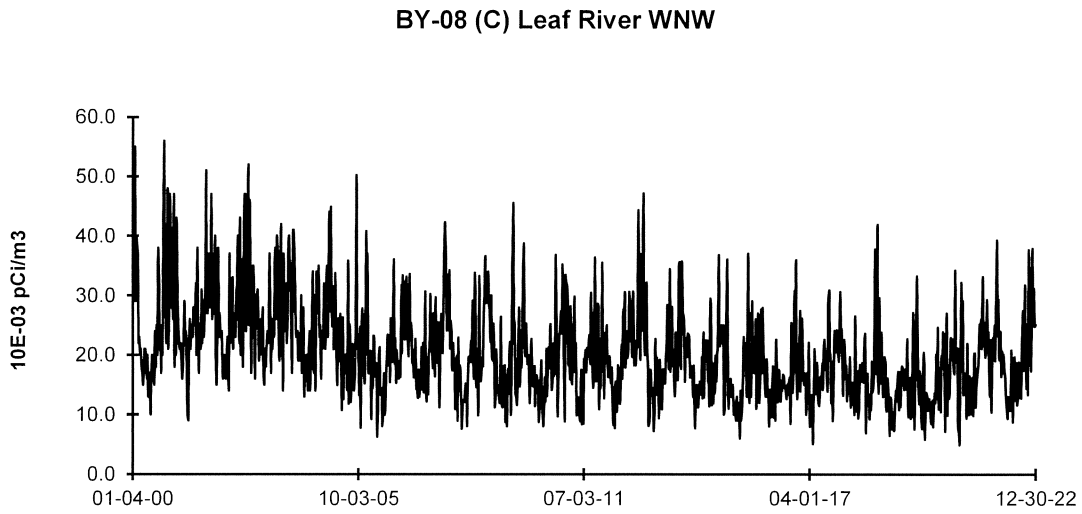


FIGURE C-8
Air Particulate - Gross Beta - Stations BY-08 (C) and BY-21 Collected in the Vicinity of BNGS, 2000 - 2022



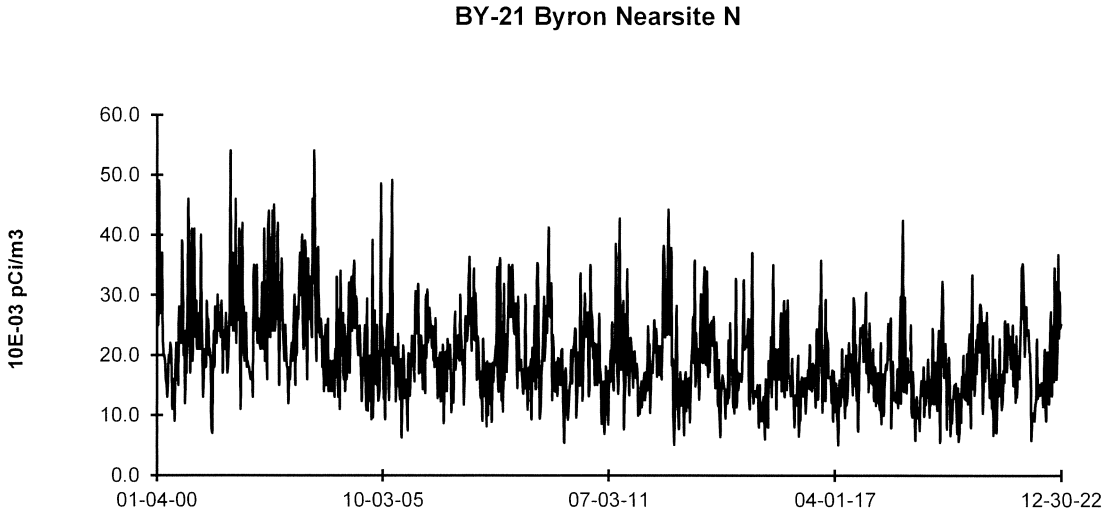
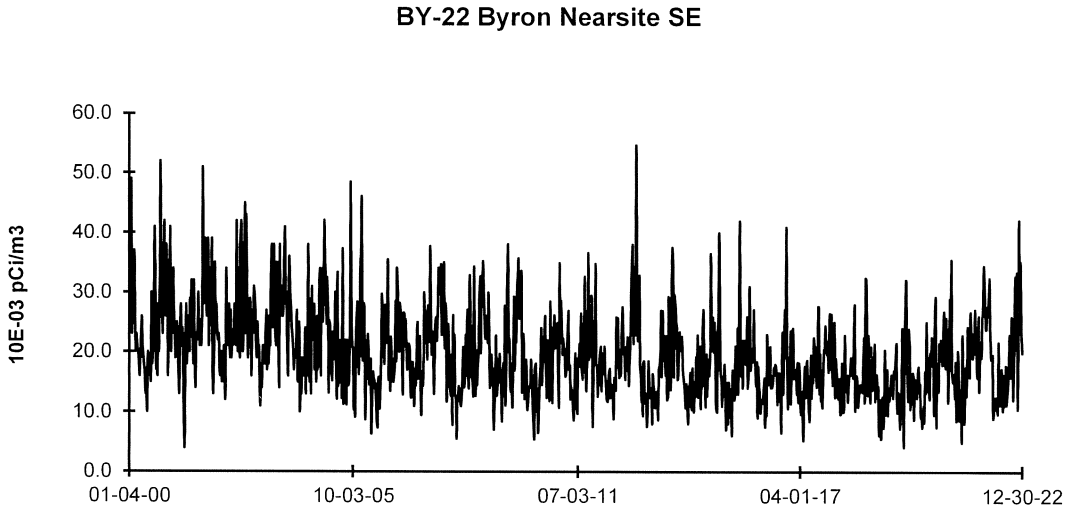


FIGURE C-9
Air Particulate - Gross Beta - Stations BY-22 and BY-23 Collected in the Vicinity of BNGS, 2000 - 2022



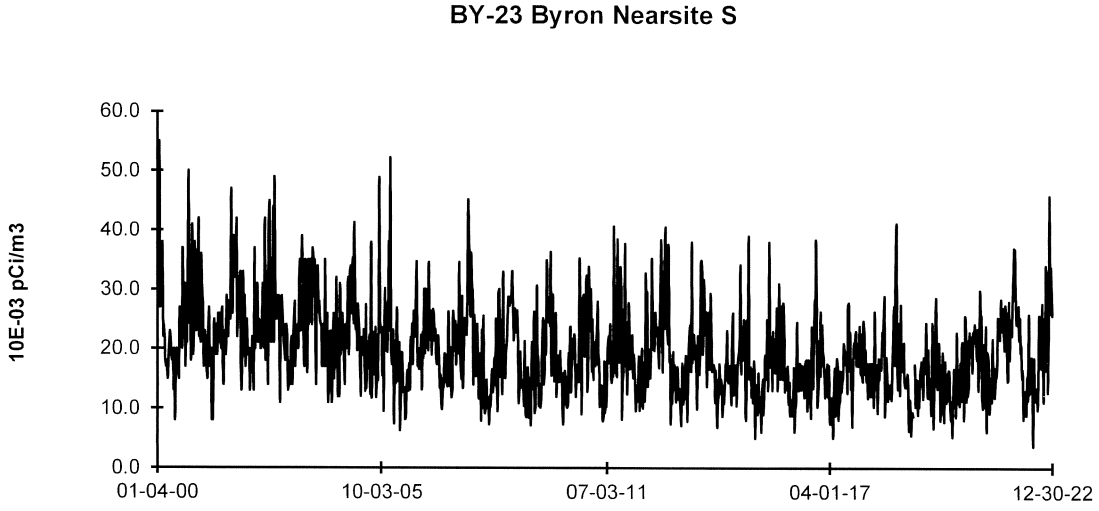


FIGURE C-10
Air Particulate - Gross Beta - Station BY-24
Collected in the Vicinity of BNGS, 2000 - 2022

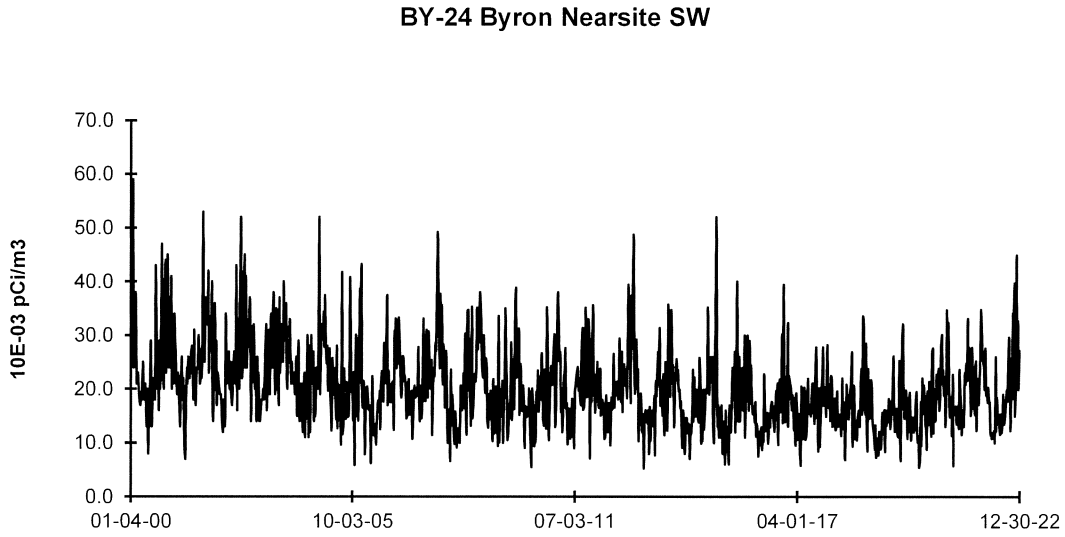
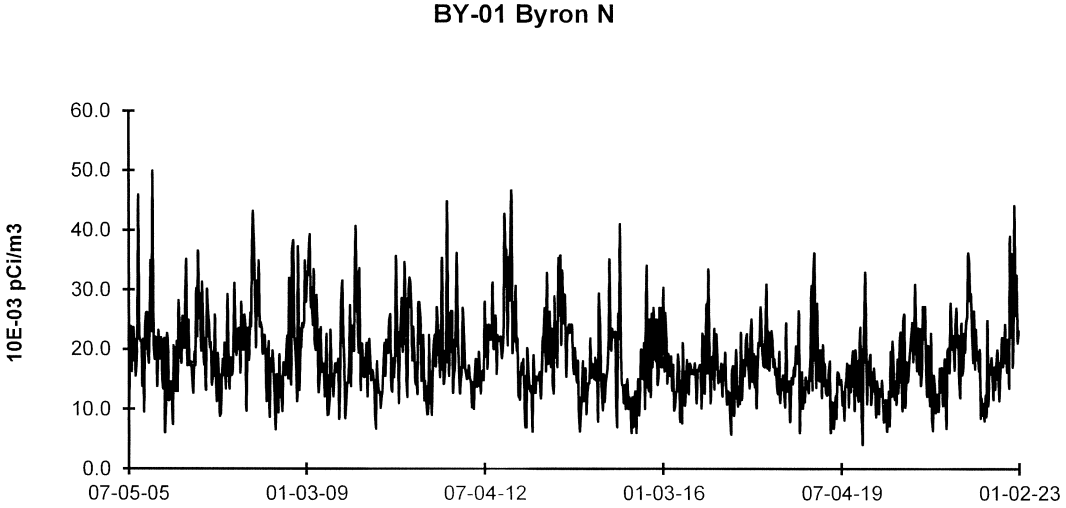
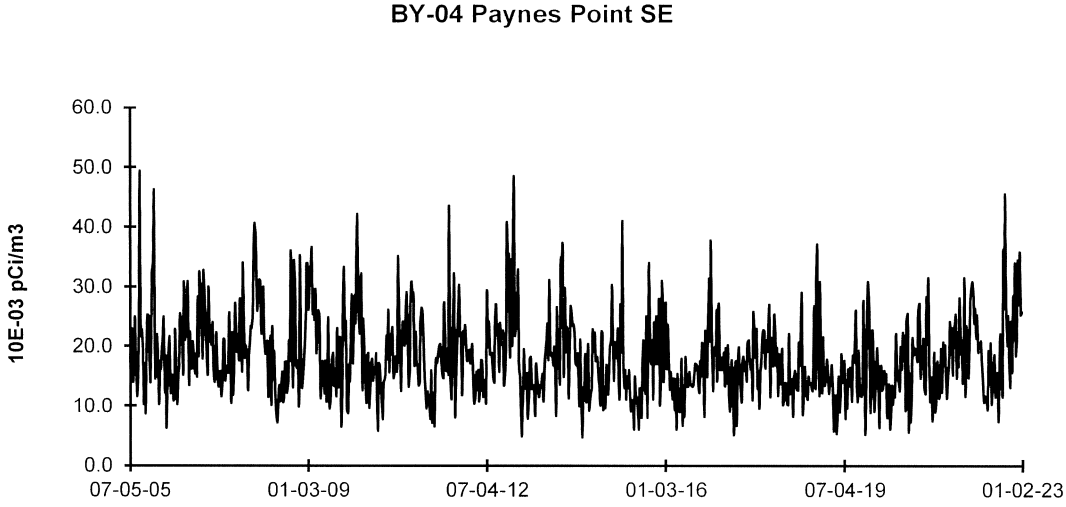


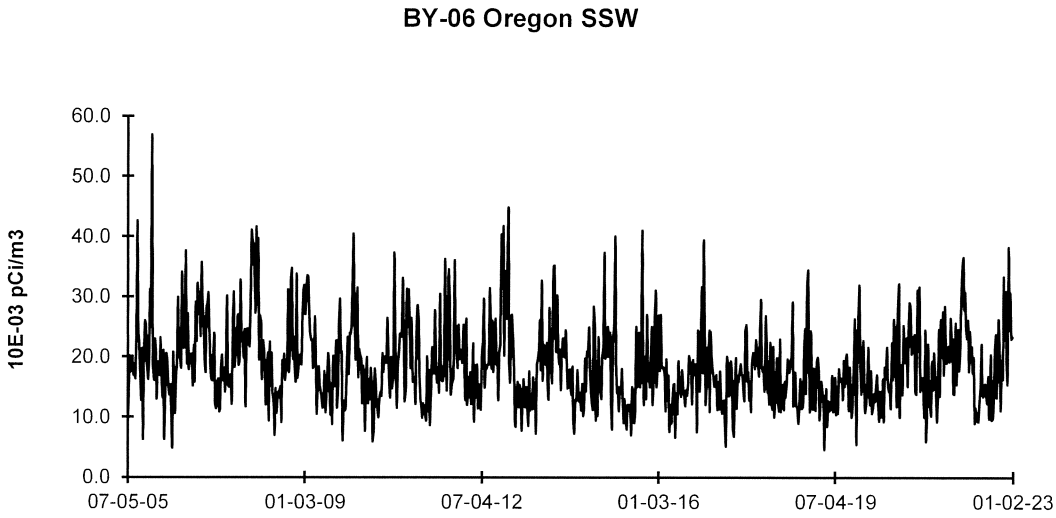
FIGURE C-11
Air Particulate - Gross Beta - Stations BY-01 and BY-04 Collected in the Vicinity of BNGS, 2005 - 2022





Regular analysis of far field air particulate & gross beta did not take place prior to 2005

FIGURE C-12
Air Particulate - Gross Beta - Station BY-06
Collected in the Vicinity of BNGS, 2005 - 2022



Regular analysis of far field air particulate & gross beta did not take place prior to 2005

Intentionally left blank

APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

Intentionally left blank

Table D.1 **Analytics Environmental Radioactivity Cross Check Program**
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Ratio of TBE to Analytics Result	Evaluation [b]
March 2022	E13706	Milk	Sr-89	pCi/L	80.3	96.8	0.83	A
			Sr-90	pCi/L	12.7	12.6	1.01	A
	E13707	Milk	Ce-141	pCi/L	62.3	65	0.96	A
			Co-58	pCi/L	158	164	0.96	A
			Co-60	pCi/L	286	302	0.95	A
			Cr-51	pCi/L	314	339	0.93	A
			Cs-134	pCi/L	155	182	0.85	A
			Cs-137	pCi/L	210	223	0.94	A
			Fe-59	pCi/L	211	185	1.14	A
			I-131	pCi/L	88.0	96.7	0.91	A
			Mn-54	pCi/L	169	164	1.03	A
			Zn-65	pCi/L	238	246	0.97	A
	E13708	Charcoal	I-131	pCi	79.9	87.1	0.92	A
	E13709	AP	Ce-141	pCi	60.9	42.0	1.45	N[1]
			Co-58	pCi	118	107	1.11	A
			Co-60	pCi	218	196	1.11	A
			Cr-51	pCi	251	221	1.14	A
			Cs-134	pCi	129	118	1.09	A
			Cs-137	pCi	156	145.0	1.07	A
			Fe-59	pCi	124	120.0	1.03	A
			Mn-54	pCi	120	107	1.12	A
			Zn-65	pCi	162	160	1.01	A
	E13710	Soil	Ce-141	pCi/g	0.123	0.103	1.19	A
			Co-58	pCi/g	0.254	0.263	0.97	A
			Co-60	pCi/g	0.493	0.483	1.02	A
			Cr-51	pCi/g	0.603	0.543	1.11	A
			Cs-134	pCi/g	0.268	0.292	0.92	A
			Cs-137	pCi/g	0.399	0.431	0.93	A
			Fe-59	pCi/g	0.320	0.296	1.08	A
			Mn-54	pCi/g	0.263	0.263	1.00	A
			Zn-65	pCi/g	0.407	0.395	1.03	A
	E13711	AP	Sr-89	pCi	83.2	97.4	0.85	A
			Sr-90	pCi	12.7	12.7	1.00	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:
A = Acceptable - reported result falls within ratio limits of 0.80-1.20
W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30
N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

*(1) See **NCR 22-04***

Table D.1 **Analytics Environmental Radioactivity Cross Check Program**
Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Ratio of TBE to Analytics Result	Evaluation [b]
September 2022	E13712	Milk	Sr-89	pCi/L	71.1	89.1	0.80	A
			Sr-90	pCi/L	12.0	13.6	0.88	A
	E13713	Milk	Ce-141	pCi/L	148	161	0.92	A
			Co-58	pCi/L	178	189	0.94	A
			Co-60	pCi/L	229	260	0.88	A
			Cr-51	pCi/L	486	456	1.07	A
			Cs-134	pCi/L	220	252	0.87	A
			Cs-137	pCi/L	203	222	0.92	A
			Fe-59	pCi/L	174	173	1.01	A
			I-131	pCi/L	75.9	94.2	0.81	A
			Mn-54	pCi/L	269	282	0.95	A
			Zn-65	pCi/L	364	373	0.97	A
	E13714	Charcoal	I-131	pCi	81.4	83.6	0.97	A
	E13715	AP	Ce-141	pCi	102	91	1.12	A
			Co-58	pCi	118	107	1.11	A
			Co-60	pCi	207	147	1.41	N(2)
			Cr-51	pCi	310	257	1.21	W
			Cs-134	pCi	148	142	1.04	A
			Cs-137	pCi	137	125	1.10	A
			Fe-59	pCi	115	98	1.18	A
			Mn-54	pCi	168	159	1.05	A
			Zn-65	pCi	240	211	1.14	A
	E13716	Soil	Ce-141	pCi/g	0.288	0.284	1.01	A
			Co-58	pCi/g	0.320	0.334	0.96	A
			Co-60	pCi/g	0.445	0.459	0.97	A
			Cr-51	pCi/g	0.883	0.805	1.10	A
			Cs-134	pCi/g	0.410	0.446	0.92	A
			Cs-137	pCi/g	0.447	0.465	0.96	A
			Fe-59	pCi/g	0.314	0.305	1.03	A
			Mn-54	pCi/g	0.489	0.499	0.98	A
			Zn-65	pCi/g	0.666	0.660	1.01	A
	E13717	AP	Sr-89	pCi	87.5	98.3	0.89	A
			Sr-90	pCi	12.6	15.0	0.84	A

(a) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) Analytics evaluation based on TBE internal QC limits:

A = Acceptable - reported result falls within ratio limits of 0.80-1.20

W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

*(2) See **NCR 22-21***

DOE's Mixed Analyte Performance Evaluation Program (MAPEP)

Table D.2 Teledyne Brown Engineering Environmental Services

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Acceptance Range	Evaluation [b]
February 2022	22-GrF46	AP	Gross Alpha	Bq/sample	0.402	1.20	0.36 - 2.04	A
			Gross Beta	Bq/sample	0.669	0.68	0.341 - 1.022	A
	22-MaS46	Soil	Ni-63	Bq/kg	645	780	546 - 1014	A
			Tc-99	Bq/kg	526	778	545 - 1011	N(3)
	22-MaSU46	Urine	Cs-134	Bq/L	1.67	1.77	1.24 - 2.30	A
			Cs-137	Bq/L	1.50	1.56	1.09 - 2.03	A
			Co-57	Bq/L	4.93	5.39	3.77 - 7.01	A
			Co-60	Bq/L	2.13	2.06	1.44 - 2.68	A
			Mn-54	Bq/L	4.83	5.08	3.56 - 6.60	A
			U-234	Bq/L	0.142	0.0074	0.0052 - 0.0096	N(4)
			U-238	Bq/L	0.0254	0.0103	0.0072 - 0.0134	N(4)
			Zn-65	Bq/L	4.71	4.48	3.14 - 5.82	A
	22-MaW46	Water	Ni-63	Bq/L	28.6	34.0	23.8 - 44.2	A
			Tc-99	Bq/L	8.59	7.90	5.5 - 10.3	A
	22-RdV46	Vegetation	Cs-134	Bq/sample	6.61	7.61	5.33 - 9.89	A
			Cs-137	Bq/sample	1.50	1.52	1.06 - 1.98	A
			Co-57	Bq/sample	5.11	5.09	3.56 - 6.62	A
			Co-60	Bq/sample	0.0162		*(1)*	A
			Mn-54	Bq/sample	2.42	2.59	1.81 - 3.37	A
			Sr-90	Bq/sample	0.684	0.789	0.552 - 1.026	A
			Zn-65	Bq/sample	1.44	1.47	1.03 - 1.91	A
August 2022	22-MaS47	Soil	Ni-63	Bq/kg	14.6		*(1)*	A
			Tc-99	Bq/kg	994	1000	700 - 1300	A
	22-MaW47	Water	Ni-63	Bq/L	24.4	32.9	23.0 - 42.8	A
			Tc-99	Bq/L	1.9		*(1)*	N(5)
	25-RdV47	Vegetation	Cs-134	Bq/sample	0.032		*(1)*	A
			Cs-137	Bq/sample	0.891	1.08	0.758 - 1.408	A
			Co-57	Bq/sample	0.006		*(1)*	A
			Co-60	Bq/sample	4.04	4.62	3.23 - 6.01	A
			Mn-54	Bq/sample	2.01	2.43	1.70 - 3.16	A
			Sr-90	Bq/sample	1.25	1.60	1.12 - 2.08	W
			Zn-65	Bq/sample	6.16	7.49	5.24 - 9.74	A

(a) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation

(b) DOE/MAPEP evaluation:

A = Acceptable - reported result falls within ratio limits of 0.80-1.20

W = Acceptable with warning - reported result falls within 0.70-0.80 or 1.20-1.30

N = Not Acceptable - reported result falls outside the ratio limits of < 0.70 and > 1.30

(1) False positive test

(2) Sensitivity evaluation

(3) Tc-99 soil cross-checks done for TBE information only - not required

*(4) See **NCR 22-05***

*(5) See **NCR 22-22***

ERA Environmental Radioactivity Cross Check Program

Table D.3 **Teledyne Brown Engineering Environmental Services**

Month/Year	Identification Number	Matrix	Nuclide	Units	TBE Reported Value	Known Value [a]	Acceptance Limits	Evaluation [b]
March 2022	MRAD-36	Water	Am-241	pCi/L	68.3	74.6	51.2 - 95.4	A
			Fe-55	pCi/L	797	1140	670 - 1660	A
			Pu-238	pCi/L	146	147	88.4 - 190	A
			Pu-239	pCi/L	69.9	71.9	44.5 - 88.6	A
		Soil	Sr-90	pCi/kg	8050	6720	2090 - 10500	A
		AP	Fe-55	pCi/filter	148	127	46.4 - 203	A
			Pu-238	pCi/filter	29.9	29.6	22.3 - 36.4	A
			Pu-239	pCi/filter	51.6	49.7	37.2 - 60.0	A
			U-234	pCi/filter	59.9	67.3	49.9 - 78.9	A
			U-238	pCi/filter	59.0	66.7	50.4 - 79.6	A
			GR-A	pCi/filter	95.6	94.2	49.2 - 155	A
			GR-B	pCi/filter	71.2	66.8	40.5 - 101	A
April 2022	RAD-129	Water	Ba-133	pCi/L	61.7	62.9	52.3 - 69.2	A
			Cs-134	pCi/L	80.9	81.6	68.8 - 89.8	A
			Cs-137	pCi/L	37.4	36.6	32.1 - 43.3	A
			Co-60	pCi/L	103	97.4	87.7 - 109	A
			Zn-65	pCi/L	318	302	272 - 353	A
			GR-A	pCi/L	26.9	20.8	10.4 - 28.3	A
			GR-B	pCi/L	49.7	51.0	34.7 - 58.1	A
			U-Nat	pCi/L	56.3	68.9	56.3 - 75.8	A
			H-3	pCi/L	17,000	18,100	15,800 - 19,000	A
			Sr-89	pCi/L	65.3	67.9	55.3 - 76.1	A
			Sr-90	pCi/L	42.1	42.7	31.5 - 49.0	A
			I-131	pCi/L	25.7	26.2	21.8 - 30.9	A
September 2022	MRAD-37	Water	Am-241	pCi/L	111	96.2	66.0 - 123	A
			Fe-55	pCi/L	850	926	544 - 1350	A
			Pu-238	pCi/L	62.1	52.6	31.6 - 68.2	A
			Pu-239	pCi/L	139.5	117	72.5 - 144	A
		Soil	Sr-90	pCi/kg	3350	6270	1950 - 9770	A
			U-234	pCi/kg	1684	3350	1570 - 4390	A
			U-238	pCi/kg	1658	3320	1820 - 4460	N[2]
		AP	Fe-55	pCi/filter	71.9	122	44.5 - 195	A
			Pu-238	pCi/filter	38.8	29.9	22.6 - 36.7	N[1]
			Pu-239	pCi/filter	14.5	13.0	9.73 - 15.7	A
			U-234	pCi/filter	78.0	71.5	53.0 - 83.8	A
			U-238	pCi/filter	79.7	70.9	53.5 - 84.6	A
			GR-A	pCi/filter	62.8	55.5	29.0 - 91.4	A
			GR-B	pCi/filter	70.9	64.8	39.3 - 97.9	A
October 2022	RAD-131	Water	Ba-133	pCi/L	76.2	79.4	66.6 - 87.3	A
			Cs-134	pCi/L	28.0	30.5	23.9 - 33.6	A
			Cs-137	pCi/L	202	212	191 - 235	A
			Co-60	pCi/L	52.4	51.4	46.3 - 59.1	A
			Zn-65	pCi/L	216	216	194 - 253	A
			GR-A	pCi/L	19.7	16.9	8.28 - 23.7	A
			GR-B	pCi/L	49.8	53.0	36.1 - 60.0	A
			U-Nat	pCi/L	10.54	8.53	6.60 - 9.88	N[3]
			H-3	pCi/L	13,900	15,100	13,200 - 16,600	A
			Sr-89	pCi/L	59.7	64.5	52.3 - 72.5	A
			Sr-90	pCi/L	32.9	37.3	27.4 - 43.0	A
			I-131	pCi/L	26.9	24.4	20.2 - 28.9	A

(a) The ERA known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(b) ERA evaluation:
A = Acceptable - Reported value falls within the Acceptance Limits
N = Not Acceptable - Reported value falls outside of the Acceptance Limits

*(1) See **NCR 22-19***

(2) U soil cross-checks done for TBE information only - not required

*(3) See **NCR 22-20***

APPENDIX E

EFFLUENT REPORT

Intentionally left blank

Table of Contents

Summary

Calculations based on gaseous and liquid effluents and meteorological data indicate that public dose due to radioactive material attributable to Byron Station during the period does not exceed regulatory or Offsite Dose Calculation Manual (ODCM) limits.

The Total Effective Dose Equivalent (TEDE) due to licensed activities at Byron Station calculated for the maximum exposed individual for the period is 4.97E-01 mrem. The annual limit on TEDE is 100 mrem.

The assessment of radiation doses to the public is performed in accordance with the ODCM. The results of these analyses confirm that the station is operating in compliance with 10CFR50 Appendix I, 10CFR20 and 40CFR190.

There were no additional operational controls implemented which affected the areas of radiological effluents in 2022.

There were no measurements which exceeded the reporting levels, including any which would not have been attributable to station effluents.

The results of the current radiological environmental monitoring program are approximately the same as those found during the pre-operational studies conducted at Byron Station.

Introduction

Liquid effluents from Byron Station are released to the Rock River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere and are calculated on the basis of analyses of weekly grab samples and grab samples of batch releases prior to the release of noble gases as well as continuously collected composite samples of iodine and particulate radioactivity sampled during the course of the year. The results of effluent analyses are summarized on a monthly basis. Airborne concentrations of noble gases, I-131, and particulate radioactivity in offsite areas are calculated using isotopic composition of effluents and meteorological data. Carbon-14 (C-14) concentration in offsite areas is calculated based on industry-approved methodology for estimation of the amount released and meteorological data.

Environmental monitoring is conducted by sampling at indicator and control (background) locations in the vicinity of Byron Station to measure changes in radiation or radioactivity levels that may be attributable to station operation. If significant changes attributable to Byron Station are measured, these changes are correlated with effluent releases. An environmental monitoring program is conducted which also includes all potential pathways at the site. Gaseous pathways include ground plane (direct), inhalation, vegetation, meat, and milk. Liquid pathways include potable water and freshwater fish. The critical pathway for 2022 gaseous dose was vegetation. The critical pathway for 2022 liquid dose was freshwater fish.

1.0 Gaseous Effluents to the Atmosphere

Measured concentrations and isotopic composition of noble gases radioiodine, tritium and particulate radioactivity released to the atmosphere during the year are listed in Table 1. The average quarterly release rate for all gaseous effluents were below detectable limits.

A total of 7.74E-01 curies of fission and activation gases were released.

A total of 8.63E+00 curies of other (C-14) radioisotopes were released.

A total of 1.32E+02 curies of tritium were released.

Iodine-131 and gross alpha-emitting radionuclides were below detectable limits.

2.0 Solid Radioactive Waste

Solid radioactive wastes were shipped by truck. For detail, refer to Byron Station 2022 Annual Radiological Effluent Release Report.

3.0 Dose Limits to Members of the Public

Byron Station did not exceed any of the dose limits as shown below based on concurrent or historical meteorological data.

- The limits on dose or dose commitment to a member of the public due to radioactive materials in liquid effluents from each reactor is 1.5 mrem to the whole body or 5 mrem to any organ during any calendar quarter and 3 mrem to the whole body or 10 mrem to any organ during a calendar year.
- The limits on air dose in noble gases released in gaseous effluents to a member of the public from each reactor is 5 mrad for gamma radiation or 10 mrad for beta radiation during any calendar quarter and 10 mrad for gamma radiation or 20 mrad for beta radiation during a calendar year.
- The limits on dose to a member of the public due to radioactive iodine & particulate with half-lives greater than eight days in gaseous effluents released from each reactor is 7.5 mrem to any organ during any calendar quarter and 15 mrem during a calendar year.
- The annual 10CFR20 limit on Total Effective Dose Equivalent to individual members of the public is 100 mrem.
- The 40CFR190 limits on individual members of the public is 25 mrem to the whole body, 25 mrem to any organ (except thyroid), and 75 mrem to the thyroid.

4.0 Site Meteorology

Detailed records of the site meteorological measurements taken during each calendar quarter of the year are maintained by the meteorological vendor, retained on site, and are available upon request. The data are presented as cumulative joint frequency distributions of the wind direction for the 250' level and wind speed class by atmospheric stability class determined from the temperature difference between the 250' and 30' levels. Data recovery for all measurements on the meteorological tower was 99.8% during 2022.

Intentionally left blank

APPENDIX E-1

EFFLUENT AND WASTE DISPOSAL REPORT
DATA TABLES

Intentionally left blank

Table 1
GASEOUS EFFLUENTS
SUMMATION OF ALL RELEASES
UNIT 1

REPORT FOR 2022	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission & Activation Gases						
1. Total Release	Ci	1.11E-01	1.84E-01	1.02E-01	8.24E-02	4.79E-01
2. Avg. Release Rate	µCi/sec	1.42E-02	2.34E-02	1.29E-02	1.04E-02	
Iodine-131						
1. Total Release	Ci	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
2. Avg. Release Rate	µCi/sec	*(1)*	*(1)*	*(1)*	*(1)*	
Particulates Half Life >= 8 days						
1. Total Release	Ci	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
2. Avg. Release Rate	µCi/sec	*(1)*	*(1)*	*(1)*	*(1)*	
Carbon-14						
1. Total Release	Ci	1.09E+00	1.11E+00	1.12E+00	1.16E+00	4.47E+00
2. Avg. Release Rate	µCi/sec	1.40E-01	1.41E-01	1.41E-01	1.46E-01	
Tritium						
1. Total Release	Ci	3.59E+00	4.94E+00	3.84E+00	5.86E+00	1.82E+01
2. Avg. Release Rate	µCi/sec	4.62E-01	6.28E-01	4.84E-01	7.37E-01	
Gross Alpha Radioactivity						
1. Total Release	Ci	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
2. Avg. Release Rate	µCi/sec	*(1)*	*(1)*	*(1)*	*(1)*	

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 1 (cont.)
GASEOUS EFFLUENTS
SUMMATION OF ALL RELEASES
UNIT 2

REPORT FOR 2022	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission & Activation Gases						
1. Total Release	Ci	1.01E-01	1.08E-01	4.52E-02	4.13E-02	2.95E-01
2. Avg. Release Rate	µCi/sec	1.29E-02	1.37E-02	5.69E-03	5.20E-03	
Iodine-131						
1. Total Release	Ci	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
2. Avg. Release Rate	µCi/sec	*(1)*	*(1)*	*(1)*	*(1)*	
Particulates Half Life >= 8 days						
1. Total Release	Ci	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
2. Avg. Release Rate	µCi/sec	*(1)*	*(1)*	*(1)*	*(1)*	
Carbon-14						
1. Total Release	Ci	1.12E+00	7.79E-01	1.16E+00	1.11E+00	4.16E+00
2. Avg. Release Rate	µCi/sec	1.44E-01	9.90E-02	1.46E-01	1.39E-01	
Tritium						
1. Total Release	Ci	3.22E+01	3.99E+01	1.42E+01	2.71E+01	1.14E+02
2. Avg. Release Rate	µCi/sec	4.14E+00	5.08E+00	1.79E+00	3.41E+00	
Gross Alpha Radioactivity						
1. Total Release	Ci	*(1)*	*(1)*	*(1)*	*(1)*	*(1)*
2. Avg. Release Rate	µCi/sec	*(1)*	*(1)*	*(1)*	*(1)*	

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 2
LIQUID EFFLUENTS
SUMMATION OF ALL RELEASES
UNIT 1

REPORT FOR 2022	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	3.39E-03	8.50E-03	1.44E-03	1.30E-03	1.46E-02
2. Avg. Diluted Conc.	µCi/ml	1.03E-09	2.46E-09	3.72E-10	3.39E-10	1.01E-09
Tritium						
1. Total Release	Ci	4.40E+02	2.21E+02	6.54E+01	3.47E+02	1.07E+03
2. Avg. Diluted Conc.	µCi/ml	1.34E-04	6.40E-05	1.69E-05	9.02E-05	7.42E-05
Dissolved & Entrained Gases						
1. Total Release	Ci	9.26E-05	7.75E-06	*(1)*	9.88E-06	1.10E-04
2. Avg. Diluted Conc.	µCi/ml	2.82E-11	2.24E-12	N/A	2.57E-12	7.63E-12
Gross Alpha Radioactivity						
1. Total Release	Ci	9.26E-05	7.75E-05	*(1)*	9.88E-06	1.10E-04
Volume of liquid waste	Liters	3.28E+09	3.45E+09	3.87E+09	3.85E+09	1.45E+10
Volume of dil. water	Liters	6.56E+09	6.90E+09	7.74E+09	7.69E+09	2.89E+10

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 2 (cont.)
LIQUID EFFLUENTS
SUMMATION OF ALL RELEASES
Unit 2

REPORT FOR 2022	Units	QTR 1	QTR 2	QTR 3	QTR 4	YEAR
Fission and Activation Products						
1. Total Release	Ci	3.39E-03	8.50E-03	1.44E-03	1.30E-03	1.46E-02
2. Avg. Diluted Conc.	µCi/ml	3.85E-06	7.83E-06	2.91E-06	2.31E-06	4.83E-06
Tritium						
1. Total Release	Ci	4.21E+02	2.03E+02	5.20E+01	3.27E+02	1.00E+03
2. Avg. Diluted Conc.	µCi/ml	4.77E-01	1.87E-01	1.05E-01	5.79E-01	3.31E-01
Dissolved & Entrained Gases						
1. Total Release	Ci	9.26E-05	7.75E-06	*(1)*	9.88E-06	1.10E-04
2. Avg. Diluted Conc.	µCi/ml	1.05E-07	7.13E-09	*N/A*	1.75E-08	3.64E-08
Gross Alpha Radioactivity						
1. Total Release	Ci	9.26E-05	7.75E-06	*(1)*	9.88E-06	1.10E-04
Volume of liquid waste	Liters	8.82E+05	1.09E+06	4.96E+05	5.65E+05	3.03E+06
Volume of dil. water	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.89E+10

(1) Less than minimum detectable activity which meets the lower limit of detection (LLD) requirements of TRM Section 3.11

Table 3
Summary of Gaseous and Liquid Effluents Doses to Members of the Public at the Highest Dose Receptors vs 10CFR50 Design Objectives

Unit 1

Noble Gas	Applicable Dose	Estimated Dose	Age Group	% of Applicable Limit	Design Objective Limit (per year, combined)	Unit
Maximum Location	Gamma Air	1.77E-04	All	1.77E-03	10	mrad
Maximum Location	Beta Air Dose	5.65E-05	All	3.83E-04	20	mrad
Maximum Location	Total Body	1.68E-04	All	3.36E-03	5	mrem
Maximum Location	Skin	2.39E-04	All	1.60E-03	15	mrem
Non-Noble Gas						
Maximum	Bone	1.17E+00	Child	7.79E+00	15	mrem
Liquid						
Maximum	Total Body	1.09E-02	Child	3.61E-01	3	mrem
Maximum	GI-Lli	1.12E-02	Child	1.12E-01	10	mrem

Unit 2

Noble Gas	Applicable Dose	Estimated Dose	Age Group	% of Applicable Limit	Design Objective Limit (per year, combined)	Unit
Maximum Location	Gamma Air	6.26E-05	All	6.26E-04	10	mrad
Maximum Location	Beta Air Dose	2.59E-05	All	1.30E-04	20	mrad
Maximum Location	Total Body	5.90E-05	All	1.18E-03	5	mrem
Maximum Location	Skin	8.62E-05	All	5.75E-04	15	mrem
Non-Noble Gas						
Maximum	Bone	1.09E+00	Child	7.24E+00	15	mrem
Liquid						
Maximum	Total Body	1.09E-02	Child	3.62E-01	3	mrem
Maximum	GI-Lli	1.12E-02	Child	1.12E-01	10	mrem

Table 4
Summary of Doses to Members of the Public at the Highest Dose Receptors for 40CFR190 and 10CFR72.104 Compliance

Highest Dose Receptors	Noble Gas	Non-Noble Gas	Liquid	On-Site Storage Facilities	Total	% of Applicable Limit	Limit	Unit
Total Body	2.27E-04	4.75E-01	2.17E-02	0.00E+00	4.97E-01	1.99E+00	25	mrem
Organ Dose	N/A	2.25E+00	2.25E-02	0.00E+00	2.28E+00	9.11E+00	25	mrem

Table 5
MAXIMUM ANNUAL CALCULATED CUMULATIVE OFFSITE DOSES
Resulting from Airborne Releases
Based on Concurrent Meteorological Data 2022

Unit 1:

Dose	*Maximum Value*	*Sector Affected*
gamma air [1]	3.37×10^{-5} mrad	North-Northwest
beta air [2]	1.37×10^{-5} mrad	North-Northwest
whole body [3]	7.53×10^{-2} mrem	North-Northwest
skin [4]	3.65×10^{-5} mrem	North-Northwest
organ [5] (child-bone)	3.70×10^{-1} mrem	North-Northwest

Unit 1 Compliance Status

10 CFR 50 Appendix I	**Yearly Objective**		**% of Appendix I**
gamma air	10.0	mrad	0.00
beta air	20.0	mrad	0.00
whole body	5.0	mrem	1.51
skin	15.0	mrem	0.00
organ	15.0	mrem	2.47

Unit 2:

Dose	*Maximum Value*	*Sector Affected*
gamma air [1]	1.34×10^{-5} mrad	North-Northwest
beta air [2]	1.08×10^{-5} mrad	North-Northwest
whole body [3]	8.17×10^{-2} mrem	North-Northwest
skin [4]	158×10^{-5} mrem	North-Northwest
organ [5] (child-bone)	3.82×10^{-1} mrem	North-Northwest

Unit 2 Compliance Status

10 CFR 50 Appendix I	**Yearly Objective**		**% of Appendix I**
gamma air	10.0	mrad	0.00
beta air	20.0	mrad	0.00
whole body	5.0	mrem	1.63
skin	15.0	mrem	0.00
organ	15.0	mrem	2.55

---

(1) Gamma Air Dose - GASPAR II, NUREG-0597
(2) Beta Air Dose - GASPAR II, NUREG-0597
(3) Whole Body Dose - GASPAR II, NUREG-0597
(4) Skin Dose - GASPAR II, NUREG-0597
(5) Inhalation and Food Pathways Dose - GASPAR II, NUREG-0597

Data recovery: 99.8%

APPENDIX F

METEOROLOGICAL DATA

Intentionally left blank

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	1	0	0	3
NNE	1	0	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	2	4	0	0	0	6
E	0	3	0	0	0	0	3
ESE	0	3	0	0	0	0	3
SE	0	1	0	0	0	0	1
SSE	0	1	1	0	0	0	2
S	0	1	0	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	5	0	0	0	0	5
WNW	1	2	4	0	0	0	7
NW	0	1	2	0	0	0	3
NNW	0	1	5	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	2	20	18	1	0	0	41

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	1	0	0	0	1
NE	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	1	1	0	0	0	2
NW	0	1	3	0	0	0	4
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	2	6	0	0	0	8

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	1	0	0	0	1
NE	0	0	4	0	0	0	4
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	1	1	0	0	0	2
WNW	0	0	4	3	0	0	7
NW	0	0	2	4	0	0	6
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	15	7	0	0	23

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	12	59	81	0	0	152
NNE	2	14	16	5	0	0	37
NE	2	6	26	20	6	0	60
ENE	1	6	13	3	1	0	24
E	1	5	10	0	0	0	16
ESE	1	5	7	19	5	0	37
SE	0	2	3	10	0	0	15
SSE	1	7	24	30	1	0	63
S	1	13	26	17	2	0	59
SSW	1	13	23	14	7	0	58
SW	2	10	43	17	4	0	76
WSW	2	13	19	11	3	0	48
W	4	25	54	39	15	9	146
WNW	2	26	63	52	22	0	165
NW	4	24	97	73	4	0	202
NNW	1	15	76	20	0	0	112
Variable	0	0	0	0	0	0	0
Total	25	196	559	411	70	9	1270

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 22
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	13	13	0	0	0	29
NNE	0	12	6	1	0	0	19
NE	1	5	5	2	1	0	14
ENE	2	2	2	3	0	0	9
E	3	10	3	0	0	0	16
ESE	1	8	6	7	13	1	36
SE	0	7	17	11	1	0	36
SSE	1	13	18	24	3	0	59
S	2	11	17	19	4	0	53
SSW	8	21	15	8	9	0	61
SW	12	26	15	9	1	0	63
WSW	6	22	22	2	1	4	57
W	1	23	22	4	0	0	50
WNW	6	16	6	0	1	1	30
NW	11	17	4	1	0	0	33
NNW	2	14	5	0	0	0	21
Variable	0	0	0	0	0	0	0
Total	59	220	176	91	34	6	586

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 26
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	1	0	0	0	3
NNE	1	1	0	0	0	0	2
NE	0	1	0	0	0	0	1
ENE	4	1	0	0	0	0	5
E	1	3	0	0	0	0	4
ESE	1	2	1	0	0	0	4
SE	2	2	5	0	0	0	9
SSE	5	11	13	2	0	0	31
S	4	10	0	2	0	0	16
SSW	5	3	0	0	0	0	8
SW	3	4	0	0	0	0	7
WSW	3	2	0	0	0	0	5
W	6	2	0	0	0	0	8
WNW	9	3	0	0	0	0	12
NW	6	2	0	0	0	0	8
NNW	2	1	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	54	48	20	4	0	0	126

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 5
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	1	1	2	0	0	0	4
SE	0	4	4	0	0	0	8
SSE	1	4	5	0	0	0	10
S	3	4	0	0	0	0	7
SSW	2	1	0	0	0	0	3
SW	1	0	0	0	0	0	1
WSW	3	0	0	0	0	0	3
W	2	0	0	0	0	0	2
WNW	5	0	0	0	0	0	5
NW	3	0	0	0	0	0	3
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	22	15	11	0	0	0	48

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	3	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	1	0	0	1
E	0	1	3	2	0	0	6
ESE	1	2	1	0	0	0	4
SE	0	1	1	0	0	0	2
SSE	0	1	1	0	0	0	2
S	0	1	0	1	0	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	1	4	0	0	0	0	5
WNW	0	1	6	1	0	0	8
NW	0	0	2	1	0	0	3
NNW	0	1	0	4	0	0	5
Variable	0	0	0	0	0	0	0
Total	2	12	14	13	0	0	41

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	1	1	0	2
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	1	1	0	0	2
NW	0	1	0	3	0	0	4
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	1	5	1	0	8

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	0	1	0	0	1
NE	0	0	0	4	0	0	4
ENE	0	0	0	0	0	0	0
E	0	0	0	1	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	2	1	0	0	3
WNW	0	0	0	9	0	0	9
NW	0	0	0	3	0	0	3
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	3	20	0	0	23

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	7	17	63	53	1	142
NNE	1	9	17	11	10	1	49
NE	0	5	6	19	13	8	51
ENE	2	5	2	17	2	1	29
E	0	2	3	13	1	0	19
ESE	2	1	3	12	12	6	36
SE	0	1	0	3	7	1	12
SSE	1	2	5	15	20	4	47
S	1	0	27	26	18	2	74
SSW	0	7	18	24	15	13	77
SW	0	7	21	29	14	4	75
WSW	0	11	11	23	6	3	54
W	1	10	33	43	30	21	138
WNW	2	11	71	62	33	17	196
NW	1	13	64	81	26	2	187
NNW	1	11	38	51	5	0	106
Variable	0	0	0	0	0	0	0
Total	13	102	336	492	265	84	1292

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	3	4	6	0	0	14
NNE	2	4	4	15	0	0	25
NE	1	4	9	5	2	1	22
ENE	1	1	4	5	2	0	13
E	1	7	5	0	4	0	17
ESE	0	2	5	4	4	18	33
SE	0	0	4	8	8	10	30
SSE	0	0	2	16	11	16	45
S	0	4	4	14	23	16	61
SSW	0	2	7	23	17	15	64
SW	0	6	22	19	14	6	67
WSW	1	2	29	23	5	5	65
W	1	7	24	24	4	0	60
WNW	1	4	15	4	0	2	26
NW	0	3	19	24	1	0	47
NNW	1	4	15	3	0	0	23
Variable	0	0	0	0	0	0	0
Total	10	53	172	193	95	89	612

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	1	0	0	0	4
NNE	0	2	0	0	1	0	3
NE	0	5	2	0	0	0	7
ENE	2	2	0	1	0	0	5
E	2	2	1	0	0	0	5
ESE	0	1	2	1	0	0	4
SE	0	2	1	1	3	0	7
SSE	0	0	1	1	9	0	11
S	0	0	2	9	5	3	19
SSW	0	2	5	7	2	0	16
SW	1	2	2	3	0	0	8
WSW	0	1	7	0	0	0	8
W	0	1	8	1	0	0	10
WNW	0	4	8	3	0	0	15
NW	0	0	3	4	0	0	7
NNW	0	2	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	6	28	43	31	20	3	131

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: January - March 2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	2	0	0	0	0	0	2
ESE	0	1	0	1	0	0	2
SE	0	3	1	1	0	0	5
SSE	1	1	4	4	3	0	13
S	0	2	3	3	5	0	13
SSW	0	1	1	0	0	0	2
SW	1	0	1	0	0	0	2
WSW	0	0	2	0	0	0	2
W	0	1	0	0	0	0	1
WNW	0	0	0	3	0	0	3
NW	0	1	1	0	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	5	11	13	12	8	0	49

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	2	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	3	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	0	0	0	1	0	0	1
S	0	3	4	2	0	0	9
SSW	0	3	2	1	0	0	6
SW	0	3	2	0	0	0	5
WSW	2	0	1	0	0	0	3
W	1	0	1	0	0	0	2
WNW	0	0	0	2	0	0	2
NW	0	0	0	0	0	0	0
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	3	10	18	6	0	0	37

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	3	0	0	3
NE	0	0	0	1	0	0	1
ENE	0	0	3	1	0	0	4
E	0	0	1	0	0	0	1
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	1	0	0	1
S	0	1	0	1	0	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	3	1	0	0	4
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	2	0	0	2
NW	0	0	4	1	0	0	5
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	2	13	11	0	0	26

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	1	2	0	0	0	4
NNE	0	0	0	2	0	0	2
NE	1	0	0	0	0	0	1
ENE	0	1	0	1	0	0	2
E	0	3	3	0	0	0	6
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	1	1
SSE	0	0	0	0	0	0	0
S	0	1	1	0	0	0	2
SSW	0	4	5	2	0	0	11
SW	0	1	6	1	0	0	8
WSW	0	0	0	0	0	0	0
W	1	0	0	0	0	0	1
WNW	0	1	2	7	0	0	10
NW	0	1	10	1	0	0	12
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	3	14	30	14	0	1	62

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	20	13	4	0	0	39
NNE	4	9	11	6	0	0	30
NE	2	7	6	2	0	0	17
ENE	1	13	15	4	0	0	33
E	0	40	53	2	0	0	95
ESE	3	6	11	14	2	0	36
SE	0	6	11	31	16	4	68
SSE	0	1	19	13	17	6	56
S	1	18	24	37	12	0	92
SSW	2	20	34	18	2	0	76
SW	1	16	25	13	1	0	56
WSW	4	18	12	34	9	7	84
W	3	15	26	27	5	0	76
WNW	1	13	41	46	3	0	104
NW	1	20	85	19	1	0	126
NNW	2	17	20	6	0	0	45
Variable	0	0	0	0	0	0	0
Total	27	239	406	276	68	17	1033

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	25	3	0	0	0	29
NNE	1	7	5	0	0	0	13
NE	2	9	12	1	0	0	24
ENE	1	12	16	6	0	0	35
E	3	40	23	5	0	0	71
ESE	4	14	25	8	5	0	56
SE	1	9	13	22	4	0	49
SSE	2	27	38	16	6	0	89
S	9	22	27	26	6	0	90
SSW	3	19	23	5	0	0	50
SW	3	12	23	4	0	0	42
WSW	5	15	18	4	1	0	43
W	4	13	16	4	4	2	43
WNW	6	21	17	0	0	0	44
NW	2	32	15	1	0	0	50
NNW	2	10	9	0	0	0	21
Variable	0	0	0	0	0	0	0
Total	49	287	283	102	26	2	749

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	9	0	0	0	0	9
NNE	0	1	0	0	0	0	1
NE	6	1	2	0	0	0	9
ENE	1	2	2	0	0	0	5
E	2	9	1	0	0	0	12
ESE	1	8	7	0	0	0	16
SE	0	2	4	0	0	0	6
SSE	4	15	10	0	0	0	29
S	7	21	4	0	0	0	32
SSW	7	9	1	0	0	0	17
SW	6	6	0	0	0	0	12
WSW	1	3	0	0	0	0	4
W	6	3	0	0	0	0	9
WNW	6	3	0	0	0	0	9
NW	11	5	1	0	0	0	17
NNW	2	7	0	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	60	104	32	0	0	0	196

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	1	0	0	0	0	4
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	1	1	0	0	0	0	2
E	0	3	0	0	0	0	3
ESE	1	0	6	0	0	0	7
SE	1	8	2	0	0	0	11
SSE	4	2	2	0	0	0	8
S	7	9	1	0	0	0	17
SSW	2	2	0	0	0	0	4
SW	3	0	0	0	0	0	3
WSW	1	0	0	0	0	0	1
W	3	0	0	0	0	0	3
WNW	4	1	0	0	0	0	5
NW	5	0	0	0	0	0	5
NNW	1	1	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	36	28	11	0	0	0	75

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	3	0	0	3
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	1	0	0	1
ESE	0	0	0	1	0	0	1
SE	0	0	0	2	0	0	2
SSE	0	0	0	0	1	0	1
S	0	0	1	2	2	0	5
SSW	0	4	1	3	1	0	9
SW	0	2	2	0	1	0	5
WSW	1	1	1	0	1	0	4
W	0	0	0	1	1	0	2
WNW	1	0	0	0	1	0	2
NW	0	0	0	0	0	0	0
NNW	0	0	1	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	2	7	6	14	8	0	37

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	1	3	0	4
NE	0	0	0	0	1	0	1
ENE	0	0	0	1	0	0	1
E	0	0	2	2	0	0	4
ESE	0	0	0	0	0	0	0
SE	0	0	0	1	0	0	1
SSE	0	0	0	0	0	1	1
S	0	0	0	1	1	0	2
SSW	0	0	0	0	0	0	0
SW	0	0	0	3	1	0	4
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	2	0	2
NW	0	0	1	3	1	0	5
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	0	4	12	9	1	26

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	1	0	0	3
NNE	0	1	0	0	1	0	2
NE	1	0	0	0	1	0	2
ENE	0	0	2	0	1	0	3
E	0	0	5	0	0	0	5
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	1	1
SSE	0	0	0	0	0	0	0
S	0	0	2	0	0	0	2
SSW	0	0	6	1	2	0	9
SW	0	0	5	4	1	0	10
WSW	0	0	0	0	0	0	0
W	0	0	1	0	0	0	1
WNW	0	1	1	5	5	0	12
NW	0	0	2	8	0	0	10
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	1	2	28	19	11	1	62

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	16	11	6	1	0	36
NNE	2	7	5	13	5	0	32
NE	2	2	6	3	3	0	16
ENE	2	3	11	5	6	0	27
E	0	11	63	29	5	2	110
ESE	1	6	7	6	12	4	36
SE	1	3	1	12	16	28	61
SSE	2	1	8	11	9	24	55
S	1	7	24	22	26	12	92
SSW	1	9	23	29	12	2	76
SW	1	10	13	21	14	6	65
WSW	4	7	16	14	33	12	86
W	1	10	13	31	20	2	77
WNW	1	12	24	36	36	0	109
NW	0	8	49	50	6	0	113
NNW	0	7	20	15	0	0	42
Variable	0	0	0	0	0	0	0
Total	21	119	294	303	204	92	1033

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	3	7	5	0	0	17
NNE	0	0	5	23	0	0	28
NE	0	2	10	3	2	0	17
ENE	4	5	10	12	4	1	36
E	0	4	24	36	9	3	76
ESE	2	1	8	14	15	13	53
SE	0	2	5	10	10	19	46
SSE	0	4	5	14	33	12	68
S	0	1	13	34	24	18	90
SSW	0	10	14	27	17	1	69
SW	0	1	10	30	13	0	54
WSW	1	1	9	18	6	4	39
W	0	0	12	18	2	3	35
WNW	0	9	15	18	0	0	42
NW	1	3	22	29	1	0	56
NNW	1	2	13	9	0	0	25
Variable	0	0	0	0	0	0	0
Total	11	48	182	300	136	74	751

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	3	0	0	6
NNE	1	2	1	5	0	0	9
NE	0	2	3	2	0	0	7
ENE	0	2	1	2	0	0	5
E	0	3	3	2	2	0	10
ESE	0	1	2	4	6	1	14
SE	0	0	0	3	3	1	7
SSE	0	1	0	3	4	0	8
S	2	4	4	9	8	2	29
SSW	0	4	6	16	5	0	31
SW	0	1	7	6	0	0	14
WSW	0	3	4	2	0	0	9
W	0	4	3	4	0	0	11
WNW	0	0	1	3	0	0	4
NW	1	7	8	9	0	0	25
NNW	0	0	5	2	0	0	7
Variable	0	0	0	0	0	0	0
Total	4	35	50	75	28	4	196

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: April - June 2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	2	0	0	2
NNE	0	0	1	3	0	0	4
NE	0	1	1	1	0	0	3
ENE	1	4	0	1	0	0	6
E	1	2	2	0	0	0	5
ESE	0	1	0	0	0	0	1
SE	1	2	3	3	3	0	12
SSE	0	1	4	4	1	0	10
S	0	2	2	3	0	0	7
SSW	0	1	1	1	1	0	4
SW	0	1	4	4	0	0	9
WSW	1	0	2	1	0	0	4
W	0	0	0	0	0	0	0
WNW	0	0	0	3	0	0	3
NW	2	1	0	2	0	0	5
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	7	16	20	28	5	0	76

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	5	0	0	0	6
NNE	1	2	0	0	0	0	3
NE	1	0	1	0	0	0	2
ENE	0	3	0	0	0	0	3
E	0	2	0	0	0	0	2
ESE	0	0	1	0	0	0	1
SE	0	2	0	0	0	0	2
SSE	0	3	1	0	0	0	4
S	0	4	4	0	0	0	8
SSW	0	4	3	0	0	0	7
SW	0	2	0	0	0	0	2
WSW	0	3	1	0	0	0	4
W	0	0	0	0	0	0	0
WNW	1	0	0	0	0	0	1
NW	0	0	4	0	0	0	4
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	3	26	21	0	0	0	50

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	1	0	0	4
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	1	0	0	0	1
E	0	2	0	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	2	0	0	0	2
SSW	0	1	1	0	0	0	2
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	3	0	0	3
NNW	0	0	4	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	0	4	11	4	0	0	19

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	4	0	0	0	6
NNE	1	3	0	0	0	0	4
NE	0	0	1	0	0	0	1
ENE	0	1	2	0	0	0	3
E	0	1	1	0	0	0	2
ESE	0	2	0	0	0	0	2
SE	0	2	0	0	0	0	2
SSE	0	2	3	1	0	0	6
S	0	1	9	2	0	0	12
SSW	0	1	10	0	0	0	11
SW	0	1	0	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	1	0	0	0	0	1
WNW	0	1	0	0	0	0	1
NW	0	0	0	2	0	0	2
NNW	0	0	2	1	0	0	3
Variable	0	0	0	0	0	0	0
Total	1	18	32	6	0	0	57

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	10	35	36	0	0	0	81
NNE	7	42	12	0	0	0	61
NE	6	22	12	0	0	0	40
ENE	5	37	10	0	0	0	52
E	8	27	0	0	0	0	35
ESE	1	18	6	0	0	0	25
SE	1	12	13	1	0	0	27
SSE	3	35	23	1	0	0	62
S	2	43	46	7	0	0	98
SSW	2	29	34	0	0	0	65
SW	4	32	10	0	0	0	46
WSW	7	24	11	2	0	0	44
W	6	20	26	6	0	0	58
WNW	2	15	58	7	0	0	82
NW	3	45	36	8	0	0	92
NNW	6	28	20	2	0	0	56
Variable	0	0	0	0	0	0	0
Total	73	464	353	34	0	0	924

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	15	4	1	0	0	26
NNE	3	24	3	0	0	0	30
NE	7	12	5	0	0	0	24
ENE	6	14	0	0	0	0	20
E	5	22	0	0	0	0	27
ESE	6	12	2	0	0	0	20
SE	4	24	5	0	0	0	33
SSE	2	47	15	0	0	0	64
S	8	49	36	2	0	0	95
SSW	10	16	23	3	0	0	52
SW	8	13	13	0	0	0	34
WSW	10	7	6	2	0	0	25
W	7	24	10	0	0	0	41
WNW	12	31	16	0	0	0	59
NW	11	20	10	0	0	0	41
NNW	5	18	3	0	0	0	26
Variable	0	0	0	0	0	0	0
Total	110	348	151	8	0	0	617

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	6	0	0	0	0	8
NNE	5	2	1	0	0	0	8
NE	1	2	0	0	0	0	3
ENE	7	10	0	0	0	0	17
E	5	26	0	0	0	0	31
ESE	4	13	0	0	0	0	17
SE	2	26	1	0	0	0	29
SSE	4	52	5	0	0	0	61
S	14	16	1	0	0	0	31
SSW	10	4	1	0	0	0	15
SW	18	0	1	0	0	0	19
WSW	8	4	0	0	0	0	12
W	17	11	0	0	0	0	28
WNW	16	8	0	0	0	0	24
NW	20	8	0	0	0	0	28
NNW	5	9	0	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	138	197	10	0	0	0	345

Hours of calm in this stability class: 4
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	0	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	5	2	0	0	0	0	7
ESE	6	8	0	0	0	0	14
SE	2	7	3	0	0	0	12
SSE	12	16	0	0	0	0	28
S	9	2	0	0	0	0	11
SSW	11	0	0	0	0	0	11
SW	6	0	0	0	0	0	6
WSW	19	0	0	0	0	0	19
W	14	0	0	0	0	0	14
WNW	25	0	0	0	0	0	25
NW	17	1	0	0	0	0	18
NNW	5	0	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	135	36	3	0	0	0	174

Hours of calm in this stability class: 15
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	4	1	0	0	5
NNE	0	0	1	1	0	0	2
NE	1	2	0	0	0	0	3
ENE	0	2	1	2	0	0	5
E	0	0	1	0	0	0	1
ESE	0	0	0	1	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	3	1	0	0	0	4
S	0	0	2	4	1	0	7
SSW	0	1	5	3	0	0	9
SW	0	0	1	1	0	0	2
WSW	0	1	2	1	0	0	4
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	1	0	4	0	0	5
NNW	0	0	0	1	0	0	1
Variable	0	0	0	0	0	0	0
Total	1	10	19	19	1	0	50

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	2	1	0	4
NNE	0	0	0	0	1	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	1	0	0	0	1
E	0	0	2	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	0	2	0	0	2
SSW	0	0	0	2	0	0	2
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	2	2	0	4
NNW	0	0	1	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	0	6	9	4	0	19

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	4	2	0	0	6
NNE	0	0	3	0	0	0	3
NE	0	0	1	1	0	0	2
ENE	0	0	0	2	0	0	2
E	1	1	1	1	0	0	4
ESE	0	3	0	0	0	0	3
SE	0	0	1	0	0	0	1
SSE	0	1	1	3	1	0	6
S	0	0	6	3	1	0	10
SSW	0	0	5	8	0	0	13
SW	0	0	1	0	0	0	1
WSW	0	0	1	0	0	0	1
W	0	0	0	0	0	0	0
WNW	0	1	0	0	0	0	1
NW	0	0	0	0	2	0	2
NNW	0	0	1	0	1	0	2
Variable	0	0	0	0	0	0	0
Total	1	6	25	20	5	0	57

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	12	33	19	0	0	65
NNE	1	23	33	12	1	0	70
NE	0	16	24	11	0	0	51
ENE	0	20	28	9	0	0	57
E	6	15	14	1	0	0	36
ESE	2	9	9	3	0	0	23
SE	0	6	12	7	2	0	27
SSE	2	11	29	13	3	0	58
S	1	14	40	31	8	1	95
SSW	3	19	28	24	2	0	76
SW	4	22	17	10	0	0	53
WSW	1	10	18	7	3	0	39
W	4	4	22	14	7	0	51
WNW	0	5	30	39	8	0	82
NW	2	23	32	32	6	0	95
NNW	2	14	15	12	3	0	46
Variable	0	0	0	0	0	0	0
Total	29	223	384	244	43	1	924

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	6	13	9	0	0	30
NNE	0	5	19	6	1	0	31
NE	1	7	13	18	0	0	39
ENE	2	10	6	2	0	0	20
E	0	5	16	8	1	0	30
ESE	1	5	2	6	2	0	16
SE	1	6	11	7	0	0	25
SSE	0	3	12	29	4	0	48
S	0	3	13	45	21	0	82
SSW	3	4	11	51	10	1	80
SW	3	1	16	14	12	0	46
WSW	0	1	7	8	3	3	22
W	2	3	11	14	4	0	34
WNW	0	5	18	31	0	0	54
NW	0	4	12	26	0	0	42
NNW	0	8	1	9	0	0	18
Variable	0	0	0	0	0	0	0
Total	15	76	181	283	58	4	617

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	2	5	5	0	0	13
NNE	3	2	4	3	0	0	12
NE	1	2	0	1	0	0	4
ENE	2	14	6	4	0	0	26
E	1	7	23	12	1	0	44
ESE	0	3	3	2	2	0	10
SE	0	1	8	8	5	0	22
SSE	0	0	4	14	5	0	23
S	2	0	2	30	15	0	49
SSW	0	5	5	13	3	0	26
SW	0	2	6	4	1	0	13
WSW	0	0	7	5	0	0	12
W	0	2	9	7	0	0	18
WNW	2	2	11	12	0	0	27
NW	0	2	15	21	0	0	38
NNW	0	2	8	2	0	0	12
Variable	0	0	0	0	0	0	0
Total	12	46	116	143	32	0	349

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: July - September 2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	3	3	1	0	0	8
NNE	0	3	2	1	0	0	6
NE	1	2	0	0	0	0	3
ENE	1	4	0	0	0	0	5
E	1	0	2	1	0	0	4
ESE	0	1	7	3	3	0	14
SE	1	0	5	12	2	0	20
SSE	0	1	1	3	2	0	7
S	0	3	1	7	4	0	15
SSW	1	1	8	7	1	0	18
SW	2	3	3	1	0	0	9
WSW	1	4	5	1	0	0	11
W	2	12	0	1	0	0	15
WNW	0	12	9	2	0	0	23
NW	1	5	4	2	0	0	12
NNW	1	3	11	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	13	57	61	42	12	0	185

Hours of calm in this stability class: 4
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Byron Generating Station

Period of Record: October - December2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	0	0	1	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	1
W	0	1	2	1	0	0	4
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	1	1	3	2	0	0	7

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	1	1	0	0	0	2
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	2	0	0	0	2
WSW	0	0	0	0	0	0	0
W	0	1	1	0	0	0	2
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	3	7	0	0	0	10

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	3	0	0	0	3
NE	1	1	0	0	0	0	2
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	0	2	0	0	0	0	2
SE	0	0	0	1	0	0	1
SSE	0	0	0	2	0	0	2
S	0	0	0	1	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	1	0	0	0	0	1
WSW	0	0	0	1	0	0	1
W	0	0	1	1	0	0	2
WNW	0	1	1	1	0	0	3
NW	0	1	1	0	0	0	2
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	1	7	8	7	0	0	23

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	14	11	1	0	0	27
NNE	0	8	1	1	0	0	10
NE	2	8	1	0	0	0	11
ENE	2	11	5	0	0	0	18
E	4	23	16	0	0	0	43
ESE	4	15	8	12	1	0	40
SE	3	21	11	5	0	0	40
SSE	2	9	18	25	8	0	62
S	3	6	32	29	2	0	72
SSW	1	12	21	23	6	0	63
SW	4	20	35	9	0	0	68
WSW	5	11	36	51	2	0	105
W	1	17	47	77	20	2	164
WNW	0	16	52	62	29	0	159
NW	7	23	44	39	0	0	113
NNW	1	11	27	2	0	0	41
Variable	0	0	0	0	0	0	0
Total	40	225	365	336	68	2	1036

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	7	20	8	0	0	0	35
NNE	4	8	3	0	0	0	15
NE	4	13	2	0	0	0	19
ENE	5	11	11	0	0	0	27
E	5	26	9	10	0	0	50
ESE	6	11	17	9	8	0	51
SE	1	8	10	1	0	0	20
SSE	3	10	51	34	3	0	101
S	3	12	30	59	2	0	106
SSW	3	19	21	15	0	0	58
SW	5	34	11	10	0	0	60
WSW	2	20	12	5	1	0	40
W	3	27	25	6	3	0	64
WNW	3	11	11	0	2	0	27
NW	5	7	29	2	0	0	43
NNW	5	12	4	1	0	0	22
Variable	0	0	0	0	0	0	0
Total	64	249	254	152	19	0	738

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	1	0	0	0	0	5
NNE	1	4	0	0	0	0	5
NE	2	5	0	0	0	0	7
ENE	2	4	1	0	0	0	7
E	6	20	1	0	0	0	27
ESE	1	14	3	0	0	0	18
SE	2	5	1	0	0	0	8
SSE	3	11	45	4	0	0	63
S	2	12	3	0	0	0	17
SSW	6	10	0	0	0	0	16
SW	8	7	0	0	0	0	15
WSW	5	6	1	0	0	0	12
W	6	5	2	0	0	0	13
WNW	8	2	1	0	0	0	11
NW	6	0	0	0	0	0	6
NNW	1	2	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	63	108	58	4	0	0	233

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	0	0	0	0	2
NNE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	4	1	0	0	0	0	5
E	3	6	0	0	0	0	9
ESE	4	9	3	0	0	0	16
SE	3	10	1	0	0	0	14
SSE	5	9	12	0	0	0	26
S	14	16	0	0	0	0	30
SSW	11	4	0	0	0	0	15
SW	9	0	0	0	0	0	9
WSW	4	0	0	0	0	0	4
W	9	0	0	0	0	0	9
WNW	7	0	0	0	0	0	7
NW	5	1	0	0	0	0	6
NNW	4	1	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	86	57	16	0	0	0	159

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Extremely Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	1	0	1	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	1	0	1
W	0	0	1	3	0	0	4
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	1	0	2	3	1	0	7

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Moderately Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	3	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	2	0	0	0	2
WSW	0	0	0	0	0	0	0
W	0	0	1	1	0	0	2
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	9	1	0	0	10

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Slightly Unstable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	4	0	0	0	4
NE	1	0	1	0	0	0	2
ENE	0	0	0	0	0	0	0
E	0	0	1	0	0	0	1
ESE	0	0	2	0	0	0	2
SE	0	0	0	0	0	1	1
SSE	0	0	0	0	0	2	2
S	0	0	0	0	1	0	1
SSW	0	0	0	0	0	0	0
SW	0	1	0	0	0	0	1
WSW	0	0	0	0	1	0	1
W	0	0	0	1	1	0	2
WNW	0	2	0	1	1	0	4
NW	0	0	1	0	0	0	1
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	1	3	10	2	4	3	23

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Neutral - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	6	7	10	0	1	26
NNE	0	6	4	1	1	0	12
NE	0	5	5	0	0	0	10
ENE	1	10	3	2	0	0	16
E	1	10	19	16	1	0	47
ESE	3	8	10	12	7	2	42
SE	3	9	18	1	6	1	38
SSE	1	5	15	10	17	12	60
S	0	3	13	31	20	7	74
SSW	0	7	8	22	19	7	63
SW	2	11	15	30	8	1	67
WSW	1	14	22	33	37	0	107
W	0	3	29	49	55	29	165
WNW	0	6	35	31	46	30	148
NW	2	6	40	34	31	2	115
NNW	0	10	19	14	3	0	46
Variable	0	0	0	0	0	0	0
Total	16	119	262	296	251	92	1036

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Slightly Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	6	11	11	0	0	28
NNE	0	5	8	6	1	0	20
NE	1	8	12	4	0	0	25
ENE	1	5	10	3	5	0	24
E	1	5	12	17	9	6	50
ESE	1	9	5	13	14	11	53
SE	0	2	4	8	1	1	16
SSE	1	3	6	12	36	14	72
S	0	1	4	19	70	26	120
SSW	0	3	9	28	24	8	72
SW	0	1	9	23	17	3	53
WSW	0	2	16	25	5	2	50
W	0	2	17	38	5	3	65
WNW	0	2	7	13	2	2	26
NW	1	3	7	27	5	0	43
NNW	1	4	6	10	0	0	21
Variable	0	0	0	0	0	0	0
Total	7	61	143	257	194	76	738

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Moderately Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	3	1	1	0	0	6
NNE	0	0	0	0	0	0	0
NE	0	3	5	1	0	0	9
ENE	0	0	6	6	0	0	12
E	0	3	5	3	2	0	13
ESE	0	3	7	12	2	1	25
SE	1	2	4	1	3	0	11
SSE	0	1	7	3	2	0	13
S	1	0	2	11	40	5	59
SSW	0	0	4	2	2	0	8
SW	0	0	4	16	1	0	21
WSW	0	3	3	10	0	0	16
W	0	2	3	6	0	0	11
WNW	0	2	6	6	0	0	14
NW	0	2	3	2	0	0	7
NNW	1	4	2	1	0	0	8
Variable	0	0	0	0	0	0	0
Total	4	28	62	81	52	6	233

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Byron Generating Station

Period of Record: October - December2022
Stability Class - Extremely Stable - 250Ft-30Ft Delta-T (F)
Winds Measured at 250 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	1	0	0	0	0	4
NNE	0	0	0	0	0	0	0
NE	1	2	4	0	0	0	7
ENE	2	3	2	0	0	0	7
E	0	0	0	2	0	0	2
ESE	0	0	3	4	2	0	9
SE	0	1	9	13	3	0	26
SSE	0	1	2	6	3	0	12
S	0	0	4	8	10	0	22
SSW	0	0	6	13	4	0	23
SW	0	7	8	8	0	0	23
WSW	1	2	6	1	0	0	10
W	1	0	4	3	0	0	8
WNW	0	1	1	1	0	0	3
NW	1	0	2	0	0	0	3
NNW	1	0	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	10	18	52	59	22	0	161

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

APPENDIX G

ERRATA DATA

Intentionally left blank

In the 2021 ARERR there was a statement missing in the miscellaneous information section that should have stated:

> "On 2/12/21 the Circwater Blowdown compositor line was frozen, and no sample was collected for 24 hrs. Compensatory sampling started with 1x per every 8 hrs from the alternate sample point of 0PR10J until line was dethawed later on that day and continuous flow was restored."

There was no other errata data for 2022.

Intentionally left blank

APPENDIX H

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

Intentionally left blank

NRC Docket No: 50-454
50-455

BYRON NUCLEAR GENERATING STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report

1 January Through 31 December 2022

Prepared By

Teledyne Brown Engineering
Environmental Services

Byron Nuclear Generating Station
Byron, IL 61010

April 2023

Intentionally left blank

Table Of Contents

Appendices

I. Summary and Conclusions

In 2006, Exelon instituted a comprehensive monitoring program to evaluate the impact of station operations on groundwater in the vicinity of Byron Nuclear Generating Station. The monitoring was conducted in two phases. Phase 1 of the monitoring was part of a comprehensive study initiated by Exelon to determine whether groundwater or surface water at and in the vicinity of Byron Nuclear Generating Station had been adversely impacted by any releases of radionuclides. Phase 1 was conducted by Conestoga Rovers and Associates (CRA) and the conclusions were made available to state and federal regulators as well as the public.

Phase 2 of the RGPP was conducted by Exelon corporate and station personnel to initiate follow up of Phase 1 and begin long-term monitoring at groundwater locations selected during Phase 1. This is the fifteenth in a series of annual reports on the status of the Radiological Groundwater Protection Program (RGPP) conducted at Byron Nuclear Generating Station. This report covers groundwater and surface water samples collected from the environment both on and off station property in 2022. During that time period, 134 analyses were performed on 46 samples from 14 locations.

In 2022, thirteen (13) Radiological Groundwater Protection Program (RGPP) monitoring wells were sampled in total. Groundwater samples were obtained in March, June, August and November and analyzed for tritium.

Three wells contained levels of tritium above the lower limit of detection (LLD) of 200 pCi/L. They were AR-4 (200 pCi/L in March, 237 pCi/L in August, 327 pCi/L in November), AR-7 (211 pCi/L in October) and AR-11 (590 pCi/L in June, 567 pCi/L in November). Well AR-11 is near the Circulating Water Blowdown piping, where historical leakage through vacuum breakers was known to have occurred. Tritium in Well AR-7, located on-site just west of plant structures, has been measured in this well slightly above detection limits on an intermittent basis since the well was first drilled in 2006. The tritium present in this well is likely due to legacy tritium prior to 2006 or precipitation recapture and is not believed to be the result of new leaks. The tritium measured in this well has been at or below tritium levels that have been historically measured in rainwater as a result of precipitation recapture from permitted gaseous releases. In August 2014, a break in the well piping was discovered about six feet below the surface that could have served as the entry point for tritium in the recapture water. Tritium present in well AR-7 has shown a gradual decrease since 2014. Should the water in these aquifers migrate to off-site wells used for drinking, the off-site dose consequence from tritium present in any of these three wells would be negligible. There are no existing or new leaks evident at the site and all groundwater well sample results are well below the drinking water tritium standard of 20,000 pCi/L.

In December 2018, two new wells, AR-12 and AR-13, were installed near well AR-7. These wells were added to provide additional monitoring capabilities in the area directly west of plant structures. No tritium was detected in these wells during 2022.

Strontium-89 (Sr-89) and Strontium-90 (Sr-90) were not detected in any samples above their respective LLDs of 10 and 1 pCi/L.

Gross Alpha in the dissolved and suspended fractions were performed on 10 samples in 2022. Gross Alpha (dissolved) was not detected at any location above the MDC. Gross Alpha (suspended) was detected in one sample each at two locations. The positive detects for gross alpha (suspended) are believed to be due to turbid samples are not the result of plant releases.

Gamma-emitting nuclides were not detected in any sample locations above the MDC in 2022.

Hard-To Detect (HTD) analyses including americium-241 (Am-241), cerium isotopes (Cm-242, Cm-243/244), plutonium isotopes (Pu-238, Pu-239/240), uranium isotopes (U-234, U-235, U-238), were performed at 2 locations in 2022. The uranium isotopes were detected at one location. The presence of minor detections of uranium isotopes are likely due to regional geology.

Analysis of iron-55 (Fe-55) and nickel-63 (Ni-63) were performed at 9 groundwater locations in 2022. All analyses results were less than the MDC.

In assessing all the data gathered for this report, it was concluded that the operation of Byron Nuclear Generating Station had no adverse radiological impact on the environment, and there are no known active releases into the groundwater at Byron Nuclear Generating Station.

II. Introduction

The Byron Station, a two-unit PWR station, is located about two miles east of the Rock River and approximately three miles southwest of Byron in Ogle County, Illinois. The reactors are designed to have capacities of 1,268 and 1,241 MW gross, respectively. Unit One loaded fuel in November 1984 and went online February 2, 1985. Unit Two went online January 9, 1987.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) on samples collected in 2022.

A. Objectives of the RGPP

The long-term objectives of the RGPP are as follows:

1. Identify suitable locations to monitor and evaluate potential impacts from station operations before significant radiological impact to the environment and potential drinking water sources
2. Understand the local hydrogeologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface
3. Perform routine water sampling and radiological analysis of water from selected locations
4. Report new leaks, spills, or other detections with potential radiological significance to stakeholders in a timely manner
5. Regularly assess analytical results to identify adverse trends
6. Take necessary corrective actions to protect groundwater resources

B. Implementation of the Objectives

The objectives identified have been implemented at Byron Nuclear Generating Station as discussed below:

1. Constellation and its consultant identified locations as described in the Phase 1 study. Phase 1 studies were conducted by Conestoga Rovers and Associates (CRA) and the results and conclusions were made available to state and federal regulators as well as the public.
2. The Byron Nuclear Generating Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the surface and shallow subsurface are updated based on ongoing measurements.
3. Byron Nuclear Generating Station will continue to perform routine sampling and radiological analysis of water from selected locations.
4. Byron Nuclear Generating Station has implemented new procedures to identify and report new leaks, spills, or other detections with potential radiological significance in a timely manner.
5. Byron Nuclear Generating Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

C. Program Description

Sample Collection

Sample locations can be found in Table A–1 and Figure A–1, Appendix A.

Groundwater/Surface Water

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures following EPA methods. Groundwater is collected from drilled wells. Surface water is collected from the Construction Runoff Pond (CROP), which collects stormwater runoff from the site protected area prior to discharge offsite. Sample locations, sample collection frequencies and analytical frequencies are controlled in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management, and shipment of samples, as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables as data are received.

Analytical data results are reviewed by both station personnel and an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen.

Tritiated water behaves the same as ordinary water in both the environment and the body. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. Within one month or so after ingestion, essentially all tritium is cleared. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity, and in special production reactors, where the isotopes lithium-7 and/or boron-10 are activated to produce tritium. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to Helium-3 (^{3}He). This radioactive decay releases a beta

particle (low-energy electron). The radioactive decay of tritium is the source of the health risk from exposure to tritium. Tritium is one of the least dangerous radionuclides because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the Byron Nuclear Generating Station RGPP in 2022.

In order to achieve the stated objectives, the current program includes the following analyses (as required by procedure):

1. Concentrations of strontium in groundwater
2. Concentrations of tritium in groundwater/surface water
3. Concentrations of gamma nuclides in groundwater/surface water
4. Concentrations of gross alpha monitoring in groundwater/surface water
5. Concentrations of hard-to-detect nuclides (Fe-55 and Ni-63) in groundwater

B. Data Interpretation

The radiological data collected prior to Byron Nuclear Generating Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Byron Nuclear Generating Station was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

   The lower limit of detection (LLD) is specified by federal regulation as a minimum sensitivity value that must be achieved routinely by the analytical parameter.

2. Laboratory Measurements Uncertainty

   The estimated uncertainty in measurement of tritium in environmental samples is frequently on the order of 50% of the measurement value.

   Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from calibration standards, sample volume or weight measurements, sampling uncertainty and other factors. Constellation reports the uncertainty of a measurement created by statistical process (counting error) as well as all sources of error (Total Propagated Uncertainty or TPU). Each result has two values calculated. Constellation reports the TPU by following the result with plus or minus ± the estimated sample standard deviation, as TPU, that is obtained by propagating all sources of analytical uncertainty in measurements.

   Analytical uncertainties are reported at the 95% confidence level in this report for reporting consistency with the AREOR.

C. Background Analysis

A pre-operational radiological environmental monitoring program (pre-operational REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, marine life, and foodstuffs. The results of the monitoring were detailed in the report entitled, *Environmental Radiological Monitoring for Byron Nuclear Generating Nuclear Power Station, Commonwealth Edison Company, Annual Report 1984, April 1985*.

The pre-operational REMP contained analytical results from samples collected from the surface water and groundwater. All groundwater samples listed in the pre-Operational REMP report were <200 pCi/L.

1. Background Concentrations of Tritium

   The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others. Additional detail may be found by consulting references (CRA 2006).

   a. Tritium Production

      Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, “Cosmogenic” tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, “lithogenic” tritium is produced by the bombardment of natural lithium present in crystalline rocks by neutrons produced by the radioactive decay of naturally abundant uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

      A major anthropogenic source of tritium and Sr-90 comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased significantly during the 1950s and early 1960s, and later with additional testing, resulting in the release of significant amounts of tritium to the atmosphere. The Canadian heavy water nuclear power reactors, other commercial power reactors, nuclear research and weapons production continue to influence tritium concentrations in the environment.

   b. Precipitation Data

      Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation

(GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected worldwide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Illinois surface water data were typically less than 100 pCi/L.

The USEPA RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a ± 70 to 100 pCi/L 95% confidence bound on each given measurement. Therefore, the typical background data provided may be subject to measurement uncertainty of approximately ± 70 to 100 pCi/L.

The radio-analytical laboratory is counting tritium results to a Constellation-specified LLD of 200 pCi/L. Typically, the lowest positive measurement will be reported within a range of 40 – 240 pCi/L or 140 ± 100 pCi/L. Clearly, these sample results cannot be distinguished as different from background at this concentration.

IV. Results and Discussion

A. Groundwater Results

Groundwater

Samples were collected from on- and off-site wells throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below:

Tritium

Samples from all locations were analyzed for tritium activity (Table B-I.1, Appendix B). Tritium values ranged from less than the detection limit to 590 pCi/L. Outside of the station boundary, tritium concentrations were all less than detection limit (<200 pCi/L). The tritium detected in groundwater samples has been isolated to the Galena- Platteville aquifer, which is isolated from the deeper regional groundwater aquifer by the semi-confining Glenwood Formation. Groundwater quality data from production wells and monitoring wells at the station located below this aquifer do not indicate concentrations of tritium greater than the LLD of 200 pCi/L. As such, the tritium impact is limited to the Galena- Platteville aquifer.

Strontium

Strontium-89 (Sr-89) and Strontium-90 (Sr-90) were not detected in any samples above their respective LLDs of 10 and 1 pCi/L.
(Table B-I.1, Appendix B)

Gross Alpha (dissolved and suspended)

Gross Alpha in the dissolved fraction was not detected above the MDC on any of the 10 samples analyzed in 2022. Gross Alpha in the suspended fraction was detected in two samples with concentrations ranging from 2.4 to 4.5 pCi/L. (Table B-I.1, Appendix B)

Gamma Emitters

No gamma-emitting nuclides were detected in groundwater samples in 2022. (Table B-I.2, Appendix B)

Hard-To-Detects

Hard-To-Detect (HTD) analyses of iron-55 (Fe-55) and nickel-63 (Ni-63) were performed on nine groundwater samples. All results were less than the MDC. Eight other alpha spectroscopy HTD analyses were performed on two samples. Uranium-234 (U-234) and U-238 were detected in one sample with activities of 0.60 pCi/L and 0.39 pCi/L respectively. No other nuclides were detected above the MDC. (Table B-I.3, Appendix B)

B. Drinking Water Well Survey

No drinking water well surveys were conducted in 2022.

C. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE are presented in the AREOR.

D. Leaks, Spills, and Releases

There are no new previously unidentified leaks or plumes at Byron Station. There were no new leaks, spills or releases at Byron Station in 2022.

E. Trends

Wells AR-4 and AR-11 have shown an overall decrease in tritium concentration since first sampled in 2006. Tritium has been measured in Well AR-7 since 2012, however, tritium has been previously measured in this well and it is believed to be the result of legacy tritium prior to 2006 or precipitation recapture, not the result of a new spill or leak.

F. Investigations

There were no investigations that took place in 2022 as a result of groundwater sample results.

G. Actions Taken

1. Compensatory Actions

   No compensatory actions were initiated in 2022.

2. Installation of Monitoring Wells

   No new monitoring wells were installed in 2022.

3. Actions to Recover/Reverse Plumes

   No actions were undertaken to recover/reverse plumes in 2022.

APPENDIX A

LOCATION DESIGNATION

Intentionally Left Blank

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations
Distance and Direction, Byron Nuclear Generating Station, 2022

Site	Site Type	Temporary/Permanent	Distance and Direction
AR-1	Monitoring Well	Permanent	0.36 miles/NNW
AR-2	Monitoring Well	Permanent	0.6 miles/NW
AR-3	Monitoring Well	Permanent	0.8 miles/NW
AR-4	Monitoring Well	Permanent	1.36 miles/WNW
AR-5	Monitoring Well	Permanent	1.92 miles/WNW
AR-6	Monitoring Well	Permanent	2.04 miles/WNW
AR-7	Monitoring Well	Permanent	0.04 miles/W
AR-8	Monitoring Well	Permanent	0.12 miles/S
AR-9	Monitoring Well	Permanent	0.24 miles/E
AR-10	Monitoring Well	Permanent	0.28 miles/NE
AR-11	Monitoring Well	Permanent	1.36 miles/WNW
AR-12	Monitoring Well	Permanent	366 feet/W
AR-13	Monitoring Well	Permanent	461 feet/WSW
CAR-1	Monitoring Well	Permanent	2.25 miles/WNW
CAR-3	Monitoring Well	Permanent	0.16 miles/SE
TW-13	Monitoring Well	Permanent	2.3 miles/WNW
CROP	Surface Water	Permanent	0.2 miles NE

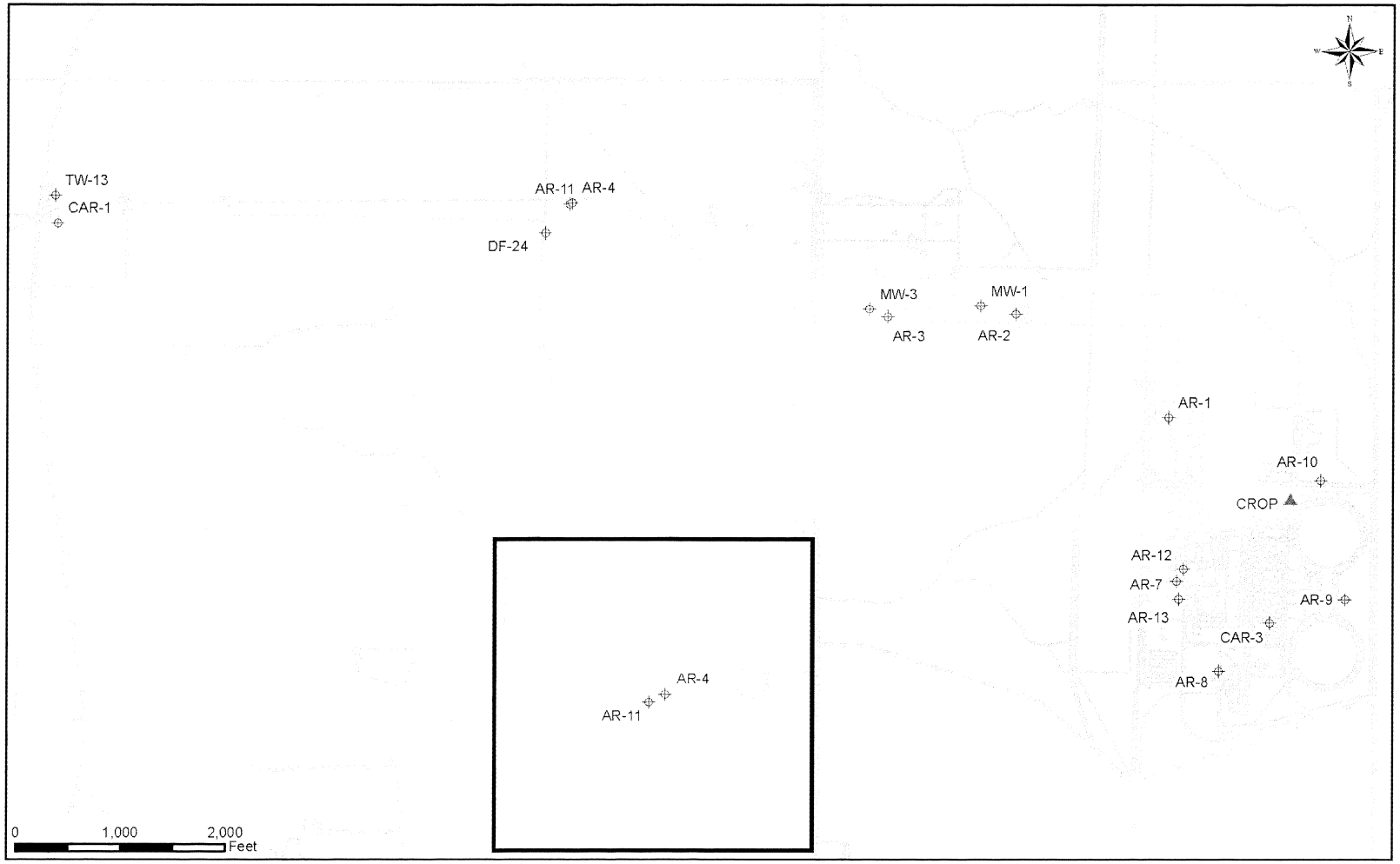


Figure A-1
Monitoring Well Locations, Byron Nuclear Generating Station, 2022

APPENDIX B

DATA TABLES

Intentionally Left Blank

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM AND GROSS ALPHA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)
AR-1	03/15/22	< 170				
AR-1	06/15/22	< 187	< 6.2	< 0.9	< 0.8	< 1.1
AR-1	08/31/22	< 197				
AR-1	11/01/22	< 200				
AR-2	06/15/22	< 185				
AR-3	03/05/22	< 167				
AR-3	06/15/22	< 184	< 6.7	< 0.8	< 1.0	2.4 ± 1.2
AR-3	08/31/22	< 194				
AR-3	11/03/22	< 187				
AR-4	03/05/22	200 ± 129				
AR-4	06/15/22	< 190	< 5.3	< 0.9	< 1.0	< 1.1
AR-4	08/31/22	237 ± 127				
AR-4	11/03/22	327 ± 135				
AR-7	03/14/22	< 180				
AR-7	06/15/22	< 174	< 6.5	< 0.8	< 1.2	< 1.1
AR-7	08/30/22	< 196				
AR-7	10/31/22	211 ± 122				
AR-8	03/14/22	< 190				
AR-8	06/14/22	< 187	< 8.6	< 1.0	< 0.6	< 1.2
AR-8	08/30/22	< 195				
AR-8	10/31/22	< 183				
AR-9	03/15/22	< 170				
AR-9	06/15/22	< 186	< 7.2	< 0.9	< 0.9	< 1.1
AR-9	08/31/22	< 183				
AR-9	11/01/22	< 179				
AR-10	06/15/22	< 189				
AR-11	06/15/22	590 ± 154				
AR-11	11/03/22	567 ± 143				
AR-12	03/15/22	< 186				
AR-12	06/14/22	< 171	< 8.5	< 0.9	< 1.9	< 1.2
AR-12	08/30/22	< 183				
AR-12	10/31/22	< 190				
AR-13	03/15/22	< 186				
AR-13	06/14/22	< 169	< 5.6	< 0.8	< 1.4	< 2.2
AR-13	08/30/22	< 189				
AR-13	10/31/22	< 191				
CAR-1	06/15/22	< 199				
CAR-3	03/15/22	< 176				
CAR-3	06/14/22	< 185	< 4.4	< 0.7	< 1.0	4.5 ± 1.5
CAR-3	08/30/22	< 194				
CAR-3	10/31/22	< 195			< 1.4	< 1.1
*CROP	03/15/22	225 ± 129				
*CROP	04/05/22	289 ± 125				
*CROP	06/15/22	< 192	< 8.5	< 0.7	< 0.7	< 2.4
*CROP	08/31/22	< 196				
*CROP	11/01/22	< 200				

**Surface Water Sample*

TABLE B-I.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATING STATION, 2022

RESULTS IN UNITS OF PCI/LITER + 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
AR-1	06/15/22	< 17	< 38	< 2	< 2	< 4	< 2	< 3	< 2	< 4	< 6	< 2	< 2	< 13	< 4
AR-2	06/15/22	< 16	< 19	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 11	< 4
AR-3	06/15/22	< 11	< 26	< 1	< 1	< 3	< 2	< 2	< 1	< 2	< 3	< 1	< 1	< 7	< 2
AR-4	06/15/22	< 16	< 35	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 10	< 3
AR-7	06/15/22	< 14	< 14	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 11	< 4
AR-8	06/14/22	< 15	< 15	< 1	< 2	< 3	< 2	< 3	< 2	< 3	< 5	< 2	< 1	< 11	< 3
AR-9	06/15/22	< 17	< 18	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 12	< 5
AR-10	06/15/22	< 14	< 22	< 1	< 1	< 3	< 2	< 3	< 1	< 3	< 5	< 1	< 1	< 11	< 4
AR-11	06/15/22	< 16	< 31	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 10	< 3
AR-12	06/14/22	< 16	< 30	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 4
AR-13	06/14/22	< 15	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 4
CAR-1	06/15/22	< 18	< 19	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 4	< 2	< 2	< 10	< 4
CAR-3	06/14/22	< 14	< 15	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 4
*CROP	06/15/22	< 14	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 11	< 4

**Surface Water Sample*

TABLE B-I.3

CONCENTRATIONS OF HARD-TO-DETECTS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF BYRON NUCLEAR GENERATNG STATION, 2022

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238	Fe-55	Ni-63
AR-1	06/15/22									< 140	< 3.8
AR-3	06/15/22									< 159	< 4.1
AR-4	06/15/22									< 78	< 3.9
AR-7	06/15/22									< 129	< 4.3
AR-8	06/14/22									< 111	< 4.2
AR-9	06/15/22									< 170	< 4.1
AR-12	06/14/22	< 0.09	< 0.03	< 0.12	< 0.10	< 0.10	0.59 ± 0.26	< 0.18	0.29 ± 0.18	< 132	< 4.0
AR-13	06/14/22									< 87	< 3.9
CAR-3	06/14/22									< 49	< 3.9
CAR-3	10/31/22	< 0.14	< 0.14	< 0.18	< 0.11	< 0.03	< 0.11	< 0.08	< 0.11		

Intentionally left blank