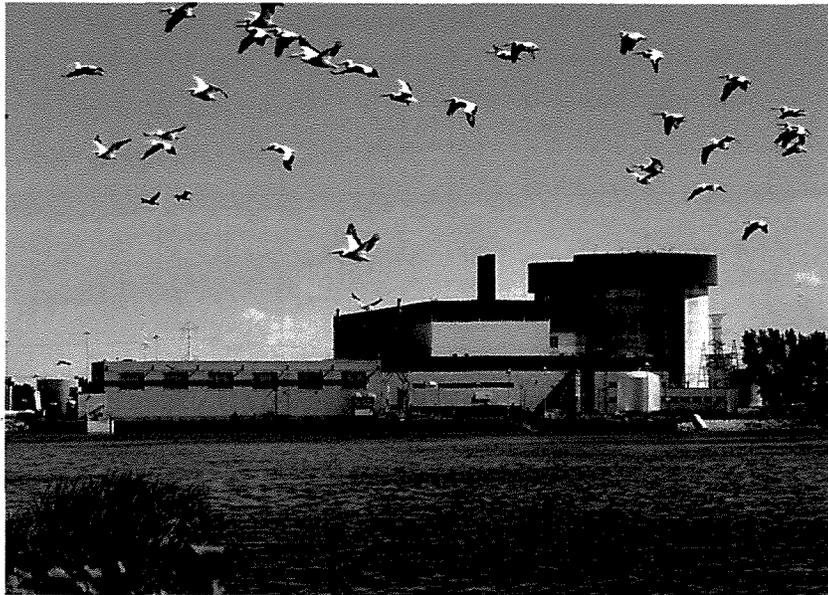


2019

Braidwood Nuclear Power Station

Annual Radioactive Effluent Release Report (ARERR)



UNIT 1 AND 2 (Docket Numbers 50-456 and 50-457)
ISFSI (Docket Number 72-73)

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
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Preface

The following sections of the preface are meant to help define key concepts, provide clarity, and give context to the readers of this report.

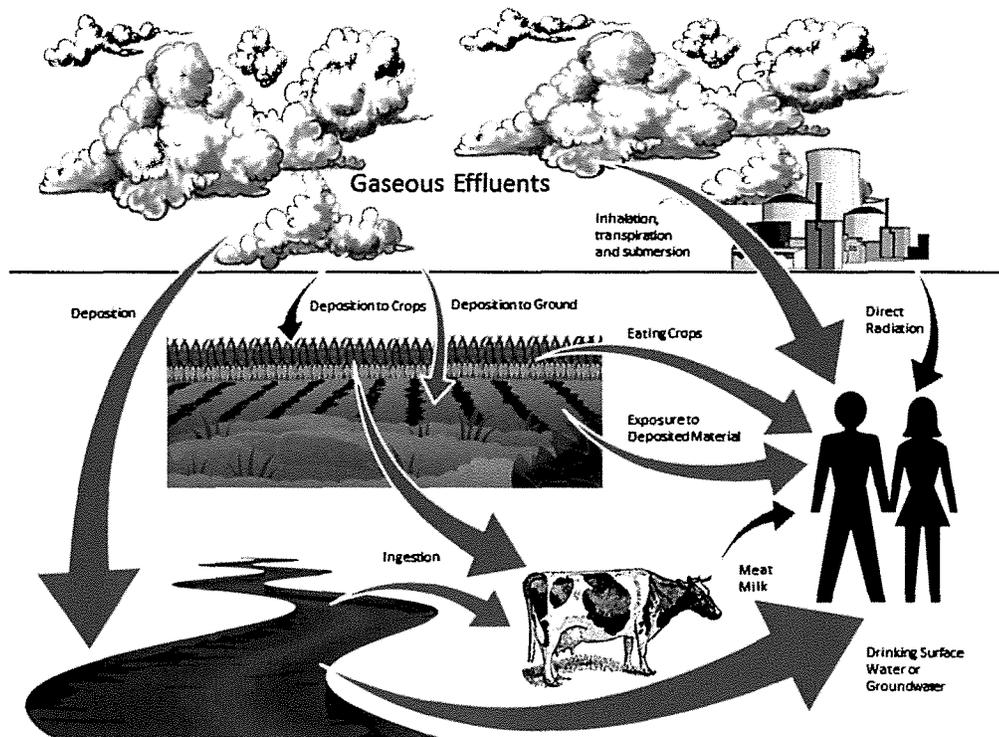
Annual Reports

The Nuclear Regulatory Commission (NRC) is the federal agency who has the role to protect public health and safety through the development of regulations governing nuclear power reactors and ensuring their compliance. As part of the many commitments Nuclear Power Plants have to the NRC to ensure this safety, they provide two reports annually to specifically address how the station's operation impacts the environment of local communities. The NRC then reviews these reports and makes them available to the public. The names of the reports are the Annual Radioactive Effluent Release Report (ARERR) and the Annual Radiological Environmental Operating Report (AREOR).

The ARERR reports the results of the sampling from the effluent release paths at the station analyzed for radioactivity. An effluent is a liquid or gaseous waste containing plant-related radioactive material emitted at the boundary of the facility.

The AREOR reports the results of the samples obtained in the environment surrounding the station. Environmental samples include air, water, vegetation, and other sample types that are identified as potential pathways radioactivity can reach humans.

Graphic 1. Examples of Gaseous and Liquid Effluent Pathways



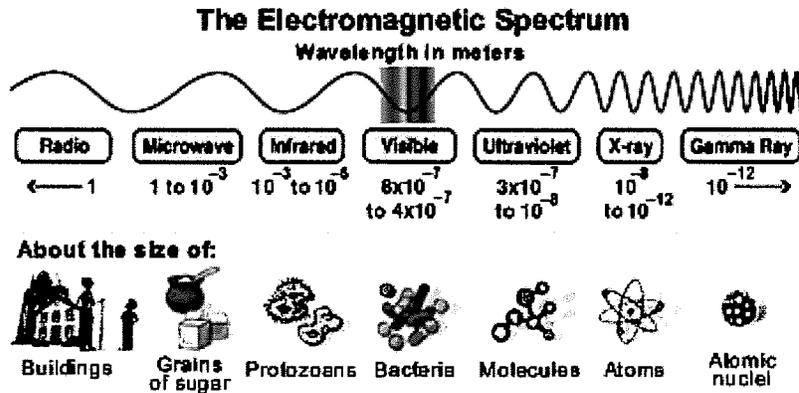
Graphic 1 demonstrates some potential exposure pathways from Braidwood Nuclear Power Station. The ARERR and AREOR together ensure Nuclear Power Plants are operating in a manner that is within established regulatory commitments meant to adequately protect the public.

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Understanding Radiation

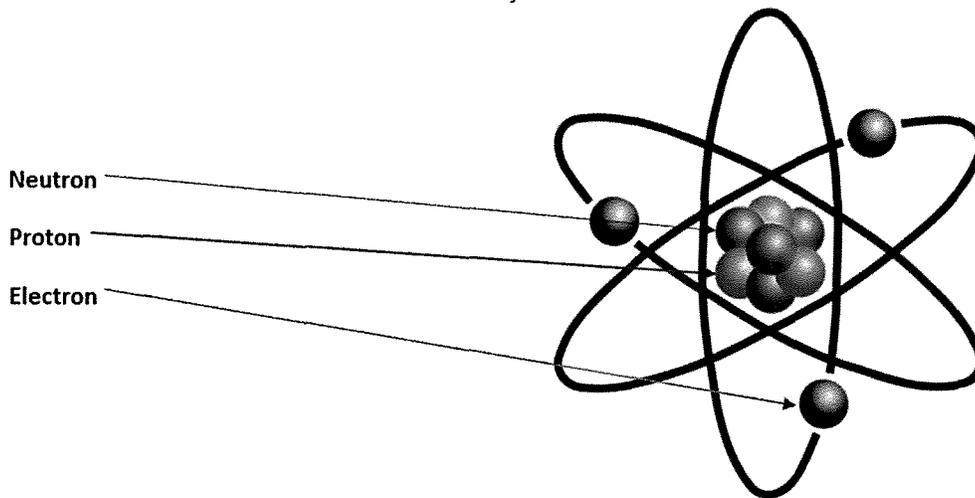
Generally radiation is defined as emitted energy in the form of waves or particles. If radiation has enough energy to displace electrons from an atom it is termed "ionizing", otherwise it is "non-ionizing". Non-ionizing radiation includes light, heat given off from a stove, radiowaves and microwaves. Ionizing radiation occurs in atoms, particles too small for the eye to see. So, what are atoms and how does radiation come from them?

Graphic 2. Types of Radiation, from NASA Hubblesite



An atom is the smallest part of an element that maintains the characteristics of that element. Atoms are made up of three parts: protons, neutrons, and electrons.

*Graphic
3. Structure of an Atom*



The number of protons in an atom determines the element. For example, a hydrogen atom will always have one proton while an oxygen atom will always have eight protons. The protons are clustered with the neutrons forming the nucleus at the center of the atom. Orbiting around the nucleus are the relatively small electrons.

Isotopes are atoms that have the same number of protons but different numbers of neutrons. Different isotopes of an element will all have the same chemical properties and many isotopes are radioactive while other isotopes are not radioactive. A radioactive isotope can emit radiation because it contains excess energy in its nucleus. Radioactive atoms and isotopes are also referred to as radionuclides and radioisotopes.

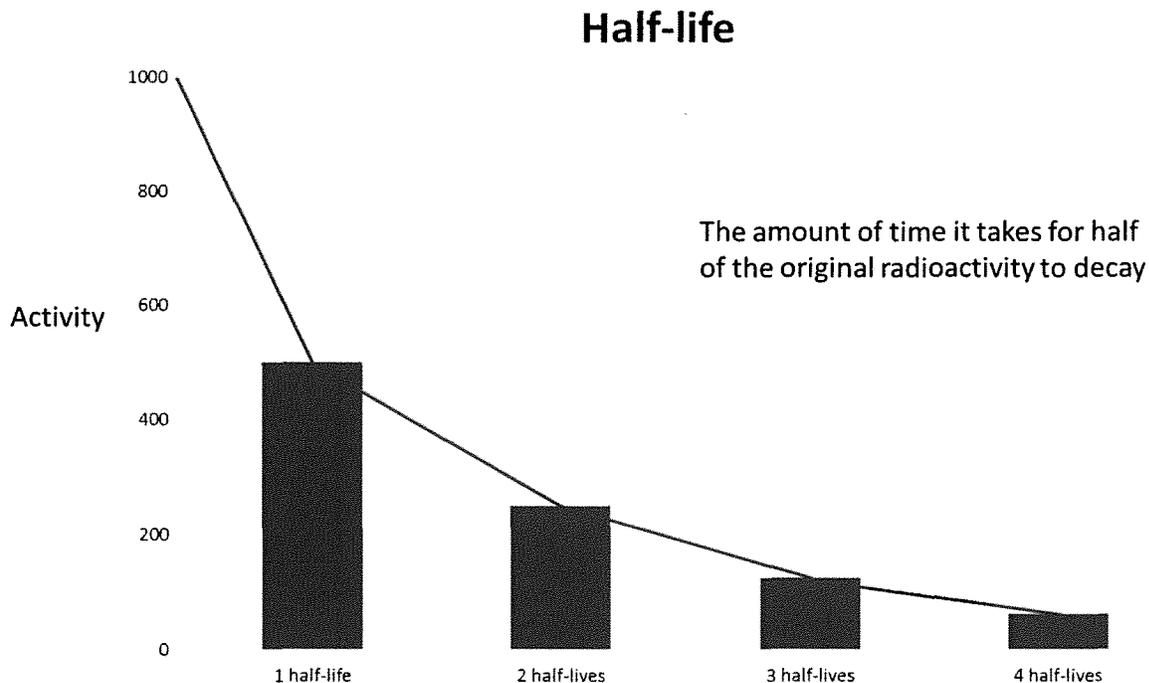
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There are two basic ways that radionuclides are produced at a nuclear power plant. The first is fission, which creates radionuclides that are called *fission products*. Fission occurs when a very large atom, such as uranium-235 (U-235) or plutonium-239 (Pu-239), absorbs a neutron into its nucleus making the atom unstable. The unstable atom can then split into smaller atoms. When fission occurs there is a large amount of energy released, in the form of heat. A nuclear power plant uses the heat generated to boil water that spins turbines to produce electricity.

The second way a radionuclide is produced at a nuclear power plant is through a process called activation. Radionuclides produced in this method are termed *activation products*. Pure water that passes over the fissioning atoms is used to cool the reactor and also produce steam to turn the turbines. Although this water is considered to be very pure, there are always some contaminants within the water from material used in the plant's construction and operation. These contaminants are exposed to the fission process and may become activation products. The atoms in the water itself can also become activated and create radionuclides.

Over time, radioactive atoms will reach a stable state and no longer be radioactive. To do this they must release their excess energy. This release of excess energy is called radioactive decay. The time it takes for a radionuclide to become stable is measured in units called half-lives. A half-life is the amount of time it takes for half of the original radioactivity to decay. Each radionuclide has a specific half-life. Some half-lives can be very long and measured in years while others may be very short and measured in seconds.

Graphic 4. Radioactive Decay Half-Life



In the annual reports you will see both man made and naturally occurring radionuclides listed, for example potassium-40 (K-40, natural) and cobalt-60 (Co-60, man-made). We are mostly concerned about man-made radionuclides because they can be produced as by-products when generating electricity at a nuclear power plant. It is important to note that there are also other ways man-made radionuclides are produced, such as detonating nuclear weapons. Weapons testing has deposited some of the same man-made radionuclides into the environment as those generated by nuclear power, and some are still present today because of long half-lives.

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Measuring Radiation

There are four different but interrelated units for measuring radioactivity, exposure, absorbed dose, and dose equivalent. Together, they are used to scientifically report the amount of radiation and its effects on humans.

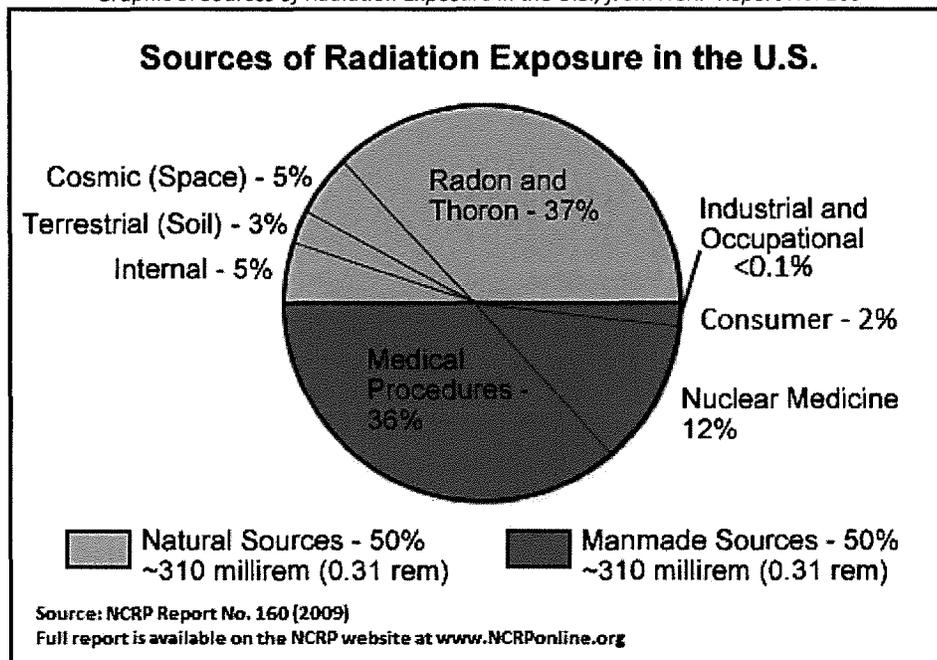
- Radioactivity refers to the amount of ionizing radiation released by a material. The units of measure for radioactivity used within the AREOR and ARERR are the Curie (Ci). Small fractions of the Ci often have a prefix, such as the microcurie (μCi), which means 1/1,000,000 of a Curie.
- Exposure describes the amount of radiation traveling through the air. The units of measure for exposure used within the AREOR and ARERR are the Roentgen (R). Traditionally direct radiation monitors placed around the site are measured milliRoentgen (mR), 1/1,000 of one R.
- Absorbed dose describes the amount of radiation absorbed by an object or person. The units of measure for absorbed dose used within the AREOR and ARERR are the rad. Noble gas air doses are reported by the site are measured in millirad (mrad), 1/1,000 of one rad.
- Dose equivalent (or effective dose) combines the amount of radiation absorbed and the health effects of that type of radiation. The units used within the AREOR and ARERR are the Roentgen equivalent man (rem). Regulations require doses to the whole body, specific organ, and direct radiation to be reported in millirem (mrem), 1/1,000 of one rem.

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Sources of Radiation

People are exposed to radiation every day of their lives and have been since the dawn of mankind. Some of this radiation is naturally occurring while some is man-made. There are many factors that will determine the amount of radiation individuals will be exposed to such as where they live, medical treatments, etc. The average person in the United States is exposed to approximately 620 mrem each year. Half of this exposure, 310 mrem, comes from natural sources and the other half, 310 mrem, from man-made sources. Graphic 5 shows what the typical sources of radiation are for an individual over a calendar year:

Graphic 5. Sources of Radiation Exposure in the U.S., from NCRP Report No. 160



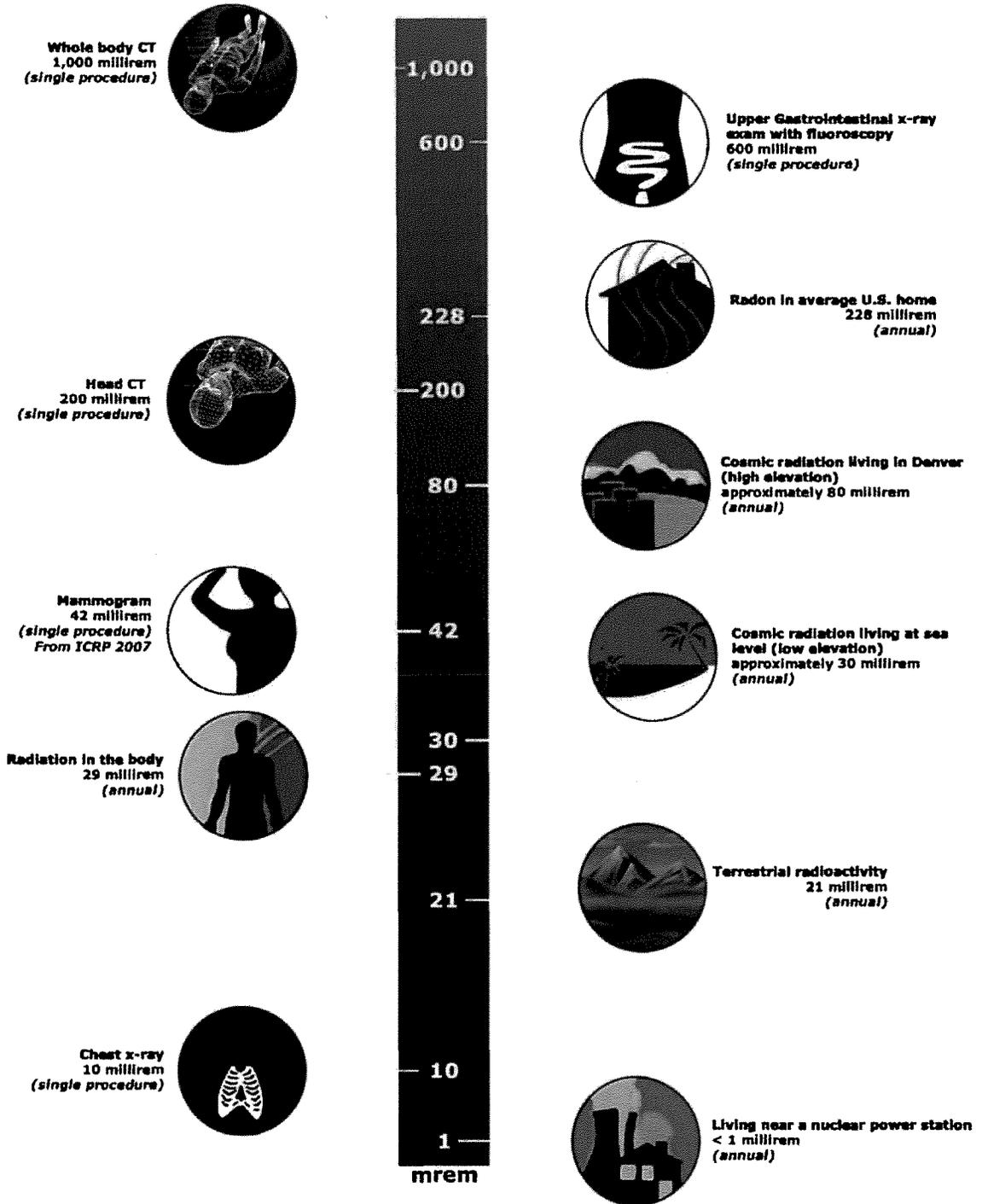
The radiation from a nuclear power plant is included in the chart as part of the "Industrial and Occupational" fraction, <0.1%. The largest natural source of radiation is from radon, because radon gas travels in the air we breathe. Perhaps you know someone who had a CT scan at a hospital to check his or her bones, brain, or heart. CT scans are included in the chart as "Medical Procedures" which make up the next largest fraction. Graphic 6 on the following page shows some of the common doses humans receive from radiation every year.

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Graphic 6 .Relative Doses from Radiation Sources, from EPA Radiation Doses and Sources

RELATIVE DOSES FROM RADIATION SOURCES

All doses from the National Council on Radiation Protection & Measurements, Report No. 160 (unless otherwise denoted)



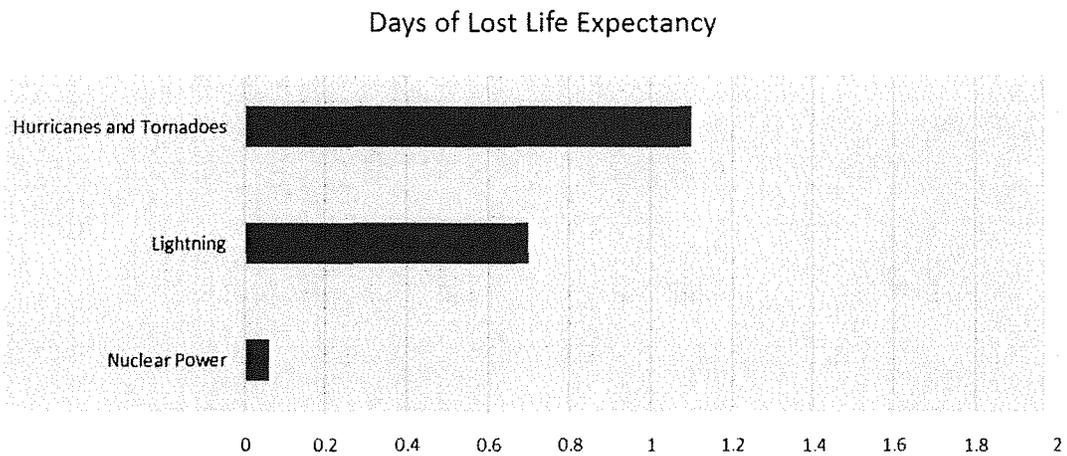
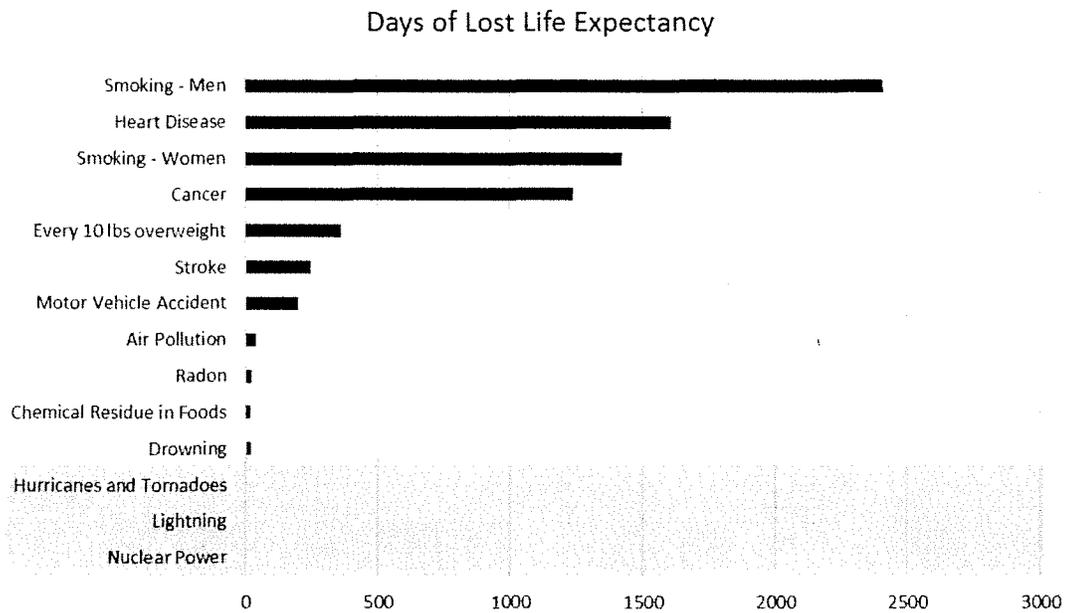
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Radiation Risk

Current science suggests there is some risk from any exposure to radiation. However, it is very hard to tell whether cancers or deaths can be attributed to very low doses of radiation or by something else. U.S. radiation protection standards are based on the premise that any radiation exposure carries some risk.

The following graph is an example of one study that tries to relate risk from many different factors. This graph represents risk as "Days of Lost Life Expectancy". All the categories are averaged over the entire population except Male Smokers, Female Smokers, and individuals that are overweight. Those risks are only for people that fall into those categories. The category for Nuclear Power is a government estimate based on all radioactivity releases from nuclear power, including accidents and wastes.

*Graphic 7. Days of Lost Life Expectancy, Adapted from the Journal of American Physicians and Surgeons Volume 8 Number 2
Summer 2003*



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Introduction

This report quantifies the radioactive gaseous, liquid, solid radioactive waste (radwaste) releases, and summarizes the local meteorological data for the period from January 01, 2019 through December 31, 2019. This report has been prepared utilizing the methodology and parameters specified in the calculation of offsite doses resulting from radioactive gaseous and liquid effluents found in Braidwood's Offsite Dose Calculation Manual (ODCM). It has been formatted consistent with Exelon Procedure CY-AA-170-2000 "ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT" and exceeds the requirements specified in Regulatory Guide 1.21 Revision 1, "MEASURING, EVALUATING, AND REPORTING RADIOACTIVITY IN SOLID WASTES AND RELEASES OF RADIOACTIVE MATERIALS IN LIQUID AND GASEOUS EFFLUENTS FROM LIGHT-WATER-COOLED NUCLEAR POWER PLANTS."

The quantity of radioactive material released from Braidwood Nuclear Power Plant was determined from in-house and vendor laboratory analysis of continuous inline sampling media and batch sample media from all ODCM specified effluent pathways. These pathways include continuous releases from the Unit 1 and 2 Station Vent Stack, Condensate Polisher Sump, Waste Water Treatment, and Circulating Water Blowdown. The ODCM specified effluent pathways also include batch releases from the Unit 1 and Unit 2 Primary Containments, Waste Gas Decay Tanks, and Liquid Radwaste Batch Release Tanks. The quantification of radioactive material released from Braidwood Nuclear Power Plant also includes non-routine planned discharges from two remediation wells, RW-11 and RW-12, installed in 2017 at the Circulating Water Blowdown House, that are not listed as ODCM effluent pathways. Remediation of wells RW-11 and RW-12 was completed in April 2019 and therefore releases from these two locations were discontinued after April 1st 2019.

The volume and quantity of radioactive waste shipped offsite from Braidwood Nuclear Power Plant for processing and disposal were determined from data maintained in the radwaste shipping database. Radwaste processed for shipment was in accordance with Exelon procedure RW-AA-100, "PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES" and consistent with the UFSAR.

Meteorological data was obtained from the 320-foot meteorological tower located on the Braidwood Station premises.

A. Supplemental Information

1. Regulatory Limits

a. Fission and Activation Gases:

Dose Rate

- 1) Less than 500 mrem/year to the whole body (instantaneous limit, per site).
- 2) Less than 3,000 mrem/year to the skin (instantaneous limit, per site).

Dose Gamma Radiation

- 1) Less than or equal to 5 mrad/quarter (per unit).
- 2) Less than or equal to 10 mrad/year (per unit).

Dose Beta Radiation

- 1) Less than or equal to 10 mrad/quarter (per unit).
- 2) Less than or equal to 20 mrad/year (per unit).

b. Iodine: (summed with particulate, see below)

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- c. Particulates with half-lives > 8 days:

Dose Rate

- 1) Less than 1,500 mrem/year to any organ (instantaneous limit, per site).

Dose

- 1) Less than or equal to 7.5 mrem/quarter to any organ (per unit).
2) Less than or equal to 15 mrem/year to any organ (per unit).

- d. Liquid Effluents

Dose

- 1) Less than or equal to 1.5 mrem to the whole body during any calendar quarter (per unit).
2) Less than or equal to 5 mrem to any organ during any calendar quarter (per unit).
3) Less than or equal to 3 mrem to the whole body during any calendar year (per unit).
4) Less than or equal to 10 mrem to any organ during any calendar year (per unit).

2. Effluent Concentration Limits

- a. Fission and Activation Gases: 10CFR20 Appendix B Table 2
b. Iodine: 10CFR20 Appendix B Table 2
c. Particulates: 10CFR20 Appendix B Table 2
d. Liquid Effluents: 10 X 10CFR20 Appendix B Table 2

3. Average Energy

The ODCM limits the dose equivalent rates due to the release of noble gases to less than or equal to 500 mrem/yr to the total body, and less than or equal to 3,000 mrem/yr to the skin. Therefore, the average beta and gamma energies (\bar{E}) for gaseous effluents as described in Regulatory Guide 1.21 are not applicable.

4. Measurements and Approximations of Total Radioactivity

- a. Fission and activation gases:

Before being discharged, containment batch releases are analyzed for noble gas via gamma spectroscopy. Gaseous decay tanks are analyzed for noble gases before being discharged via gamma spectroscopy. Released activity is normally calculated using volume of release, which is determined by purge flow rate times the duration of the discharge.

The Auxiliary Building ventilation exhaust system is continually monitored for radioactive iodines (radioiodines) and particulates. These samples are pulled every seven days and analyzed via gamma spectroscopy.

Noble gas samples are pulled and analyzed weekly by gamma spectroscopy. The average flow at the release points and nuclide specific activity concentrations are used to calculate the activity released.

Volumes and activities of effluents discharged from systems that are common to both units are divided between both units.

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b. Iodines:

Radioiodines in the Auxiliary Building ventilation exhaust system are continually being collected via activated charcoal cartridges in the diverted sample process flow. The iodine cartridges are pulled weekly and analyzed via gamma spectroscopy. Radioiodine concentrations greater than the lower limit of detection (LLD) are multiplied by the volume of air discharged during the sampling timeframe.

Radioiodines are analyzed in liquid effluent streams through performance of batch release tank grab samples and weekly liquid effluent composite samples. The analyses are performed via gamma spectroscopy of the liquid samples.

Volumes and activities of effluents discharged from systems that are common to both units are divided between both units. Effluents that are unit specific are assigned to the appropriate unit.

c. Particulates, half-lives > 8 days:

Particulates in the Auxiliary Building ventilation exhaust system are continually being collected via filter media in the diverted sample process flow. Particulate filter media is pulled weekly and analyzed via gamma spectroscopy. Particulate concentrations greater than LLD are multiplied by the volume of air discharged during the sampling timeframe. A composite sample is created from 3 month's particulate sample media for Sr-89/90, Fe-55, Ni 63, and gross alpha analysis by an offsite vendor. The vendor supplied data is utilized in conjunction with the volume of air released through the Auxiliary Building ventilation to quantify Sr-89/90, Fe-55, Ni-63, and gross alpha releases.

Volumes and activities of effluents discharged from systems that are common to both units are divided between both units. Effluents that are unit specific are assigned to the appropriate unit.

d. Tritium:

Before being discharged, containment batch releases are analyzed for tritium via a liquid scintillation counter (LSC). Tritium is sampled using a flow-through bubbler system. Released activity is calculated using volume of release, which is determined by purge flow rate multiplied by the duration of the discharge.

The Auxiliary Building ventilation exhaust system is monitored for tritium using a flow-through bubbler system. Tritium is sampled every seven days and analyzed by LSC.

The secondary sides of both units contain tritium. Minimal amounts of tritium are continually released to the atmosphere from secondary components through packing leaks, tank vents, the main condenser, etc. Bounding calculations have been performed to show that large leaks (1000 gallons/day (gpd)) for extended periods (1 month) at normal secondary tritium concentrations would provide an insignificant increase ($1.00E-5$ mrem) in offsite dose.

e. Gross alpha

Gross alpha is analyzed in both the gaseous and liquid effluent pathways. Weekly gaseous particulate media is composited for offsite vendor analysis. Gross alpha activity greater than vendor LLD values are assigned to the applicable timeframe and gaseous volume released. Liquid effluent gross alpha analysis is performed through compositing monthly discharges and gas flow proportional counting.

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f. Carbon-14

Carbon-14 (C-14) is assessed in continuous gaseous effluents using Electric Power Research Institute's (EPRI) industry accepted production mechanism and production rate study 1021106. C-14 production is a function of each unit's full power operation and gaseous volume released. C-14 is not evaluated through laboratory sample analysis.

g. Liquid effluents:

Liquid effluents are categorized as either batch release or continuous release. All liquid releases are analyzed for principal gamma emitters, radiiodines, dissolved and entrained gases, gross alpha, and tritium onsite via gamma spectroscopy, gas flow proportional counting, or liquid scintillation, as appropriate. An offsite laboratory analyzes liquid composites for Sr-89/90, Fe-55 and Ni-63. Vendor results are applied to the applicable volume of liquids discharged during the timeframe. Volumes and activities of effluents discharged from systems or locations are divided between both units.

h. Estimated Total Error Present

Procedure CY-AA-170-2100, Estimated Errors of Effluent Measurements provides the methodology to obtain an overall estimate of the error associated with radioactive effluents. Estimated total error is calculated periodically and communicated as part of Appendix A Effluent and Waste Disposal Summary.

i. Lower Limit of Detection (LLD)

Samples are analyzed such that the Offsite Dose Calculation Manual (ODCM) LLD requirements are met. When a nuclide is not detected during the quarter then <LLD is reported. The ODCM required lower limit of detection for airborne and liquid releases are as follows:

Table 4.i ODCM Effluent LLD Values

Airborne:	LLD
Gross Alpha, Sr-89, Sr-90	1.00E-11 µCi/cc
H-3	1.00E-07 µCi/cc
I-131 in Charcoal Samples	1.00E-12 µCi/cc
I-133 in Charcoal Samples	1.00E-10 µCi/cc
Principal Gamma Emitters (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, I-131, Ce-141, Ce-144) in Grab Samples	1.00E-04 µCi/cc
Principal Gamma Emitters (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, I-131, Ce-141, Ce-144) in Particulate Samples	1.00E-11 µCi/cc
Noble Gas (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, Xe-138), Gross Beta or Gamma	1.00E-06 µCi/cc

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Table 4.i ODCM Effluent LLD Values (continued)

Liquid:	LLD
Principal Gamma Emitters except Ce-144 (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141)	5.00E-07 µCi/ml
Ce-144	5.00E-06 µCi/ml
I-131	1.00E-06 µCi/ml
Entrained Gases (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, Xe-138)	1.00E-05 µCi/ml
H-3	1.00E-05 µCi/ml
Gross Alpha	1.00E-07 µCi/ml
Sr-89, Sr-90	5.00E-08 µCi/ml
Fe-55	1.00E-06 µCi/ml

This list does not mean that only these nuclides are considered, but this list is used to ensure acceptable detection standards. Braidwood tests and maintains LLD records in accordance with procedure CY-AA-130-201 "Radiochemistry Quality Control."

5. Batch Releases

a. Liquid Batch Releases	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr.	Total
1. Total Number of Batch Releases	16	14	21	32	83
2. Total Time Period for Batch Releases (minutes)	2.19E+04	2.77E+04	8.25E+04	7.07E+04	2.03E+05
3. Maximum Time Period for a Batch Release (minutes)	1.63E+03	5.55E+03	9.82E+03	5.78E+03	9.82E+03
4. Average Time Period for a Batch Release (minutes)	1.37E+03	1.98E+03	3.93E+03	2.21E+03	2.44E+03
5. Minimum Time Period for a Batch Release (minutes)	6.97E+02	9.50E+02	6.05E+02	1.33E+03	6.05E+02
6. Average Stream Flow During Periods of Release of Effluent into a Flowing Stream (Liters/min) ¹	1.53E+07	2.09E+07	6.42E+06	8.39E+06	1.27E+07

b. Gaseous Batch Releases	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr.	Total
1. Total Number of Batch Releases	76	87	76	84	323
2. Total Time Period for Batch Releases (minutes)	5.01E+03	1.814E+04	3.27E+03	1.47E+04	4.11E+04
3. Maximum Time Period for a Batch Release (minutes)	1.39E+03	2.27E+03	1.19E+02	4.03E+03	4.03E+03
4. Average Time Period for a Batch Release (minutes)	6.59E+01	2.09E+02	4.30E+01	1.75E+02	1.27E+02
5. Minimum Time Period for a Batch Release (minutes)	1.10E+01	2.00E+01	2.20E+01	2.50E+01	1.10E+01

¹ Kankakee River Flows obtained from US Geological Survey website from daily average flow data.

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6. Abnormal Releases

There were no abnormal gaseous releases that occurred in 2019.

7. Non-Routine, Planned Discharges

The CWBD remediation continued with discharges from two remediation wells, RW-11 and RW-12, installed in June 2017 at the Circulating Water Blowdown House. These two remediation wells were temporary and treated as non-routine planned discharges. They were sampled regularly and permitted in the same manner as ODCM pathways. The corresponding activity values and doses are included as part of the continuous liquid effluent releases in this report. These two remediation wells have been discontinued as of April 1, 2019.

8. Radioactive Waste Treatment System Changes

There were no changes to the gaseous radioactive waste treatment system, the ventilation exhaust treatment system, or the liquid radioactive waste treatment system in 2019.

9. Changes to the Annual Land Use Census

The 2019 Land Use Survey was performed on September 11, 2019.

10. Radioactive Effluent Monitoring Instrumentation Out of Service for More than 30 Days

There were no radioactive effluent monitoring instruments out of service for more than 30 days in 2019.

11. Revisions to the ODCM

There were no revisions to the ODCM in 2019.

12. Independent Spent Fuel Storage Installation (ISFSI)

An Independent Spent Fuel Storage Installation (ISFSI) was placed in service at Braidwood Station in 2011. The ISFSI is a closed system and the only exposure would be due to direct radiation, which is measured by Optically Stimulated Luminescent Dosimetry (OSLD). In 2019 the dose to the nearest resident from the ISFSI was estimated to be 3.20E-01 mrem. This estimate was determined using environmental dosimeters from the Radiological Environmental Monitoring Program and extrapolating the dose from the ISFSI environmental dosimeters.

13. ERRATA

In the 2018 ARERR, Table D-2 referenced a dose limit in 10 CFR 74.104 when the correct reference should be 10 CFR 72.104.

14. Sampling and Instrumentation Issues

- a. On September 9, 2019, the automatic composite sampler for the CP Sump was found with no power to the compositor. The compositor had 377 mL of water in it when the expected volume is 4 gallons. The sample was diluted to 450mL when analyzing the monthly CP composite sample. A reanalysis of the isotopic was done to verify that the LLD could in fact be met with the reduced sample amount. IR 04277986
- b. On January 9th, 2020 a trend was identified in increasing discharge gallons from the condensate polisher sump. For the weeks 12/9/19 through 12/30/19 it was determined that the totalizer 0FQI-

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CP095 was not working properly and was advancing while the pump was not running. For these weeks mentioned, the CP discharge to the lake was conservatively overestimated as documented in IR 04309137.

- c. In January 2020 discrepancies were identified with the 4th Quarter 2019 REMP OSLDs dose readings when the report was provided to Braidwood by the vendor. The OSLD dose readings were unexpectedly higher than the previous three quarters. The control and spare OSLDs were 20-40mrem higher while the field OSLDs dose readings were 2-4mrem higher compared to quarters 1, 2, and 3 of 2019. As documented in IR 04328318 an average of the 3rd and 4th quarter 2018 as well as the 1st, 2nd, and 3rd quarters in 2019 were used to estimate a dose for the 4th quarter 2019 OSLDs.

B. Gaseous Effluents

Gaseous radioactive releases for 2019 are captured in Tables 1A, 1B-1, and 1B-2 in Appendix A for Units 1 and 2 combined. Radioactive noble gases released for the timeframe totaled 6.87E-01 Curies. Releases of all radioiodines, halogens, and particulates totaled 3.39E-02 Curies. Gaseous tritium releases totaled 7.33E+01 Curies. Gaseous carbon-14 was calculated to total 8.53E+00 Curies. No gross alpha was detected in gaseous effluents.

C. Liquid Effluents

Liquid radioactive releases for 2019 are captured in Tables 2A, 2B-1, and 2B-2 in Appendix A for Units 1 and 2 combined. Eighty-three (83) liquid batch releases occurred during the reporting period. The continuous and batch release discharges contained a total of 3.37E+03 Curies of tritium, 4.39E-02 Curies of fission and activation products. No dissolved or entrained gases, and no gross alpha was detected in the liquid effluents.

D. Radiological Impact on Man

1. Dose to Members of the Public at or Beyond Site Boundary

Per ODCM Chapter 6.1 the Annual Radioactive Effluent Release Report shall include an assessment of radiation doses to the hypothetically highest exposed MEMBER OF THE PUBLIC from reactor releases, ISFSI and other nearby uranium fuel cycle sources (including doses from primary effluent pathways and direct radiation) for the previous calendar year. The ODCM does not require population doses to be calculated. For purposes of calculation, the following assumptions were made per the ODCM:

- Long term annual average meteorology X/Q and D/Q and actual gaseous effluent releases were used.
- Gamma air dose, Beta air dose, Total Body and Skin doses were attributed to noble gas releases.
- Critical organ and age group dose attributed to iodine, particulate, carbon-14 and tritium releases.
- A 0.7 shielding factor was assumed to account for shielding due to occupancy of structures
- Doses, Design Objective Limit, and Dose Limit comparisons reported combined for the site (Units 1 and 2 together).
- Dosimetry measurements obtained from the highest station values in the Radiological Environmental Monitoring Program were used to calculate dose to the nearest residence from the Independent Spent Fuel Storage Installation (ISFSI). The dose measured at the station was extrapolated to the residence location.

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- The highest doses from the critical organ and critical age group for each release pathway was summed and added to the net dosimetry measurement from nearest residence to the ISFSI for 40CFR190 and 10CFR72.104 dose compliance.
- Evaluation of 40CFR190 and 10CFR72.104 dose is used to demonstrate compliance to 10CFR 20 and satisfy station RETS and Technical Specifications.

a. Gaseous Releases

The critical age-organ was the child-bone for non-noble gas at 1.80E+00 mrem. Calculated total body dose for non-noble gas was 3.72E-01 mrem. Total body dose for noble gas was 1.01E-04 mrem for all age groups.

b. Liquid Releases

The critical age-organ was the child-GI-LLI. Calculated total body dose was 1.03E-01 mrem and organ dose was 1.04E-01 mrem.

c. 40CFR190 and 10CFR72.104 Compliance

The Braidwood ODCM defines the total dose for the uranium fuel cycle as the sum of doses due to radioactivity in airborne and liquid effluents and the doses due to direct radiation from contained sources at the nuclear power station (ODCM A.4.2 Total Dose, Equation A-25). The total dose, D^{TOT} , in the unrestricted area to a member of the public due to plant operations is given by:

$$D^{TOT} = D^{Ex} + D_{aj}^{Liq} + D_{aj}^{NNG}$$

Where:

D^{TOT} Total Dose to Member of Public [mrem]

Total off-site dose to a member of public due to plant operations.

D^{Ex} Total External Total Body Dose [mrem]

Total body dose due to external exposure to noble gases, N-16 skyshine and on-site storage facilities.

D_{aj}^{Liq} Liquid Effluent Dose [mrem]

Dose due to liquid effluents to age group *a* and organ *j*. The age group and organ with the highest dose from liquid effluents is used.

D_{aj}^{NNG} Non-Noble Gaseous Effluent Dose [mrem]

Dose due to non-noble gaseous effluents to age group *a* and organ *j*. The age group and organ with the highest dose from non-noble gas effluents is used.

The maximum calculated dose to a real individual would not exceed 7.95E-01 mrem (total body), 2.22E+00 mrem (organ), or 7.93E-01 mrem (thyroid).

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Table D.1 Summary of Gaseous and Liquid Effluent Doses to Members of the Public at the Highest Dose Receptors vs 10 CFR50 Design Objectives

Maximum Individual Noble Gas	Applicable Dose	Estimated Dose	Age Group	% of Applicable Limit	Design Objective Limit (per year, combined)	Unit
Nearest Residence	Gamma Air Dose	1.06E-04	All	5.30E-04	20	mrads
Nearest Residence	Beta Air Dose	2.25E-04	All	5.63E-04	40	mrads
Nearest Residence	Total Body	1.01E-04	All	1.01E-03	10	mrem
Nearest Residence	Skin	2.91E-04	All	9.70E-04	30	mrem
Non-Noble Gas						
Nearest Residence	Bone	1.80E+00	Child	6.00E+00	30	mrem
Liquid						
Nearest Residence	Total Body	1.03E-01	Child	1.72E+00	6	mrem
Nearest Residence	GI-LLI	1.04E-01	Child	5.20E-01	20	mrem

Table D.2 Summary of Doses to Members of the Public at the Highest Dose Receptors for 40CFR190 and 10CFR72.104 Compliance

Highest Dose Receptors	Non-Noble Gas	Liquid Effluents	External Direct Radiation	Total	% of Applicable Limit	Limit	Unit
Total Body Dose	3.72E-01	1.03E-01	3.20E-01	7.95E-01	3.18E+00	25	mrem
Organ Dose	1.80E+00	1.04E-01	3.20E-01	2.22E+00	8.90E+00	25	mrem
Thyroid Dose	3.70E-01	1.03E-01	3.20E-01	7.93E-01	1.06E+00	75	mrem

E. Meteorological Data

The Braidwood Station meteorological monitoring program produced 52,506 hours of valid data out of a possible 52,560 parameter hours during 2019 (365 days x 24 hours/day x 6 measured priority parameters), which represents an overall data recovery rate of 99.9%. Priority parameters are all parameters except dew point temperature and precipitation. For the year, winds measured at 34 ft. most frequently came from the West (9.46%) and fell into the 3.6-7.5 mph wind speed class (39.92%). Calms (wind speeds at or below the sensor threshold) were measured 0.00% of the time and speeds greater than 24.5 mph were measured 0.30% of the time. Stability based on the 199-30 ft. differential temperature most frequently fell into the neutral classification (45.05%).

Appendix C contains the Joint Frequency Distribution tables from the Meteorological Data collected in 2019.

F. Offsite Ambient Radiation Measurements

Review of the Braidwood Optically Stimulated Luminescent Dosimetry (OSLD) data showed statistical increases above background at all locations related to the ISFSI pad. As documented in IR 04328318, 4th quarter 2019 OSLD results were inconclusive. The OSLD dose readings were unexpectedly higher than the previous three quarters. The control and spare OSLDs were 20-40mrem higher while the field OSLDs dose readings were 2-4mrem higher compared to quarters 1, 2, and 3 of 2019. To be accurate and

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conservative, an average of the 3rd and 4th quarter 2018 as well as the 1st, 2nd, and 3rd quarters in 2019 were used to estimate a dose for the 4th quarter 2019 OSLDs.

A dose evaluation was performed by taking the highest readings at the ISFSI pad and extrapolating dose to the nearest resident. The dose to the resident was estimated to be 3.20E-01 mrem in 2019.

G. Radioactive Solid Waste Disposal

Radioactive wastes shipped offsite are captured in the table titled, "Solid Wastes Shipped Offsite for Burial or Disposal (Not irradiated fuel)." Approximately 2.67E+02 cubic meters of solid waste were shipped offsite containing approximately 2.93E+02 Curies during the 2019 reporting period. Appendix B contains tables and detailed information about the Solid Waste Disposal program.

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APPENDIX A: EFFLUENT AND WASTE DISPOSAL SUMMARY

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TABLE 1A
GASEOUS EFFLUENTS- – SUMMATION OF ALL RELEASES UNIT 1 AND 2

Unit	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	Est. Total Error%
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A. Fission and Activation Gas Releases

1. Total Release Activity	Ci	1.31E-01	2.14E-01	1.25E-01	2.17E-01	6.87E-01	7.59E+00
2. Average Release Rate	μCi/sec	1.70E-02	2.72E-02	1.57E-02	2.72E-02	2.18E-02	
3. Percent of ODCM Limit – gamma	%	1.67E-04	2.44E-04	1.34E-04	1.65E-04	3.55E-04	
4. Percent of ODCM Limit - beta	%	1.63E-04	2.48E-04	1.39E-04	2.01E-04	3.76E-04	

B. Iodine Releases

1. Total Iodine-131	Ci	1.00E-05	3.38E-02	3.60E-05	3.47E-05	3.39E-02	3.32E+01
2. Average Release Rate	μCi/sec	1.29E-06	4.30E-03	4.52E-06	4.37E-06	1.07E-03	
3. Percent of ODCM Limit ¹	%	1.99E+00	1.99E+00	2.06E+00	1.93E+00	3.99E+00	

C. Particulate (> 8-day half-life) Releases

1. Particulates with half-life > 8 days	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.98E+01
2. Average Release Rate	μCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM Limit ¹	%	1.99E+00	1.99E+00	2.06E+00	1.93E+00	3.99E+00	

D. Tritium Releases

1. Total Release Activity	Ci	1.80E+01	1.88E+01	1.73E+01	1.93E+01	7.33E+01	8.07E+00
2. Average Release Rate	μCi/sec	2.31E+00	2.39E+00	2.18E+00	2.42E+00	2.32E+00	
3. Percent of ODCM Limit ¹	%	1.99E+00	1.99E+00	2.06E+00	1.93E+00	3.99E+00	

E. Gross Alpha Releases

1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.98E+01
2. Average Release Rate	μCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit ¹	%	<LLD	<LLD	<LLD	<LLD	<LLD	

F. Carbon-14 Releases

1. Total Release Activity	Ci	2.13E+00	2.13E+00	2.21E+00	2.07E+00	8.53E+00	
2. Average Release Rate	μCi/sec	2.74E-01	2.71E-01	2.77E-01	2.60E-01	2.71E-01	
3. Percent of ODCM limit ¹	%	1.99E+00	1.99E+00	2.06E+00	1.93E+00	3.99E+00	

Note: ODCM LLD threshold values are included in Table 4.i of this report.

Note: The ODCM Limit is a dose-based limit combined for Iodines, Particulate, Tritium and C-14.

¹ Combined Limit per 10CFR50 Appendix I for Organ Dose Due to Specified Non-Noble Gas Radionuclides.

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TABLE 1B-1
GASEOUS EFFLUENTS – MIXED MODE RELEASES – CONTINUOUS MODE UNIT 1 AND 2

Nuclides Released	Unit	Continuous Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
A. Fission Gases						
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
B. Iodines / Halogens						
Br-82	Ci	2.89E-06	<LLD	<LLD	<LLD	2.89E-06
I-131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-132	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	2.89E-06	<LLD	<LLD	<LLD	2.89E-06
C. Particulates						
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

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TABLE 1B-1 (Cont.)
GASEOUS EFFLUENTS – MIXED MODE RELEASES – CONTINUOUS MODE UNIT 1 AND 2

Nuclides Released	Unit	Continuous Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
C. Particulates (Cont.)						
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
D. Tritium						
	Ci	1.76E+01	1.82E+01	1.66E+01	1.62E+01	6.86E+01
E. Gross Alpha						
	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
F. Carbon-14						
	Ci	2.13E+00	2.13E+00	2.21E+00	2.07E+00	8.53E+00

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TABLE 1B-2
GASEOUS EFFLUENTS – MIXED MODE RELEASES – BATCH MODE UNIT 1 AND 2

Nuclides Released	Unit	Batch Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
A. Fission Gases						
Ar-41	Ci	1.19E-01	1.73E-01	9.42E-02	1.11E-01	4.97E-01
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	1.26E-02	4.08E-02	3.04E-02	9.10E-02	1.75E-01
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	3.74E-04	1.41E-02	1.45E-02
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	1.31E-01	2.14E-01	1.25E-01	2.17E-01	6.87E-01
B. Iodines / Halogens						
Br-80	Ci	<LLD	9.98E-04	2.81E-05	8.98E-06	1.04E-03
Br-82	Ci	7.09E-06	3.28E-02	7.90E-06	2.14E-05	3.28E-02
I-131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
I-132	Ci	2.73E-08	4.83E-08	<LLD	4.30E-06	4.37E-06
I-133	Ci	1.13E-09	9.82E-10	2.56E-09	4.43E-09	9.11E-09
I-134	Ci	3.12E-08	<LLD	<LLD	<LLD	3.12E-08
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	7.15E-06	3.38E-02	3.60E-05	3.47E-05	3.39E-02
C. Particulates						
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

TABLE 1B-2 (Cont.)

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GASEOUS EFFLUENTS – MIXED MODE RELEASES – BATCH MODE UNIT 1 AND 2

Nuclides Released	Unit	Batch Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
C. Particulates (Cont.)						
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
D. Tritium	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	3.28E-01	5.92E-01	7.18E-01	3.03E+00	4.67E+00
E. Gross Alpha	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
F. Carbon-14	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

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TABLE 2A
LIQUID EFFLUENTS-- SUMMATION OF ALL RELEASES UNIT 1 AND 2

Unit	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	Est. Total Error %
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A. Fission and Activation Products

1. Total Release	Ci	3.85E-03	2.81E-03	4.19E-03	3.30E-02	4.39E-02	2.64E+00
2. Average Diluted Concentration	μCi/mL	3.27E-10	2.92E-10	1.76E-10	2.01E-09	7.13E-10	
3. Percent of applicable limit	%	*	*	*	*	*	

B. Tritium

1. Total Release	Ci	3.32E+02	1.10E+03	9.17E+02	1.02E+03	3.37E+03	5.85E+00
2. Average Diluted Concentration	μCi/mL	2.81E-05	1.14E-04	3.86E-05	6.24E-05	5.47E-05	
3. % of Limit (1E-2 μCi/ml)	%	2.81E-01	1.14E+00	3.86E-01	6.24E-01	5.47E-01	

C. Dissolved Noble Gases

1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	2.64E+00
2. Average Diluted Concentration	μCi/mL	N/A	N/A	N/A	N/A	N/A	
3. % of Limit (2E-4 μCi/ml)	%	N/A	N/A	N/A	N/A	N/A	

D. Gross Alpha

1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	1.47E+01
2. Average Diluted Concentration	μCi/ml	N/A	N/A	N/A	N/A	N/A	

E. Volume of Waste Released (prior to dilution)	Liters	9.65E+9	7.53E+09	1.58E+10	1.10E+10	4.39E+10
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F. Volume of Dilution Water	Liters	2.13E+09	2.10E+09	7.94E+09	5.45E+09	1.76E+10
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G. Average Stream Flow¹	m ³ /s	2.55E+02	3.49E+02	1.07E+02	1.40E+02	2.12E+02
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Note: ODCM LLD threshold values are included in Table 4.i of this report.

* This limit is equal to 10 times the concentration values in Appendix B, Table 2, Column 2 to 10CFR20.1001-20.2402, except for Dissolved Noble Gases. The limits for Dissolved Noble Gases are found the Braidwood Station ODCM, Table C-6 of ODCM Appendix C for Noble Gases.

¹ Kankakee River Flows obtained from US Geological Survey website from daily average flow data.

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TABLE 2B-1
LIQUID EFFLUENTS – CONTINUOUS MODE UNIT 1 AND 2

Nuclides Released		Continuous Mode				
A. Fission and Activation Products	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Mn-54	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
B. Tritium	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	9.13E-01	4.13E+02	1.17E+02	7.16E+01	6.03E+02
C. Dissolved and Entrained Gases	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
D. Gross Alpha	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

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TABLE 2B-2
LIQUID EFFLUENTS – BATCH MODE UNIT 1 AND 2

Nuclides Released	Unit	Batch Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
A. Fission and Activation Products						
Cr-51	Ci	<LLD	<LLD	<LLD	4.32E-03	4.32E-03
Mn-54	Ci	4.39E-05	1.80E-05	1.61E-05	1.62E-04	2.40E-04
Fe-55	Ci	<LLD	9.06E-04	1.68E-03	3.22E-03	5.81E-03
Fe-59	Ci	<LLD	<LLD	<LLD	5.34E-05	5.34E-05
Co-57	Ci	<LLD	<LLD	3.68E-06	<LLD	3.68E-06
Co-58	Ci	1.69E-03	3.50E-04	3.28E-04	9.84E-03	1.22E-02
Co-60	Ci	2.07E-03	1.48E-03	1.88E-03	6.88E-03	1.23E-02
Zr-95	Ci	<LLD	<LLD	<LLD	1.09E-04	1.09E-04
Zr-97	Ci	<LLD	<LLD	8.30E-06	<LLD	8.30E-06
Nb-95	Ci	<LLD	<LLD	<LLD	5.19E-04	5.19E-04
Nb-97	Ci	3.23E-05	1.65E-05	1.21E-04	3.17E-04	4.87E-04
Mo-99	Ci	2.60E-06	<LLD	<LLD	<LLD	2.60E-06
Tc-99m	Ci	2.65E-06	<LLD	<LLD	<LLD	2.65E-06
Ag-110m	Ci	1.14E-05	2.14E-05	1.44E-04	3.09E-04	4.86E-04
Sn-113	Ci	<LLD	4.94E-06	<LLD	<LLD	4.94E-06
Sb-122	Ci	<LLD	<LLD	<LLD	6.45E-06	6.45E-06
Sb-124	Ci	<LLD	<LLD	<LLD	9.46E-04	9.46E-04
Sb-125	Ci	<LLD	1.48E-05	<LLD	5.10E-03	5.12E-03
Sb-126	Ci	<LLD	<LLD	<LLD	4.74E-05	4.74E-05
Te-123m	Ci	<LLD	<LLD	<LLD	7.84E-06	7.84E-06
Te-125m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-129m	Ci	<LLD	<LLD	<LLD	1.21E-03	1.21E-03
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-136	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	3.85E-03	2.81E-03	4.19E-03	3.30E-02	4.39E-02
B. Tritium	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	3.31E+02	6.83E+02	8.00E+02	9.52E+02	2.77E+03

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TABLE 2B-2 (Cont.)
LIQUID EFFLUENTS – BATCH MODE UNIT 1 AND 2

Nuclides Released		Batch Mode				
C. Dissolved and Entrained Gases	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
D. Gross Alpha	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

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APPENDIX B: SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

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A. Solid Waste Shipped Offsite for Burial or Disposal (Not Irradiated Fuel)

1. Low-Level Waste

Resins, Filters, And Evaporator Bottoms			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	3.13E+03	8.87E+01	2.09E+01
B	2.38E+02	6.74E+00	2.72E+02
C	0.00E+00	0.00E+00	0.00E+00
All	3.37E+03	9.54E+01	2.93E+02
Major Nuclides for the Above Table: H-3, Be-7, C-14, Cr-51, Mn-54, Fe-55, Co-58, Co-60, Ni-59, Ni-63, Sr-90, Tc-99, Sb-125, I-129, Cs-134, Cs-137, Ce-144, Pu-238, Pu-239, Pu-241, Am-241, Cm-243, Cm-244			

Dry Active Waste (DAW)			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	5.74E+03	1.62E+02	3.04E-01
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	5.74E+03	1.62E+02	3.04E-01
Major Nuclides for the Above Table: H-3, C-14, Cr-51, Mn-54, Fe-55, Fe-59, Co-58, Co-60, Ni-59, Ni-63, Sr-90, Zr-95, Nb-95, Tc-99, Sb-125, I-129, Cs-137, Ce-144, Pu-238, Pu-241, Am-241, Cm-242, Cm-243, Cm-244			

Irradiated Components			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	0.00E+00	0.00E+00	0.00E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	0.00E+00	0.00E+00	0.00E+00
Major Nuclides for the Above Table: None			

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1. Low-Level Waste (continued)

Other Waste			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	3.11E+02	8.79E+00	1.82E-01
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	3.11E+02	8.79E+00	1.82E-01

Major Nuclides for the Above Table:
H-3, C-14, Cr-51, Mn-54, Fe-55, Fe-59, Co-58, Co-60, Ni-59, Ni-63, Sr-90, Zr-95, Nb-95, Tc-99, Sb-125, I-129, Cs-137, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, Cm-243, Cm-244

Sum of All Low-Level Waste Shipped from Site			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	9.18E+03	2.60E+02	2.14E+01
B	2.38E+02	6.74E+00	2.72E+02
C	0.00E+00	0.00E+00	0.00E+00
All	9.42E+03	2.67E+02	2.93E+02

Major Nuclides for the Above Table:
H-3, Be-7, C-14, Cr-51, Mn-54, Fe-55, Fe-59, Co-58, Co-60, Ni-59, Ni-63, Sr-90, Zr-95, Nb-95, Tc-99, Sb-125, I-129, Cs-134, Cs-137, Ce-144, Pu-238, Pu-239, Pu-241, Am-241, Cm-242, Cm-243, Cm-244

2. Estimate of Major Nuclide Composition (By Waste Type and Class)

a. Category A – Spent Resins, Filter Sludges, Evaporator Bottoms, etc.

Isotope	Waste Class A Curies	Percent Abundance	Waste Class B Curies	Percent Abundance
H-3	3.35E+00	16.24%	2.67E+00	0.98%
Be-7	4.56E-04	0%	4.51E+00	1.66%
C-14	5.18E-03	0.03%	9.58E-01	0.35%
Cr-51	8.12E-03	0.04%	4.58E-01	0.17%
Mn-54	2.50E-01	1.21%	1.30E+01	4.8%
Fe-55	3.11E+00	15.1%	3.31E+01	12.18%
Fe-59	3.69E-05	0%	9.53E-01	0.35%
Co-57	3.72E-02	0.18%	1.65E+01	6.07%
Co-58	3.32E-01	1.61%	7.64E+01	28.11%
Co-60	3.29E+00	15.94%	1.56E+00	0.57%
Ni-59	1.66E-01	0.81%	1.07E+02	39.3%
Ni-63	9.62E+00	46.68%	2.63E+00	0.97%
Zn-65	6.28E-02	0.3%	1.18E-02	0%

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Isotope	Waste Class A Curies	Percent Abundance	Waste Class B Curies	Percent Abundance
Sr-89	1.23E-05	0%	4.06E-02	0.01%
Sr-90	3.49E-03	0.02%	2.62E-01	0.1%
Zr-95	2.93E-04	0%	1.73E-02	0.01%
Nb-95	2.95E-03	0.01%	2.06E-01	0.08%
Tc-99	1.19E-02	0.06%	8.22E+00	3.03%
Ag-110m	5.41E-03	0.03%	9.06E-01	0.33%
Sn-113	1.62E-03	0.01%	2.48E+00	0.91%
Sb-124	2.94E-05	0%	5.10E-03	0%
Sb-125	9.99E-02	0.48%	5.79E-04	0%
Cs-134	3.43E-02	0.17%	1.74E-04	0%
Cs-137	2.16E-01	1.05%	7.74E-03	0%
Ce-144	3.84E-03	0.02%	5.89E-04	0%
Pu-238	2.48E-04	0%	1.26E-03	0%
Pu-239	6.54E-05	0%	7.54E-04	0%
Pu-241	1.83E-03	0.01%	2.67E+00	0.98%
Am-241	1.34E-07	0%	5.89E-04	0%
Cm-242	4.30E-08	0%	NA	NA
Cm-243	1.71E-07	0%	1.26E-03	0%
Cm-244	2.12E-07	0%	7.54E-04	0%

b. Category B – Dry Compressible Waste, Contaminated Equip, etc.

Isotope	Waste Class A Curies	Percent Abundance
H-3	3.92E-02	12.93%
Cr-51	1.31E-02	4.32%
Mn-54	3.90E-03	1.29%
Fe-55	6.59E-02	21.73%
Fe-59	2.15E-03	0.71%
Co-57	5.40E-04	0.18%
Co-58	5.11E-02	16.83%
Co-60	5.25E-02	17.31%
Ni-59	6.48E-04	0.21%
Ni-63	5.37E-02	17.68%
Zn-65	1.09E-03	0.36%
Sr-90	1.64E-04	0.05%
Zr-95	6.39E-03	2.1%
Nb-95	7.06E-03	2.33%
Tc-99	5.61E-04	0.18%
Ag-110m	6.99E-04	0.23%
Sn-113	6.37E-04	0.21%
Sb-125	2.80E-03	0.92%
Cs-137	8.89E-04	0.29%
Ce-144	2.18E-04	0.07%
Pu-238	4.09E-06	0%
Pu-241	1.87E-04	0.06%
Am-241	3.66E-06	0%
Cm-242	2.43E-06	0%
Cm-243	5.16E-06	0%
Cm-244	8.07E-06	0%

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c. Category C – Irradiated Components, Control Rods, etc.

None

d. Category D – Other (Oil, Reverse Osmosis Reject Water, Soil, Lagoon Sediment)

Isotope	Waste Class A Curies	Percent Abundance
H-3	1.74E-01	96.11%
C-14	2.14E-05	0.01%
Cr-51	2.56E-04	0.14%
Mn-54	7.06E-05	0.04%
Fe-55	1.57E-03	0.86%
Fe-59	4.01E-05	0.02%
Co-57	9.72E-06	0.01%
Co-58	9.24E-04	0.51%
Co-60	1.39E-03	0.76%
Ni-59	2.13E-05	0.01%
Ni-63	2.34E-03	1.29%
Zn-65	1.95E-05	0.01%
Sr-89	3.24E-29	0%
Sr-90	4.73E-06	0%
Zr-95	1.16E-04	0.06%
Nb-95	1.26E-04	0.07%
Tc-99	1.23E-05	0.01%
Ag-110m	1.26E-05	0.01%
Sn-113	1.13E-05	0.01%
Sn-117m	1.80E-157	0%
Sb-124	2.14E-40	0%
Sb-125	6.14E-05	0.03%
Te-123m	6.22E-24	0%
I-129	4.98E-09	0%
Cs-134	5.67E-07	0%
Cs-137	5.54E-05	0.03%
Ce-144	3.90E-06	0%
Pu-238	1.23E-07	0%
Pu-239	8.13E-10	0%
Pu-241	3.96E-06	0%
Am-241	1.34E-07	0%
Cm-242	4.30E-08	0%
Cm-243	1.71E-07	0%
Cm-244	2.12E-07	0%

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3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
1	CAST Transportation	Diversified Scientific Services, Inc 657 Gallaher Rd
4	Hittman Transportation	Energy Solutions Services - Gallaher Rd 628 Gallaher Rd.
6	Hittman Transportation	Energy Solutions-Bear Creek Facility 1560 Bear Creek Road
4	Hittman Transportation	EnergySolutions LLC. Clive Disposal Site - Containerized Waste Facility
2	Hittman Transportation	Waste Control Specialists LLC Compact Waste Disposal Facility

B. Irradiated Fuel Shipments

None

C. Irradiated Fuel Shipments (disposition)

No irradiated fuel shipments were dispositioned at Braidwood during January through December 2019.

D. Changes to the Process Control Program (PCP)

There were no Process Control Changes in 2019.

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APPENDIX C: WIND DIRECTION AND STABILITY CLASSES

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Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	5	0	0	0	5
NNE	0	0	1	0	0	0	1
NE	0	3	3	2	0	0	8
ENE	0	4	6	0	0	0	10
E	1	24	4	0	0	0	29
ESE	0	5	3	0	0	0	8
SE	0	10	3	0	0	0	13
SSE	0	1	5	0	0	0	6
S	0	2	0	3	0	0	5
SSW	0	0	2	2	0	0	4
SW	0	1	5	0	0	0	6
WSW	0	1	5	7	0	0	13
W	0	3	5	24	3	5	40
WNW	0	6	30	14	1	0	51
NW	0	5	14	3	0	0	22
NNW	0	3	11	2	0	0	16
Variable	0	0	0	0	0	0	0
Total	1	68	102	57	4	5	237

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

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Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	2	4	0	0	0	7
NNE	0	4	0	0	0	0	4
NE	0	2	1	2	0	0	5
ENE	0	12	2	0	0	0	14
E	2	16	0	0	0	0	18
ESE	0	5	2	0	0	0	7
SE	0	2	2	0	0	0	4
SSE	0	2	4	0	0	0	6
S	0	0	1	0	0	0	1
SSW	0	0	1	0	0	0	1
SW	0	3	6	0	0	0	9
WSW	0	0	3	2	0	1	6
W	1	7	13	11	14	2	48
WNW	0	7	18	23	2	0	50
NW	2	5	5	0	0	0	12
NNW	1	5	7	0	0	0	13
Variable	0	0	0	0	0	0	0
Total	7	72	69	38	16	3	205

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

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Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	6	1	0	0	0	8
NNE	3	6	1	0	0	0	10
NE	1	6	6	2	0	0	15
ENE	0	10	3	0	0	0	13
E	0	16	1	0	0	0	17
ESE	0	4	8	0	0	0	12
SE	0	4	4	0	0	0	8
SSE	1	3	1	0	0	0	5
S	0	0	1	1	0	0	2
SSW	0	2	0	0	0	0	2
SW	0	2	3	0	1	0	6
WSW	0	2	7	1	1	0	11
W	0	3	7	16	9	2	37
WNW	1	6	28	19	7	0	61
NW	0	6	6	0	0	0	12
NNW	2	4	8	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	9	80	85	39	18	2	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: 4

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Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	9	21	6	5	0	0	41
NNE	9	26	12	10	0	0	57
NE	10	30	27	6	0	0	73
ENE	15	70	37	1	0	0	123
E	20	61	18	1	0	0	100
ESE	0	17	19	6	0	0	42
SE	1	18	19	15	0	0	53
SSE	0	13	22	12	0	0	47
S	0	7	31	28	1	0	67
SSW	0	2	25	11	3	0	41
SW	0	12	32	5	2	0	51
WSW	4	14	40	13	8	0	79
W	5	20	26	28	18	8	105
WNW	7	28	32	12	5	0	84
NW	15	45	10	2	0	0	72
NNW	11	45	31	1	0	0	88
Variable	0	0	0	0	0	0	0
Total	106	429	387	156	37	8	1123

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

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Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	3	0	0	0	0	7
NNE	5	3	0	0	0	0	8
NE	9	6	0	0	0	0	15
ENE	9	5	0	0	0	0	14
E	16	6	0	0	0	0	22
ESE	8	4	2	0	0	0	14
SE	2	15	5	1	0	0	23
SSE	1	14	1	0	0	0	16
S	1	5	17	3	0	0	26
SSW	0	2	20	4	0	0	26
SW	0	7	4	0	0	0	11
WSW	3	16	2	0	0	0	21
W	3	11	9	0	0	0	23
WNW	11	17	2	1	0	0	31
NW	3	3	0	0	0	0	6
NNW	2	1	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	77	118	62	9	0	0	266

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

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Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	0	0	0	0	0	3
NNE	2	0	0	0	0	0	2
NE	1	0	0	0	0	0	1
ENE	2	0	0	0	0	0	2
E	3	0	0	0	0	0	3
ESE	2	0	0	0	0	0	2
SE	1	0	0	0	0	0	1
SSE	1	0	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	1	2	0	0	0	0	3
SW	0	2	0	0	0	0	2
WSW	1	8	0	0	0	0	9
W	5	15	1	0	0	0	21
WNW	4	8	0	0	0	0	12
NW	8	0	0	0	0	0	8
NNW	4	0	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	38	35	1	0	0	0	74

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
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	1	0	0	0	0	0	1
ESE	1	0	0	0	0	0	1
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	4	1	0	0	0	0	5
WNW	2	0	0	0	0	0	2
NW	3	0	0	0	0	0	3
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	16	1	0	0	0	0	17

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: January - March 2019

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	5	0	0	5
NNE	0	0	0	3	0	0	3
NE	0	3	0	2	1	0	6
ENE	0	3	7	1	0	0	11
E	0	9	14	3	1	0	27
ESE	0	4	4	5	0	0	13
SE	0	5	4	0	0	0	9
SSE	0	1	3	3	0	0	7
S	0	1	0	3	2	0	6
SSW	0	0	2	1	0	0	3
SW	0	0	5	1	0	0	6
WSW	0	1	2	8	3	0	14
W	0	3	5	11	10	9	38
WNW	0	4	20	17	9	2	52
NW	0	1	6	13	5	0	25
NNW	0	2	3	6	1	0	12
Variable	0	0	0	0	0	0	0
Total	0	37	75	82	32	11	237

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	3	2	0	0	7
NNE	0	3	1	0	0	0	4
NE	0	2	0	1	2	0	5
ENE	0	9	3	0	0	0	12
E	0	13	6	1	0	0	20
ESE	0	2	3	2	0	0	7
SE	0	2	1	1	0	0	4
SSE	0	1	4	1	0	0	6
S	0	0	0	1	0	0	1
SSW	0	0	5	2	0	0	7
SW	0	0	3	0	0	0	3
WSW	0	2	5	2	3	2	14
W	0	4	5	8	6	15	38
WNW	1	3	4	12	19	9	48
NW	2	2	8	5	0	0	17
NNW	0	4	5	3	0	0	12
Variable	0	0	0	0	0	0	0
Total	3	49	56	41	30	26	205

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	6	4	0	0	0	11
NNE	0	4	5	1	2	0	12
NE	0	4	9	0	0	0	13
ENE	1	3	5	0	0	0	9
E	0	6	8	4	0	0	18
ESE	0	4	1	5	5	0	15
SE	0	1	6	2	0	0	9
SSE	0	0	2	1	0	0	3
S	0	1	1	0	1	0	3
SSW	0	1	0	2	0	1	4
SW	0	2	1	1	0	0	4
WSW	0	1	6	5	0	1	13
W	0	2	5	7	14	11	39
WNW	0	2	6	22	16	9	55
NW	0	2	6	4	2	0	14
NNW	2	2	1	6	0	0	11
Variable	0	0	0	0	0	0	0
Total	4	41	66	60	40	22	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: 4

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	13	15	7	4	0	43
NNE	0	19	19	14	7	5	64
NE	1	18	16	25	5	0	65
ENE	2	26	59	19	0	0	106
E	4	22	51	26	6	2	111
ESE	0	3	16	10	15	6	50
SE	0	2	11	11	15	5	44
SSE	2	2	10	21	8	8	51
S	1	1	10	28	31	3	74
SSW	1	1	3	25	8	5	43
SW	0	3	20	23	4	2	52
WSW	0	6	15	35	12	14	82
W	1	12	17	34	15	17	96
WNW	2	7	25	23	12	8	77
NW	5	10	31	20	2	2	70
NNW	2	18	51	23	2	0	96
Variable	0	0	0	0	0	0	0
Total	25	163	369	344	146	77	1124

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	4	2	0	0	8
NNE	0	3	7	2	0	0	12
NE	0	2	11	3	0	0	16
ENE	0	2	5	0	0	0	7
E	1	5	10	4	0	0	20
ESE	0	4	7	1	1	0	13
SE	1	4	11	2	5	1	24
SSE	0	0	11	8	1	0	20
S	0	0	4	12	11	0	27
SSW	0	0	4	13	10	0	27
SW	1	1	7	7	0	0	16
WSW	0	0	6	4	0	0	10
W	1	2	11	10	0	0	24
WNW	2	1	13	14	0	1	31
NW	0	1	9	1	0	0	11
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	6	27	120	83	28	2	266

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	6	0	0	0	7
NNE	1	1	1	0	0	0	3
NE	0	0	1	0	0	0	1
ENE	1	0	1	0	0	0	2
E	0	0	1	0	0	0	1
ESE	0	0	2	0	0	0	2
SE	3	0	1	0	0	0	4
SSE	1	1	0	0	0	0	2
S	1	1	0	0	0	0	2
SSW	1	1	0	0	0	0	2
SW	0	0	6	0	0	0	6
WSW	0	0	1	2	0	0	3
W	1	0	2	8	0	0	11
WNW	0	0	10	11	0	0	21
NW	0	0	2	0	0	0	2
NNW	0	2	1	2	0	0	5
Variable	0	0	0	0	0	0	0
Total	10	6	35	23	0	0	74

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2019
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	1	1	0	0	4
NNE	1	0	0	0	0	0	1
NE	0	1	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	1	0	0	0	0	0	1
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	0	0	0	0	0	0
WNW	0	0	2	0	0	0	2
NW	1	0	0	1	0	0	2
NNW	0	0	3	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	5	2	7	3	0	0	17

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	3	3	0	0	8
NNE	0	1	2	5	5	0	13
NE	0	3	11	0	0	0	14
ENE	0	2	9	0	0	0	11
E	0	3	2	0	0	0	5
ESE	0	2	5	0	0	0	7
SE	0	1	1	0	0	0	2
SSE	0	0	4	0	0	0	4
S	0	4	2	4	0	0	10
SSW	0	2	6	15	0	0	23
SW	1	1	10	7	8	0	27
WSW	1	3	9	2	0	0	15
W	0	0	7	5	0	0	12
WNW	0	2	7	2	0	0	11
NW	0	2	11	3	0	0	16
NNW	0	4	11	8	0	0	23
Variable	0	0	0	0	0	0	0
Total	2	32	100	54	13	0	201

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	5	1	0	0	0	6
NNE	0	4	1	2	0	0	7
NE	2	7	5	2	0	0	16
ENE	1	6	9	0	0	0	16
E	2	11	6	0	0	0	19
ESE	2	1	1	0	0	0	4
SE	1	3	5	0	0	0	9
SSE	0	3	3	1	0	0	7
S	0	5	5	3	0	0	13
SSW	0	4	7	5	1	0	17
SW	1	6	8	1	2	0	18
WSW	0	3	11	2	2	0	18
W	0	6	4	7	1	0	18
WNW	1	4	1	0	0	0	6
NW	1	6	4	0	0	0	11
NNW	0	7	10	2	0	0	19
Variable	0	0	0	0	0	0	0
Total	11	81	81	25	6	0	204

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	8	1	0	0	0	10
NNE	2	3	3	2	1	0	11
NE	1	4	9	0	0	0	14
ENE	5	14	7	1	0	0	27
E	3	11	4	0	0	0	18
ESE	1	4	2	1	0	0	8
SE	0	4	1	0	0	0	5
SSE	0	1	3	0	0	0	4
S	0	4	2	3	0	0	9
SSW	0	4	1	11	0	0	16
SW	1	3	7	4	0	0	15
WSW	2	5	4	3	0	0	14
W	0	4	6	3	0	0	13
WNW	0	8	6	1	0	0	15
NW	0	5	4	0	0	0	9
NNW	1	4	2	1	0	0	8
Variable	0	0	0	0	0	0	0
Total	17	86	62	30	1	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: 0

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	11	10	21	5	0	0	47
NNE	7	42	27	13	0	0	89
NE	17	57	47	6	0	0	127
ENE	20	92	38	6	0	0	156
E	10	40	22	2	0	0	74
ESE	2	25	11	1	0	0	39
SE	3	13	13	0	0	0	29
SSE	1	13	26	1	0	0	41
S	0	9	41	20	0	0	70
SSW	1	3	30	39	3	0	76
SW	1	21	47	14	0	0	83
WSW	1	17	23	4	0	0	45
W	2	11	21	6	1	0	41
WNW	3	23	20	0	0	0	46
NW	7	23	21	0	0	0	51
NNW	3	14	18	0	0	0	35
Variable	0	0	0	0	0	0	0
Total	89	413	426	117	4	0	1049

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	9	1	0	0	0	13
NNE	4	8	0	0	0	0	12
NE	10	7	1	0	0	0	18
ENE	21	13	0	0	0	0	34
E	29	15	1	0	0	0	45
ESE	12	20	0	0	0	0	32
SE	1	28	7	0	0	0	36
SSE	1	6	15	0	0	0	22
S	3	14	9	0	0	0	26
SSW	0	6	14	0	0	0	20
SW	0	19	24	1	0	0	44
WSW	2	19	5	0	0	0	26
W	4	14	4	0	0	0	22
WNW	5	15	1	0	0	0	21
NW	6	2	0	0	0	0	8
NNW	3	6	1	0	1	0	11
Variable	0	0	0	0	0	0	0
Total	104	201	83	1	1	0	390

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: 0

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	1	0	0	0	0	5
NNE	1	2	0	0	0	0	3
NE	6	0	0	0	0	0	6
ENE	9	0	0	0	0	0	9
E	13	0	0	0	0	0	13
ESE	7	0	0	0	0	0	7
SE	1	0	0	0	0	0	1
SSE	2	4	0	0	0	0	6
S	0	0	0	0	0	0	0
SSW	1	5	1	0	0	0	7
SW	2	1	1	0	0	0	4
WSW	3	3	0	0	0	0	6
W	3	9	1	0	0	0	13
WNW	7	5	0	0	0	0	12
NW	1	0	0	0	0	0	1
NNW	6	0	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	66	30	3	0	0	0	99

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2019
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	0	0	0	0	0	2
NNE	1	0	0	0	0	0	1
NE	6	0	0	0	0	0	6
ENE	6	0	0	0	0	0	6
E	8	0	0	0	0	0	8
ESE	3	0	0	0	0	0	3
SE	1	0	0	0	0	0	1
SSE	1	1	0	0	0	0	2
S	3	0	0	0	0	0	3
SSW	1	1	0	0	0	0	2
SW	0	0	0	0	0	0	0
WSW	1	0	0	0	0	0	1
W	2	0	0	0	0	0	2
WNW	2	0	0	0	0	0	2
NW	1	0	0	0	0	0	1
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	39	2	0	0	0	0	41

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: 0

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	4	1	0	5
NNE	0	0	4	0	4	6	14
NE	0	3	7	3	0	0	13
ENE	0	1	2	7	0	0	10
E	0	4	0	2	0	0	6
ESE	0	0	1	4	2	0	7
SE	0	1	2	0	0	0	3
SSE	0	0	1	2	1	0	4
S	0	2	3	4	0	1	10
SSW	0	0	9	3	17	1	30
SW	0	1	4	5	3	7	20
WSW	0	1	7	5	1	0	14
W	1	0	1	10	0	0	12
WNW	0	1	5	3	1	1	11
NW	0	0	4	7	6	0	17
NNW	0	0	10	5	9	1	25
Variable	0	0	0	0	0	0	0
Total	1	14	60	64	45	17	201

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	3	0	0	0	6
NNE	0	3	5	1	1	1	11
NE	0	4	3	1	1	0	9
ENE	1	7	5	7	0	0	20
E	1	3	7	4	2	0	17
ESE	0	3	0	2	1	0	6
SE	0	4	3	1	0	0	8
SSE	0	2	0	2	2	0	6
S	0	4	3	6	0	1	14
SSW	0	1	6	6	4	1	18
SW	1	7	6	2	0	2	18
WSW	1	2	5	6	1	2	17
W	0	4	3	5	4	2	18
WNW	0	6	2	1	0	0	9
NW	0	3	6	2	2	0	13
NNW	0	3	9	1	1	0	14
Variable	0	0	0	0	0	0	0
Total	4	59	66	47	19	9	204

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	2	4	1	0	0	8
NNE	0	4	1	3	1	1	10
NE	1	3	6	6	1	0	17
ENE	0	10	8	2	0	0	20
E	2	3	6	5	4	0	20
ESE	2	3	2	0	2	0	9
SE	0	3	2	0	0	0	5
SSE	0	1	3	3	0	0	7
S	0	2	1	2	3	1	9
SSW	0	2	4	3	8	1	18
SW	0	2	4	3	2	0	11
WSW	0	4	3	7	0	0	14
W	2	4	5	2	3	0	16
WNW	0	3	4	4	1	0	12
NW	1	4	2	4	2	0	13
NNW	0	2	3	1	1	0	7
Variable	0	0	0	0	0	0	0
Total	9	52	58	46	28	3	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: 0

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	12	14	12	9	1	49
NNE	5	17	39	22	13	1	97
NE	4	17	53	43	6	1	124
ENE	4	29	68	21	6	0	128
E	0	8	29	39	10	4	90
ESE	0	5	16	16	2	1	40
SE	0	2	14	13	1	0	30
SSE	1	2	8	16	11	0	38
S	0	4	4	29	28	5	70
SSW	0	4	9	42	32	11	98
SW	1	3	29	29	10	0	72
WSW	0	8	9	19	5	0	41
W	1	5	12	13	6	1	38
WNW	0	5	14	22	1	0	42
NW	3	8	16	22	7	0	56
NNW	0	5	16	13	2	0	36
Variable	0	0	0	0	0	0	0
Total	20	134	350	371	149	25	1049

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	3	10	2	0	0	16
NNE	1	8	4	0	0	0	13
NE	1	4	5	4	1	0	15
ENE	3	12	13	1	0	0	29
E	0	8	26	4	1	0	39
ESE	0	3	12	7	0	0	22
SE	0	10	22	13	0	0	45
SSE	0	0	7	16	6	0	29
S	0	0	5	11	3	0	19
SSW	0	1	10	17	0	0	28
SW	0	2	22	15	2	1	42
WSW	0	2	14	13	0	0	29
W	0	2	9	8	1	0	20
WNW	2	1	12	5	0	0	20
NW	1	1	2	5	0	0	9
NNW	1	5	7	2	0	1	16
Variable	0	0	0	0	0	0	0
Total	10	62	180	123	14	2	391

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	0	3	0	0	0	5
NNE	0	2	3	0	0	0	5
NE	1	1	0	0	0	0	2
ENE	1	2	0	0	0	0	3
E	1	5	2	0	0	0	8
ESE	1	3	5	0	0	0	9
SE	2	6	2	0	0	0	10
SSE	0	3	1	0	0	0	4
S	0	0	2	1	0	0	3
SSW	0	1	3	0	0	0	4
SW	0	2	3	4	0	0	9
WSW	0	2	1	2	0	0	5
W	0	1	5	3	0	0	9
WNW	0	0	6	7	0	0	13
NW	1	0	4	0	0	0	5
NNW	1	2	3	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	10	30	43	17	0	0	100

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: 0

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2019

Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

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

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: 0

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	0	0	0	0	4
NNE	0	7	7	0	0	0	14
NE	0	8	4	0	0	0	12
ENE	0	11	4	0	0	0	15
E	0	17	0	0	0	0	17
ESE	0	7	4	0	0	0	11
SE	2	6	1	0	0	0	9
SSE	0	12	2	0	0	0	14
S	0	10	3	0	0	0	13
SSW	0	3	4	5	0	0	12
SW	0	0	23	13	0	0	36
WSW	0	4	13	1	0	0	18
W	0	14	23	5	0	0	42
WNW	0	10	10	0	0	0	20
NW	0	26	2	0	0	0	28
NNW	0	5	2	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	2	144	102	24	0	0	272

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: 5

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
 UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2019

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)

Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	6	2	0	0	0	8
NNE	0	5	3	0	0	0	8
NE	1	6	4	0	0	0	11
ENE	3	10	1	0	0	0	14
E	2	11	0	0	0	0	13
ESE	6	3	0	0	0	0	9
SE	2	12	0	0	0	0	14
SSE	2	14	1	0	0	0	17
S	0	9	0	0	0	0	9
SSW	0	3	8	1	0	0	12
SW	0	5	16	2	0	0	23
WSW	0	6	8	3	0	0	17
W	0	14	8	1	0	0	23
WNW	1	13	5	0	0	0	19
NW	1	9	0	0	0	0	10
NNW	0	5	1	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	18	131	57	7	0	0	213

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	7	0	0	0	0	8
NNE	2	5	3	0	0	0	10
NE	0	7	4	0	0	0	11
ENE	4	7	1	0	0	0	12
E	1	6	0	0	0	0	7
ESE	2	6	0	0	0	0	8
SE	1	5	0	0	0	0	6
SSE	2	4	2	0	0	0	8
S	0	3	1	0	0	0	4
SSW	1	3	6	7	1	0	18
SW	0	3	11	3	0	0	17
WSW	2	6	5	0	0	0	13
W	1	9	4	1	0	0	15
WNW	5	6	1	0	0	0	12
NW	2	4	2	0	0	0	8
NNW	2	6	5	0	0	0	13
Variable	0	0	0	0	0	0	0
Total	26	87	45	11	1	0	170

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	6	6	2	0	0	0	14
NNE	2	18	11	0	0	0	31
NE	9	24	13	0	0	0	46
ENE	25	57	0	0	0	0	82
E	10	26	0	0	0	0	36
ESE	3	17	0	0	0	0	20
SE	2	18	2	0	0	0	22
SSE	3	22	5	0	0	0	30
S	2	19	35	3	0	0	59
SSW	0	13	55	19	1	0	88
SW	1	23	57	10	0	0	91
WSW	0	23	13	1	0	0	37
W	6	21	10	1	0	0	38
WNW	8	24	3	0	0	0	35
NW	4	11	0	0	0	0	15
NNW	7	8	6	0	0	0	21
Variable	0	0	0	0	0	0	0
Total	88	330	212	34	1	0	665

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	11	12	2	0	0	0	25
NNE	12	17	0	0	0	0	29
NE	13	10	1	0	0	0	24
ENE	30	14	0	0	0	0	44
E	44	6	1	0	0	0	51
ESE	19	21	1	0	0	0	41
SE	13	34	2	0	0	0	49
SSE	16	37	5	1	0	0	59
S	6	42	17	0	0	0	65
SSW	5	14	11	0	0	0	30
SW	5	23	8	0	0	0	36
WSW	3	24	1	0	0	0	28
W	13	26	1	0	0	0	40
WNW	23	23	1	0	0	0	47
NW	11	5	0	0	0	0	16
NNW	9	7	0	0	0	0	16
Variable	0	0	0	0	0	0	0
Total	233	315	51	1	0	0	600

Hours of calm in this stability class: 3
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	11	1	0	0	0	0	12
NNE	9	1	0	0	0	0	10
NE	6	0	0	0	0	0	6
ENE	13	0	0	0	0	0	13
E	28	3	0	0	0	0	31
ESE	13	0	0	0	0	0	13
SE	4	2	0	0	0	0	6
SSE	1	2	0	0	0	0	3
S	3	1	0	0	0	0	4
SSW	1	3	0	0	0	0	4
SW	4	4	0	0	0	0	8
WSW	8	10	0	0	0	0	18
W	28	2	0	0	0	0	30
WNW	26	0	0	0	0	0	26
NW	15	1	0	0	0	0	16
NNW	6	0	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	176	30	0	0	0	0	206

Hours of calm in this stability class: 8
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	0	0	0	0	1
NNE	4	0	0	0	0	0	4
NE	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	3	0	0	0	0	0	3
ESE	4	1	0	0	0	0	5
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	2	0	0	0	0	0	2
SW	5	0	0	0	0	0	5
WSW	5	1	0	0	0	0	6
W	6	1	0	0	0	0	7
WNW	17	0	0	0	0	0	17
NW	6	0	0	0	0	0	6
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	57	3	0	0	0	0	60

Hours of calm in this stability class: 6
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	2	1	0	0	7
NNE	0	1	10	2	0	0	13
NE	0	5	5	1	0	0	11
ENE	0	5	8	0	0	0	13
E	0	6	12	1	0	0	19
ESE	0	3	5	4	0	0	12
SE	1	5	3	1	0	0	10
SSE	0	7	4	1	0	0	12
S	0	3	9	1	0	0	13
SSW	0	0	2	7	2	0	11
SW	0	0	7	22	5	0	34
WSW	0	4	12	6	1	0	23
W	0	5	21	7	4	0	37
WNW	0	3	10	5	1	0	19
NW	0	9	20	2	0	0	31
NNW	0	1	5	1	0	0	7
Variable	0	0	0	0	0	0	0
Total	1	61	135	62	13	0	272

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019

Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	5	1	2	0	0	8
NNE	0	8	3	1	0	0	12
NE	2	7	2	3	0	0	14
ENE	0	5	4	0	0	0	9
E	1	10	3	1	0	0	15
ESE	0	7	1	0	0	0	8
SE	0	15	2	0	0	0	17
SSE	0	7	6	1	0	0	14
S	0	1	9	0	0	0	10
SSW	0	0	2	9	1	1	13
SW	0	5	4	14	1	0	24
WSW	1	4	10	3	2	0	20
W	0	10	6	3	1	0	20
WNW	0	4	8	1	0	0	13
NW	1	6	1	1	0	0	9
NNW	0	5	1	1	0	0	7
Variable	0	0	0	0	0	0	0
Total	5	99	63	40	5	1	213

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	3	3	0	0	0	9
NNE	0	4	2	3	0	0	9
NE	1	8	3	1	0	0	13
ENE	1	3	3	1	0	0	8
E	1	4	4	0	0	0	9
ESE	0	4	2	1	0	0	7
SE	2	4	1	0	0	0	7
SSE	0	5	1	2	0	0	8
S	3	1	1	1	0	1	7
SSW	0	1	6	7	5	2	21
SW	1	1	6	8	0	0	16
WSW	0	2	5	3	0	0	10
W	0	1	6	1	1	0	9
WNW	0	9	4	1	0	0	14
NW	3	2	2	3	0	0	10
NNW	0	4	5	3	1	0	13
Variable	0	0	0	0	0	0	0
Total	15	56	54	35	7	3	170

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	3	1	0	0	8
NNE	0	4	17	13	0	0	34
NE	3	16	14	8	0	0	41
ENE	4	35	29	1	0	0	69
E	5	17	25	6	0	0	53
ESE	0	2	8	7	0	0	17
SE	2	8	7	4	0	0	21
SSE	0	5	12	4	1	0	22
S	0	4	17	32	4	0	57
SSW	2	1	21	79	22	1	126
SW	0	9	38	26	3	0	76
WSW	0	4	19	8	0	0	31
W	2	6	15	11	1	0	35
WNW	1	5	21	2	0	0	29
NW	2	5	9	5	0	0	21
NNW	5	4	11	5	0	0	25
Variable	0	0	0	0	0	0	0
Total	26	129	266	212	31	1	665

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	7	15	2	0	0	25
NNE	0	7	16	1	0	0	24
NE	3	8	17	1	0	0	29
ENE	1	18	22	1	0	0	42
E	1	4	24	2	0	0	31
ESE	1	9	21	7	0	0	38
SE	2	6	26	8	0	0	42
SSE	0	15	27	10	2	0	54
S	0	4	34	35	1	0	74
SSW	1	8	26	23	0	0	58
SW	1	4	23	6	0	0	34
WSW	1	4	20	8	0	0	33
W	2	4	23	5	0	0	34
WNW	1	8	27	3	0	0	39
NW	0	5	14	2	0	0	21
NNW	2	8	15	0	0	0	25
Variable	0	0	0	0	0	0	0
Total	17	119	350	114	3	0	603

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	11	0	0	0	14
NNE	1	3	6	0	0	0	10
NE	0	7	12	0	0	0	19
ENE	1	5	3	0	0	0	9
E	0	2	14	1	0	0	17
ESE	0	2	12	5	0	0	19
SE	0	7	3	1	0	0	11
SSE	1	2	3	0	0	0	6
S	0	5	4	0	0	0	9
SSW	1	3	2	0	0	0	6
SW	1	2	4	0	0	0	7
WSW	1	3	11	1	0	0	16
W	0	4	15	3	0	0	22
WNW	0	11	12	0	0	0	23
NW	1	2	6	0	0	0	9
NNW	0	5	12	0	0	0	17
Variable	0	0	0	0	0	0	0
Total	7	66	130	11	0	0	214

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: 5

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: July - September 2019
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	4	0	0	0	5
NNE	0	2	4	0	0	0	6
NE	1	0	0	0	0	0	1
ENE	0	3	0	0	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	2	1	1	0	0	4
SSE	0	2	0	0	0	0	2
S	0	4	0	0	0	0	4
SSW	0	2	1	0	0	0	3
SW	3	4	1	0	0	0	8
WSW	1	0	6	1	0	0	8
W	1	1	0	0	0	0	2
WNW	0	2	4	1	0	0	7
NW	0	2	6	0	0	0	8
NNW	0	3	2	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	6	28	29	3	0	0	66

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: 5

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	1	0	0	0	4
NNE	0	2	3	0	0	0	5
NE	0	0	1	0	0	0	1
ENE	0	2	0	0	0	0	2
E	0	2	1	0	0	0	3
ESE	0	3	2	0	0	0	5
SE	0	3	2	0	0	0	5
SSE	0	1	4	0	0	0	5
S	0	0	6	2	0	0	8
SSW	0	0	2	1	0	0	3
SW	0	1	4	6	0	0	11
WSW	0	4	3	4	0	0	11
W	0	8	4	8	0	0	20
WNW	0	5	14	7	0	0	26
NW	0	10	4	0	0	0	14
NNW	0	2	7	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	0	46	58	28	0	0	132

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	0	1	0	0	5
NNE	0	3	2	1	0	0	6
NE	0	2	0	0	0	0	2
ENE	0	1	0	0	0	0	1
E	0	2	1	0	0	0	3
ESE	0	3	0	0	0	0	3
SE	0	2	2	0	0	0	4
SSE	0	7	5	0	0	0	12
S	0	6	6	5	0	0	17
SSW	0	2	6	4	2	0	14
SW	0	4	14	3	0	0	21
WSW	0	4	6	0	0	0	10
W	0	6	5	1	0	0	12
WNW	0	14	7	1	2	0	24
NW	1	9	3	0	0	0	13
NNW	1	10	4	2	0	0	17
Variable	0	0	0	0	0	0	0
Total	2	79	61	18	4	0	164

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	3	1	0	0	7
NNE	1	6	1	0	0	0	8
NE	1	5	2	0	0	0	8
ENE	4	1	0	0	0	0	5
E	3	4	1	0	0	0	8
ESE	1	0	0	0	0	0	1
SE	0	7	0	0	0	0	7
SSE	0	4	5	0	0	0	9
S	1	3	6	2	0	0	12
SSW	0	2	3	1	3	0	9
SW	0	2	14	2	0	0	18
WSW	0	7	2	4	0	0	13
W	0	5	12	3	0	3	23
WNW	0	4	15	10	2	0	31
NW	3	17	3	0	0	0	23
NNW	1	12	2	3	0	0	18
Variable	0	0	0	0	0	0	0
Total	15	82	69	26	5	3	200

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	10	17	25	2	0	0	54
NNE	11	27	16	4	0	0	58
NE	5	12	5	0	0	0	22
ENE	5	9	0	0	0	0	14
E	12	25	5	0	0	0	42
ESE	2	17	18	1	0	0	38
SE	2	21	20	2	0	0	45
SSE	0	20	23	6	0	0	49
S	1	12	71	26	2	0	112
SSW	0	9	51	42	10	0	112
SW	0	14	71	22	2	0	109
WSW	2	23	18	14	9	1	67
W	8	23	45	15	7	4	102
WNW	10	26	56	14	3	0	109
NW	14	25	24	0	0	0	63
NNW	12	36	43	2	0	0	93
Variable	0	0	0	0	0	0	0
Total	94	316	491	150	33	5	1089

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: 0

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	7	5	0	0	0	0	12
NNE	4	2	0	0	0	0	6
NE	0	2	0	0	0	0	2
ENE	7	5	0	0	0	0	12
E	20	5	0	0	0	0	25
ESE	16	27	0	0	0	0	43
SE	5	24	4	0	0	0	33
SSE	1	20	7	0	0	0	28
S	6	20	17	0	0	0	43
SSW	1	5	34	1	0	0	41
SW	2	22	20	0	0	0	44
WSW	7	35	8	0	0	0	50
W	12	41	6	0	0	0	59
WNW	15	14	2	0	0	0	31
NW	9	1	0	0	0	0	10
NNW	3	6	0	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	115	234	98	1	0	0	448

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	0	0	0	0	0	2
NNE	5	0	0	0	0	0	5
NE	4	0	0	0	0	0	4
ENE	6	0	0	0	0	0	6
E	23	0	0	0	0	0	23
ESE	11	12	0	0	0	0	23
SE	1	3	0	0	0	0	4
SSE	1	0	0	0	0	0	1
S	3	0	0	0	0	0	3
SSW	1	1	1	0	0	0	3
SW	5	4	1	0	0	0	10
WSW	5	6	0	0	0	0	11
W	10	2	0	0	0	0	12
WNW	7	4	0	0	0	0	11
NW	4	0	0	0	0	0	4
NNW	4	0	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	92	32	2	0	0	0	126

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T.(F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	3	0	0	0	0	0	3
ENE	6	0	0	0	0	0	6
E	14	0	0	0	0	0	14
ESE	2	1	0	0	0	0	3
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	1	0	0	0	0	0	1
W	0	1	0	0	0	0	1
WNW	1	0	0	0	0	0	1
NW	4	0	0	0	0	0	4
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	32	2	0	0	0	0	34

Hours of calm in this stability class: 12
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	3	0	0	0	4
NNE	0	0	4	1	0	0	5
NE	0	0	1	0	0	0	1
ENE	0	2	0	0	0	0	2
E	0	0	2	1	0	0	3
ESE	0	0	4	2	0	0	6
SE	0	0	4	1	0	0	5
SSE	0	0	3	1	0	0	4
S	0	0	5	3	2	0	10
SSW	0	0	0	1	1	0	2
SW	0	1	2	4	4	0	11
WSW	0	0	4	3	3	0	10
W	0	3	6	4	3	0	16
WNW	0	2	9	9	7	0	27
NW	0	5	8	3	0	0	16
NNW	0	0	5	5	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	14	60	38	20	0	132

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	4	0	1	0	5
NNE	0	2	3	0	1	0	6
NE	0	2	0	0	0	0	2
ENE	0	0	1	0	0	0	1
E	0	0	1	1	0	0	2
ESE	0	2	2	0	0	0	4
SE	0	0	2	2	0	0	4
SSE	0	5	5	2	0	0	12
S	0	2	8	2	5	1	18
SSW	0	2	4	4	3	4	17
SW	0	1	9	9	0	0	19
WSW	0	2	5	1	0	0	8
W	0	4	6	2	0	0	12
WNW	0	5	6	5	2	2	20
NW	2	8	4	2	2	0	18
NNW	0	5	5	4	2	0	16
Variable	0	0	0	0	0	0	0
Total	2	40	65	34	16	7	164

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	2	3	1	0	7
NNE	1	3	5	0	0	0	9
NE	0	2	3	0	0	0	5
ENE	1	1	2	0	0	0	4
E	0	6	2	2	0	0	10
ESE	0	1	1	1	0	0	3
SE	0	0	6	0	0	0	6
SSE	0	3	5	2	0	0	10
S	0	2	2	4	3	0	11
SSW	0	2	2	3	2	3	12
SW	0	0	4	12	0	0	16
WSW	0	3	5	1	1	3	13
W	0	3	5	6	3	4	21
WNW	0	2	4	14	8	3	31
NW	0	4	10	6	2	0	22
NNW	0	11	4	1	4	0	20
Variable	0	0	0	0	0	0	0
Total	2	44	62	55	24	13	200

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	17	15	23	3	0	60
NNE	2	12	21	13	3	1	52
NE	3	7	12	2	2	0	26
ENE	0	5	8	0	0	0	13
E	0	7	16	11	2	1	37
ESE	0	4	8	17	11	2	42
SE	0	2	17	13	9	0	41
SSE	0	2	15	15	12	3	47
S	0	3	8	60	27	6	104
SSW	0	1	20	72	43	16	152
SW	1	4	30	37	14	4	90
WSW	0	6	16	20	8	17	67
W	3	8	15	40	12	11	89
WNW	1	15	21	48	19	5	109
NW	0	15	21	21	14	1	72
NNW	1	16	26	39	7	0	89
Variable	0	0	0	0	0	0	0
Total	13	124	269	431	186	67	1090

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	6	2	0	0	10
NNE	0	3	4	0	0	0	7
NE	0	5	3	0	0	0	8
ENE	1	1	3	0	0	0	5
E	0	0	11	0	0	0	11
ESE	0	4	8	20	0	0	32
SE	1	3	24	9	1	0	38
SSE	0	8	11	19	0	0	38
S	0	5	14	20	2	0	41
SSW	0	1	13	30	5	0	49
SW	4	2	15	25	3	0	49
WSW	0	8	23	19	0	0	50
W	0	6	25	14	0	0	45
WNW	0	2	16	13	0	0	31
NW	0	9	8	3	0	0	20
NNW	1	3	9	1	0	0	14
Variable	0	0	0	0	0	0	0
Total	7	62	193	175	11	0	448

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2019
UNIT 1, 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2019
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	0	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	1	1	0	0	0	2
ENE	0	6	0	0	0	0	6
E	0	1	4	4	0	0	9
ESE	2	3	7	4	0	0	16
SE	0	2	4	11	0	0	17
SSE	2	0	0	0	0	0	2
S	0	2	3	0	0	0	5
SSW	1	2	1	0	0	0	4
SW	3	5	3	1	1	0	13
WSW	2	2	5	1	0	0	10
W	1	1	5	3	0	0	10
WNW	1	2	4	3	0	0	10
NW	1	5	6	2	0	0	14
NNW	0	2	5	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	14	36	48	29	1	0	128

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

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Braidwood Generating Station

Period of Record: October - December 2019

Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	1	0	0	0	1
NNE	1	2	0	0	0	0	3
NE	0	3	1	0	0	0	4
ENE	0	4	0	0	0	0	4
E	1	5	3	0	0	0	9
ESE	0	2	2	2	0	0	6
SE	0	2	2	0	0	0	4
SSE	0	1	0	0	0	0	1
S	0	1	0	0	0	0	1
SSW	1	0	0	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	2	0	0	0	2
WNW	0	1	3	1	0	0	5
NW	1	2	0	0	0	0	3
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	4	24	15	3	0	0	46

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

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WIND STABILITY CLASSES

Table C-4

Atmospheric Stability Classes

<u>Description</u>	<u>Pasquill Stability Class</u>	<u>σ_g(degrees)</u>	<u>Temperature Change with Height($^{\circ}$C/100 m)</u>
Extremely Unstable	A	>22.5	< -1.9
Moderately Unstable	B	17.5 to 22.5	-1.9 to -1.7
Slightly Unstable	C	12.5 to 17.5	-1.7 to -1.5
Neutral	D	7.5 to 12.5	-1.5 to -0.5
Slightly Stable	E	3.8 to 7.5	-0.5 to 1.5
Moderately Stable	F	2.1 to 3.8	1.5 to 4.0
Extremely Stable	G	0 to 2.1	>4.0

σ_g is the standard deviation of horizontal wind direction fluctuation over a period of 15 minutes to 1 hour.

From Regulatory Guide 1.21, Table 4B.

Atmospheric Stability Classes, Table C-4 from Braidwood ODCM.

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APPENDIX D: ERRATA

There was one error identified in 2019 in the 2018 ARERR.

In the 2018 ARERR, Table D-2 referenced a dose limit in 10 CFR 74.104 when the correct reference should be 10 CFR 72.104.