

2020

Braidwood Nuclear Power Station

Annual Radioactive Effluent Release Report (ARERR)



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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

DOCUMENT INDEX

Preface	2
Introduction.....	9
A. Supplemental Information	9
B. Gaseous Effluents.....	16
C. Liquid Effluents.....	16
D. Radiological Impact on Man.....	16
E. Meteorological Data	18
F. Offsite Ambient Radiation Measurements	18
G. Radioactive Solid Waste Disposal	19
APPENDIX A: EFFLUENT AND WASTE DISPOSAL SUMMARY	20
APPENDIX B: SOLID WASTE AND IRRADIATED FUEL SHIPMENTS	30
APPENDIX C: WIND DIRECTION AND STABILITY CLASSES	36
APPENDIX D: ERRATA.....	94

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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.

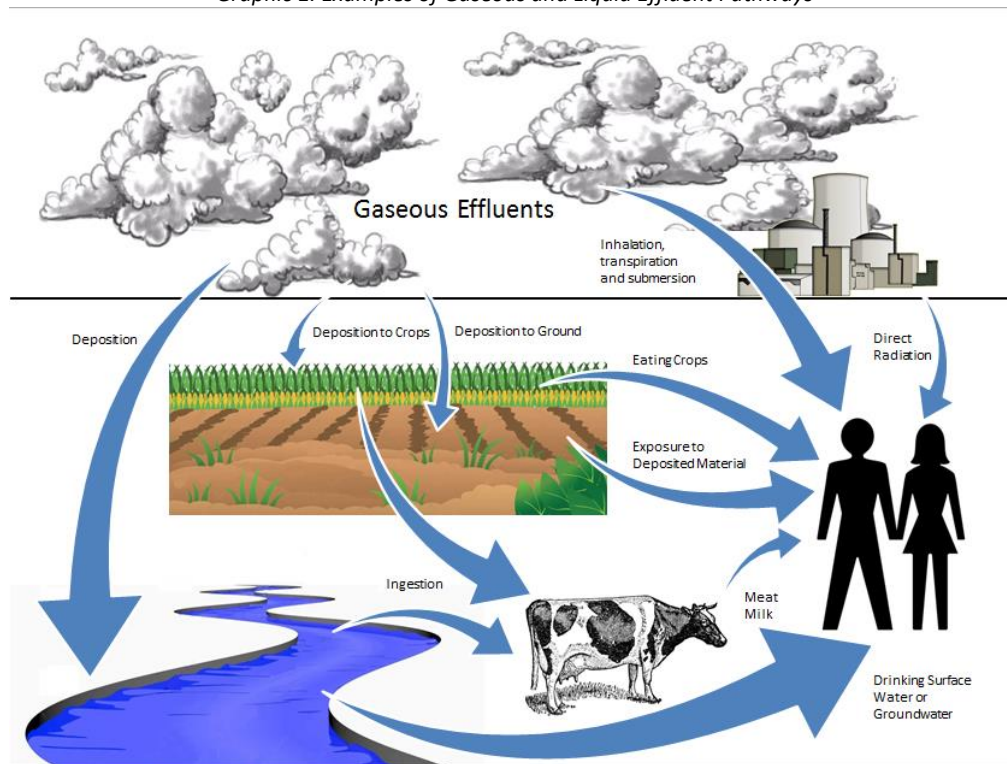
Annual Reports

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



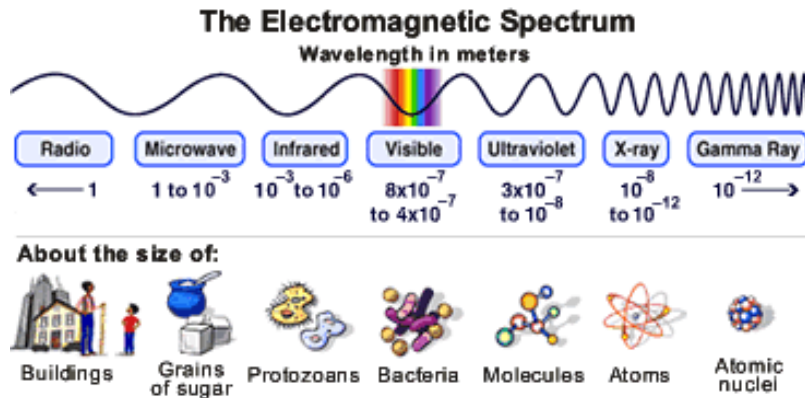
Graphic 1 demonstrates some potential exposure pathways from Braidwood Nuclear Power Station. The ARERR and AREOR together ensure Nuclear Power Plants are operating in a manner that is within established regulatory commitments meant to adequately protect the public.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Understanding Radiation

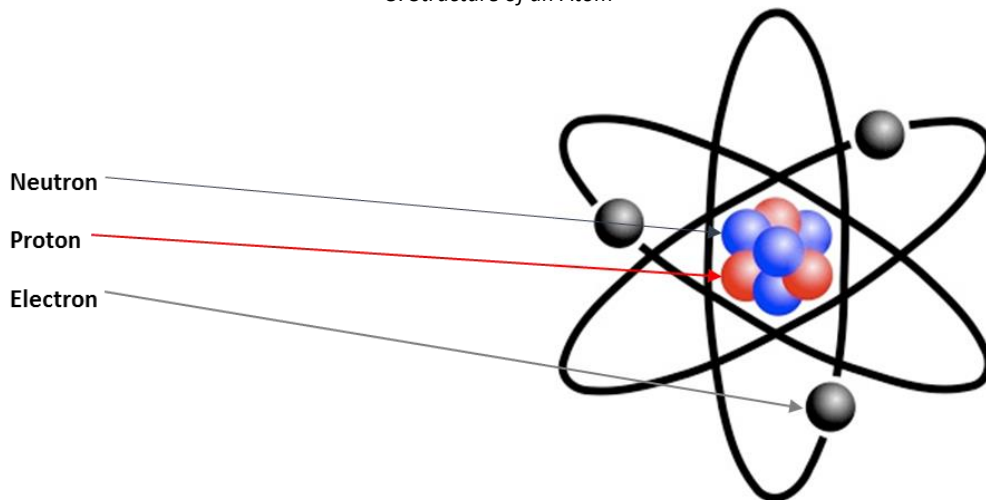
Generally radiation is defined as emitted energy in the form of waves or particles. If radiation has enough energy to displace electrons from an atom it is termed “ionizing”, otherwise it is “non-ionizing”. Non-ionizing radiation includes light, heat given off from a stove, radiowaves and microwaves. 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.

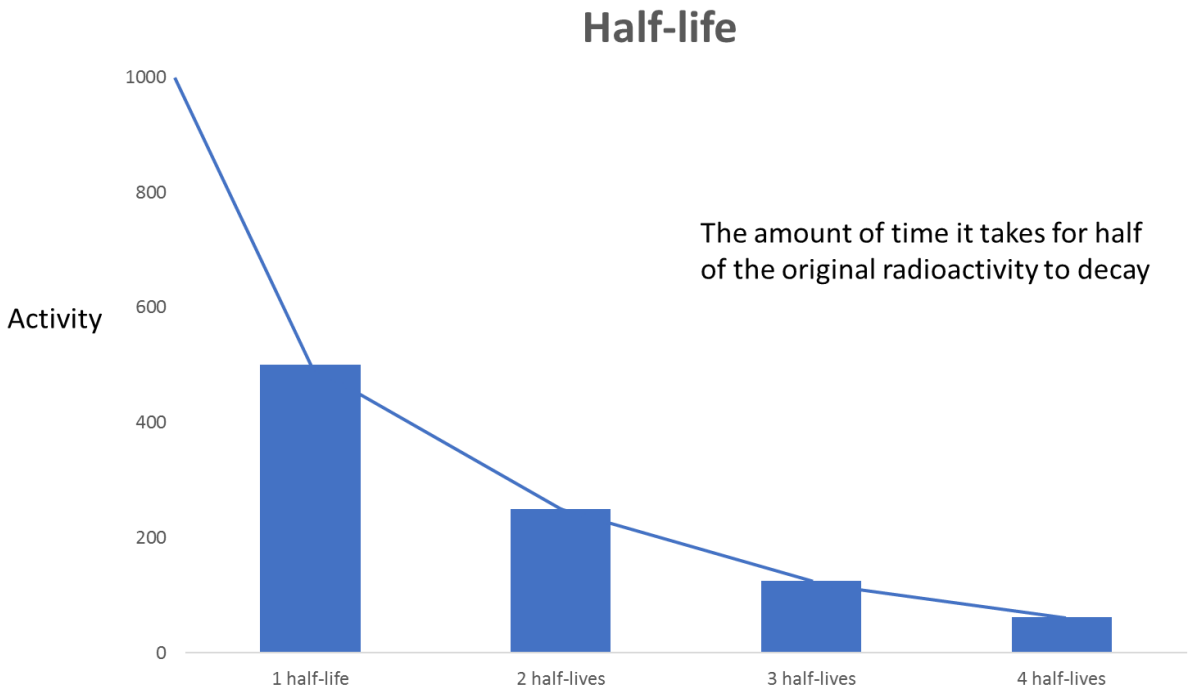
BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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.

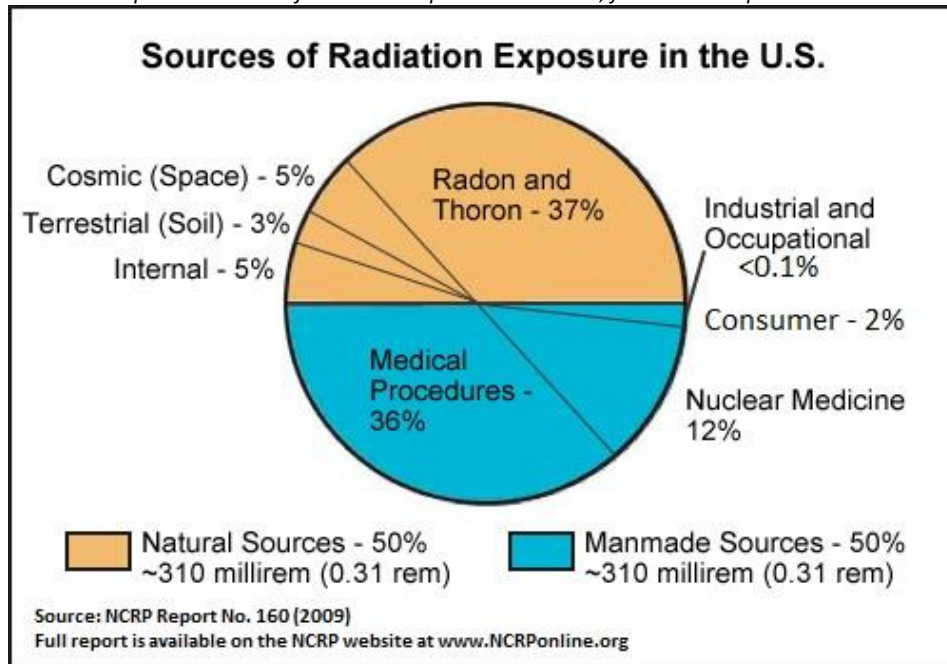
- Radioactivity refers to the amount of ionizing radiation released by a material. The units of measure for radioactivity used within the AREOR and ARERR are the Curie (Ci). Small fractions of the Ci often have a prefix, such as the microcurie (μCi), which means 1/1,000,000 of a Curie.
- Exposure describes 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.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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



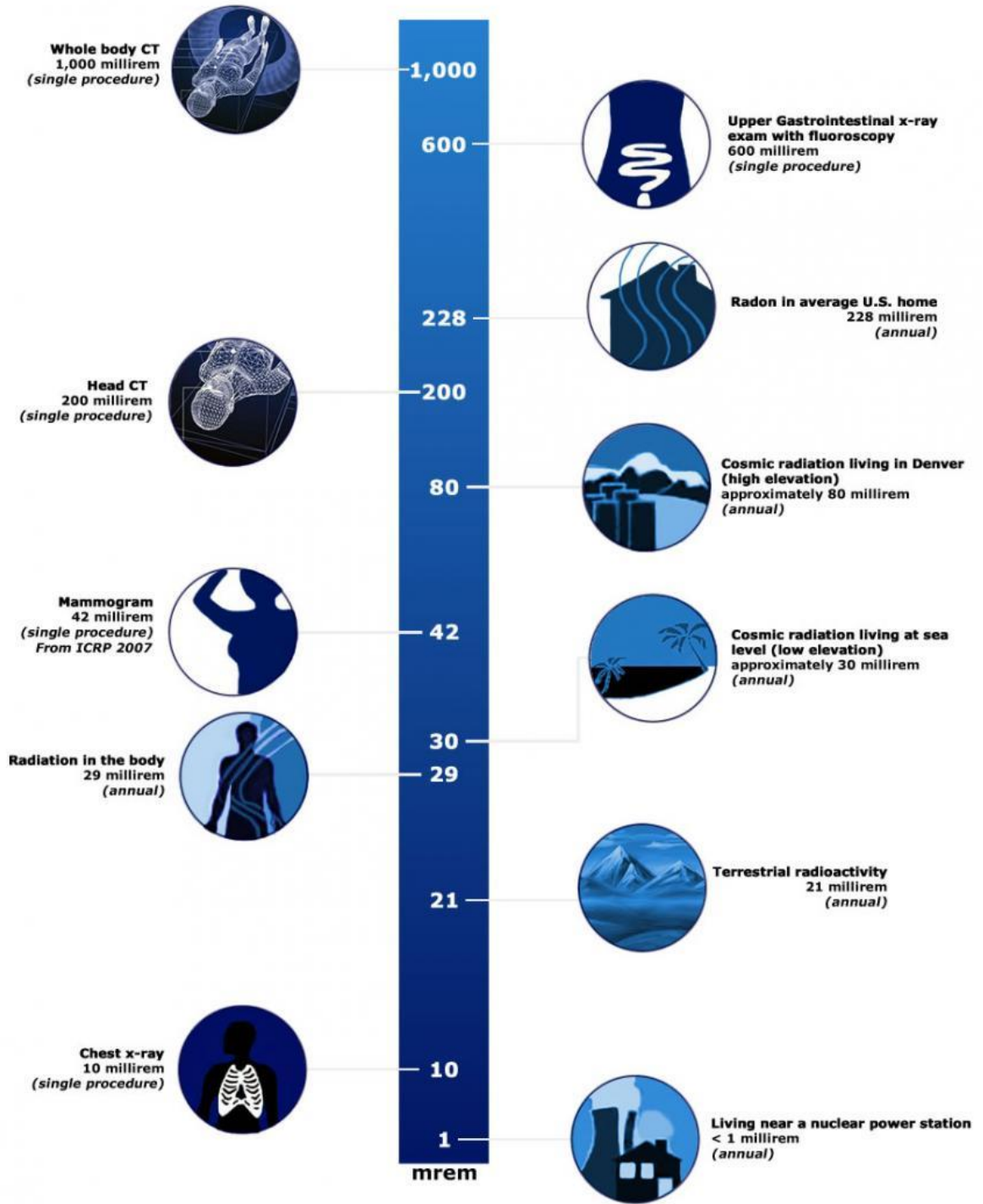
The radiation from a nuclear power plant is included in the chart as part of the "Industrial and Occupational" fraction, <0.1%. The largest natural source of radiation is from radon, because radon gas travels in the air we breathe. Perhaps you know someone who had a CT scan at a hospital to check his 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.

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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)



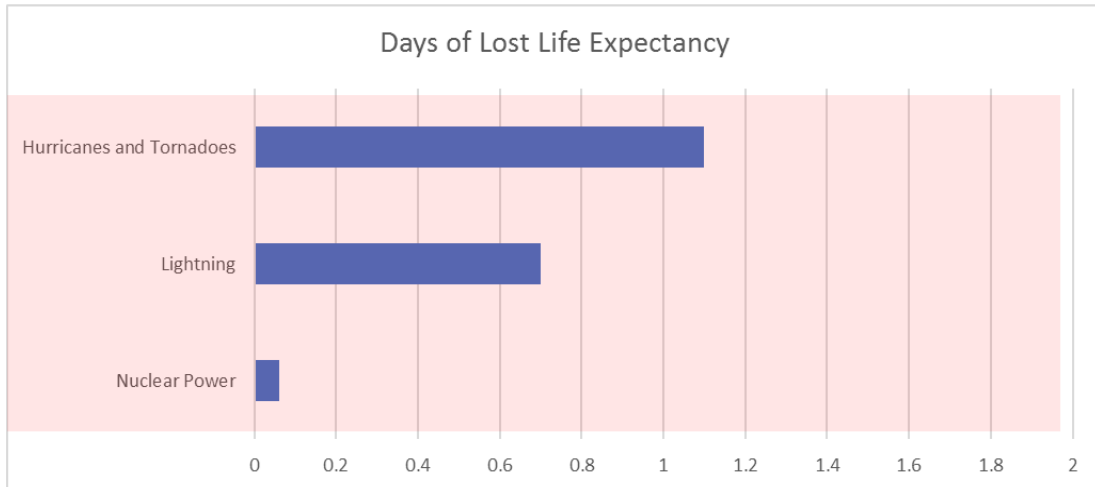
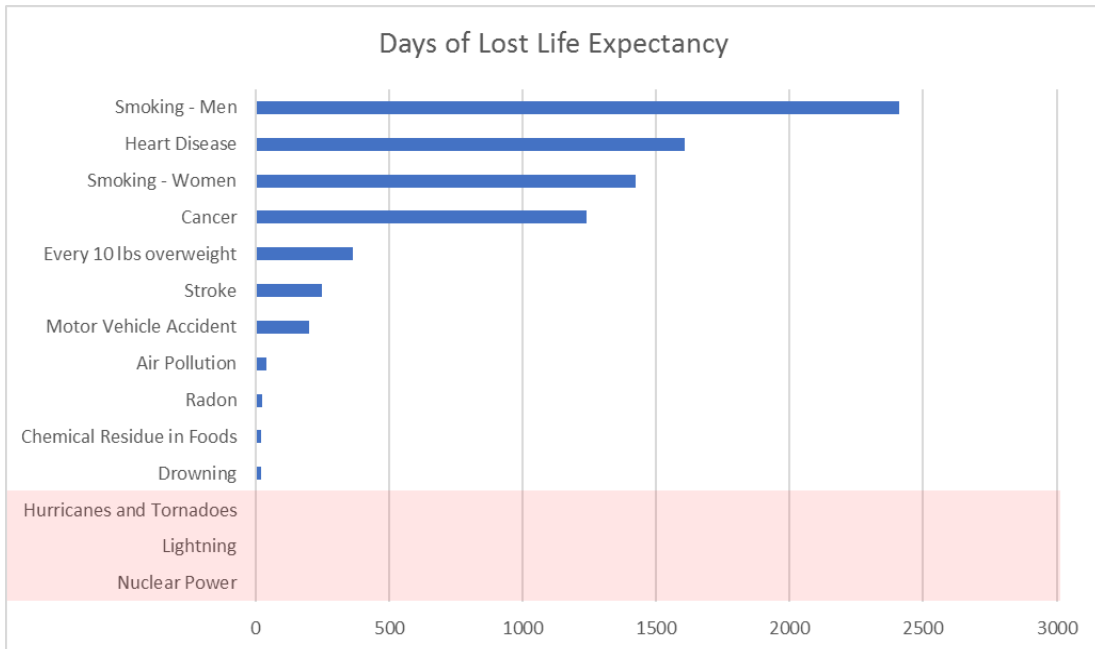
BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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



BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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, 2020 through December 31, 2020. 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" as well as 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 Unit 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 volume and quantity of radioactive waste shipped offsite from Braidwood Nuclear Power Plant for processing and disposal was 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)

c. Particulates with half-lives > 8 days:

Dose Rate

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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 obtained every seven days and analyzed via gamma spectroscopy.

Noble gas samples are obtained 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.

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.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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. Particulate, 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.

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:

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Liquid effluents are categorized as either batch release or continuous release. All liquid releases are analyzed for principal gamma emitters, radioiodines, 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

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."

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

5. Batch Releases

a. Liquid Batch Releases	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	Annual
1. Total Number of Batch Releases	14	31	12	10	67
2. Total Time Period for Batch Releases (minutes)	2.235E+04	6.171E+04	2.391E+04	4.199E+04	1.499E+05
3. Maximum Time Period for a Batch Release (minutes)	2.917E+03	5.913E+03	4.920E+03	9.147E+03	9.147E+03
4. Average Time Period for a Batch Release (minutes)	1.596E+03	1.991E+03	1.992E+03	4.199E+03	2.238E+03
5. Minimum Time Period for a Batch Release (minutes)	4.970E+02	1.254E+03	9.120E+02	6.930E+02	4.970E+02
6. Average Stream Flow During Periods of Release of Effluent into a Flowing Stream (Liters/min) ¹	1.63E+07	1.61E+07	3.22E+06	1.96E+06	9.07E+06

b. Gaseous Batch Releases	1 st Qtr	2 nd Qtr	3 rd Qtr	4 th Qtr	Annual
1. Total Number of Batch Releases	78	78	77	85	318
2. Total Time Period for Batch Releases (minutes)	6.146E+03	1.806E+04	2.776E+04	4.961E+04	1.016E+05
3. Maximum Time Period for a Batch Release (minutes)	1.513E+03	2.945E+03	1.874E+03	4.240E+03	4.240E+03
4. Average Time Period for a Batch Release (minutes)	7.879E+01	2.316E+02	3.605E+02	5.836E+02	3.194E+02
5. Minimum Time Period for a Batch Release (minutes)	2.200E+01	2.200E+01	1.900E+01	2.000E+01	1.900E+01

6. Abnormal Releases

There were no abnormal gaseous releases that occurred in 2020.

7. Non-Routine, Planned Discharges

There was one non-routine, planned discharge in 2020. G-20201214-899-B was approved for Hi-Trac painting in the Fuel Handling Building in December 2020.

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 2020.

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

9. Changes to the Annual Land Use Census

The 2020 Land Use Survey was performed on August 29th, 2020.

10. Radioactive Effluent Monitoring Instrumentation out of service for more than 30 Days

- a. On 11/16/2020 at 11:20am, 0RE-PR010 was inoperable for 30 days. 0RE-PR010 has been inoperable due to clearance order 00-CW-CWBDOOS-003 for CW Blowdown line inspections IR 04383819
- b. Due to required parts acquisition delays, 2PR01J was in RETS for greater than the required restoration time (7 days) as of 12:04am on 10/3/20. IR 04374015
- c. Due to CW blowdown being drained/inspected, 0PR01J and 0PR90J were in RETS for greater than the required restoration time (14 days) as of 1120 on 10/31/20. IR 04380050

11. Revisions to the ODCM

Revision 11 of CY-BR-170-301, Offsite Dose Calculation Manual was completed in October 2020.

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 2020 the dose to the nearest resident from the ISFSI was estimated to be 3.3E-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 (Appendix D)

- a. CWBD Post Release Permit Adjustment An error was identified with the tritium activity in permt L-20190528-052. IR 04368302
- b. Issues Identified with OpenEMS. An analysis with Mirion Technologies determined the effluent program, OpenEMS, was not calculating dose in accordance with the Braidwood ODCM. IR 04353041

14. Sampling and Instrumentation Issues

- a. The ODCM compositor for the condensate polisher sump was not pulling the proper aliquot. The was consistently 4.5 gallons full each week, which caused a safety concern because it weighed over 40lbs. When a calibration was performed, the sample amount showed that it was adjusted correctly. After exiting the calibration screen exits, it did not store the change. The compositor also collects sample during the rinsing cycle when it should have been expelling samples during that process. The rinse process provides no value and was functioning only to add additional water to the compositor jug, so the rinse cycle was disabled. The compositor is now collecting the appropriate volume of condensate polisher sump water. IR 04314950
- b. While preparing the shipment of U-1/2 PR28J and PR29J second quarter air particulate sample filters to be shipped for offsite analysis, it was discovered that there was not a U1 air particulate sample filter for the time frame of 5/11/2020 1257 to 5/12/2020 0105. All the sample filters and their

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

IDs were immediately sorted and reviewed again. This second review and a search of the filter storage container, trash can, and surrounding area did not turn up the missing sample filter. A review of the results of the gamma isotopic analysis performed on the missing sample filter (when the missing filter had been removed from service) indicated that the particulate nuclides were all less than LLD. At some point after the gamma isotopic analysis, the sample filter was lost or discarded. This missing filter and the associated volume was not part of the U1 quarterly composite sent to Teledyne Brown Engineering for the difficult to measure nuclides analysis. IR 04356971

- c. While performing Inside Rover Rounds, the reading from 0FQ-TR046 (Clean Water Effluent Totalizer, 0TR01J in Waste Treatment Building) was found to be reading 2058280 Gallons. This was the same reading that was recorded on the previous shift, indicating 0 gallons of process flow. This is clearly not the case as TR was set to process to the Lake at 1700 on 3/1/20 and Lagoon Levels have lowered since then (Level is measured from the top, therefore a higher reading indicates level has gone down in the Lagoon). It appears that the totalizer stopped advancing between 2/25/20 and 2/26/20.

TR was on Recirc from 2/28/20 at 0211 until 3/1/20 at 1700 when it was realigned to the Lake. The totalizer should continue to advance even when aligned for Recirc (to EQ Tank). 0FT-TR046 (Flow Transmitter) is shown being upstream of 0TR081 and 0TR082 in print M-85 Sheet 3, C6. Locally, flow was indicated at 0FI-TR046 (Flow Indicator) reading 100gpm (after the 12.5 multiplier) with the Clean Water Pump Running and the totalizer was observed not advancing at that time. The Field Supervisor and Chemistry were immediately informed of this condition. IR 04322982

- e. While performing the weekly check of the ODCM condensate polisher compositor, it was noticed that there was no water in the compositor bottle. Initially the compositor was found on and the program indicated running. The hoses were walked down to verify that nothing had come loose or had any holes were present. While a grab sample was being performed in order to check to make sure the pump was working appropriately, the screen on the compositor went dark and no power was on. The power cord was checked, and it appeared that the plug was not pushed in all of the way causing a loss of power. Once the cord was plugged in the power to the compositor came back on. The GFCI was verified and a grab sample was taken. The program was then resumed to obtain normal sampling frequency. IR 04319645
- f. The CWBD compositor collects CWBD samples into its collection jug multiple times each day. On each Monday or Tuesday, the CWBD compositor is sampled, and this becomes the weekly CWBD composite sample. On the first Monday or Tuesday of each month, the final weekly composite for the preceding month is collected, and the preceding month's weekly composites are combined to become the monthly CWBD composite sample. The previous methodology compared the CWBD monthly compositor sample that overlapped adjacent months to the release tank tritium curies for the calendar month. If the CWBD monthly composite sample multiplied by the volume of CWBD in a calendar month had a higher tritium activity than that of the release tanks, the difference was attributed to CWBD by creating a permit in OpenEMS for the remaining curies of tritium.

Release tanks are the only significant source of tritium input to the CWBD line. An extra week in the monthly composite period that overlaps an adjacent month, in conjunction with release tank discharge(s) in the adjacent month(s) create instances where the CWBD compositor sampling period (e.g., 5-28-2019 1130 to 7-1-2019 1330) has inputs from release tank discharges spanning one to three calendar months. This creates a condition where the CWBD compositor has a higher tritium activity from a longer sampling period than the total release tanks for the compared single calendar month. The mismatch in timing of release tanks and the CWBD monthly composite samples results in an overly conservative accounting of the tritium released in the blowdown line.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

In order to align the monthly CWBD and release tank permit comparison, the period for the release tanks compared on a monthly basis will match the period of the CWBD monthly composite. Alignment with the release times will also align the tritium reporting resulting in more accurate reporting. Release tanks that cross over two CWBD monthly composite periods will be prorated based on total release time. A percentage of the release will be attributed to each monthly composite period so that there is no overlap. IR 04377245

B. Gaseous Effluents

Gaseous radioactive releases for 2020 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 2.476E+00 Curies. Releases of all radioiodines, halogens, and particulates totaled 1.47E-03 Curies. Gaseous tritium releases totaled 8.288E+01 Curies. Gaseous carbon-14 was calculated to total 8.544E+00 Curies. No gross alpha was detected in gaseous effluents.

C. Liquid Effluents

Liquid radioactive releases for 2020 are captured in Tables 2A, 2B-1, and 2B-2 in Appendix A for Units 1 and Unit 2 combined. Sixty-seven (67) liquid batch releases occurred during the reporting period. The continuous and batch release discharges contained a total of 1.910E+03 Curies of tritium and 7.188E-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. This includes 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 for both Unit 1 and Unit 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.
- 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.

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

a. Gaseous Releases

Calculated total body dose was 3.43E-01 mrem. The critical age-organ was the child-bone and the organ dose was 1.66E+00 mrem.

b. Liquid Releases

Calculated total body dose was 1.65E-01 mrem. The critical age-organ was the child-GI-LLI and the organ dose was 1.74E-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-24). 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 8.38E-01 mrem (total body), 2.16E+00 mrem (organ), or 8.38E-01 mrem (thyroid).

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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	6.36E-04	All	2.12E-03	20	mrad
Nearest Residence	Beta Air Dose	6.41E-04	All	1.07E-03	40	mrad
Nearest Residence	Total Body	6.05E-04	All	4.03E-03	10	mrem
Nearest Residence	Skin	1.23E-03	All	2.73E-03	30	mrem
Non-Noble Gas						
Nearest Residence	Bone	1.66E+00	Child	3.69E+00	30	mrem
Liquid						
Nearest Residence	Total Body	1.65E-01	Child	2.75E+00	6	mrem
Nearest Residence	GI-LLI	1.74E-01	Child	8.68E-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	3.43E-01	1.65E-01	3.30E-01	8.38E-01	3.35E+00	25	mrem
Organ Dose	1.66E+00	1.74E-01	3.30E-01	2.16E+00	8.64E+00	25	mrem
Thyroid Dose	3.44E-01	1.64E-01	3.30E-01	8.38E-01	1.12E+00	75	mrem

E. Meteorological Data

The Braidwood Station meteorological monitoring program produced 52,617 hours of valid data out of a possible 52,704 parameter hours during 2020 (365 days x 24 hours/day x 6 measured priority parameters), which represents an overall data recovery rate of 99.8%. 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-Northwest (9.79) and fell into the 3.6 - 7.5 mph wind speed class (41.48%). 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 0.14% of the time. Stability based on the 199 - 30 ft. differential temperature most frequently fell into the neutral classification (45.14%).

Appendix C contains the Joint Frequency Distribution tables from the Meteorological Data collected in 2020.

F. Offsite Ambient Radiation Measurements

Review of the Braidwood Optically Stimulated Luminescent Dosimetry (OSLD) data showed statistical increases above background at only locations related to the ISFSI pad. A dose evaluation was performed taking the highest readings and extrapolating dose to the nearest resident. The dose to the resident was estimated to be 3.30E-1 mrem in 2020.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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 2.23E+02 cubic meters of solid waste were shipped offsite containing approximately 2.90E+02 Curies during the 2020 reporting period. Appendix B contains tables and detailed information about the Solid Waste Disposal program.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

APPENDIX A: EFFLUENT AND WASTE DISPOSAL SUMMARY

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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

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

1. Total Release Activity	Ci	7.349E-02	2.637E-01	1.25E-01	1.362E+00	2.476E+00	7.59E+00
2. Average Release Rate	μCi/sec	9.347E-03	3.354E-02	9.778E-02	1.714E-01	7.831E-02	
3. Percent of ODCM Limit – gamma	%	9.99E-05	2.84E-4	1.08E-03	2.78E-03	2.12E-03	
4. Percent of ODCM Limit - beta	%	9.59E-05	2.96E-04	1.03E-03	7.14E-04	1.07E-03	

B. Iodine Releases

1. Total Iodine-131	Ci	1.241E-05	4.113E-05	6.187E-04	8.008E-04	1.473E-03	3.32E+01
2. Average Release Rate	μCi/sec	1.578E-06	5.231E-06	7.783E-05	1.007E-04	4.658E-05	
3. Percent of ODCM Limit ¹	%	1.91E+00	1.86E+00	2.14E+00	1.46E+00	3.69E+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	%	1.91E+00	1.86E+00	2.14E+00	1.46E+00	3.69E+00	

D. Tritium Releases

1. Total Release Activity	Ci	8.166E+0	2.713E+0	2.395E+01	2.363E+01	8.288E+01	8.07E+00
2. Average Release Rate	μCi/sec	1.039E+0	3.450E+0	3.013E+00	2.973E+00	2.621E+00	
3. Percent of ODCM Limit ¹	%	1.91E+00	1.86E+00	2.14E+00	1.46E+00	3.69E+00	

E. Gross Alpha Releases

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

F. Carbon-14 Releases

1. Total Release Activity	Ci	2.041E+0	1.991E+00	2.289E+00	2.222E+00	8.544E+00	
2. Average Release Rate	μCi/sec	2.596E-01	2.533E-01	2.880E-01	2.795E-01	2.702E-01	
3. Percent of ODCM limit ¹	%	1.91E+00	1.86E+00	2.14E+00	1.46E+00	3.69E+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.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

TABLE 1B-1
GASEOUS EFFLUENTS – MIXED MODE RELEASES – CONTINUOUS MODE UNIT 1 AND UNIT 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-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-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
B. Iodines / Halogens						
Br-82	Ci	<LLD	<LLD	<LLD	6.185E-05	6.185E-05
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
Total for Period	Ci	<LLD	<LLD	<LLD	6.185E-05	6.185E-05
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
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

TABLE 1B-1 (Cont.)

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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

Nuclides Released		Continuous Mode				
C. Tritium	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	7.174E+00	2.441E+01	1.501E+01	6.989E+00	5.358E+01
D. Gross Alpha	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
E. Carbon-14	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
	Ci	2.041E+00	1.991E+00	2.289E+00	2.222E+00	8.544E+00

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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

Nuclides Released	Unit	Batch Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
A. Fission Gases						
Ar-41	Ci	7.129E-02	1.990E-01	7.724E-01	1.356E+00	2.398E+00
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	2.196E-03	5.804E-02	4.754E-03	6.571E-03	7.156E-02
Xe-133m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	6.663E-03	<LLD	<LLD	6.663E-03
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	7.349E-02	2.637E-01	7.772E-01	1.362E+00	2.476E+00
B. Iodines / Halogens						
Br-80	Ci	<LLD	1.594E-05	5.288E-04	5.651E-04	1.110E-03
Br-82	Ci	1.241E-05	2.406E-05	8.259E-05	1.529E-04	2.719E-04
I-131	Ci	<LLD	1.897E-07	1.723E-06	4.771E-06	6.684E-06
I-133	Ci	<LLD	9.316E-07	5.235E-06	1.615E-05	2.231E-05
I-135	Ci	<LLD	7.408E-09	<LLD	<LLD	<LLD
Total for Period	Ci	1.241E-05	4.113E-05	6.187E-04	7.389E-04	1.411E-03
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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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

Nuclides Released		Batch Mode				
C. Particulates (Cont.)	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
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	9.921E-01	2.721E+00	8.945E+00	1.664E+01	2.930E+01
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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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

	Unit	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Annual	Est. Total Error %
A. Fission and Activation Products							
1. Total Release	Ci	1.096E-02	5.347E-02	4.577E-03	2.873E-03	7.188E-02	2.64E+00
2. Average Diluted Concentration	μCi/mL	1.049E-09	4.576E-09	5.467E-10	3.552E-10	1.863E-09	
3. Percent of applicable limit	%	*	*	*	*	*	
B. Tritium							
1. Total Release	Ci	5.302E+02	1.10E+02	1.612E+02	1.02E+02	1.910E+03	5.85E+00
2. Average Diluted Concentration	μCi/mL	5.077E-05	8.246E-05	1.925E-05	3.158E-05	4.951E-05	
3. % of Limit (1E-2 μCi/ml)	%	5.077E-01	8.246E-01	1.925E-01	3.158E-01	4.951E-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	8.547E+9	7.962E+09	6.403E+09	4.288E+09	2.720E+10	
F. Volume of Dilution Water							
	Liters	1.897E+09	3.723E+09	1.968E+09	3.801E+09	1.139E+10	
G. Average Stream Flow¹							
	m ³ /s	2.72E+02	2.68E+02	5.37E+01	3.26E+01	1.51E+02	

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.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

TABLE 2B-1
LIQUID EFFLUENTS – CONTINUOUS MODE UNIT 1 AND UNIT 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	1.696E+01	6.876E+01	7.181E+00	6.767E-01	9.358E+01
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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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

Nuclides Released	Unit	Batch Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
A. Fission and Activation Products						
Cr-51	Ci	1.767E-04	6.205E-03	<LLD	<LLD	6.382E-03
Mn-54	Ci	1.954E-04	2.105E-04	<LLD	<LLD	4.059E-04
Fe-55	Ci	3.607E-03	2.987E-03	7.292E-04	<LLD	7.323E-03
Fe-59	Ci	<LLD	1.378E-03	<LLD	<LLD	1.378E-03
Co-57	Ci	<LLD	1.104E-05	<LLD	<LLD	1.104E-05
Co-58	Ci	1.349E-03	1.728E-02	1.392E-03	4.840E-04	2.051E-02
Co-60	Ci	5.256E-03	6.904E-03	6.384E-04	5.281E-04	1.333E-02
Zr-95	Ci	<LLD	2.537E-04	<LLD	<LLD	2.537E-04
Nb-95	Ci	1.839E-04	5.140E-04	<LLD	<LLD	6.979E-04
Nb-97	Ci	1.689E-05	<LLD	<LLD	<LLD	1.689E-05
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	1.010E-04	1.587E-04	<LLD	<LLD	2.59E-04
Sn-113	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sb-122	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	<LLD	3.537E-04	<LLD	<LLD	3.537E-04
Sb-125	Ci	7.334E-05	1.721E-02	1.817E-03	1.861E-03	2.096E-02
Sb-126	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-123m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-125m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Te-129m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
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	1.096E-02	5.347E-02	4.577E-03	2.873E-03	7.188E-02
B. Tritium						
	Ci	5.132E+02	8.948E+02	1.540E+02	2.548E+02	1.817E+03
C. Dissolved and Entrained Gases						
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

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

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

Nuclides Released	Unit	Batch Mode				
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
D. Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD	<LLD

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

APPENDIX B: SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

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	3.50E+03	9.92E+01	4.25E+01
B	1.84E+02	5.21E+00	2.46E+02
C	0.00E+00	0.00E+00	0.00E+00
All	3.69E+03	1.04E+02	2.89E+02
Major Nuclides for the Above Table: H-3, C-14, Mn-54, Fe-55, Co-58, Co-60, Ni-59, Ni-63, Zn-65, Sr-90, Tc-99, Sb-125, I-129, Cs-137, Pu-238, Pu-239, Pu-241, Am-241, Cm-243, Cm-244			

Dry Active Waste (DAW)			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	3.47E+03	9.81E+01	1.65E+00
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	3.47E+03	9.81E+01	1.65E+00
Major Nuclides for the Above Table: H-3, C-14, Cr-51, Mn-54, Fe-55, 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-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			

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

1. Low-Level Waste (continued)

Other Waste			
Waste Class	Volume		Curies Shipped
	ft³	m³	
A	7.14E+02	2.02E+01	3.83E-02
B	0.00E+00	0.00E+00	0.00E+00
C	0.00E+00	0.00E+00	0.00E+00
All	7.14E+02	2.02E+01	3.83E-02

Major Nuclides for the Above Table:
 C-14, Cr-51, Mn-54, Fe-55, 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-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	1.43E+03	2.18E+02	4.42E+01
B	1.84E+02	5.21E+00	2.46E+02
C	0.00E+00	0.00E+00	0.00E+00
All	7.87E+03	2.23E+02	2.90E+02

Major Nuclides for the Above Table:
 H-3, C-14, Cr-51, Mn-54, Fe-55, Co-58, Co-60, Ni-59, Ni-63, Zn-65, 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

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	4.32E+00	10.17%	3.15E+00	1.28%
Be-7	NA	0.00%	3.69E-01	0.15%
C-14	2.53E-02	0.06%	7.18E-02	0.03%
Cr-51	5.63E-01	1.32%	6.76E-05	0.00%
Mn-54	4.73E-01	1.11%	1.64E+01	6.67%
Fe-55	4.73E+00	11.11%	9.20E+01	37.36%
Co-57	5.65E-02	0.13%	7.44E-01	0.30%
Co-58	2.94E+00	6.91%	1.26E+01	5.11%
Co-60	6.48E+00	15.23%	8.02E+01	32.56%
Ni-59	7.39E-01	1.74%	9.73E-01	0.39%
Ni-63	1.78E+01	41.83%	3.36E+01	13.63%
Zn-65	5.63E-02	0.13%	2.90E+00	1.18%

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Isotope (continued)	Waste Class A Curies	Percent Abundance	Waste Class B Curies	Percent Abundance
Sr-89	NA	0.00%	3.30E-03	0.00%
Sr-90	5.09E-03	0.01%	7.12E-03	0.00%
Zr-95	1.16E+00	2.72%	2.04E-05	0.00%
Nb-95	1.12E+00	2.64%	1.71E-03	0.00%
Tc-99	NA	0.00%	1.87E-02	0.01%
Ag-110m	6.99E-02	0.16%	1.40E-02	0.01%
Sn-113	5.18E-02	0.12%	4.00E-02	0.02%
Sb-124	2.97E-02	0.07%	1.14E-03	0.00%
Sb-125	1.48E+00	3.48%	2.04E+00	0.83%
Cs-134	4.16E-02	0.10%	1.76E-02	0.01%
Cs-137	3.46E-01	0.81%	8.97E-01	0.36%
Ce-144	6.18E-02	0.15%	2.61E-01	0.11%
Pu-238	6.04E-06	0.00%	3.59E-05	0.00%
Pu-239	3.25E-06	0.00%	7.06E-06	0.00%
Pu-241	7.25E-04	0.00%	1.95E-02	0.01%
Am-241	1.52E-05	0.00%	1.61E-05	0.00%
Cm-242	6.80E-06	0.00%	1.61E-06	0.00%
Cm-244	2.96E-05	0.00%	3.65E-05	0.00%

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

Isotope	Waste Class A Curies	Percent Abundance
H-3	1.93E-02	1.17%
C-14	1.86E-02	1.13%
Cr-51	1.19E-02	0.73%
Mn-54	9.06E-03	0.55%
Fe-55	2.38E-01	14.47%
Fe-59	2.38E-01	0.14%
Co-57	1.20E-03	0.07%
Co-58	6.83E-02	4.15%
Co-60	2.55E-01	15.48%
Ni-59	9.13E-03	0.55%
Ni-63	8.39E-01	50.94%
Zn-65	2.35E-03	0.14%
Sr-89	2.09E-37	0.00%
Sr-90	8.21E-04	0.05%
Zr-95	8.19E-03	0.50%
Nb-95	1.12E-02	0.68%
Tc-99	1.97E-03	0.12%
Ag-110m	1.51E-03	0.09%
Sn-113	1.04E-03	0.06%
Sn-117m	5.78E-158	0.00%
Sb-124	5.70E-39	0.00%
Te-123m	4.66E-22	0.00%
Sb-125	9.47E-03	0.58%
I-129	6.27E-06	0.00%
Cs-134	5.57E-04	0.03%
Cs-137	1.36E-01	8.28%

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Ce-144	4.92E-04	0.03%
Pu-238	1.77E-05	0.00%
Pu-239	1.04E-06	0.00%
Pu-241	6.19E-04	0.04%
Am-241	2.58E-05	0.00%
Cm-242	4.53E-06	0.00%
Cm-243	3.00E-05	0.00%
Cm-244	3.40E-05	0.00%

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	1.33E-2	34.61%
Cr-51	9.16E-04	2.39%
Mn-54	2.16E-04	0.56%
Fe-55	5.67E-03	14.78%
Fe-59	1.19E-04	0.31%
Co-57	2.66E-05	0.07%
Co-58	3.07E-03	8.02%
Co-60	5.49E-03	14.31%
Ni-59	8.27E-05	0.22%
Ni-63	9.16E-03	21.29%
Zn-65	5.75E-05	0.15%
Sr-90	2.21E-05	0.06%
Zr-95	4.06E-04	1.06%
Nb-95	4.10E-04	1.07%
Tc-99	2.73E-05	0.07%
Ag-110m	3.51E-05	0.09%
Sn-113	3.35E-05	0.09%
Sb-125	2.08E-04	0.54%
Cs-137	9.48E-05	0.25%
Ce-144	1.50E-05	0.04%
Pu-238	5.02E-07	0.00%
Pu-241	9.10E-06	0.02%
Am-241	6.59E-07	0.00%
Cm-242	1.22E-07	0.00%
Cm-243	1.05E-06	0.00%
Cm-244	1.05E-06	0.00%

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
4	Hittman Transportation	Energy Solutions Services - Gallaher Rd 628 Gallaher Rd.
7	Hittman Transportation	Energy Solutions-Bear Creek Facility 1560 Bear Creek Road
6	Hittman Transportation	EnergySolutions LLC.
1	Hittman Transportation	Erwin ResinSoulutions, LLC
1	Hittman Transportation	Waste Control Specialists - TSDF

B. Irradiated Fuel Shipments

None

C. Irradiated Fuel Shipments (disposition)

No irradiated fuel shipments were dispositioned at Braidwood during January through December 2020.

D. Changes to the Process Control Program (PCP)

There were no Process Control Changes in 2020.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

APPENDIX C: WIND DIRECTION AND STABILITY CLASSES

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

WIND STABILITY CLASSES

Table C-4

Atmospheric Stability Classes

<u>Description</u>	<u>Pasquill Stability Class</u>	<u>^aσ_{θ}(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

^a σ_{θ} 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.

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	5	1	0	0	8
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	2	0	0	0	0	2
E	0	1	0	0	0	0	1
ESE	0	0	2	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	6	4	0	0	10
SSW	0	0	0	4	10	0	14
SW	0	1	12	5	0	0	18
WSW	0	3	9	1	0	0	13
W	1	3	4	8	2	0	18
WNW	0	9	10	12	3	0	34
NW	0	10	17	0	0	0	27
NNW	0	5	21	2	0	0	28
Variable	0	0	0	0	0	0	0
Total	1	37	87	37	15	0	177

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	1	1	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	4	2	0	0	0	6
ENE	0	4	0	0	0	0	4
E	0	3	0	0	0	0	3
ESE	0	2	2	0	0	0	4
SE	0	0	0	0	0	0	0
SSE	0	1	1	0	0	0	2
S	0	1	4	2	0	0	7
SSW	0	0	3	5	1	0	9
SW	0	0	2	4	0	0	6
WSW	0	1	2	1	0	0	4
W	0	2	8	3	5	0	18
WNW	0	11	3	6	7	0	27
NW	0	10	9	0	0	0	19
NNW	0	3	12	1	0	0	16
Variable	0	0	0	0	0	0	0
Total	0	43	49	22	13	0	127

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	2	1	0	0	0	3
NNE	1	0	6	3	0	0	10
NE	0	2	5	2	0	0	9
ENE	3	11	0	0	0	0	14
E	1	1	2	0	0	0	4
ESE	0	0	6	0	0	0	6
SE	0	4	1	0	0	0	5
SSE	0	5	2	0	0	0	7
S	0	3	5	5	0	0	13
SSW	0	1	3	3	0	0	7
SW	0	2	5	3	0	0	10
WSW	0	8	7	2	0	0	17
W	0	11	5	2	1	0	19
WNW	1	11	12	3	0	0	27
NW	1	8	4	0	0	0	13
NNW	0	7	5	3	0	0	15
Variable	0	0	0	0	0	0	0
Total	7	76	69	26	1	0	179

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	7	14	13	1	0	0	35
NNE	6	31	53	26	0	0	116
NE	7	26	44	4	0	0	81
ENE	14	50	5	0	0	0	69
E	15	38	4	0	0	0	57
ESE	1	32	20	2	0	0	55
SE	4	26	29	6	0	0	65
SSE	2	37	51	9	0	0	99
S	0	11	51	49	11	0	122
SSW	1	4	20	34	10	0	69
SW	0	19	33	14	2	0	68
WSW	1	36	18	6	4	2	67
W	9	35	40	13	3	1	101
WNW	13	45	39	22	1	0	120
NW	14	44	10	4	0	0	72
NNW	6	47	21	10	0	0	84
Variable	0	0	0	0	0	0	0
Total	100	495	451	200	31	3	1280

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	1	2	0	0	0	0	3
NNE	2	3	0	0	0	0	5
NE	4	1	0	0	0	0	5
ENE	18	12	0	0	0	0	30
E	21	12	0	0	0	0	33
ESE	6	7	0	0	0	0	13
SE	3	5	2	0	0	0	10
SSE	4	8	6	1	0	0	19
S	1	4	5	0	1	0	11
SSW	1	4	6	3	0	0	14
SW	0	15	14	2	0	0	31
WSW	5	20	3	0	0	0	28
W	11	16	5	0	0	0	32
WNW	15	34	11	1	0	0	61
NW	7	7	1	0	0	0	15
NNW	4	1	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	103	151	53	7	1	0	315

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	1	0	0	0	0	0	1
NNE	1	0	0	0	0	0	1
NE	3	0	0	0	0	0	3
ENE	5	1	0	0	0	0	6
E	5	0	0	0	0	0	5
ESE	2	0	0	0	0	0	2
SE	1	1	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	2	0	0	0	0	0	2
SSW	0	3	5	0	0	0	8
SW	4	4	2	0	0	0	10
WSW	1	6	1	0	0	0	8
W	6	8	0	0	0	0	14
WNW	8	0	0	0	0	0	8
NW	3	0	0	0	0	0	3
NNW	3	0	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	45	23	8	0	0	0	76

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	0	1	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	4	1	0	0	0	0	5
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	1	0	0	0	0	0	1
SSW	0	1	0	0	0	0	1
SW	2	0	0	0	0	0	2
WSW	1	0	0	0	0	0	1
W	3	1	0	0	0	0	4
WNW	3	0	0	0	0	0	3
NW	2	0	0	0	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	18	4	0	0	0	0	22

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	6	0	1	0	8
NNE	0	0	0	0	0	0	0
NE	0	1	0	0	0	0	1
ENE	0	1	1	0	0	0	2
E	0	0	1	0	0	0	1
ESE	0	0	0	2	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	0	0	1	0	0	1
S	0	0	1	6	3	0	10
SSW	0	0	0	0	4	10	14
SW	0	2	7	9	1	0	19
WSW	0	3	6	3	1	0	13
W	1	2	1	7	5	1	17
WNW	0	3	9	7	10	4	33
NW	0	2	7	16	1	0	26
NNW	0	3	14	11	2	0	30
Variable	0	0	0	0	0	0	0
Total	1	18	53	62	28	15	177

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	1	3	2	0	0	6
ENE	0	2	1	0	0	0	3
E	0	0	4	0	0	0	4
ESE	0	1	1	1	1	0	4
SE	0	0	0	0	0	0	0
SSE	0	0	2	0	0	0	2
S	0	0	3	2	3	0	8
SSW	0	0	1	2	3	1	7
SW	0	0	3	1	3	0	7
WSW	0	0	2	1	1	0	4
W	0	0	5	6	1	5	17
WNW	0	7	4	3	5	7	26
NW	0	7	5	10	1	0	23
NNW	0	3	3	7	2	0	15
Variable	0	0	0	0	0	0	0
Total	0	21	37	36	20	13	127

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	0	3	0	0	0	3
NNE	0	0	1	4	5	0	10
NE	0	0	3	4	1	0	8
ENE	3	4	6	0	0	0	13
E	0	2	1	2	0	0	5
ESE	0	1	0	6	0	0	7
SE	0	1	3	1	0	0	5
SSE	0	3	3	1	0	0	7
S	0	2	4	2	4	1	13
SSW	0	0	2	2	3	0	7
SW	0	2	3	3	3	0	11
WSW	0	7	8	3	2	0	20
W	0	4	5	2	2	1	14
WNW	1	6	4	9	5	0	25
NW	1	8	3	1	1	0	14
NNW	0	4	5	5	2	1	17
Variable	0	0	0	0	0	0	0
Total	5	44	54	45	28	3	179

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	7	16	10	2	0	37
NNE	0	7	30	42	27	5	111
NE	2	5	39	33	5	0	84
ENE	3	24	26	3	0	0	56
E	1	16	38	10	1	0	66
ESE	1	6	9	25	9	2	52
SE	2	7	22	22	9	1	63
SSE	0	14	38	35	11	2	100
S	0	3	18	43	40	23	127
SSW	1	2	4	18	34	18	77
SW	1	9	22	27	12	2	73
WSW	2	10	33	8	6	6	65
W	3	12	27	38	5	9	94
WNW	2	17	28	29	20	10	106
NW	3	19	34	22	4	3	85
NNW	3	12	42	16	10	4	87
Variable	0	0	0	0	0	0	0
Total	26	170	426	381	195	85	1283

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	0	1	1	0	0	3
NNE	0	0	3	0	0	0	3
NE	1	1	3	0	0	0	5
ENE	2	4	11	0	0	0	17
E	2	2	22	1	0	0	27
ESE	0	5	15	3	0	0	23
SE	1	3	4	2	0	0	10
SSE	0	6	5	9	2	0	22
S	1	2	8	3	1	1	16
SSW	0	1	1	10	5	2	19
SW	0	2	10	13	1	0	26
WSW	0	6	14	2	0	0	22
W	1	5	15	9	1	0	31
WNW	0	3	26	14	6	0	49
NW	1	6	20	4	2	0	33
NNW	1	1	6	1	0	0	9
Variable	0	0	0	0	0	0	0
Total	11	47	164	72	18	3	315

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	1	0	0	0	0	1
NNE	0	0	1	0	0	0	1
NE	0	0	0	1	0	0	1
ENE	1	4	1	0	0	0	6
E	0	0	3	0	0	0	3
ESE	0	0	3	1	0	0	4
SE	0	1	1	0	0	0	2
SSE	1	0	0	0	0	0	1
S	0	2	0	0	0	0	2
SSW	0	2	0	0	0	0	2
SW	0	2	4	7	1	0	14
WSW	0	2	5	3	0	0	10
W	0	1	5	6	0	0	12
WNW	0	1	4	0	0	0	5
NW	0	4	4	0	0	0	8
NNW	0	2	3	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	2	22	34	18	1	0	77

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: January - March 2020
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	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	1	1	0	0	2
ENE	0	0	0	0	0	0	0
E	0	1	0	0	0	0	1
ESE	0	0	1	0	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	1	0	0	0	0	1
S	0	1	0	0	0	0	1
SSW	0	2	0	0	0	0	2
SW	1	0	0	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	1	0	0	0	0	1
WNW	0	1	1	1	0	0	3
NW	0	2	1	0	0	0	3
NNW	0	1	3	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	1	12	7	2	0	0	22

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	2	3	0	0	5
NE	0	3	17	0	0	0	20
ENE	0	4	5	0	0	0	9
E	0	17	5	0	0	0	22
ESE	0	2	1	0	0	0	3
SE	0	9	6	1	0	0	16
SSE	0	1	2	0	0	0	3
S	0	0	4	0	0	0	4
SSW	0	0	3	4	2	0	9
SW	0	2	3	3	2	0	10
WSW	0	1	5	1	1	0	8
W	0	1	14	10	0	0	25
WNW	0	3	13	9	4	0	29
NW	0	2	13	4	0	0	19
NNW	0	2	11	1	0	0	14
Variable	0	0	0	0	0	0	0
Total	0	47	109	36	9	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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	3	4	0	0	0	7
NNE	0	1	3	1	0	0	5
NE	0	2	2	0	0	0	4
ENE	1	3	3	0	0	0	7
E	0	5	3	0	0	0	8
ESE	0	5	0	0	0	0	5
SE	0	8	2	0	0	0	10
SSE	0	5	7	3	0	0	15
S	0	1	2	1	0	0	4
SSW	0	3	1	0	1	0	5
SW	0	1	4	5	2	0	12
WSW	0	4	6	2	0	0	12
W	0	2	8	5	1	0	16
WNW	0	5	3	4	1	0	13
NW	0	5	3	0	0	0	8
NNW	0	3	3	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	1	56	54	21	5	0	137

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	2	2	0	0	0	4
NNE	0	2	2	1	0	0	5
NE	0	6	7	0	0	0	13
ENE	0	4	4	0	0	0	8
E	0	7	1	0	0	0	8
ESE	0	9	0	0	0	0	9
SE	1	16	5	0	0	0	22
SSE	1	11	4	0	0	0	16
S	0	6	3	1	0	0	10
SSW	0	3	10	4	0	0	17
SW	0	0	3	3	1	0	7
WSW	0	4	7	1	0	0	12
W	0	6	3	1	1	0	11
WNW	0	3	10	2	0	0	15
NW	0	5	8	0	0	0	13
NNW	0	4	6	1	0	0	11
Variable	0	0	0	0	0	0	0
Total	2	88	75	14	2	0	181

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	5	12	11	4	0	0	32
NNE	1	20	36	6	0	0	63
NE	2	46	42	0	0	0	90
ENE	3	53	18	0	0	0	74
E	10	39	2	0	0	0	51
ESE	5	17	2	0	0	0	24
SE	4	24	6	3	0	0	37
SSE	2	39	36	5	0	0	82
S	0	13	27	12	0	0	52
SSW	2	6	26	18	1	0	53
SW	0	17	29	18	0	0	64
WSW	2	19	19	8	1	0	49
W	5	20	14	5	0	0	44
WNW	1	20	29	9	0	0	59
NW	3	15	9	9	0	0	36
NNW	6	15	20	7	0	0	48
Variable	0	0	0	0	0	0	0
Total	51	375	326	104	2	0	858

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	14	0	0	0	0	18
NNE	3	8	1	0	0	0	12
NE	7	3	0	0	0	0	10
ENE	28	26	1	0	0	0	55
E	37	13	0	0	0	0	50
ESE	12	34	0	0	0	0	46
SE	3	32	1	0	0	0	36
SSE	4	36	8	0	0	0	48
S	5	19	13	5	0	0	42
SSW	2	9	18	6	0	0	35
SW	3	17	16	3	0	0	39
WSW	5	39	5	0	0	0	49
W	10	44	7	1	0	0	62
WNW	16	24	16	3	0	0	59
NW	15	7	1	0	0	0	23
NNW	5	4	2	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	159	329	89	18	0	0	595

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	1	0	0	0	3
NNE	0	1	0	0	0	0	1
NE	4	0	0	0	0	0	4
ENE	7	0	0	0	0	0	7
E	32	2	0	0	0	0	34
ESE	17	7	0	0	0	0	24
SE	7	2	0	0	0	0	9
SSE	5	4	0	0	0	0	9
S	1	1	0	0	0	0	2
SSW	0	0	0	0	0	0	0
SW	2	4	0	0	0	0	6
WSW	3	12	0	0	0	0	15
W	19	10	0	0	0	0	29
WNW	6	1	0	0	0	0	7
NW	4	0	1	0	0	0	5
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	111	44	2	0	0	0	157

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	2	0	0	0	0	0	2
ENE	3	0	0	0	0	0	3
E	14	1	0	0	0	0	15
ESE	3	1	0	0	0	0	4
SE	2	0	0	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	1	0	0	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	2	1	0	0	0	0	3
W	3	0	0	0	0	0	3
WNW	10	0	0	0	0	0	10
NW	2	0	0	0	0	0	2
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	45	3	0	0	0	0	48

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	2	3	0	0	5
NNE	0	0	0	3	2	0	5
NE	0	1	14	5	0	0	20
ENE	0	0	5	2	0	0	7
E	0	1	17	6	0	0	24
ESE	0	1	2	2	0	0	5
SE	0	4	5	4	1	0	14
SSE	0	0	3	1	0	0	4
S	0	0	2	1	0	0	3
SSW	0	0	0	6	2	2	10
SW	0	0	2	4	1	2	9
WSW	0	0	5	2	0	1	8
W	0	0	12	6	7	0	25
WNW	0	0	9	10	4	8	31
NW	0	0	5	6	6	1	18
NNW	0	0	8	4	1	0	13
Variable	0	0	0	0	0	0	0
Total	0	7	91	65	24	14	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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	3	0	0	8
NNE	0	0	1	2	0	0	3
NE	0	1	2	1	0	0	4
ENE	0	1	2	1	0	0	4
E	0	2	5	5	0	0	12
ESE	0	3	0	0	0	0	3
SE	0	4	7	2	0	0	13
SSE	0	3	6	2	2	0	13
S	0	1	3	2	0	0	6
SSW	0	0	2	0	1	1	4
SW	0	1	4	2	3	2	12
WSW	0	0	6	4	1	0	11
W	0	1	7	3	4	1	16
WNW	0	0	5	2	1	4	12
NW	0	1	6	4	0	0	11
NNW	0	3	2	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	23	61	33	12	8	137

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
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	1	0	0	4
NNE	0	2	2	0	1	0	5
NE	0	1	4	4	0	0	9
ENE	0	2	5	2	0	0	9
E	0	3	4	1	0	0	8
ESE	0	6	4	0	0	0	10
SE	0	11	12	2	0	0	25
SSE	0	4	6	2	0	0	12
S	0	8	4	1	1	0	14
SSW	0	1	6	6	1	1	15
SW	0	0	0	5	2	0	7
WSW	0	2	7	2	0	0	11
W	0	1	6	1	1	1	10
WNW	0	3	2	9	2	1	17
NW	0	4	4	5	1	0	14
NNW	0	2	6	1	1	0	10
Variable	0	0	0	0	0	0	0
Total	0	51	74	42	10	3	180

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

**BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)**

Braidwood Generating Station

Period of Record: April - June 2020
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	10	13	7	4	1	36
NNE	1	6	11	17	9	0	44
NE	1	12	40	41	0	0	94
ENE	0	7	31	6	0	0	44
E	6	11	34	4	0	0	55
ESE	0	6	9	9	0	0	24
SE	2	7	18	6	2	2	37
SSE	0	10	30	30	4	4	78
S	3	3	15	21	11	1	54
SSW	1	2	15	26	17	8	69
SW	0	8	21	19	10	2	60
WSW	2	8	16	9	5	2	42
W	3	8	16	11	5	1	44
WNW	3	4	16	23	5	5	56
NW	1	6	10	16	2	8	43
NNW	1	10	5	17	8	2	43
Variable	0	0	0	0	0	0	0
Total	25	118	300	262	82	36	823

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 35
Hours of missing stability measurements in all stability classes: 0

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
 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	2	13	2	0	0	18
NNE	0	4	3	1	0	0	8
NE	0	3	14	0	0	0	17
ENE	0	13	25	2	0	0	40
E	0	10	43	3	0	0	56
ESE	0	8	17	17	0	0	42
SE	0	5	18	8	0	0	31
SSE	0	1	30	14	0	0	45
S	0	4	26	11	4	0	45
SSW	1	5	14	17	13	0	50
SW	2	9	19	11	3	0	44
WSW	0	6	14	15	0	0	35
W	1	7	34	24	1	0	67
WNW	0	5	22	16	5	1	49
NW	0	4	21	10	2	0	37
NNW	1	1	6	2	0	0	10
Variable	0	0	0	0	0	0	0
Total	6	87	319	153	28	1	594

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

Braidwood Generating Station

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Period of Record: April - June 2020
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	1	2	0	0	0	3
NNE	0	3	1	0	0	0	4
NE	0	1	2	0	0	0	3
ENE	1	3	1	0	0	0	5
E	1	2	8	4	0	0	15
ESE	0	2	18	3	0	0	23
SE	0	4	11	5	0	0	20
SSE	1	1	4	0	0	0	6
S	0	3	5	2	0	0	10
SSW	1	3	0	0	0	0	4
SW	0	1	5	0	0	0	6
WSW	1	2	2	2	0	0	7
W	1	1	10	6	0	0	18
WNW	1	5	10	6	0	0	22
NW	0	4	5	0	0	0	9
NNW	0	1	3	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	7	37	87	28	0	0	159

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 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: April - June 2020
 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	1	0	0	0	2
NNE	1	0	1	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	1	2	0	0	0	0	3
E	1	0	1	0	0	0	2
ESE	1	1	4	3	0	0	9
SE	0	1	1	0	0	0	2
SSE	0	3	1	0	0	0	4
S	1	0	0	0	0	0	1
SSW	2	4	0	0	0	0	6
SW	2	2	1	0	0	0	5
WSW	1	1	1	0	0	0	3
W	0	1	3	1	0	0	5
WNW	0	0	0	0	0	0	0
NW	0	5	0	0	0	0	5
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	10	22	15	4	0	0	51

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 Generating Station

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Period of Record: July - September 2020
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	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	5	1	0	0	0	6
ENE	1	4	1	0	0	0	6
E	0	0	0	0	0	0	0
ESE	0	5	1	0	0	0	6
SE	0	3	1	0	0	0	4
SSE	0	4	8	0	0	0	12
S	0	4	12	0	0	0	16
SSW	0	5	10	1	0	0	16
SW	0	4	11	1	0	0	16
WSW	0	2	8	1	0	0	11
W	0	3	6	1	0	0	10
WNW	0	3	5	1	0	0	9
NW	0	0	6	0	0	0	6
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	1	43	72	5	0	0	121

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	0	1	0	0	0	1
NNE	0	1	1	0	0	0	2
NE	0	5	6	0	0	0	11
ENE	1	5	1	0	0	0	7
E	0	10	0	0	0	0	10
ESE	0	9	0	0	0	0	9
SE	0	4	0	0	0	0	4
SSE	0	10	2	0	0	0	12
S	0	10	5	1	0	0	16
SSW	0	6	6	1	0	0	13
SW	0	4	6	3	0	0	13
WSW	0	9	10	1	0	0	20
W	0	6	7	0	0	0	13
WNW	0	8	1	0	0	0	9
NW	1	7	3	0	0	0	11
NNW	0	5	3	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	2	99	52	6	0	0	159

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	4	3	0	0	0	0	7
NNE	0	7	3	0	0	0	10
NE	1	7	8	0	0	0	16
ENE	3	14	0	0	0	0	17
E	2	17	0	0	0	0	19
ESE	1	6	0	0	0	0	7
SE	1	11	2	0	0	0	14
SSE	0	12	0	0	0	0	12
S	0	12	9	1	0	0	22
SSW	1	6	4	0	0	0	11
SW	2	7	7	1	0	0	17
WSW	0	8	8	0	0	0	16
W	1	15	5	0	0	0	21
WNW	0	8	5	2	0	0	15
NW	1	8	4	0	0	0	13
NNW	1	10	3	0	0	0	14
Variable	0	0	0	0	0	0	0
Total	18	151	58	4	0	0	231

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	3	13	5	0	0	0	21
NNE	5	24	14	2	0	0	45
NE	8	51	22	0	0	0	81
ENE	18	42	5	0	0	0	65
E	15	15	0	0	0	0	30
ESE	8	15	0	0	0	0	23
SE	4	20	2	0	0	0	26
SSE	2	18	9	0	0	0	29
S	3	16	26	4	0	0	49
SSW	0	7	18	20	1	0	46
SW	0	31	60	7	0	0	98
WSW	2	14	12	3	0	0	31
W	7	24	10	3	0	0	44
WNW	6	20	9	2	0	0	37
NW	4	15	8	1	0	0	28
NNW	6	26	11	0	0	0	43
Variable	0	0	0	0	0	0	0
Total	91	351	211	42	1	0	696

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	7	0	0	0	0	14
NNE	6	25	1	0	0	0	32
NE	9	15	0	0	0	0	24
ENE	26	13	1	0	0	0	40
E	28	1	0	0	0	0	29
ESE	9	16	0	0	0	0	25
SE	8	25	0	0	0	0	33
SSE	13	56	2	0	0	0	71
S	5	37	13	5	0	0	60
SSW	0	20	14	0	0	0	34
SW	5	26	38	0	0	0	69
WSW	4	25	1	2	0	0	32
W	10	21	1	0	0	0	32
WNW	13	13	2	0	0	0	28
NW	16	7	0	0	0	0	23
NNW	8	14	1	1	0	0	24
Variable	0	0	0	0	0	0	0
Total	167	321	74	8	0	0	570

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	2	0	0	0	0	13
NNE	4	5	0	0	0	0	9
NE	9	1	0	0	0	0	10
ENE	28	0	0	0	0	0	28
E	43	2	0	0	0	0	45
ESE	20	14	0	0	0	0	34
SE	8	2	0	0	0	0	10
SSE	7	8	0	0	0	0	15
S	6	0	0	0	0	0	6
SSW	3	7	1	0	0	0	11
SW	6	13	4	0	0	0	23
WSW	10	9	0	0	0	0	19
W	25	5	0	0	0	0	30
WNW	22	0	0	0	0	0	22
NW	8	1	0	0	0	0	9
NNW	9	0	0	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	219	69	5	0	0	0	293

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	5	0	0	0	0	0	5
NNE	13	0	0	0	0	0	13
NE	11	0	0	0	0	0	11
ENE	21	0	1	0	0	0	22
E	14	1	0	0	0	0	15
ESE	3	1	0	0	0	0	4
SE	3	0	0	0	0	0	3
SSE	2	0	0	0	0	0	2
S	0	0	0	0	0	0	0
SSW	2	0	0	0	0	0	2
SW	3	0	0	0	0	0	3
WSW	2	3	0	0	0	0	5
W	11	1	0	0	0	0	12
WNW	20	0	0	0	0	0	20
NW	9	0	0	0	0	0	9
NNW	3	0	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	122	6	1	0	0	0	129

Hours of calm in this stability class: 5
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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	1	0	0	1
NNE	0	1	0	0	0	0	1
NE	0	2	2	1	0	0	5
ENE	1	0	5	0	0	0	6
E	0	0	0	0	0	0	0
ESE	0	4	2	1	0	0	7
SE	0	3	1	1	0	0	5
SSE	0	1	7	3	0	0	11
S	0	1	10	9	0	0	20
SSW	0	2	12	4	0	0	18
SW	0	0	4	4	1	0	9
WSW	0	0	11	2	0	0	13
W	0	0	7	0	1	0	8
WNW	0	1	4	3	1	0	9
NW	0	0	0	6	0	0	6
NNW	0	0	1	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	1	15	66	36	3	0	121

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	1	0	1	0	0	2
NNE	0	2	0	1	0	0	3
NE	0	2	1	5	0	0	8
ENE	1	5	2	0	0	0	8
E	0	6	8	0	0	0	14
ESE	0	2	3	0	0	0	5
SE	0	1	4	0	0	0	5
SSE	0	3	9	1	0	0	13
S	0	9	7	5	0	0	21
SSW	0	2	1	4	0	0	7
SW	0	2	9	4	1	0	16
WSW	0	7	9	1	1	0	18
W	0	2	6	1	0	0	9
WNW	0	5	5	0	0	0	10
NW	0	4	2	3	0	0	9
NNW	0	2	4	3	0	0	9
Variable	0	0	0	0	0	0	0
Total	1	55	70	29	2	0	157

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	2	6	0	1	0	0	9
NNE	1	5	1	1	0	0	8
NE	0	7	1	8	0	0	16
ENE	3	10	4	1	0	0	18
E	0	15	7	0	0	0	22
ESE	1	3	2	0	0	0	6
SE	0	6	6	0	0	0	12
SSE	0	8	4	0	0	0	12
S	0	9	10	5	1	0	25
SSW	0	5	6	2	0	0	13
SW	0	3	6	3	0	0	12
WSW	0	7	7	3	0	0	17
W	0	10	6	2	0	0	18
WNW	0	7	4	1	0	2	14
NW	0	6	1	5	0	0	12
NNW	2	4	7	2	0	0	15
Variable	0	0	0	0	0	0	0
Total	9	111	72	34	1	2	229

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

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	7	9	4	0	0	21
NNE	2	7	19	8	3	0	39
NE	1	12	26	17	0	0	56
ENE	4	26	20	5	0	0	55
E	3	30	14	0	0	0	47
ESE	3	4	7	3	0	0	17
SE	2	4	12	5	0	0	23
SSE	0	4	17	7	0	0	28
S	1	4	21	22	4	0	52
SSW	2	4	16	33	16	8	79
SW	3	10	40	18	3	0	74
WSW	2	5	17	4	2	1	31
W	2	11	19	4	2	1	39
WNW	1	10	13	3	2	0	29
NW	2	11	9	11	1	1	35
NNW	1	17	18	8	0	0	44
Variable	0	0	0	0	0	0	0
Total	30	166	277	152	33	11	669

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 27
Hours of missing stability measurements in all stability classes: 0

BRAIDWOOD NUCLEAR POWER STATION
 RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
 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	5	10	1	0	0	17
NNE	2	4	21	3	0	0	30
NE	0	4	20	0	0	0	24
ENE	1	18	22	1	0	0	42
E	2	9	14	0	0	0	25
ESE	0	3	10	3	0	0	16
SE	1	4	17	6	0	0	28
SSE	1	13	39	7	0	0	60
S	1	10	39	15	6	0	71
SSW	0	7	25	18	0	0	50
SW	1	9	36	34	0	0	80
WSW	0	4	14	3	1	1	23
W	0	4	24	1	0	0	29
WNW	0	6	14	4	0	0	24
NW	0	4	14	3	0	1	22
NNW	2	3	23	1	0	0	29
Variable	0	0	0	0	0	0	0
Total	12	107	342	100	7	2	570

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	2	1	0	0	6
NNE	0	4	4	2	0	0	10
NE	0	3	8	1	0	0	12
ENE	0	13	7	0	0	0	20
E	0	5	22	5	0	0	32
ESE	0	3	23	10	0	0	36
SE	0	5	8	7	0	0	20
SSE	0	1	3	1	0	0	5
S	0	7	11	1	0	0	19
SSW	0	10	10	1	0	0	21
SW	1	9	13	8	0	0	31
WSW	1	4	14	0	0	0	19
W	0	2	9	2	0	0	13
WNW	0	4	23	1	0	0	28
NW	1	2	10	1	0	0	14
NNW	1	3	6	1	0	0	11
Variable	0	0	0	0	0	0	0
Total	4	78	173	42	0	0	297

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: July - September 2020
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	7	5	0	0	0	12
NNE	0	2	3	0	0	0	5
NE	1	2	8	0	0	0	11
ENE	0	7	3	0	0	0	10
E	0	5	5	0	0	0	10
ESE	0	3	2	2	0	0	7
SE	1	3	0	1	0	0	5
SSE	0	3	2	0	0	0	5
S	0	6	0	0	0	0	6
SSW	0	14	5	0	0	0	19
SW	1	4	0	0	0	0	5
WSW	0	0	2	0	0	0	2
W	1	2	3	5	0	0	11
WNW	0	1	7	0	0	0	8
NW	0	4	6	0	0	0	10
NNW	0	2	6	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	4	65	57	8	0	0	134

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 Generating Station

BRAIDWOOD NUCLEAR POWER STATION
RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Period of Record: October - December 2020
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	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	0	1	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	1	0	0	1
W	0	0	0	2	0	0	2
WNW	0	0	8	2	0	0	10
NW	0	6	7	1	0	0	14
NNW	0	2	1	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	9	17	6	0	0	32

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	1	1	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	4	0	0	0	0	4
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	1	4	1	0	6
SSW	0	0	6	7	0	0	13
SW	0	0	11	1	0	0	12
WSW	0	3	2	1	0	0	6
W	0	1	8	3	0	0	12
WNW	0	6	1	2	0	0	9
NW	0	3	6	3	0	0	12
NNW	0	1	5	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	0	21	42	21	1	0	85

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	4	0	0	0	0	4
NNE	0	3	0	0	0	0	3
NE	0	2	0	0	0	0	2
ENE	0	5	0	0	0	0	5
E	0	8	0	0	0	0	8
ESE	0	0	0	0	0	0	0
SE	0	1	0	0	0	0	1
SSE	0	0	4	0	0	0	4
S	0	0	3	8	0	1	12
SSW	0	1	8	5	1	0	15
SW	0	2	10	7	0	0	19
WSW	0	1	5	1	0	0	7
W	0	7	5	1	0	0	13
WNW	0	4	11	1	0	0	16
NW	0	5	2	0	0	0	7
NNW	0	5	5	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	48	53	23	1	1	126

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	34	21	7	0	0	71
NNE	3	49	12	3	0	0	67
NE	3	39	20	0	0	0	62
ENE	8	40	13	0	0	0	61
E	6	14	0	0	0	0	20
ESE	2	14	5	0	0	0	21
SE	0	9	30	6	0	0	45
SSE	0	13	24	13	0	0	50
S	1	7	27	63	12	1	111
SSW	1	1	20	31	19	4	76
SW	1	9	57	10	3	1	81
WSW	1	19	27	2	2	0	51
W	3	35	22	15	17	2	94
WNW	6	40	66	24	3	0	139
NW	12	36	21	1	0	0	70
NNW	9	46	38	7	0	0	100
Variable	0	0	0	0	0	0	0
Total	65	405	403	182	56	8	1119

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	16	1	0	0	0	24
NNE	9	8	2	0	0	0	19
NE	3	3	0	0	0	0	6
ENE	8	7	0	0	0	0	15
E	14	3	0	0	0	0	17
ESE	9	18	1	0	0	0	28
SE	0	25	8	0	0	0	33
SSE	1	38	13	2	0	0	54
S	1	16	29	16	0	0	62
SSW	0	6	48	19	1	0	74
SW	0	19	61	5	0	0	85
WSW	1	36	10	1	0	0	48
W	14	25	10	2	0	0	51
WNW	10	16	8	5	0	0	39
NW	12	10	2	0	0	0	24
NNW	6	8	1	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	95	254	194	50	1	0	594

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	0	0	0	0	0	4
NNE	3	0	0	0	0	0	3
NE	3	1	0	0	0	0	4
ENE	4	0	0	0	0	0	4
E	5	4	0	0	0	0	9
ESE	6	5	0	0	0	0	11
SE	6	0	0	0	0	0	6
SSE	1	1	0	0	0	0	2
S	3	2	0	0	0	0	5
SSW	3	9	3	0	0	0	15
SW	0	3	4	0	0	0	7
WSW	4	12	2	0	0	0	18
W	21	29	0	0	0	0	50
WNW	17	10	0	0	0	0	27
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	88	76	9	0	0	0	173

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	3	0	0	0	0	0	3
NNE	2	0	0	0	0	0	2
NE	4	0	0	0	0	0	4
ENE	7	0	0	0	0	0	7
E	9	0	0	0	0	0	9
ESE	8	0	0	0	0	0	8
SE	5	1	0	0	0	0	6
SSE	1	0	0	0	0	0	1
S	2	0	0	0	0	0	2
SSW	1	1	0	0	0	0	2
SW	2	2	1	0	0	0	5
WSW	1	4	0	0	0	0	5
W	5	0	0	0	0	0	5
WNW	5	0	0	0	0	0	5
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	67	8	1	0	0	0	76

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	0	0	1	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	1	0	1
W	0	0	0	1	1	0	2
WNW	0	0	3	3	2	0	8
NW	0	0	10	6	0	1	17
NNW	0	0	2	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	1	15	11	4	1	32

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	3	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	2	1	0	0	0	3
ESE	0	1	1	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	0	0	1	0	0	0	1
S	0	0	1	0	4	1	6
SSW	0	0	2	8	4	1	15
SW	0	0	6	2	1	0	9
WSW	0	1	5	1	0	0	7
W	0	1	3	7	1	0	12
WNW	0	1	5	1	1	1	9
NW	0	0	5	4	0	3	12
NNW	0	0	4	2	0	0	6
Variable	0	0	0	0	0	0	0
Total	0	6	37	25	11	6	85

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	2	0	0	0	0	2
NNE	0	2	2	0	0	0	4
NE	0	2	0	0	0	0	2
ENE	0	3	1	0	0	0	4
E	0	2	6	1	0	0	9
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	4	0	0	0	4
S	0	0	2	4	4	1	11
SSW	0	0	2	9	5	2	18
SW	0	1	5	9	2	0	17
WSW	0	0	2	4	0	0	6
W	0	2	8	4	1	0	15
WNW	0	1	5	4	3	0	13
NW	0	2	3	3	1	0	9
NNW	0	4	3	3	1	0	11
Variable	0	0	0	0	0	0	0
Total	0	22	43	41	17	3	126

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 2020
 UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
 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	14	23	16	7	0	64
NNE	2	20	30	10	3	0	65
NE	2	19	27	19	0	0	67
ENE	2	14	26	8	0	0	50
E	4	5	20	1	0	0	30
ESE	0	5	4	7	3	0	19
SE	0	1	10	27	5	2	45
SSE	0	3	12	20	17	3	55
S	0	5	6	20	42	28	101
SSW	0	2	3	28	30	30	93
SW	1	3	28	32	4	5	73
WSW	2	7	26	13	5	2	55
W	1	16	21	11	8	23	80
WNW	0	18	32	45	20	16	131
NW	2	11	20	34	11	1	79
NNW	1	32	36	34	10	0	113
Variable	0	0	0	0	0	0	0
Total	21	175	324	325	165	110	1120

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	2	4	13	3	0	0	22
NNE	1	5	5	5	0	0	16
NE	2	1	3	2	0	0	8
ENE	1	4	7	0	0	0	12
E	2	2	11	1	0	0	16
ESE	1	0	6	7	0	0	14
SE	0	2	15	18	2	0	37
SSE	0	2	15	32	1	0	50
S	0	3	11	23	15	2	54
SSW	0	2	11	59	23	8	103
SW	1	3	16	45	10	0	75
WSW	0	5	19	21	1	0	46
W	1	2	14	19	4	0	40
WNW	0	8	12	16	7	2	45
NW	0	4	14	10	0	0	28
NNW	2	8	15	3	0	0	28
Variable	0	0	0	0	0	0	0
Total	13	55	187	264	63	12	594

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	0	3	1	0	0	4
NNE	0	2	2	0	0	0	4
NE	0	0	2	0	0	0	2
ENE	0	0	0	0	0	0	0
E	0	3	1	0	0	0	4
ESE	0	0	4	4	0	0	8
SE	0	1	4	1	0	0	6
SSE	0	0	5	0	0	0	5
S	3	3	2	0	0	0	8
SSW	0	2	5	1	2	0	10
SW	1	5	6	6	0	0	18
WSW	1	0	4	4	0	0	9
W	2	2	13	9	0	0	26
WNW	0	2	26	14	0	0	42
NW	0	1	13	2	0	0	16
NNW	0	1	11	0	0	0	12
Variable	0	0	0	0	0	0	0
Total	7	22	101	42	2	0	174

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

Braidwood Generating Station

Period of Record: October - December 2020
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	4	7	0	0	0	12
NNE	0	3	2	0	0	0	5
NE	0	1	3	0	0	0	4
ENE	1	0	0	0	0	0	1
E	0	2	0	0	0	0	2
ESE	0	3	1	1	0	0	5
SE	0	3	2	2	0	0	7
SSE	0	0	1	0	0	0	1
S	1	4	1	0	0	0	6
SSW	0	5	4	0	0	0	9
SW	3	2	1	1	0	0	7
WSW	0	0	0	5	0	0	5
W	0	0	2	2	0	0	4
WNW	0	0	0	3	0	0	3
NW	0	0	0	0	0	0	0
NNW	0	2	4	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	6	29	28	14	0	0	77

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 2020
UNIT 1, UNIT 2 and ISFSI (Docket Numbers 50-456, 50-457 and 72-73)

APPENDIX D: ERRATA

There were two errors identified in 2020.

a. An error was identified by the ODCM chemist with the H3 (tritium) activity used in permit L-20190528-052. For permit L-20190528-052, the original H3 activity of 1.17 E-4 uCi/ml (microcuries per milliliter) was used rather than the H3 difference of 2.99 E-05 uCi/ml. Using the original H3 activity in the post-release permit rather than the difference value resulted in a conservatively higher H3 activity being calculated and documented in the post-release permit. Re-analysis of the post release permit with the value corrected adjusted the 2019 curies released value from CWBD H3 from 599 curies to 287 curies. IR 04368302

b. Braidwood was notified by Mirion (OpenEMS effluent permit vendor) that OpenEMS was not calculating liquid doses IAW Braidwood's Offsite Dose Calculation Manual (ODCM). Braidwood ODCM equation A-18 specifies that the "Dilution Flow" used in the "Near Field Average Dilution Factor" should be the "Dilution Water Flow During Period of Interest" in gpm. Previously OpenEMS was using the dilution volume (in gallons) for a larger time frame corresponding to that of the CWBD permit when the recal.exe was used or if a permit is reanalyzed. OpenEMS is used to document and survey results that is then put into the annual report (ARERR). This is considered a minor violation of 10CFR20.1302a due to the consequence being 1 to 2 times an increase in dose reported. Below are actual doses calculated after permits were reprocessed. No dose limits were exceeded based on Appendix I limits from 10CFR50. Appendix I limits are 3 mRem annual total body and 10 mRem annual organ dose for liquid effluents per unit (6 mRem and 20mRem per year combined unit). See below for dose after all permits were recalculated. Doses were validated using an excel spreadsheet and was verified by ODCM Chemist and Mirion Technologies. IR 04353041

2017 Before reanalysis: Total Body 7.78E-02, Organ 7.88E-02

2018 Before reanalysis: Total Body 7.81E-02, Organ 7.96E-02

2019 Before reanalysis : Total Body 1.03E-01, Organ 1.04E-01

2017 After reanalysis: Total Body 1.59E-01, Organ 1.80E-01

2018 After reanalysis: Total Body 1.51E-01, Organ 1.60E-01

2019 After reanalysis: Total Body 1.95E-01, Organ 2.02E-01