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U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, D.C. 20555-0001

Braidwood Station, Units 1 and 2
Renewed Facility Operating License Nos. NPF-72 and NPF-77
NRC Docket Nos. STN 50-456 and STN 50-457

Subject: 2016 Annual Radiological Environmental Operating Report

Attached is the 2016 Annual Radiological Environmental Operating Report for Braidwood Station. This report is being submitted in accordance with Technical Specification 5.6.2, "Annual Radiological Environmental Operating Report." This report contains information associated with the station's radiological environmental and meteorological monitoring programs. This information is consistent with the objectives described in the Offsite Dose Calculation Manual and 10 CFR 50, Appendix I, "Numerical Guides for Design Objectives and Limiting Conditions for Operation to Meet the Criterion 'As Low as is Reasonably Achievable' for Radioactive Material In Light-Water-Cooled Nuclear Power Reactor Effluents," Sections IV.B.2, IV.B.3, and IV.C. Technical Specification 5.6.2 requires the Annual Radiological Environmental Operating Report to be submitted by May 15 of each year.

If you have any questions regarding this information, please contact Steven Reynolds, Regulatory Assurance Manager, at (815) 417-2800.

Respectfully,

Marri Marchionda-Palmer
Site Vice President
Braidwood Station

cc: US NRC Regional Administrator, Region III
US NRC Senior Resident Inspector - Braidwood Station
NRR Project Manager - Braidwood Station
Illinois Emergency Management Agency - Division of Nuclear Safety

Docket No: 50-456
50-457

BRAIDWOOD STATION
UNITS 1 and 2

Annual Radiological Environmental Operating Report

1 January through 31 December 2016

Prepared By
Teledyne Brown Engineering
Environmental Services

Exelon Generation

Braidwood Station
Braceville, IL 60407

May 2017

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Appendices

I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program (REMP) conducted for Exelon's Braidwood Station covers the period January 1, 2016 through December 31, 2016. During that time period 1,680 analyses were performed on 1,358 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of Braidwood Station had no adverse radiological impact on the environment.

Surface, public, and ground/well water samples were analyzed for concentrations of tritium and gamma-emitting nuclides. Surface water and public water samples were also analyzed for concentrations of gross beta. Gross beta and tritium activities detected were consistent with those detected in previous years. No fission or activation products were detected. As part of an effort to implement industry best practices, both gaseous and liquid station effluents were evaluated for all 10CFR61 required nuclides. Nuclides exceeding 1% relative abundance in the waste stream were added to the list of nuclides that Teledyne Brown evaluates in potentially impacted REMP matrices. For Braidwood Station, Nickel-63 (Ni-63) exceeds 1% relative abundance in the radwaste resins. Occasionally, Ni-63 is observed in liquid release tank quarterly composites, therefore, beginning in the fall of 2013 the station requested that Ni-63 be evaluated in the downstream surface water, sediment, and fish analyses. Ni-63 has not been observed in downstream surface water.

Fish (commercially and/or recreationally important species) and sediment samples were analyzed for concentrations of gamma-emitting nuclides. No fission or activation products were detected in fish. Nickel-63 was not detected in any fish or sediment samples analyzed. Two of six sediment samples had Cs-137. The concentration was consistent with levels observed during the preoperational years. No plant-produced fission or activation products were found in sediment.

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

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

Cow milk samples were analyzed for concentrations of I-131 and gamma-emitting nuclides. Iodine-131 was not detected in any milk samples. Concentrations of naturally-occurring Potassium-40 (K-40) were detected. No fission or activation products were found and all required LLDs (Lower Limit of Detection) were met.

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

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

II. Introduction

The Braidwood Station, consisting of two 3,587 MWt pressurized water reactors owned and operated by Exelon Corporation is located in Will County, Illinois. Unit No. 1 went critical on May 29, 1987. Unit No. 2 went critical on March 08, 1988. The site is located in northeastern Illinois, 15 miles south-southwest of Joliet, Illinois, 60 miles southwest of Chicago and southwest of the Kankakee River.

This report covers those analyses performed by Teledyne Brown Engineering (TBE), Landauer Technologies and Environmental Inc. (Midwest Labs) on samples collected during the period January 1, 2016 through December 31, 2016.

A. Objective of the REMP

The objectives of the REMP are to:

1. Provide data on measurable levels of radiation and radioactive materials in the site environs;

2. Evaluate the relationship between quantities of radioactive material released from the plant and resultant radiation doses to individuals from principal pathways of exposure.

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways

2. Establishing baseline radiological data of media within those pathways

3. Continuously monitoring those media before and during Station operation to assess Station radiological effects (if any) on man and the environment

III. Program Description

A. Sample Collection

Samples for the Braidwood Station REMP were collected for Exelon Nuclear by Environmental Inc. Midwest Labs (EIML). This section

describes the general collection methods used by EIML to obtain environmental samples for the Braidwood Station REMP in 2016. Sample locations and descriptions can be found in Table B–1 and Figures B–1 through B–3, Appendix B. The sampling methods used by EIML are listed in Table B-2.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, public water, well water, fish, and sediment. Two gallon water samples were collected weekly from six surface water locations (BD-10, BD-25 [control], BD-38, BD-40, BD-55 and BD-56), and one weekly composite samples of public drinking water at location (BD-22) and ground/well water samples collected quarterly from eight locations (BD-13, BD-34, BD-35, BD-36, BD-37, BD-50, BD-51 and BD-54). All samples were collected in new unused plastic bottles, which were rinsed with source water prior to collection. Fish samples comprising the flesh of golden redhorse, shorthead redhorse, smallmouth bass, common carp, and largemouth bass were collected semiannually at three locations, BD-25 (control), BD-28 and BD-41. Sediment samples composed of recently deposited substrate were collected at three locations semiannually, BD-10, BD-25 (control), and BD-57.

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate and airborne iodine. Air particulate samples were collected and analyzed weekly at eight locations (BD-02, BD-03 [control], BD-04, BD-05, BD-06, BD-19, BD-20 and BD-21). The control location was BD-03. Airborne iodine and particulate samples were obtained at each location, using a vacuum pump with charcoal and glass fiber filters attached. The pumps were run continuously and sampled air at the rate of approximately one cubic foot per minute. The air filters and air iodine samples were replaced weekly and sent to the laboratory for analysis.

Terrestrial Environment

The terrestrial environment was evaluated by performing radiological analyses on milk and food product samples. Milk samples were collected biweekly at two locations (BD-17 and BD-18 [control]) from May through October and monthly from November through April. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite and shipped promptly to the laboratory. Food products were collected annually in at six locations

(BD-Control, BD-Quad 1 [offsite location and onsite location], BD-Quad 2, BD-Quad 3 and BD-Quad 4). The control location was BD-Control. Various types of samples were collected and placed in new unused plastic bags and sent to the laboratory for analysis.

Ambient Gamma Radiation

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

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

An inner ring consisting of 16 locations (BD-101, BD-102, BD-103, BD-104, BD-105, BD-106, BD-107, BD-108, BD-109, BD-110, BD-111a, BD-112, BD-113a, BD-114, BD-115 and BD-116) at or near the site boundary.

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

An additional (other) set consisting of seven locations (BD-02, BD-04, BD-05, BD-06, BD-19, BD-20 and BD-21).

The balance of one location (BD-03) represents the control area.

The specific OSLD locations were determined by the following criteria:

1. The presence of relatively dense population;

2. Site meteorological data taking into account distance and elevation for each of the sixteen–22 1/2 degree sectors around the site

3. Where estimated annual dose from Braidwood Station, if any, would be most significant.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE and Environmental Inc. (Midwest Labs) to analyze the environmental samples for radioactivity for the Braidwood Station REMP in 2016. The analytical procedures used by the laboratories are listed in Table B-2.

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

1. Concentrations of beta emitters in public and surface water and air particulates

2. Concentrations of gamma emitters in public, ground/well and surface water, air particulates, milk, fish, sediment and food products

3. Concentrations of tritium in public, ground/well and surface water

4. Concentrations of I-131 in air, milk and public water

5. Concentrations of Ni-63 in surface water, fish and sediment

6. Ambient gamma radiation levels at various site environs

C. Data Interpretation

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

1. Lower Limit of Detection and Minimum Detectable Concentration

The lower limit of detection (LLD) was defined as the smallest concentration of radioactive material in a sample that would yield a net count (above background) that would be detected with only a 5% probability of falsely concluding that a blank observation represents a "real" signal. The LLD was intended as a before the fact estimate of a system (including instrumentation, procedure and

sample type) and not as an after the fact criteria for the presence of activity. All analyses were designed to achieve the required Braidwood Station detection capabilities for environmental sample analysis.

The MDC is the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. The MDC is an *a posteriori* determination.

2. Net Activity Calculation and Reporting of Results

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

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

For surface, ground/well water, and fish 12 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140 were reported.

For public water, sediment, air particulate, milk and vegetation 11 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

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

D. Program Exceptions

For 2016 the Braidwood Station REMP had a sample recovery rate in excess of 98.3%. Sample anomalies and missed samples are listed in the tables below:

Table D-1 LISTING OF SAMPLE ANOMALIES

Sample Type	Location Code	Collection Date	Reason
MI	BD-18	01/07/16	No milk available; farmer "resting" cows. Collector looked diligently for fresh leafy vegetation, none available. Local hay substituted
WW	BD-54	01/14/16	No sample; house vacant; water off. Collector will check during remaining 1st qtr
APAI	BD-04	02/25/16	No apparent reason for low reading of 164.6 hours
APAI	BD-03	04/07/16	Low reading of 50.3 hours due to power outage at sampler; POC notified
APAI	BD-20	06/09/16	Low reading of 164 hours possibly due to power outage from storm
APAI	BD-21	06/09/16	Low reading of 164.5 hours possibly due to power outage from storm
PW	BD-22	10/13/16	No water in compositor; grab sample taken from piping. NOTE: Compositor repaired 10/14/16
APAI	BD-03	10/27/16	Low reading of 140.8 hours possibly due to power outage from storms
APAI	BD-02	12/08/16	No reason given for low reading of 166.2 hours. NOTE: Collected at 11:15 on 12/01/16 and 17:40 on 12/08/16. Reading should be approx.. 174 hours
APAI	BD-03	12/08/16	Low reading of 153.3 hours due to recent Power restoration on 12/01/16. New filter and cartridge placed on 12/02/16.
APAI	BD-19	12/22/16	No apparent reason for low reading of 122.6 hours

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
SW	BD-56	01/07/16	No sample; water frozen
SW	BD-55	01/14/16	No sample; water frozen
SW	BD-56	01/14/16	No sample; water frozen
SW	BD-25	01/21/16	No sample; water frozen
SW	BD-55	01/21/16	No sample; water frozen
SW	BD-56	01/21/16	No sample; water frozen
SW	BD-55	01/27/16	No sample; water frozen
SW	BD-56	01/27/16	No sample; water frozen
SW	BD-55	02/04/16	No sample; water frozen
SW	BD-56	02/04/16	No sample; water frozen
SW	BD-55	02/10/16	No sample; water frozen
SW	BD-56	02/10/16	No sample; water frozen
SW	BD-25	02/18/16	No sample; water frozen
SW	BD-55	02/18/16	No sample; water frozen
SW	BD-56	02/18/16	No sample; water frozen
APAI	BD-03	04/14/16	Pump not running, timer reading zero; collector started pump, checked back later to ensure power was on and perform field check
OLSD	BD-108-1	06/30/16	OSLD was lost in transit
OLSD	ISFSI-SBR-1 & 2	08/04/16	OSLDs missing during monthly check; collector placed spares 9341, 0009, 291551 EX00025328U and 9342, 00010, 291551 EX00064829B

Table D-2 LISTING OF MISSED SAMPLES (cont'd)

Sample Type	Location Code	Collection Date	Reason
OLSD	BD-203-1	09/29/16	OSLDs found missing during monthly exchange; pole replaced. Collector installed new cricket cage and new 4th quarter OSLD
APAI	BD-03	11/17/16	Power out. POC notified
APAI	BD-03	11/23/16	Power out.
APAI	BD-03	12/01/16	Power out. NOTE: Power restored on 12/01/16
SW	BD-56	12/08/16	No sample; water frozen
SW	BD-10	12/15/16	No sample; water frozen
SW	BD-25	12/15/16	No sample; water frozen
SW	BD-55	12/15/16	No sample; water frozen
SW	BD-56	12/15/16	No sample; water frozen
SW	BD-10	12/22/16	No sample; water frozen
SW	BD-25	12/22/16	No sample; water frozen
SW	BD-55	12/22/16	No sample; water frozen
SW	BD-56	12/22/16	No sample; water frozen
SW	BD-40	12/22/16	Backup collector did not have access to location
SW	BD-55	12/29/16	No sample; water frozen
SW	BD-56	12/29/16	No sample; water frozen

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

The overall sample recovery rate indicates that the appropriate

procedures and equipment are in place to assure reliable program implementation.

E. Program Changes

There were no program changes in 2016.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly and composited monthly at six locations (BD-10, BD-25 (control), BD-38, BD-40, BD-55 and BD-56). Of these locations, only BD-10 could be affected by Braidwood Station's effluent releases as it is downstream of the NPDES permitted outfall. The following analyses were performed:

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta (Table C–I.1, Appendix C). Gross beta was detected in 60 of 73 samples. The values ranged from 2.3 to 10.4 pCi/L. Concentrations detected were consistent with those detected in previous years (Figures C–1 through C-3, Appendix C).

Tritium

Quarterly composites of weekly collections were analyzed for tritium activity (Table C–I.2, Appendix C). Tritium activity was detected in one sample. The value was 460 pCi/l (Figures C–4 through C-6, Appendix C).

Nickel-63

Monthly samples were analyzed for Ni-63 activity (Table C–I.3, Appendix C). Ni-63 was not detected and the required LLD was met.

Gamma Spectrometry

Samples from all locations were analyzed for gamma-emitting nuclides (Table C–I.4, Appendix C). The LLD for I-131 and La-140 could not be met for 3 samples due to their age upon receipt at the

laboratory. The samples were counted for 200 minutes to achieve the lowest detection limit possible. No nuclides were detected and all other required LLDs were met.

2. Public Water

Monthly composites of weekly samples were made at one location (BD-22). This location could be affected by Braidwood Station's effluent releases. The following analyses were performed:

Gross Beta

Samples from the location were analyzed for concentrations of gross beta (Tables C–II.1, Appendix C). Gross beta was detected in 9 of 12 samples. The values ranged from 2.3 to 6.4 pCi/L. Concentrations detected were consistent with those detected in previous years (Figure C–7, Appendix C).

Tritium

Monthly composites of weekly samples from BD-22 were analyzed for tritium activity (Table C–II.2, Appendix C). Tritium was detected in 8 of 12 samples. Concentrations ranged from 300 to 1,040 pCi/L. Concentrations detected were consistent with those detected in previous years (Figure C–8, Appendix C).

Iodine

Monthly composites of weekly samples from the location were analyzed for I-131 (Table C-II.3, Appendix C). Iodine was not detected in any samples and the required LLD was met.

Gamma Spectrometry

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

3. Ground/Well Water

Quarterly samples were collected at eight locations (BD-13, BD-34, BD-35, BD-36, BD-37, BD-50, BD-51 and BD-54). The following analyses were performed:

Tritium

Quarterly grab samples from the locations were analyzed for tritium activity (Table C–III.1, Appendix C). Tritium was not detected in any sample and the required LLD was met. (Figures C–9 through C–13, Appendix C).

Gamma Spectrometry

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

4. Fish

Fish samples comprised of golden redhorse, shorthead redhorse, smallmouth bass, common carp, and largemouth bass were collected at three locations (BD-25, BD-28, and BD-41) semiannually. Location BD-28 could be affected by Braidwood Station's effluent releases. The following analyses were performed:

Nickel-63

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

Gamma Spectrometry

The edible portion of fish samples from all three locations was analyzed for gamma-emitting nuclides (Table C–IV.1, Appendix C). No fission or activation products were found. No nuclides were detected and all required LLDs were met.

5. Sediment

Aquatic sediment samples were collected at three locations (BD-10, BD-25, and BD-57) semiannually. The locations at the Braidwood Station outfall to the Kanakakee River and downstream of the outfall, could be affected by Braidwood Station's effluent releases. Sediment samples were also obtained from spoil piles resulting from river dredging in the vicinity of the station's outfall. The following analyses were performed:

Nickel-63

Sediment samples from all three locations was analyzed for Ni-63 activity (Table C–V.1, Appendix C). Ni-63 was not detected and the required LLD was met.

Gamma Spectrometry

Sediment samples from the location were analyzed for gamma-emitting nuclides (Table C–V.1, Appendix C). Concentrations of the fission product Cs-137 were found at locations BD-10 and BD-57. The concentrations were 132 pCi/kg/dry and 126 pCi/kg dry respectively. The concentrations of Cs-137 at locations BD-10 and BD-57 were less than the required Cs-137 in sediment LLD of 180 pCi/kg dry. The activity detected was consistent with those detected in previous years (29 pCi/kg to 260 pCi/kg from 1995 to 2006). No other Braidwood fission or activation products were found and all required LLDs were met.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from eight locations on a weekly basis. The eight locations were separated into three groups: Near field samplers (BD-06, BD-19, BD-20 and BD-21), far field samplers within 10 km of the site (BD-02, BD-04 and BD-05) and the Control sampler between 10 and 30 km from the site (BD-03). The following analyses were performed:

Gross Beta

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

I) ranged from 6E-03 to 38E-03 pCi/m^3 with a mean of 17E-03 pCi/m^3. The results from the far field (Group II) ranged from 6E-03 to 36E-03 pCi/m^3 with a mean of 17 E-03 pCi/m^3. The results from the Control location (Group III) ranged from 6E-03 to 29E-03 pCi/m^3 with a mean of 16E-03 pCi/m^3. Comparison of the 2016 air particulate data with previous years' data indicate no effects from the operation of Braidwood Station. Additionally, a comparison of the weekly mean values for 2016 indicate no notable differences among the three groups (Figures C–14 through C-18, Appendix C).

Gamma Spectrometry

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

b. Airborne Iodine

Continuous air samples were collected from eight locations (BD-02, BD-03, BD-04, BD-05, BD-06, BD-19, BD-20 and BD-21) and analyzed weekly for I-131 (Table C–VII.1, Appendix C). All results were less than the minimum detectable concentration for I-131.

C. Terrestrial Environment

1. Milk

Samples were collected from two locations (BD-17 and control location BD-18). Sampling frequencies were increased to biweekly in May and continued through October and monthly sampling was performed November through April. The following analyses were performed:

Iodine-131

Milk samples from the indicator location were analyzed for concentrations of I-131 (Table C–VIII.1, Appendix C). Iodine-131 was not detected in any samples. All required LLDs were met.

Gamma Spectrometry

Each milk sample was analyzed for concentrations of

gamma-emitting nuclides (Table C–VIII.2, Appendix C). No nuclides were detected and all required LLDs were met.

2. Food Products

Food product samples were collected at six locations (BD-Control, BD-Quad 1 [offsite and onsite], BD-Quad 2, BD-Quad 3 and BD-Quad 4) when available. Five locations, (located downwind, BD-Quad 1 [offsite and onsite], BD-Quad 2, BD-Quad 3 and BD-Quad 4) could be affected by Braidwood Station's effluent releases. The following analysis was performed:

Gamma Spectrometry

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

D. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Optically Stimulated Luminescence Dosimeter (OSLD). 86 OSLD locations were established around the site. Results of OSLD measurements are listed in Tables C–X.1 to C–X.3, Appendix C.

Most OSLD measurements were below 30 mrem/quarter, with a range of 16.5 to 35.0 mrem/quarter. A comparison of the Inner Ring, Outer Ring and Other data to the Control Location data, indicate that the ambient gamma radiation levels from all locations were similar.

E. Land Use Survey

A Land Use Survey conducted during August 2016 around the Braidwood Station was performed by EIML for Exelon Nuclear to comply with section 12.5.2 of the Braidwood Station's Offsite Dose Calculation Manual ODCM). The purpose of the survey was to document the nearest resident, milk-producing animal and garden of greater than 500 ft^2 in each of the sixteen 22 ½ degree sectors around the site. For dose calculation, a garden is assumed at the nearest residence. There were no changes required to the Braidwood Station REMP, as a result of this survey. The results of this survey are summarized below:

Distance in Miles from the Braidwood Station Reactor Buildings			
Sector	Residence Miles	Livestock Miles	Milk Farm Miles
(A) N	0.5	2.6	-
(B) NNE	0.9	-	-
(C) NE	0.7	-	-
(D) ENE	0.8	3.3	-
(E) E	1.5	2.3	-
(F) ESE	2.2	2.3	-
(G) SE	2.7	2.7	-
(H) SSE	4.5	-	-
(J) S	4.2	4.8	-
(K) SSW	1.3	5.3	5.5
(L) SW	0.4	1.2	-
(M) WSW	0.5	-	-
(N) W	0.4	1.6	8.7
(P) WNW	0.4	-	-
(Q) NW	0.4	-	-
(R) NNW	0.4	-	-

Distance in Miles from the Braidwood Station ISFSI PAD, 2016	
Sector	Residence Miles
(N) W	0.7
(P) WNW	0.7
(Q) NW	0.7
(R) NNW	0.7

F. Errata Data

There was no errata data for 2016.

G. Summary of Results – Inter-Laboratory Comparison Program

The primary and secondary laboratories analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices (Appendix D). The PE samples supplied by Analytics Inc., Environmental Resource Associates (ERA) and DOE's Mixed Analyte Performance Evaluation Program (MAPEP) were evaluated against the following pre-set acceptance criteria:

1. Analytics Evaluation Criteria

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

2. ERA Evaluation Criteria

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

3. DOE Evaluation Criteria

   MAPEP's evaluation report provides an acceptance range with associated flag values.

   The MAPEP defines three levels of performance: Acceptable (flag = "A"), Acceptable with Warning (flag = "W"), and Not Acceptable (flag = "N"). Performance is considered acceptable when a mean result for the specified analyte is ± 20% of the reference value. Performance is acceptable with warning when a mean result falls in the range from ± 20% to ± 30% of the reference value (i.e., 20% < bias < 30%). If the bias is greater than 30%, the results are deemed not acceptable.

For the TBE laboratory, 156 out of 160 analyses performed met the specified acceptance criteria. Four analyses (Milk - Sr-90, Vegetation - Sr-90, and Water - H-3 samples) did not meet the specified acceptance criteria for the following reasons and were addressed through the TBE Corrective Action Program.

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

1. Teledyne Brown Engineering's MAPEP March 2016 air particulate

cross check sample is now being provided to TBE by Analytics. MAPEP's policy is to evaluate as failed non-reported nuclides that were reported in the previous study. NCR 16-14

1a Since the Sr-90 was reported in the previous MAPEP study but not in this study MAPEP evaluated the Sr-90 for Soil as failed. No client samples were affected by this failure. NCR 16-14

1b. The MAPEP March 2016 Sr-90 in vegetation was evaluated as failing a false positive test. In reviewing the data that was reported vs the data in LIMS, it was found that the error was incorrectly reported as 0.023 rather than the correct value of 0.230. If the value had been reported with the activity and correct uncertainty of 0.301 ± 0.230, MAPEP would have evaluated the result as acceptable. No client samples were affected by this failure. NCR 16-14

2. Teledyne Brown Engineering's Analytics' March 2016 milk Sr-90 result of 15 ± .125 pCi/L was higher than the known value of 11.4 pCi/L with a ratio of 1.32. The upper ratio of 1.30 (acceptable with warning) was exceeded. After an extensive review of the data it is believed the technician did not rinse the filtering apparatus properly and some cross contamination from one of the internal laboratory spike samples may have been transferred to the Analytics sample. We feel the issue is specific to the March 2016 Analytics sample. No client samples were affected by this failure. NCR 16-26

3. Teledyne Brown Engineering's ERA November 2016 sample for H-3 in water was evaluated as failing. A result of 918 pCi/L was reported incorrectly due to a data entry issue. If the correct value of 9180 had been reported, ERA would have evaluated the result as acceptable. No client samples were affected by this failure. NCR 16-34

4. Teledyne Brown Engineering's Analytics' December 2016 milk Sr-90 sample result of 14.7 ± .26 pCi/L was higher than the known value of 10 pCi/L with a ratio of 1.47. The upper ratio of 1.30 (acceptable with warning) was exceeded. The technician entered the wrong aliquot into the LIMS system. To achieve a lower error term TBE uses a larger aliquot of 1.2L (Normally we use .6L for client samples). If the technician had entered an aliquot of 1.2L into the LIMS system, the result would have been 12.2 pCi/L, which would have been considered acceptable. No client samples were affected by this failure. NCR 16-35

For the EIML laboratory, 198 of 203 analyses met the specified acceptance criteria. Five analyses (Water – Ba-133, Co-57; Soil – Ni-63, U-233/234, U-238) did not meet the specified acceptance criteria for the following reasons:

1. The Environmental Inc., Midwest Laboratory's ERA April 2016 water Ba-133 result of 65.2 pCi/L was higher than the known value of 58.8 pCi/L, exceeding the upper control limit of 64.9 pCi/L. The reanalysis result of 57.8 pCi/L fell within acceptance criteria. There was no impact to client samples as a result of this failure.

2. The Environmental Inc., Midwest Laboratory's MAPEP February 2016 water Co-57 result of 1.38 Bq/L sample was higher than the known value of 0.00 Bq/L sample. This sample is considered a false positive. There was no impact to client samples as a result of this failure.

3. The Environmental Inc., Midwest Laboratory's MAPEP August 2016 soil Ni-63 result of 648 Bq/kg was lower than the known value of 990 Bq/kg, exceeding the lower control limit of 693 Bq/kg. Reanalysis with a smaller aliquot resulted in acceptable results. An investigation is in process to identify better techniques for analyzing samples with complex matrices. There was no impact to client samples as a result of this failure.

4. The Environmental Inc., Midwest Laboratory's MAPEP August 2016 soil U-233/234 result of 46.8 Bq/kg was lower than the known value of 122 Bq/kg, exceeding the lower control limit of 85 Bq/kg. MAPEP states that samples contain two fractions of Uranium; one that is soluble in concentrated HNO3 and HCL acid and one that is "fundamentally insoluble in these acids". They also state that HF treatment cannot assure complete dissolution. Results are consistent with measuring the soluble form. There was no impact to client samples as a result of this failure.

5. The Environmental Inc., Midwest Laboratory's MAPEP August 2016 soil U-238 result of 46.6 Bq/kg was lower than the known value of 121 Bq/kg, exceeding the lower control limit of 85 Bq/kg. MAPEP states that samples contain two fractions of Uranium; one that is soluble in concentrated HNO3 and HCL acid and one that is "fundamentally insoluble in these acids". They also state that HF treatment cannot assure complete dissolution. Results are consistent with measuring the soluble form. There was no impact to client samples as a result of this failure.

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BRAIDWOOD STATION, 2016

NAME OF FACILITY: BRAIDWOOD						DOCKET NUMBER:	50-456 & 50-457	
LOCATION OF FACILITY: BRACEVILLE, IL						REPORTING PERIOD:	2016	
MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) *RANGE*	CONTROL LOCATION MEAN (M) (F) *RANGE*	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER *(PCI/LITER)*	**GR-B**	71	4	5.4 (48/59) *2.3 - 10.4*	3.9 (10/12) *2.7 - 5.5*	8.4 (12/12) *5.7 - 10.4*	BD-40 INDICATOR BRAIDWOOD STATION COOLING LAKE ONSITE	0
	H-3	24	200	460 (1/20)	<LLD	460 (1/4)	BD-10 INDICATOR KANKAKEE RIVER DOWNSTREAM 5.4 MILES NE OF SITE	0
	NI-63	71	30	<LLD	<LLD	-		0
	GAMMA	71						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	I-131		15	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
PUBLIC WATER *(PCI/LITER)*	**GR-B**	12	4	3.7 (9/12) *2.3 - 6.4*	NA	3.7 (9/12) *2.3 - 6.4*	BD-22 INDICATOR WILMINGTON 6.0 MILES NE OF SITE	0
	H-3	12	200	488 (8/12) *300 - 1040*	NA	488 (8/12) *300 - 1040*	BD-22 INDICATOR WILMINGTON 6.0 MILES NE OF SITE	0
	I-131	12	1	<LLD	NA	-		0

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

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NAME OF FACILITY: BRAIDWOOD | DOCKET NUMBER: 50-456 & 50-457
LOCATION OF FACILITY: BRACEVILLE, IL | REPORTING PERIOD: 2016

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
PUBLIC WATER	**GAMMA**	12						
(PCI/LITER)	*MN-54*		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
GROUND WATER	**H-3**	32	200	<LLD	NA	-		0
(PCI/LITER)								
	GAMMA	32						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0
	I-131		15	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
FISH	**NI-63**	12	260	<LLD	<LLD	-		0
(PCI/KG WET)								

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

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BRAIDWOOD STATION, 2016

NAME OF FACILITY: BRAIDWOOD | DOCKET NUMBER: 50-456 & 50-457
LOCATION OF FACILITY: BRACEVILLE, IL | REPORTING PERIOD: 2016

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FISH	**GAMMA**	12						
(PCI/KG WET)	*MN-54*		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	I-131		NA	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
SEDIMENT *(PCI/KG DRY)*	**NI-63**	7	260	<LLD	<LLD	-		0
	GAMMA	7						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	129 (2/4) *126 - 132*	<LLD	132 (1/2)	BD-10 INDICATOR KANKAKEE RIVER DOWNSTREAM 5.4 MILES NE OF SITE	0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0

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

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NAME OF FACILITY: BRAIDWOOD						DOCKET NUMBER:	50-456 & 50-457	
LOCATION OF FACILITY: BRACEVILLE, IL						REPORTING PERIOD:	2016	
MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) *RANGE*	CONTROL LOCATION MEAN (M) (F) *RANGE*	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
AIR PARTICULATE	**GR-B**	412	10	17	16	17	BD-21 INDICATOR	0
(E-3 PCI/CU.METER)				(364/364)	(47/48)	(52/52)	NEARSITE NE	
				6 - 38	*6 - 29*	*8 - 38*	0.5 MILES NE OF SITE	
	GAMMA	32						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		50	<LLD	<LLD	-		0
	CS-137		60	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
AIR IODINE	**GAMMA**	412						
(E-3 PCI/CU.METER)	*I-131*		70	<LLD	<LLD	-		0
MILK	**I-131**	37	1	<LLD	<LLD	-		0
(PCI/LITER)								
	GAMMA	38						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0

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

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR BRAIDWOOD STATION, 2016

NAME OF FACILITY: BRAIDWOOD | DOCKET NUMBER: 50-456 & 50-457
LOCATION OF FACILITY: BRACEVILLE, IL | REPORTING PERIOD: 2016

MEDIUM OR PATHWAY SAMPLED *(UNIT OF MEASUREMENT)*	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) *RANGE*	CONTROL LOCATION MEAN (M) (F) *RANGE*	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) *RANGE*	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
VEGETATION	**GAMMA**	18						
(PCI/KG WET)	*MN-54*		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
DIRECT RADIATION	**OSLD-QUARTERLY**	342	NA	21 (334/334) *16.5 - 35*	20.8 (8/8) *19.4 - 22.2*	31.2 (4/4) *24.3 - 5*	BD-105-4 INDICATOR 0.20 MILES SE	0
(MILLIREM/QTR.)								

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

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APPENDIX B

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

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Braidwood Station, 2016

Location	Location Description	Distance & Direction From Site
A. Surface Water		
BD-10	Kankakee River Downstream (indicator)	5.4 miles NE
BD-25	Kankakee River Upstream (control)	9.6 miles E
BD-38	Main Drainage Ditch (indicator)	1.5 miles SE
BD-40	Braidwood Station Cooling Lake (indicator)	Onsite
BD-55	North Pond Fatlan Site (indicator)	0.6 miles NE
BD-56	South Pond Fatlan Site (indictor)	0.6 miles NE
B. Drinking (Potable) Water		
BD-22	Wilmington (indicator)	6.0 miles NE
C. Ground/Well Water		
BD-13	Braidwood City Hall Well (indicator)	1.7 miles NNE
BD-34	Gibson Well (indicator)	4.7 miles E
BD-35	Joly Well (indicator)	4.7 miles E
BD-36	Hutton Well (indicator)	4.7 miles E
BD-37	Nurczyk Well (indicator)	4.7 miles E
BD-50	Skole Well (indicator)	4.7 miles E
BD-51	Fatlan Well (indicator)	0.6 miles NE
BD-54	Cash Well (indicator)	0.9 miles NE
D. Milk - bi-weekly / monthly		
BD-17	Halpin's Dairy (indicator)	5.5 miles SSW
BD-18	Biros' Farm (control)	8.7 miles W
E. Air Particulates / Air Iodine		
BD-02	Custer Park (indicator)	5.0 miles E
BD-03	County Line Road (control)	6.2 miles ESE
BD-04	Essex (indicator)	4.8 miles SSE
BD-05	Gardner (indicator)	5.5 miles SW
BD-06	Godley (indicator)	0.5 miles WSW
BD-19	Nearsite NW (indicator)	0.3 miles NW
BD-20	Nearsite N (indicator)	0.6 miles N
BD-21	Nearsite NE (indicator)	0.5 miles NE
F. Fish		
BD-25	Kankakee River, Upstream (control)	9.6 miles E
BD-28	Kankakee River, Discharge (indicator)	5.4 miles E
BD-41	Cooling Lake (indicator)	1.0 mile E
G. Sediment		
BD-10	Kankakee River, Downstream (indicator)	5.4 miles NE
BD-25	Kankakee River Upstream (control)	9.6 miles E
BD-57	Circulating Water Blowdown Discharge (indicator)	5.4 miles E
H. Food Products		
Quadrant 1	Clark Farm	3.8 miles ENE
	Onsite Garden	0.6 miles NE
Quadrant 2	W.F. Soltwisch	4.5 miles SSE
Quadrant 3	Terri Schultz	4.8 miles SSW
Quadrant 4	Bruce Sinkular	1.9 miles NNW
Control	Gorman Farm	9.0 miles NE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Braidwood Station, 2016

Location	Location Description	Distance & Direction From Site
I. Environmental Dosimetry - OSLD		
Inner Ring		
BD-101-3 and -4		0.5 miles N
BD-102-1 and -2		1.1 miles NNE
BD-103-1 and -2		1.0 mile NE
BD-104-1 and -2		0.7 miles ENE
BD-105-1 and -2		2.2 miles E
BD-106-1 and -2		2.5 miles ESE
BD-107-1 and -2		3.2 miles SE
BD-108-1 and -2		3.2 miles SSE
BD-109-1 and -2		3.8 miles S
BD-110-1 and -2		2.8 miles SSW
BD-111a-1 and -2		1.4 miles SW
BD-112-1 and -2		0.7 miles WSW
BD-113a-1 and -2		0.5 miles W
BD-114-1 and -2		0.4 miles WNW
BD-115-1 and -2		0.3 miles NW
BD-116-1		0.4 miles NNW
BD-116-2		0.5 miles NNW
Outer Ring		
BD-201-1 and -2		4.2 miles N
BD-202-1 and -2		4.8 miles NNE
BD-203-1 and -2		4.9 miles NE
BD-204-1 and -2		4.3 miles ENE
BD-205-1 and -2		4.0 miles E
BD-206-1 and -2		4.5 miles ESE
BD-207-1 and -2		4.5 miles SE
BD-208-1 and -2		4.5 miles SSE
BD-209-1 and -2		4.8 miles S
BD-210-1 and -2		5.3 miles SSW
BD-211-1 and -2		4.8 miles SW
BD-212-3 and -4		5.0 miles WSW
BD-213-3 and -4		4.8 miles W
BD-214-1 and -2		4.3 miles WNW
BD-215-1 and -2		4.5 miles NW
BD-216-1 and -2		4.0 miles NNW
Other		
BD-02-1 and -2	Custer Park (indicator)	5.0 miles E
BD-04-1 and -2	Essex (indicator)	4.8 miles SSE
BD-05-1 and -2	Gardner (indicator)	5.5 miles SW
BD-06-1 and -2	Godley (indicator)	0.5 miles WSW
BD-19-1 and -2	Nearsite NW (indicator)	0.3 miles NW
BD-20-1 and -2	Nearsite N (indicator)	0.6 miles N
BD-21-1 and -2	Nearsite NE (indicator)	0.5 miles NE
I. Environmental Dosimetry – OSLD (cont'd)		
Control		
BD-03-1 and -2	13000 W. Road	6.2 miles ESE
ISFSI		
BD-104-3 and -4		0.12 miles E

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Braidwood Station, 2016

Location	Location Description	Distance & Direction From Site
BD-105-3 and -4		0.22 miles SE
BD-110-3 and -4		0.17 miles SE

Distance in Miles from the Braidwood Station ISFSI Pad, 2016

Sector	Residence Miles
(N) W	0.7
(P) WNW	0.7
(Q) NW	0.7
(R) NNW	0.7

Distance in Miles from the Braidwood Station Reactor Buildings, 2016

Sector	Residence Miles	Livestock Miles	Milk Farm Miles
(A) N	0.5	2.6	-
(B) NNE	0.9	-	-
(C) NE	0.7	-	-
(D) ENE	0.8	3.3	-
(E) E	1.5	2.3	-
(F) ESE	2.2	2.3	-
(G) SE	2.7	2.7	-
(H) SSE	4.5	-	-
(J) S	4.2	4.8	-
(K) SSW	1.3	5.3	5.5
(L) SW	0.4	1.2	-
(M) WSW	0.5	-	-
(N) W	0.4	1.6	8.7
(P) WNW	0.4	-	-
(Q) NW	0.4	-	-
(R) NNW	0.4	-	-

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Braidwood Station, 2016

Sample Medium	Analysis	Sampling Method	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from weekly grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis
Surface Water	Gross Beta	Monthly composite from weekly grab samples.	TBE, TBE-2008 Gross Alpha and/or Gross Beta activity in various matrices
Surface Water	Tritium	Quarterly composite from weekly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Surface Water	Nickel-63	Monthly composite from weekly grab samples.	TBE, TBE-2013 Radionickel activity in various matrices
Drinking Water	Gross Beta	Monthly composite from weekly composite samples.	TBE, TBE-2008 Gross Alpha and/or Gross Beta activity in various matrices
Drinking Water	Gamma Spectroscopy	Monthly composite from weekly composite samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis
Drinking Water	Tritium	Monthly composite from weekly composite samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Drinking Water	Iodine	Monthly composite from weekly composite samples.	TBE, TBE-2031 Radioactive Iodine in drinking water
Ground/Well Water	Gamma Spectroscopy	Quarterly grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis
Ground/Well Water	Tritium	Quarterly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Fish	Nickel-63	Semi-annual samples collected via electroshocking or other techniques	TBE, TBE-2013 Radionickel activity in various matrices
Fish	Gamma Spectroscopy	Samples collected twice annually via electro-shocking or other techniques	TBE-2007 Gamma emitting radioisotope analysis
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis
Sediment	Nickel-63	Semi-annual grab samples	TBE, TBE-2013 Radionickel activity in various matrices
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2007 Gamma emitting radioisotope analysis

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Braidwood Station, 2016

Sample Medium	Analysis	Sampling Method	Analytical Procedure Number
Air Iodine	I-131	Weekly composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma emitting radioisotope analysis
Milk	I-131	Bi-weekly grab sample May through October. Monthly all other times	TBE, TBE-2012 Radioiodine in various matrices
Milk	Gamma Spectroscopy	Bi-weekly grab sample May through October. Monthly all other times	TBE, TBE-2007 Gamma emitting radioisotope analysis
Food Products	Gamma Spectroscopy	Annual grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements.	Landauer Incorporated

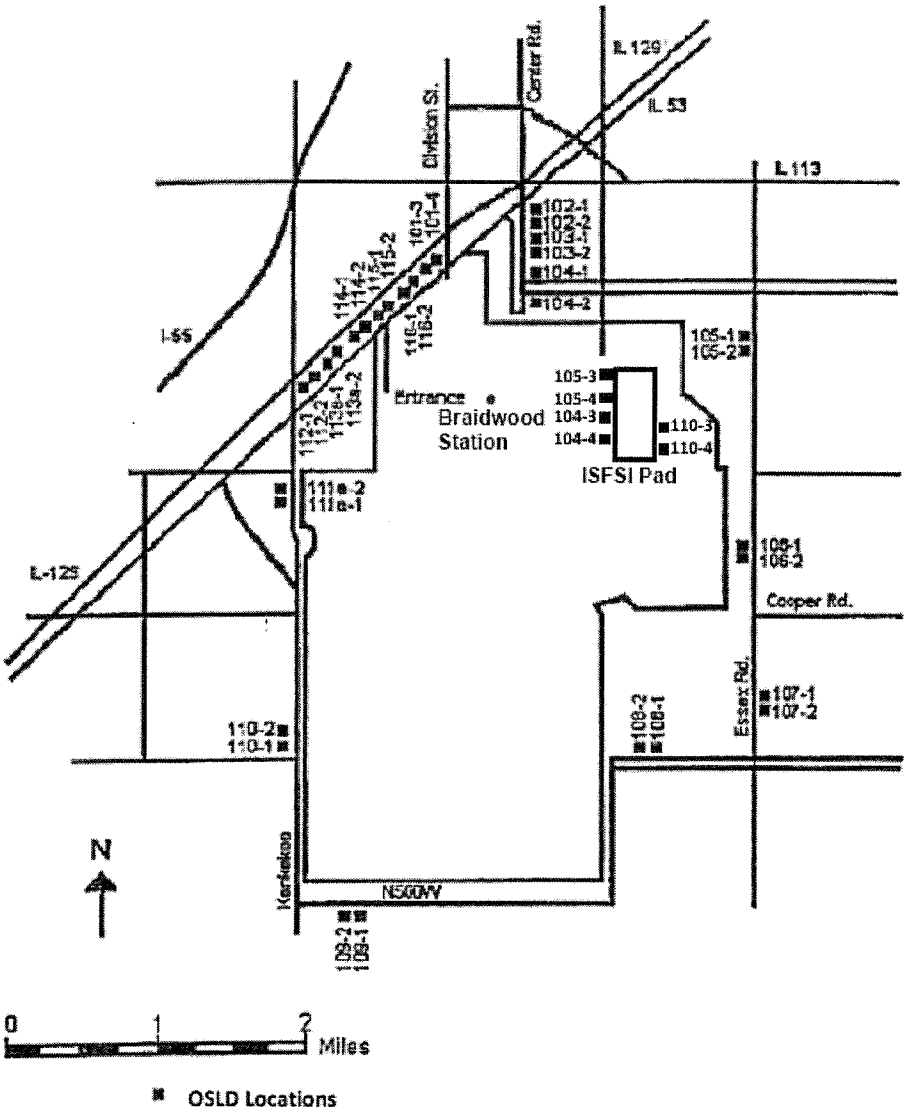

Figure B-1
Inner Ring and Other OSLD Locations
of the Braidwood Station, 2016

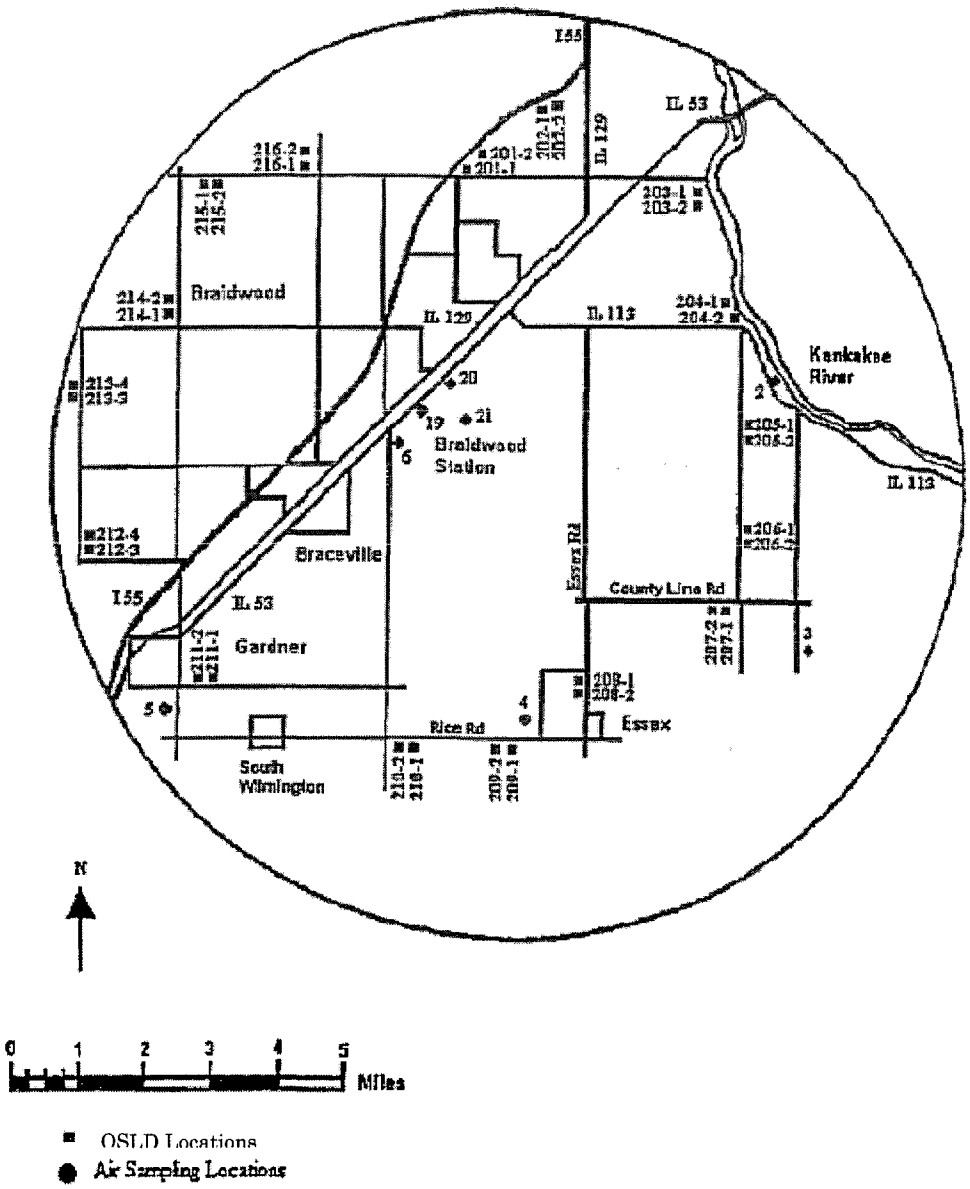

Figure B-2
Fixed Air Sampling and Outer Ring
OSLD Locations of the Braidwood Station, 2016

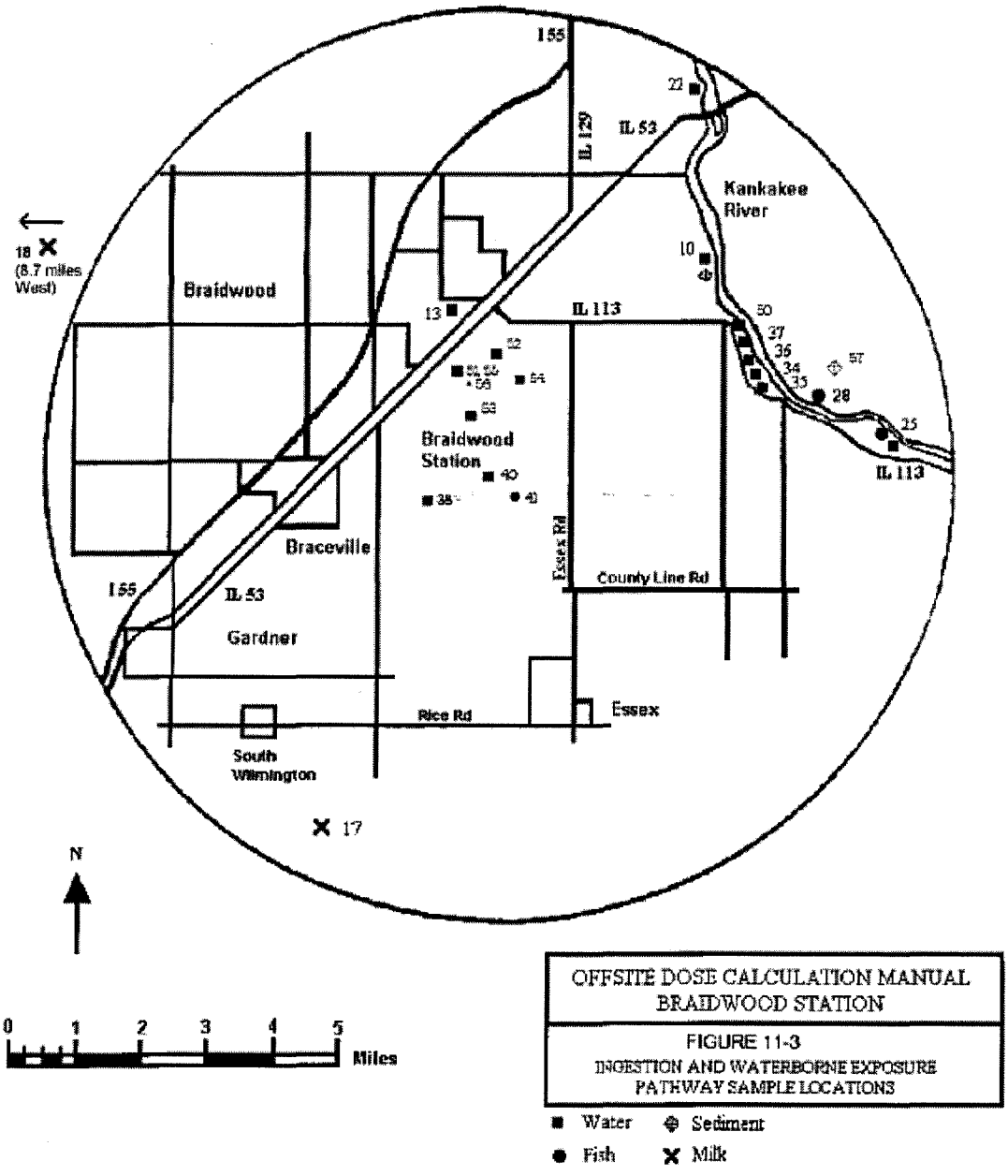

Figure B-3
Ingestion and Waterborne Exposure Pathway
Sample Locations of the Braidwood Station, 2016

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APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

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Table C-I.1 CONCENTRATIONS OF GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25	BD-38	BD-40	BD-55	BD-56
01/07/16 - 01/27/16	< 2.9	5.3 ± 2.0	< 3.4	8.8 ± 2.6	3.4 ± 1.8	(1)
02/04/16 - 02/25/16	6.4 ± 2.2	4.7 ± 2.1	4.2 ± 2	10.4 ± 2.7	3.9 ± 1.8	5.3 ± 2.2
03/03/16 - 03/31/16	< 2.8	3.3 ± 1.9	< 3.2	8.6 ± 2.5	3.8 ± 1.8	< 2.9
04/07/16 - 04/28/16	4.1 ± 1.8	5.5 ± 1.9	5.6 ± 2.2	10.3 ± 2.4	4.6 ± 1.7	4.1 ± 1.9
05/05/16 - 05/26/16	< 3.3	3.7 ± 2.3	3.5 ± 1.5	10.1 ± 2.9	< 3.0	< 3.1
06/02/16 - 06/30/16	3.1 ± 1.8	2.7 ± 1.8	3.0 ± 2.0	7.1 ± 2.3	2.7 ± 1.6	3.5 ± 1.9
07/07/16 - 07/28/16	3.5 ± 1.9	< 2.7	3.9 ± 2.2	7.9 ± 2.4	< 2.4	7.4 ± 2.3
08/04/16 - 08/25/16	4.7 ± 1.9	4.0 ± 1.8	4.0 ± 2.1	9.1 ± 2.4	3.5 ± 1.6	8.2 ± 2.2
09/01/16 - 09/29/16	2.9 ± 2.0	4.0 ± 1.8	< 2.9	6.7 ± 2.2	2.9 ± 1.6	4.5 ± 1.9
10/06/16 - 10/27/16	3.1 ± 1.7	3.2 ± 1.8	4.1 ± 2.2	7.5 ± 2.3	2.3 ± 1.5	2.8 ± 1.8
11/03/16 - 11/23/16	3.0 ± 1.8	< 2.5	5.7 ± 2.3	8.3 ± 2.2	2.5 ± 1.4	8.9 ± 2.2
12/01/16 - 12/29/16	5.0 ± 2.2	3.3 ± 1.9	< 2.8	5.7 ± 2.2	3.6 ± 1.6	9.1 ± 3.2
	4.0 ± 2.4	3.9 ± 1.9	4.3 ± 1.9	8.4 ± 3.0	3.3 ± 1.4	6.0 ± 4.9

Table C-I.2 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25	BD-38	BD-40	BD-55	BD-56
01/07/16 - 03/31/16	< 173	< 171	< 168	< 171	< 168	*(1)*
04/07/16 - 06/30/16	< 185	< 186	< 171	< 172	< 170	< 172
07/07/16 - 09/29/16	460 ± 141	< 190	< 190	< 189	< 190	< 190
10/06/16 - 12/29/16	< 196	< 194	< 198	< 195	< 197	< 200
MEAN ± 2 STD DEV	460 ± 0	-	-	-	-	-

Table C-I.3 CONCENTRATIONS OF NI-63 IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-10	BD-25	BD-38	BD-40	BD-55	BD-56
01/07/16 - 01/27/16	< 16	< 16	< 23	< 23	< 22	*(1)*
02/04/16 - 02/25/16	< 18	< 19	< 19	< 19	< 19	< 19
03/03/16 - 03/31/16	< 14	< 14	< 15	< 14	< 14	< 14
04/07/16 - 04/28/16	< 14	< 14	< 14	< 14	< 14	< 14
05/05/16 - 05/26/16	< 14	< 14	< 14	< 15	< 15	< 15
06/02/16 - 06/30/16	< 12	< 12	< 12	< 15	< 14	< 14
07/07/16 - 07/28/16	< 16	< 16	< 16	< 16	< 16	< 16
08/04/16 - 08/25/16	< 16	< 16	< 16	< 16	< 16	< 13
09/01/16 - 09/29/16	< 15	< 15	< 15	< 16	< 16	< 16
10/06/16 - 10/27/16	< 16	< 16	< 16	< 16	< 23	< 23
11/03/16 - 11/23/16	< 13	< 13	< 13	< 13	< 13	< 12
12/01/16 - 12/29/16	< 16	< 16	< 16	< 16	< 16	< 15
MEAN	-	-	-	-	-	-

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-I.4 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-10	01/07/16 - 01/27/16	< 3	< 4	< 10	< 4	< 8	< 5	< 8	< 12	< 4	< 4	< 28	< 8
	02/04/16 - 02/25/16	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 6	< 3	< 4	< 18	< 5
	03/03/16 - 03/31/16	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 6	< 2	< 2	< 13	< 4
	04/07/16 - 04/28/16	< 3	< 3	< 7	< 4	< 6	< 3	< 5	< 8	< 3	< 3	< 17	< 6
	05/05/16 - 05/26/16	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 11	< 2	< 2	< 18	< 5
	06/02/16 - 06/30/16	< 4	< 5	< 9	< 4	< 9	< 5	< 8	< 14	< 4	< 4	< 29	< 11
	07/07/16 - 07/28/16	< 2	< 2	< 5	< 2	< 3	< 2	< 4	< 11	< 2	< 2	< 19	< 6
	08/04/16 - 08/25/16	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 1	< 20	< 6
	09/01/16 - 09/29/16	< 3	< 4	< 7	< 4	< 7	< 3	< 7	< 10	< 3	< 3	< 22	< 7
	10/06/16 - 10/27/16	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 10	< 2	< 2	< 17	< 5
	11/03/16 - 11/23/16	< 3	< 3	< 7	< 3	< 7	< 4	< 7	< 15	< 3	< 3	< 31	< 10
	12/01/16 - 12/29/16	< 2	< 2	< 6	< 2	< 4	< 3	< 5	< 10	< 2	< 2	< 21	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-25	01/07/16 - 01/27/16	< 5	< 4	< 11	< 5	< 9	< 5	< 11	< 15	< 4	< 5	< 29	< 11
	02/04/16 - 02/25/16	< 3	< 3	< 8	< 3	< 7	< 4	< 6	< 7	< 3	< 3	< 18	< 6
	03/03/16 - 03/31/16	< 2	< 2	< 3	< 1	< 3	< 2	< 3	< 5	< 2	< 2	< 11	< 4
	04/07/16 - 04/28/16	< 3	< 4	< 7	< 3	< 7	< 4	< 6	< 10	< 3	< 3	< 23	< 6
	05/05/16 - 05/26/16	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 21	< 7
	06/02/16 - 06/30/16	< 4	< 4	< 11	< 6	< 9	< 5	< 9	< 14	< 4	< 5	< 34	< 7
	07/07/16 - 07/28/16	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 10	< 2	< 2	< 18	< 5
	08/04/16 - 08/25/16	< 1	< 1	< 3	< 2	< 2	< 1	< 2	< 10	< 1	< 1	< 15	< 4
	09/01/16 - 09/29/16	< 3	< 3	< 5	< 3	< 5	< 3	< 5	< 8	< 2	< 3	< 17	< 6
	10/06/16 - 10/27/16	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 10	< 2	< 2	< 19	< 6
	11/03/16 - 11/23/16	< 3	< 3	< 7	< 3	< 7	< 4	< 6	< 15	< 3	< 3	< 27	< 9
	12/01/16 - 12/29/16	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 20	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-38	01/07/16 - 01/27/16	< 4	< 4	< 8	< 4	< 8	< 4	< 8	< 11	< 4	< 4	< 25	< 8
	02/04/16 - 02/25/16	< 3	< 3	< 6	< 3	< 7	< 3	< 6	< 6	< 3	< 4	< 15	< 4
	03/03/16 - 03/31/16	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 5	< 1	< 2	< 11	< 3
	04/07/16 - 04/28/16	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 9	< 3	< 3	< 19	< 6
	05/05/16 - 05/26/16	< 1	< 2	< 3	< 1	< 3	< 2	< 3	< 10	< 1	< 2	< 17	< 6
	06/02/16 - 06/30/16	< 6	< 5	< 15	< 5	< 10	< 5	< 9	< 15	< 5	< 5	< 37	< 11
	07/07/16 - 07/28/16	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 20	< 6
	08/04/16 - 08/25/16	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 15	< 1	< 2	< 22	< 7
	09/01/16 - 09/29/16	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 10	< 3	< 3	< 21	< 7
	10/06/16 - 10/27/16	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 19	< 6
	11/03/16 - 11/23/16	< 3	< 3	< 8	< 3	< 7	< 4	< 6	< 15	< 3	< 3	< 28	< 9
	12/01/16 - 12/29/16	< 2	< 2	< 5	< 2	< 5	< 3	< 5	< 11	< 2	< 2	< 20	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-I.4 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-40	01/07/16 - 01/27/16	< 5	< 5	< 9	< 5	< 9	< 6	< 9	< 15	< 4	< 5	< 33	< 9
	02/04/16 - 02/25/16	< 3	< 3	< 8	< 4	< 6	< 3	< 5	< 6	< 3	< 3	< 17	< 6
	03/03/16 - 03/31/16	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 5	< 1	< 2	< 11	< 3
	04/07/16 - 04/28/16	< 3	< 3	< 6	< 3	< 6	< 3	< 6	< 9	< 3	< 3	< 19	< 7
	05/05/16 - 05/26/16	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 23	< 6
	06/02/16 - 06/30/16	< 5	< 7	< 13	< 4	< 11	< 6	< 10	< 15	< 5	< 5	< 41	< 10
	07/07/16 - 07/28/16	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 14	< 2	< 2	< 24	< 8
	08/04/16 - 08/25/16	< 2	< 2	< 5	< 2	< 3	< 2	< 3	< 15	< 2	< 2	< 23	< 7
	09/01/16 - 09/29/16	< 3	< 3	< 7	< 3	< 6	< 3	< 5	< 9	< 3	< 3	< 19	< 6
	10/06/16 - 10/27/16	< 2	< 2	< 5	< 2	< 4	< 3	< 4	< 12	< 2	< 2	< 20	< 7
	11/03/16 - 11/23/16	< 3	< 4	< 9	< 3	< 7	< 3	< 6	< 15	< 3	< 3	< 30	< 9
	12/01/16 - 12/29/16	< 2	< 2	< 6	< 2	< 5	< 3	< 4	< 11	< 2	< 2	< 20	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-55	01/07/16 - 01/27/16	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< **22**	< 1	< 1	< 25	< 8
	02/04/16 - 02/25/16	< 5	< 5	< 11	< 5	< 11	< 5	< 9	< 10	< 5	< 6	< 27	< 9
	03/03/16 - 03/31/16	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 6	< 2	< 2	< 13	< 4
	04/07/16 - 04/28/16	< 4	< 4	< 9	< 4	< 8	< 4	< 7	< 14	< 4	< 4	< 32	< 11
	05/05/16 - 05/26/16	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 21	< 5
	06/02/16 - 06/30/16	< 6	< 6	< 14	< 6	< 11	< 7	< 11	< 15	< 6	< 6	< 36	< 12
	07/07/16 - 07/28/16	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 11	< 2	< 2	< 19	< 5
	08/04/16 - 08/25/16	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 1	< 2	< 21	< 6
	09/01/16 - 09/29/16	< 3	< 3	< 6	< 3	< 6	< 3	< 6	< 11	< 4	< 3	< 22	< 6
	10/06/16 - 10/27/16	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 23	< 8
	11/03/16 - 11/23/16	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 12	< 2	< 2	< 20	< 6
	12/01/16 - 12/29/16	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< **32**	< 1	< 1	< 30	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-56	01/07/16 - 01/27/16	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
	02/04/16 - 02/25/16	< 7	< 6	< 13	< 6	< 13	< 7	< 11	< 12	< 6	< 7	< 34	< 10
	03/03/16 - 03/31/16	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 1	< 2	< 11	< 4
	04/07/16 - 04/28/16	< 5	< 5	< 9	< 4	< 9	< 6	< 9	< 14	< 4	< 5	< 32	< 9
	05/05/16 - 05/26/16	< 2	< 2	< 4	< 2	< 3	< 2	< 4	< 12	< 2	< 2	< 20	< 6
	06/02/16 - 06/30/16	< 5	< 5	< 10	< 4	< 10	< 5	< 8	< 14	< 5	< 5	< 32	< 8
	07/07/16 - 07/28/16	< 0	< 0	< 1	< 0	< 1	< 0	< 1	< 3	< 0	< 0	< 5	< 1
	08/04/16 - 08/25/16	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 15	< 1	< 2	< 22	< 7
	09/01/16 - 09/29/16	< 4	< 4	< 8	< 4	< 8	< 5	< 7	< 12	< 4	< 4	< 28	< 9
	10/06/16 - 10/27/16	< 2	< 2	< 5	< 2	< 4	< 3	< 4	< 12	< 2	< 2	< 20	< 7
	11/03/16 - 11/23/16	< 3	< 3	< 6	< 2	< 6	< 3	< 5	< 13	< 2	< 3	< 23	< 7
	12/01/16 - 12/29/16	< 1	< 2	< 5	< 1	< 2	< 2	< 3	< **62**	< 1	< 1	< 56	< **15**
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-II.1 **CONCENTRATIONS OF GROSS BETA IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/15 - 02/04/16	3.3 ± 1.7
02/04/16 - 03/03/16	< 2.3
03/03/16 - 03/31/16	< 2.6
03/31/16 - 04/28/16	< 2.0
04/28/16 - 06/02/16	3.2 ± 1.6
06/02/16 - 06/30/16	4.3 ± 1.7
06/30/16 - 07/28/16	4.0 ± 1.5
07/28/16 - 09/01/16	3.0 ± 1.5
09/01/16 - 09/29/16	6.4 ± 1.8
09/29/16 - 11/03/16	2.8 ± 1.6
11/03/16 - 12/01/16	3.8 ± 1.7
12/01/16 - 12/29/16	2.3 ± 1.5
MEAN ± 2 STD DEV	3.7 ± 2.4

Table C-II.2 **CONCENTRATIONS OF TRITIUM IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/15 - 02/04/16	< 180
02/04/16 - 03/03/16	< 176
03/03/16 - 03/31/16	< 182
03/31/16 - 04/28/16	410 ± 127
04/28/16 - 06/02/16	300 ± 125
06/02/16 - 06/30/16	378 ± 126
06/30/16 - 07/28/16	491 ± 131
07/28/16 - 09/01/16	411 ± 134
09/01/16 - 09/29/16	555 ± 137
09/29/16 - 11/03/16	< 184
11/03/16 - 12/01/16	320 ± 128
12/01/16 - 12/29/16	1040 ± 170
MEAN ± 2 STD DEV	488 ± 476

Table C-II.3 **CONCENTRATIONS OF I-131 IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-22
12/31/15 - 02/04/16	< 0.5
02/04/16 - 03/03/16	< 0.6
03/03/16 - 03/31/16	< 0.5
03/31/16 - 04/28/16	< 0.6
04/28/16 - 06/02/16	< 0.7
06/02/16 - 06/30/16	< 0.6
06/30/16 - 07/28/16	< 0.6
07/28/16 - 09/01/16	< 0.6
09/01/16 - 09/29/16	< 0.9
09/29/16 - 11/03/16	< 0.4
11/03/16 - 12/01/16	< 0.4
12/01/16 - 12/29/16	< 0.7
MEAN	-

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

Table C-II.4

CONCENTRATIONS OF GAMMA EMITTERS IN PUBLIC WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-22	12/31/15 - 02/04/16	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 3	< 3	< 28	< 7
	02/04/16 - 03/03/16	< 4	< 5	< 9	< 4	< 8	< 5	< 6	< 3	< 4	< 29	< 10
	03/03/16 - 03/31/16	< 5	< 5	< 10	< 4	< 9	< 5	< 9	< 5	< 5	< 30	< 9
	03/31/16 - 04/28/16	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 1	< 1	< 12	< 4
	04/28/16 - 06/02/16	< 4	< 4	< 10	< 4	< 6	< 4	< 7	< 3	< 4	< 33	< 8
	06/02/16 - 06/30/16	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 16	< 5
	06/30/16 - 07/28/16	< 1	< 2	< 3	< 1	< 3	< 2	< 3	< 1	< 1	< 15	< 5
	07/28/16 - 09/01/16	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 19	< 4
	09/01/16 - 09/29/16	< 7	< 8	< 17	< 10	< 17	< 9	< 16	< 8	< 7	< 40	< 11
	09/29/16 - 11/03/16	< 5	< 7	< 13	< 5	< 12	< 7	< 11	< 5	< 7	< 38	< 12
	11/03/16 - 12/01/16	< 6	< 5	< 12	< 5	< 10	< 6	< 12	< 7	< 6	< 37	< 15
	12/01/16 - 12/29/16	< 4	< 4	< 9	< 4	< 7	< 5	< 8	< 4	< 4	< 25	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-III.1 **CONCENTRATIONS OF TRITIUM IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	BD-13	BD-34	BD-35	BD-36	BD-37	BD-50	BD-51	BD-54
01/19/16 - 03/10/17	< 181	< 180	< 181	< 184	< 181	< 182	< 178	< 192
04/14/16 - 04/14/16	< 186	< 186	< 186	< 192	< 188	< 191	< 172	< 170
07/14/16 - 07/14/16	< 168	< 167	< 161	< 168	< 166	< 171	< 168	< 166
10/13/16 - 10/13/16	< 190	< 191	< 193	< 194	< 195	< 192	< 191	< 193
MEAN	-	-	-	-	-	-	-	-

Table C-III.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-13	01/19/16 - 01/19/16	< 7	< 6	< 14	< 6	< 12	< 8	< 11	< 10	< 6	< 6	< 30	< 10
	04/14/16 - 04/14/16	< 8	< 9	< 18	< 6	< 17	< 9	< 14	< 13	< 7	< 8	< 33	< 15
	07/14/16 - 07/14/16	< 5	< 5	< 11	< 4	< 8	< 5	< 8	< 11	< 4	< 4	< 27	< 8
	10/13/16 - 10/13/16	< 3	< 3	< 5	< 3	< 6	< 3	< 5	< 5	< 3	< 3	< 14	< 4
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-34	01/19/16 - 01/19/16	< 7	< 7	< 10	< 9	< 10	< 5	< 12	< 10	< 7	< 7	< 37	< 14
	04/14/16 - 04/14/16	< 6	< 6	< 12	< 7	< 13	< 6	< 11	< 9	< 6	< 7	< 29	< 8
	07/14/16 - 07/14/16	< 6	< 6	< 9	< 6	< 11	< 5	< 10	< 12	< 5	< 5	< 29	< 11
	10/13/16 - 10/13/16	< 8	< 7	< 16	< 9	< 17	< 9	< 13	< 13	< 7	< 6	< 35	< 13
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-35	01/19/16 - 01/19/16	< 8	< 7	< 14	< 7	< 17	< 9	< 15	< 14	< 8	< 7	< 30	< 10
	04/14/16 - 04/14/16	< 5	< 4	< 10	< 6	< 10	< 6	< 11	< 7	< 5	< 5	< 20	< 8
	07/14/16 - 07/14/16	< 9	< 8	< 16	< 8	< 15	< 8	< 14	< 12	< 7	< 8	< 39	< 15
	10/13/16 - 10/13/16	< 6	< 6	< 15	< 9	< 15	< 7	< 13	< 11	< 7	< 8	< 35	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-36	01/19/16 - 01/19/16	< 6	< 8	< 17	< 8	< 16	< 9	< 12	< 14	< 8	< 9	< 38	< 9
	04/14/16 - 04/14/16	< 6	< 6	< 13	< 6	< 13	< 7	< 11	< 12	< 6	< 7	< 31	< 13
	07/14/16 - 07/14/16	< 9	< 8	< 14	< 7	< 16	< 7	< 14	< 13	< 7	< 6	< 36	< 9
	10/13/16 - 10/13/16	< 6	< 6	< 10	< 5	< 14	< 7	< 11	< 10	< 6	< 6	< 29	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-37	01/19/16 - 01/19/16	< 6	< 6	< 10	< 6	< 12	< 7	< 12	< 12	< 5	< 8	< 31	< 13
	04/14/16 - 04/14/16	< 4	< 5	< 11	< 7	< 12	< 5	< 10	< 8	< 6	< 5	< 24	< 9
	07/14/16 - 07/14/16	< 6	< 6	< 13	< 5	< 9	< 6	< 11	< 15	< 5	< 7	< 26	< 10
	10/13/16 - 10/13/16	< 7	< 8	< 16	< 8	< 17	< 8	< 15	< 13	< 8	< 9	< 36	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-III.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-50	01/19/16 - 01/19/16	< 6	< 6	< 13	< 9	< 12	< 9	< 9	< 12	< 7	< 9	< 39	< 10
	04/14/16 - 04/14/16	< 5	< 5	< 9	< 5	< 10	< 4	< 7	< 8	< 5	< 5	< 22	< 7
	07/14/16 - 07/14/16	< 7	< 7	< 11	< 7	< 16	< 6	< 11	< 12	< 6	< 7	< 29	< 12
	10/13/16 - 10/13/16	< 6	< 7	< 17	< 8	< 13	< 9	< 12	< 12	< 7	< 7	< 33	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-51	01/19/16 - 01/19/16	< 8	< 8	< 13	< 7	< 11	< 9	< 11	< 11	< 7	< 8	< 29	< 11
	04/14/16 - 04/14/16	< 4	< 4	< 8	< 4	< 8	< 4	< 7	< 7	< 4	< 4	< 20	< 6
	07/14/16 - 07/14/16	< 5	< 5	< 11	< 5	< 12	< 7	< 10	< 12	< 6	< 6	< 31	< 7
	10/13/16 - 10/13/16	< 8	< 8	< 11	< 6	< 15	< 10	< 15	< 11	< 8	< 8	< 37	< 12
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-54	03/10/16 - 03/10/16	< 8	< 6	< 17	< 7	< 15	< 6	< 11	< 10	< 7	< 8	< 34	< 9
	04/14/16 - 04/14/16	< 6	< 6	< 10	< 5	< 12	< 6	< 10	< 10	< 6	< 5	< 30	< 8
	07/14/16 - 07/14/16	< 7	< 8	< 14	< 7	< 14	< 7	< 12	< 13	< 6	< 7	< 38	< 9
	10/13/16 - 10/13/16	< 6	< 5	< 10	< 7	< 11	< 7	< 10	< 11	< 6	< 5	< 28	< 11
	MEAN *MEAN*	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IV.1

CONCENTRATIONS OF NICKEL-63 AND GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Ni-63	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
BD-25														
Golden Redhorse	05/12/16	< 253	< 55	< 43	< 98	< 44	< 110	< 43	< 94	< 89	< 42	< 50	< 256	< 70
Smallmouth Bass	05/12/16	< 224	< 50	< 48	< 125	< 45	< 120	< 56	< 103	< 107	< 58	< 52	< 307	< 73
Golden Redhorse	10/13/16	< 193	< 71	< 79	< 174	< 78	< 170	< 63	< 123	< 124	< 71	< 73	< 402	< 84
Smallmouth Bass	10/13/16	< 167	< 45	< 49	< 92	< 39	< 98	< 55	< 68	< 75	< 39	< 45	< 200	< 75
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-28														
Golden Redhorse	05/12/16	< 203	< 32	< 37	< 64	< 33	< 58	< 34	< 53	< 56	< 31	< 35	< 153	< 47
Smallmouth Bass	05/12/16	< 193	< 38	< 33	< 66	< 40	< 76	< 37	< 62	< 61	< 34	< 41	< 157	< 50
Golden Redhorse	10/13/16	< 181	< 60	< 60	< 163	< 69	< 113	< 57	< 113	< 96	< 53	< 62	< 263	< 76
Shorthead Redhorse	10/13/16	< 171	< 66	< 63	< 158	< 73	< 137	< 83	< 122	< 119	< 71	< 87	< 341	< 62
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-
BD-41														
Common Carp	05/11/16	< 200	< 42	< 45	< 89	< 45	< 106	< 50	< 72	< 145	< 45	< 41	< 252	< 96
Largemouth Bass	05/11/16	< 204	< 48	< 52	< 100	< 41	< 85	< 49	< 91	< 108	< 46	< 52	< 300	< 98
Common Carp	10/13/16	< 174	< 61	< 50	< 123	< 53	< 149	< 64	< 107	< 96	< 66	< 63	< 281	< 79
Largemouth Bass	10/13/16	< 169	< 53	< 59	< 102	< 54	< 124	< 53	< 90	< 91	< 59	< 54	< 291	< 84
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-	-

Table C-V.1

CONCENTRATIONS OF NICKEL-63 AND GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/KG DRY ± 2 SIGMA

SITE	COLLECTION PERIOD	Ni-63	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-10	05/18/16	< 206	< 105	< 107	< 181	< 109	< 278	< 135	< 201	< 106	< 158	< 541	< 164
	10/13/16	< 207	< 71	< 67	< 104	< 72	< 156	< 80	< 144	< 57	132 ± 53	< 322	< 83
	MEAN	-	-	-	-	-	-	-	-	-	132 ± 0	-	-
BD-25	05/18/16	< 195	< 94	< 88	< 182	< 87	< 180	< 95	< 170	< 86	< 99	< 389	< 134
	10/13/16	< 212	< 65	< 58	< 181	< 40	< 120	< 78	< 122	< 52	< 85	< 256	< 71
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-57	05/18/16	< 220	< 160	< 125	< 418	< 97	< 333	< 156	< 332	< 97	< 179	< 1977	< 459
	10/13/16	< 201	< 96	< 100	< 170	< 89	< 229	< 108	< 170	< 104	126 ± 79	< 452	< 154
	MEAN	-	-	-	-	-	-	-	-	-	126 ± 0	-	-
BD-SPOIL-1	04/07/16	< 242	< 55	< 57	< 149	< 59	< 131	< 67	< 111	< 45	< 66	< 441	< 180
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-SPOIL-2	05/18/16	< 242	< 50	< 65	< 173	< 58	< 134	< 76	< 134	< 58	< 67	< 550	< 161
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-SPOIL-3	05/18/16	< 225	< 63	< 69	< 196	< 62	< 188	< 102	< 148	< 66	< 87	< 695	< 89
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
BD-SPOIL-4	05/18/16	< 242	< 54	< 68	< 174	< 54	< 131	< 79	< 137	< 58	< 65	< 606	< 137
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-VI.1

CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

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

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

THE MEAN AND TWO STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES
(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VI.2 **MONTHLY AND YEARLY VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

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

GROUP I - NEAR FIELD LOCATIONS				GROUP II - FAR FIELD LOCATIONS				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
12/31/15 - 02/04/16	15	27	21 ± 7	12/31/15 - 02/04/16	17	30	22 ± 7	12/31/15 - 02/04/16	18	29	22 ± 8
02/04/16 - 03/03/16	6	23	15 ± 8	02/04/16 - 03/03/16	10	22	15 ± 7	02/04/16 - 03/03/16	9	21	15 ± 10
03/03/16 - 03/31/16	7	19	13 ± 7	03/03/16 - 03/31/16	10	17	13 ± 5	03/03/16 - 03/31/16	9	16	11 ± 6
03/31/16 - 04/28/16	8	21	14 ± 7	03/31/16 - 04/28/16	9	22	16 ± 9	04/14/16 - 04/28/16	17	17	17 ± 1
04/28/16 - 06/02/16	8	21	14 ± 7	04/28/16 - 06/02/16	6	22	13 ± 8	04/28/16 - 06/02/16	6	19	13 ± 9
06/02/16 - 06/30/16	10	20	16 ± 6	06/02/16 - 06/30/16	9	20	15 ± 7	06/02/16 - 06/30/16	10	21	15 ± 10
06/30/16 - 08/04/16	9	28	16 ± 9	06/30/16 - 08/04/16	12	23	16 ± 6	06/30/16 - 08/04/16	12	23	17 ± 7
08/04/16 - 09/01/16	12	22	16 ± 7	08/04/16 - 09/01/16	10	24	16 ± 9	08/04/16 - 09/01/16	13	22	17 ± 8
09/01/16 - 09/29/16	10	25	18 ± 11	09/01/16 - 09/29/16	10	27	18 ± 12	09/01/16 - 09/29/16	13	24	18 ± 11
09/29/16 - 11/03/16	9	25	16 ± 11	09/29/16 - 11/03/16	8	24	16 ± 9	09/29/16 - 11/03/16	10	19	14 ± 8
11/03/16 - 12/01/16	14	38	23 ± 15	11/03/16 - 12/01/16	13	36	23 ± 15	11/03/16 - 11/10/16	24	24	24 ± 0
12/01/16 - 12/29/16	10	38	21 ± 15	12/01/16 - 12/29/16	9	28	20 ± 14	12/01/16 - 12/29/16	9	28	19 ± 16
12/31/15 - 12/29/16	6	38	17 ± 11	12/31/15 - 12/29/16	6	36	17 ± 11	12/31/15 - 12/29/16	6	29	16 ± 10

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

Table C-VI.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

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

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-02	12/31/15 - 03/31/16	< 4	< 6	< 16	< 4	< 9	< 6	< 9	< 4	< 3	< 147	< 43
	03/31/16 - 06/30/16	< 3	< 6	< 11	< 4	< 11	< 5	< 9	< 4	< 5	< 46	< 16
	06/30/16 - 09/29/16	< 3	< 3	< 6	< 4	< 8	< 3	< 4	< 4	< 3	< 13	< 7
	09/29/16 - 12/29/16	< 2	< 2	< 5	< 3	< 6	< 2	< 5	< 2	< 1	< 14	< 4
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-03	12/31/15 - 03/31/16	< 2	< 3	< 8	< 3	< 3	< 4	< 5	< 2	< 3	< 76	< 39
	03/31/16 - 06/30/16	< 4	< 4	< 9	< 3	< 6	< 4	< 6	< 3	< 4	< 36	< 15
	06/30/16 - 09/29/16	< 2	< 2	< 6	< 1	< 5	< 2	< 3	< 2	< 2	< 9	< 4
	09/29/16 - 12/29/16	< 3	< 3	< 6	< 2	< 7	< 4	< 5	< 3	< 2	< 16	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-04	12/31/15 - 03/31/16	< 3	< 4	< 15	< 3	< 7	< 5	< 9	< 4	< 4	< 110	< 41
	03/31/16 - 06/30/16	< 3	< 4	< 6	< 4	< 6	< 3	< 8	< 4	< 3	< 37	< 12
	06/30/16 - 09/29/16	< 2	< 2	< 5	< 3	< 6	< 2	< 4	< 3	< 2	< 10	< 3
	09/29/16 - 12/29/16	< 3	< 3	< 10	< 4	< 7	< 4	< 7	< 3	< 4	< 18	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-05	12/31/15 - 03/31/16	< 3	< 4	< 8	< 3	< 6	< 4	< 7	< 3	< 2	< 67	< 26
	03/31/16 - 06/30/16	< 3	< 3	< 6	< 4	< 5	< 4	< 6	< 2	< 3	< 36	< 11
	06/30/16 - 09/29/16	< 2	< 2	< 5	< 3	< 6	< 2	< 2	< 2	< 2	< 8	< 3
	09/29/16 - 12/29/16	< 2	< 2	< 5	< 3	< 5	< 3	< 5	< 2	< 3	< 17	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-06	12/31/15 - 03/31/16	< 2	< 2	< 7	< 2	< 4	< 3	< 4	< 2	< 2	< 61	< 20
	03/31/16 - 06/30/16	< 4	< 4	< 11	< 3	< 8	< 4	< 4	< 4	< 3	< 47	< 14
	06/30/16 - 09/29/16	< 3	< 4	< 7	< 5	< 10	< 4	< 6	< 4	< 3	< 16	< 5
	09/29/16 - 12/29/16	< 2	< 1	< 6	< 3	< 4	< 2	< 4	< 2	< 2	< 13	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VI.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

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

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-19	12/31/15 - 03/31/16	< 2	< 3	< 7	< 4	< 6	< 3	< 4	< 2	< 2	< 71	< 27
	03/31/16 - 06/30/16	< 3	< 3	< 9	< 3	< 6	< 4	< 7	< 3	< 3	< 34	< 12
	06/30/16 - 09/29/16	< 2	< 2	< 4	< 1	< 5	< 2	< 3	< 3	< 2	< 9	< 2
	09/29/16 - 12/29/16	< 4	< 3	< 9	< 4	< 10	< 5	< 7	< 4	< 4	< 21	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-20	12/31/15 - 03/31/16	< 3	< 4	< 11	< 3	< 6	< 4	< 8	< 3	< 2	< 76	< 30
	03/31/16 - 06/30/16	< 3	< 4	< 9	< 3	< 7	< 3	< 7	< 4	< 3	< 42	< 14
	06/30/16 - 09/29/16	< 4	< 3	< 6	< 3	< 7	< 3	< 5	< 3	< 3	< 14	< 4
	09/29/16 - 12/29/16	< 2	< 2	< 6	< 2	< 4	< 2	< 4	< 2	< 2	< 10	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-21	12/31/15 - 03/31/16	< 3	< 3	< 8	< 3	< 6	< 3	< 5	< 3	< 2	< 65	< 32
	03/31/16 - 06/30/16	< 3	< 3	< 8	< 3	< 9	< 3	< 6	< 2	< 3	< 30	< 9
	06/30/16 - 09/29/16	< 2	< 2	< 6	< 3	< 6	< 2	< 4	< 2	< 2	< 11	< 4
	09/29/16 - 12/29/16	< 2	< 3	< 4	< 2	< 6	< 3	< 4	< 2	< 2	< 14	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VII.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

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

COLLECTION PERIOD	GROUP I - NEAR FIELD				GROUP II - FAR FIELD			GROUP III - CONTROL
	BD-06	BD-19	BD-20	BD-21	BD-02	BD-04	BD-05	BD-03
12/31/15 - 01/07/16	< 65	< 63	< 63	< 65	< 38	< 39	< 39	< 20
01/07/16 - 01/14/16	< 26	< 51	< 51	< 51	< 65	< 65	< 65	< 63
01/14/16 - 01/21/16	< 50	< 52	< 53	< 52	< 50	< 51	< 51	< 20
01/21/16 - 01/27/16	< 59	< 60	< 60	< 60	< 51	< 53	< 53	< 49
01/27/16 - 02/04/16	< 36	< 36	< 36	< 36	< 52	< 54	< 54	< 50
02/04/16 - 02/10/16	< 65	< 65	< 65	< 65	< 37	< 38	< 38	< 36
02/10/16 - 02/18/16	< 51	< 51	< 51	< 53	< 25	< 47	< 47	< 46
02/18/16 - 02/25/16	< 68	< 68	< 68	< 68	< 34	< 36	< 36	< 33
02/25/16 - 03/03/16	< 50	< 50	< 50	< 50	< 55	< 57	< 57	< 53
03/03/16 - 03/10/16	< 21	< 21	< 21	< 21	< 22	< 22	< 22	< 22
03/10/16 - 03/17/16	< 28	< 28	< 28	< 28	< 38	< 39	< 39	< 37
03/17/16 - 03/25/16	< 44	< 44	< 42	< 44	< 34	< 34	< 35	< 33
03/25/16 - 03/31/16	< 39	< 38	< 38	< 39	< 29	< 29	< 27	< 27
03/31/16 - 04/07/16	< 17	< 65	< 26	< 69	< 8	< 17	< 16	< 55
04/07/16 - 04/14/16	< 37	< 69	< 66	< 68	< 37	< 39	< 37	*(1)*
04/14/16 - 04/21/16	< 63	< 62	< 65	< 62	< 36	< 40	< 36	< 35
04/21/16 - 04/28/16	< 46	< 46	< 46	< 45	< 40	< 41	< 41	< 38
04/28/16 - 05/05/16	< 44	< 18	< 45	< 46	< 33	< 34	< 34	< 33
05/05/16 - 05/12/16	< 62	< 61	< 62	< 61	< 41	< 41	< 39	< 15
05/12/16 - 05/19/16	< 60	< 66	< 66	< 64	< 68	< 68	< 62	< 26
05/19/16 - 05/26/16	< 50	< 67	< 50	< 50	< 53	< 66	< 67	< 66
05/26/16 - 06/02/16	< 65	< 66	< 67	< 67	< 63	< 20	< 60	< 58
06/02/16 - 06/09/16	< 56	< 56	< 58	< 58	< 69	< 67	< 67	< 64
06/09/16 - 06/16/16	< 55	< 54	< 54	< 54	< 41	< 41	< 39	< 16
06/16/16 - 06/23/16	< 43	< 43	< 44	< 44	< 67	< 67	< 65	< 28
06/23/16 - 06/30/16	< 42	< 43	< 41	< 42	< 57	< 59	< 55	< 55
06/30/16 - 07/07/16	< 39	< 39	< 39	< 39	< 56	< 56	< 55	< 56
07/07/16 - 07/14/16	< 59	< 60	< 56	< 59	< 54	< 54	< 52	< 53
07/14/16 - 07/21/16	< 65	< 68	< 64	< 69	< 67	< 68	< 61	< 25
07/21/16 - 07/28/16	< 62	< 63	< 59	< 62	< 64	< 65	< 23	< 61
07/28/16 - 08/04/16	< 65	< 68	< 64	< 66	< 51	< 51	< 49	< 50
08/04/16 - 08/11/16	< 57	< 57	< 55	< 57	< 40	< 40	< 15	< 39
08/11/16 - 08/18/16	< 62	< 63	< 30	< 62	< 48	< 46	< 59	< 46
08/18/16 - 08/25/16	< 57	< 55	< 53	< 54	< 66	< 64	< 61	< 63
08/25/16 - 09/01/16	< 52	< 54	< 52	< 56	< 64	< 65	< 32	< 66
09/01/16 - 09/08/16	< 44	< 43	< 40	< 42	< 65	< 67	< 63	< 63
09/08/16 - 09/15/16	< 40	< 40	< 37	< 41	< 55	< 56	< 53	< 53
09/15/16 - 09/22/16	< 46	< 48	< 45	< 47	< 54	< 54	< 52	< 52
09/22/16 - 09/29/16	< 46	< 44	< 43	< 43	< 46	< 43	< 44	< 44
09/29/16 - 10/06/16	< 52	< 56	< 52	< 57	< 62	< 62	< 57	< 58
10/06/16 - 10/13/16	< 32	< 33	< 30	< 33	< 36	< 33	< 32	< 32
10/13/16 - 10/20/16	< 50	< 50	< 48	< 49	< 52	< 54	< 53	< 54
10/20/16 - 10/27/16	< 53	< 53	< 51	< 54	< 56	< 56	< 22	< 64
10/27/16 - 11/03/16	< 54	< 55	< 23	< 56	< 66	< 63	< 22	< 64
11/03/16 - 11/10/16	< 45	< 44	< 43	< 45	< 46	< 47	< 18	< 44
11/10/16 - 11/17/16	< 29	< 29	< 28	< 29	< 28	< 28	< 27	*(1)*
11/17/16 - 11/23/16	< 53	< 64	< 62	< 65	< 53	< 53	< 51	*(1)*
11/23/16 - 12/01/16	< 49	< 38	< 36	< 15	< 51	< 50	< 50	*(1)*
12/01/16 - 12/08/16	< 36	< 35	< 34	< 36	< 13	< 12	< 11	< 13
12/08/16 - 12/15/16	< 25	< 25	< 24	< 26	< 29	< 29	< 27	< 28
12/15/16 - 12/22/16	< 25	< 35	< 25	< 25	< 38	< 39	< 35	< 36
12/22/16 - 12/29/16	< 45	< 24	< 44	< 47	< 60	< 58	< 24	< 58
MEAN	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VIII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	INDICATOR FARM BD-17	CONTROL FARM BD-18	
01/07/16	< 0.88	< 49.3	*(1)*
02/04/16	< 0.5	< 0.52	
03/03/16	< 0.5	< 0.67	
04/07/16	< 0.4	< 0.73	
05/04/16		< 0.46	
05/05/16	< 0.6		
05/16/16		< 0.67	
05/19/16	< 0.5		
06/02/16	< 0.7	< 0.89	
06/16/16	< 0.8	< 0.83	
06/29/16		< 0.37	
06/30/16	< 0.4		
07/13/16		< 0.73	
07/14/16	< 0.9		
07/28/16	< 0.7	< 0.81	
08/10/17		< 0.74	
08/11/16	< 0.4		
08/24/17		< 0.67	
08/25/16	< 0.8		
09/08/16	< 0.4	< 0.36	
09/22/16	< 0.7	< 0.55	
10/06/16	< 0.9	< 0.9	
10/20/16	< 0.6	< 0.73	
11/02/16		< 0.83	
11/03/16	< 0.8		
11/30/17		< 0.7	
12/01/16	< 0.8		
MEAN	-	-	

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VIII.2

CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-17	01/07/16	< 7	< 8	< 27	< 13	< 22	< 9	< 20	< 8	< 9	< 46	< 15
	02/04/16	< 7	< 8	< 12	< 8	< 16	< 8	< 12	< 7	< 8	< 32	< 11
	03/03/16	< 8	< 7	< 15	< 8	< 18	< 7	< 13	< 7	< 7	< 33	< 10
	04/07/16	< 10	< 9	< 23	< 10	< 22	< 11	< 15	< 9	< 8	< 44	< 12
	05/05/16	< 7	< 8	< 19	< 9	< 16	< 8	< 14	< 6	< 7	< 34	< 10
	05/19/16	< 6	< 6	< 17	< 6	< 14	< 6	< 11	< 5	< 6	< 49	< 14
	06/02/16	< 5	< 6	< 13	< 6	< 12	< 7	< 11	< 5	< 5	< 35	< 10
	06/16/16	< 8	< 8	< 17	< 9	< 14	< 6	< 11	< 7	< 8	< 38	< 10
	06/30/16	< 11	< 9	< 25	< 10	< 21	< 10	< 15	< 10	< 9	< 56	< 10
	07/14/16	< 9	< 9	< 23	< 8	< 20	< 8	< 14	< 9	< 11	< 41	< 8
	07/28/16	< 8	< 8	< 20	< 7	< 19	< 9	< 16	< 6	< 8	< 52	< 14
	08/11/16	< 7	< 7	< 15	< 8	< 16	< 8	< 11	< 6	< 6	< 29	< 8
	08/25/16	< 8	< 7	< 14	< 8	< 18	< 7	< 15	< 8	< 8	< 41	< 14
	09/08/16	< 8	< 9	< 20	< 9	< 23	< 9	< 18	< 10	< 9	< 44	< 10
	09/22/16	< 8	< 6	< 17	< 6	< 16	< 7	< 12	< 8	< 6	< 32	< 9
	10/06/16	< 7	< 7	< 18	< 8	< 16	< 9	< 15	< 6	< 8	< 36	< 8
	10/20/16	< 5	< 7	< 16	< 6	< 14	< 7	< 12	< 5	< 7	< 55	< 14
	11/03/16	< 6	< 8	< 15	< 8	< 19	< 8	< 14	< 8	< 7	< 35	< 10
	12/01/16	< 7	< 7	< 15	< 6	< 16	< 7	< 12	< 7	< 8	< 32	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-18	01/07/16	< 41	< 33	< 92	< 56	< 95	< 37	< 62	< 30	< 40	< 177	< 57 *(1)*
	02/04/16	< 7	< 6	< 20	< 7	< 18	< 7	< 12	< 6	< 8	< 34	< 11
	03/03/16	< 9	< 9	< 20	< 9	< 18	< 8	< 16	< 7	< 9	< 41	< 14
	04/07/16	< 9	< 9	< 20	< 4	< 21	< 9	< 17	< 9	< 8	< 43	< 13
	05/04/16	< 7	< 8	< 15	< 7	< 16	< 8	< 12	< 7	< 8	< 31	< 6
	05/16/16	< 4	< 5	< 12	< 5	< 10	< 5	< 9	< 3	< 5	< 53	< 14
	06/02/16	< 5	< 7	< 13	< 6	< 14	< 6	< 12	< 6	< 6	< 37	< 10
	06/16/16	< 10	< 12	< 23	< 12	< 26	< 12	< 18	< 10	< 9	< 47	< 15
	06/29/16	< 7	< 9	< 16	< 9	< 13	< 6	< 11	< 7	< 7	< 45	< 13
	07/13/16	< 7	< 8	< 17	< 8	< 18	< 7	< 10	< 8	< 9	< 46	< 12
	07/28/16	< 6	< 6	< 14	< 6	< 12	< 8	< 12	< 6	< 7	< 37	< 13
	08/10/16	< 6	< 8	< 15	< 6	< 16	< 7	< 12	< 7	< 7	< 35	< 9
	08/24/16	< 6	< 7	< 16	< 6	< 14	< 8	< 12	< 7	< 8	< 38	< 11
	09/08/16	< 7	< 8	< 19	< 7	< 16	< 6	< 10	< 6	< 8	< 31	< 10
	09/22/16	< 7	< 9	< 15	< 9	< 18	< 7	< 14	< 6	< 9	< 32	< 10
	10/06/16	< 8	< 7	< 19	< 8	< 20	< 9	< 16	< 8	< 8	< 34	< 10
	10/20/16	< 5	< 6	< 14	< 5	< 12	< 6	< 10	< 5	< 5	< 47	< 15
	11/02/16	< 7	< 8	< 17	< 7	< 14	< 7	< 12	< 7	< 8	< 30	< 11
	11/30/16	< 7	< 5	< 15	< 6	< 15	< 7	< 10	< 5	< 5	< 31	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-IX.1

CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	Cs-134	Cs-137	Ba-140	La-140
BD-CONTROL												
Cabbage	08/25/16	< 17	< 14	< 37	< 16	< 43	< 18	< 30	< 17	< 18	< 84	< 25
Radishes	08/25/16	< 15	< 15	< 29	< 13	< 28	< 15	< 25	< 13	< 14	< 119	< 28
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 1												
Clark Farm Broccoli	08/04/16	< 18	< 19	< 38	< 19	< 46	< 19	< 33	< 16	< 19	< 117	< 28
Clark Farm Cabbage	08/04/16	< 22	< 23	< 50	< 24	< 51	< 25	< 43	< 23	< 25	< 146	< 46
Clark Farm Radishes	08/04/16	< 26	< 28	< 61	< 25	< 56	< 29	< 45	< 26	< 23	< 150	< 44
Cabbage	09/29/16	< 29	< 34	< 62	< 35	< 76	< 47	< 57	< 32	< 32	< 165	< 54
Kohlrabi	09/29/16	< 25	< 23	< 39	< 32	< 65	< 36	< 40	< 28	< 27	< 133	< 33
Red chard	09/29/16	< 28	< 28	< 59	< 21	< 70	< 39	< 47	< 32	< 29	< 135	< 32
Cabbage	10/06/16	< 22	< 22	< 41	< 21	< 39	< 31	< 43	< 23	< 30	< 96	< 33
Turnip greens	10/06/16	< 29	< 30	< 59	< 25	< 63	< 35	< 47	< 29	< 33	< 140	< 36
Yellow Swiss chard	10/06/16	< 32	< 31	< 61	< 35	< 74	< 35	< 50	< 27	< 34	< 120	< 42
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 2												
Cabbage	07/14/16	< 17	< 16	< 39	< 17	< 37	< 17	< 26	< 15	< 15	< 81	< 21
Beets	08/04/16	< 8	< 8	< 20	< 8	< 19	< 8	< 16	< 8	< 9	< 51	< 13
Onions	08/04/16	< 10	< 10	< 21	< 9	< 20	< 11	< 18	< 11	< 11	< 63	< 16
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 3												
Cabbage	07/14/16	< 29	< 25	< 44	< 20	< 56	< 24	< 41	< 19	< 24	< 138	< 52
Onions	07/14/16	< 37	< 50	< 86	< 24	< 94	< 42	< 75	< 29	< 45	< 145	< 68
	MEAN	-	-	-	-	-	-	-	-	-	-	-
BD-QUAD 4												
Beets	08/25/16	< 8	< 8	< 18	< 10	< 15	< 9	< 17	< 8	< 8	< 68	< 19
Cabbage	08/25/16	< 21	< 14	< 48	< 24	< 52	< 23	< 31	< 22	< 19	< 101	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-X.1 **QUARTERLY OSLD RESULTS FOR BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
BD-02-1	20.4 ± 3.0	20.0	20.7	18.7	22.3
BD-02-2	20.5 ± 2.7	19.7	20.0	19.7	22.5
BD-03-1	21.1 ± 1.6	20.9	22.2	20.4	20.7
BD-03-2	20.5 ± 1.7	20.3	19.4	21.0	21.3
BD-04-1	20.0 ± 3.0	19.9	18.9	19.1	22.2
BD-04-2	19.7 ± 1.4	19.3	20.7	19.2	19.6
BD-05-1	21.2 ± 2.8	21.0	20.0	20.6	23.2
BD-05-2	21.3 ± 1.9	20.5	20.7	21.4	22.6
BD-06-1	20.2 ± 1.7	19.5	21.2	19.5	20.7
BD-06-2	19.9 ± 2.0	18.9	19.7	19.8	21.3
BD-19-1	21.3 ± 2.0	20.7	21.1	20.7	22.8
BD-19-2	21.1 ± 2.3	20.9	21.2	19.8	22.6
BD-20-1	20.2 ± 3.0	19.0	21.7	18.9	21.3
BD-20-2	21.4 ± 5.0	20.5	24.7	18.7	21.6
BD-21-1	20.5 ± 2.9	20.7	19.1	19.7	22.4
BD-21-2	21.5 ± 3.4	20.1	23.5	20.1	22.4
BD-101-3	19.8 ± 2.5	19.3	21.6	18.7	19.4
BD-101-4	20.3 ± 2.4	20.1	21.6	18.7	20.7
BD-102-1	18.9 ± 1.0	19.6	18.5	18.9	18.6
BD-102-2	21.4 ± 2.9	21.9	21.7	19.3	22.6
BD-103-1	19.9 ± 2.5	18.4	20.0	19.7	21.5
BD-103-2	20.7 ± 1.2	21.0	20.6	19.8	21.2
BD-104-1	19.6 ± 0.7	19.4	19.3	20.1	19.4
BD-104-2	19.9 ± 1.2	19.9	19.8	19.3	20.7
BD-104-3	24.9 ± 3.5	24.2	24.9	23.1	27.2
BD-104-4	25.5 ± 3.5	23.4	27.5	24.9	26.0
BD-105-1	19.6 ± 3.1	18.6	21.8	18.5	19.6
BD-105-2	19.7 ± 1.4	20.5	19.5	19.9	18.8
BD-105-3	26.5 ± 5.2	22.8	28.0	26.6	28.6
BD-105-4	31.2 ± 9.5	24.3	32.1	33.4	35.0
BD-106-1	19.1 ± 2.8	19.9	19.2	17.1	20.3
BD-106-2	19.4 ± 3.8	18.3	21.7	17.4	20.0
BD-107-1	20.7 ± 1.7	20.0	20.8	20.2	21.9
BD-107-2	19.3 ± 1.9	19.9	20.0	18.0	19.1
BD-108-1	20.0 ± 2.6	21.1	*(1)*	18.6	20.3
BD-108-2	20.4 ± 2.2	19.1	20.4	20.2	21.8
BD-109-1	22.9 ± 3.6	23.4	24.4	20.3	23.4
BD-109-2	23.4 ± 2.5	24.4	23.8	21.6	23.9
BD-110-1	18.5 ± 2.5	18.4	18.7	16.9	19.9
BD-110-2	19.4 ± 2.7	19.4	20.4	17.4	20.2
BD-110-3	21.7 ± 2.0	20.3	22.5	21.5	22.3
BD-110-4	26.4 ± 3.9	25.0	27.2	24.6	28.7
BD-112-1	18.9 ± 1.7	18.7	18.9	18.0	20.1
BD-112-2	19.6 ± 2.5	20.2	18.9	18.3	21.1
BD-114-1	21.1 ± 5.3	20.0	24.6	18.4	21.3
BD-114-2	20.0 ± 1.6	20.0	20.0	19.1	21.0
BD-115-1	20.2 ± 2.9	20.1	19.2	19.3	22.3
BD-115-2	20.7 ± 1.9	20.5	21.5	19.4	21.2
BD-116-1	20.7 ± 2.4	20.4	20.7	19.3	22.2
BD-116-2	20.4 ± 1.4	20.3	20.8	19.5	21.1
BD-201-1	24.3 ± 5.0	24.7	20.9	24.7	26.9
BD-201-2	22.3 ± 1.9	22.1	21.8	21.5	23.6
BD-202-1	20.8 ± 1.7	19.6	20.9	21.3	21.5
BD-202-2	19.9 ± 2.9	18.4	21.0	18.9	21.2
BD-203-1	21.0 ± 2.5	20.1	22.4	*(1)*	20.5
BD-203-2	19.2 ± 2.6	18.8	20.7	17.7	19.7

Table C-X.1 **QUARTERLY OSLD RESULTS FOR BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
BD-204-1	18.7 ± 3.2	18.5	20.0	16.5	19.8
BD-204-2	19.8 ± 1.5	20.0	19.7	18.9	20.7
BD-205-1	19.6 ± 2.3	19.4	19.8	18.2	21.0
BD-205-2	19.6 ± 3.1	20.0	18.8	17.9	21.5
BD-206-1	20.1 ± 3.6	20.3	20.5	17.6	21.9
BD-206-2	21.4 ± 2.0	22.0	20.5	20.5	22.4
BD-207-1	19.0 ± 1.9	19.7	19.8	17.8	18.5
BD-207-2	19.6 ± 1.8	19.2	20.5	18.6	20.2
BD-208-1	19.4 ± 1.7	19.4	20.4	18.3	19.5
BD-208-2	20.6 ± 1.1	20.3	20.3	20.2	21.4
BD-209-1	23.3 ± 2.2	23.0	23.4	22.1	24.7
BD-209-2	24.9 ± 2.7	24.0	25.5	23.5	26.4
BD-210-1	22.8 ± 3.5	23.1	20.7	22.6	24.9
BD-210-2	20.8 ± 1.9	19.9	21.5	20.1	21.8
BD-211-1	25.1 ± 1.7	24.7	25.3	24.2	26.2
BD-211-2	24.3 ± 5.1	23.8	24.6	21.3	27.5
BD-212-3	19.9 ± 1.4	20.3	20.6	19.8	19.0
BD-212-4	24.2 ± 3.0	22.9	24.3	23.3	26.3
BD-213-3	19.0 ± 2.8	18.7	20.7	17.3	19.3
BD-213-4	19.5 ± 3.7	18.7	20.3	17.4	21.6
BD-214-1	19.5 ± 2.7	18.0	21.1	18.9	20.0
BD-214-2	23.2 ± 1.0	22.6	23.8	23.0	23.3
BD-215-1	20.4 ± 1.8	19.8	21.4	19.4	20.8
BD-215-2	19.4 ± 3.0	18.1	19.5	18.5	21.5
BD-216-1	22.5 ± 2.4	21.4	23.1	21.7	23.9
BD-216-2	21.9 ± 2.0	22.4	23	21.2	20.8
BD-111A-1	19.1 ± 1.2	18.4	18.9	19.7	19.5
BD-111A-2	20.2 ± 2.5	18.8	20.3	19.7	21.8
BD-113A-1	20.6 ± 5.4	19.2	24.6	18.7	19.9
BD-113A-2	20.6 ± 2.0	19.8	21.5	19.6	21.4

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-X.2 **MEAN QUARTLY OSLD RESULTS FOR THE SITE BOUNDARY, INTERMEDIATE DISTANCE, OTHER, CONTROL AND ISFSI LOCATIONS FOR BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATION OF THE STATION DATA

COLLECTION PERIOD	SITE BOUNDARY ± 2 S.D.	INTERMEDIATE DIST ± 2 S.D.	OTHER ± 2 S.D.	CONTROL ± 2 S.D.	ISFSI ± 2 S.D.
JAN-MAR	20.0 ± 2.7	20.7 ± 4.0	20.1 ± 1.4	20.6 ± 0.8	23.3 ± 3.3
APR-JUN	20.8 ± 3.4	21.5 ± 3.5	20.9 ± 3.2	20.8 ± 4.0	27.0 ± 6.4
JUL-SEP	19.1 ± 2.1	20.1 ± 4.5	19.7 ± 1.6	20.7 ± 0.8	25.7 ± 8.3
OCT-DEC	20.8 ± 2.6	22.1 ± 5.0	22.0 ± 1.9	21.0 ± 0.8	28.0 ± 8.3

TABLE C-X.3 **SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATION

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
SITE BOUNDARY	127	16.9	24.6	20.1 ± 3.1
INTERMEDIATE DISTANCE	127	16.5	27.5	21.1 ± 4.5
OTHER	56	18.7	24.7	20.7 ± 2.7
CONTROL	8	19.4	22.2	20.8 ± 1.6
ISFSI	24	20.3	35.0	26.0 ± 7.4

SITE BOUNDARY STATIONS - BD-101-3, BD-101-4, BD-102-1, BD-102-2, BD-103-1, BD-103-2, BD-104-1, BD-104-2, BD-105-1, BD-105-2, BD-106-1, BD-106-2, BD-107-1, BD-107-2, BD-108-1, BD-108-2, BD-109-1, BD-109-2, BD-110-1, BD-110-2, BD-111A-1, BD-111A-2, BD-112-1, BD-112-2, BD-113A-1, BD-113A-2, BD-114-1, BD-114-2, BD-115-1, BD-115-2, BD-116-1, BD-116-2

INTERMEDIATE DISTANCE STATIONS - BD-201-1, BD-201-2, BD-202-1, BD-202-2, BD-203-1, BD-203-2, BD-204-1, BD-204-2, BD-205-1, BD-205-2, BD-206-1, BD-206-2, BD-207-1, BD-207-2, BD-208-1, BD-208-2, BD-209-1, BD-209-2, BD-210-1, BD-210-2, BD-211-1, BD-211-2, BD-212-3, BD-212-4, BD-213-3, BD-213-4, BD-214-1, BD-214-2, BD-215-1, BD-215-2, BD-216-1, BD-216-2

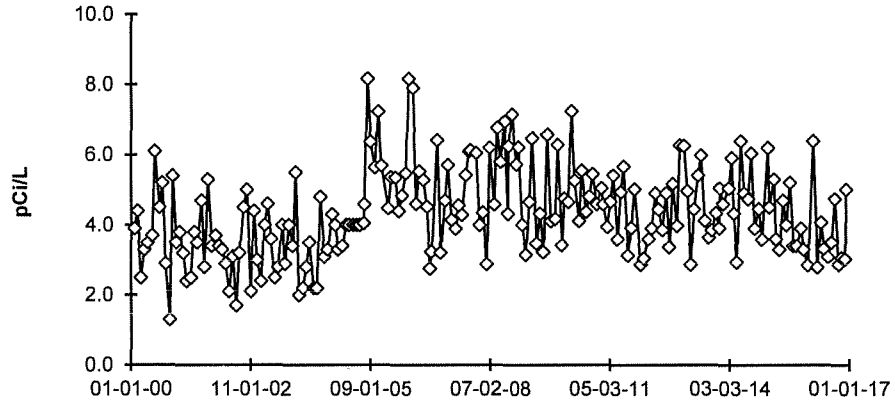
OTHER STATIONS - BD-02-1, BD-02-2, BD-04-1, BD-04-2, BD-05-1, BD-05-2, BD-06-1, BD-06-2, BD-19-1, BD-19-2, BD-20-1, BD-20-2, BD-21-1, BD-21-2

CONTROL STATIONS - BD-03-1, BD-03-2

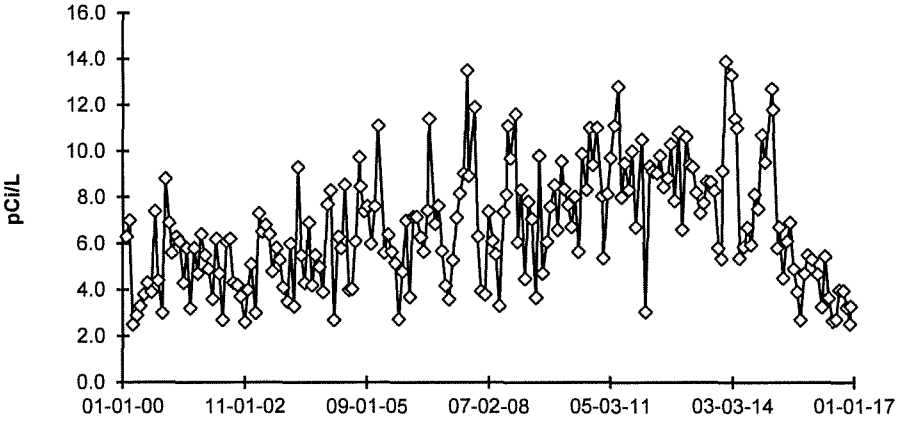
ISFSI STATIONS - BD-104-3, BD-104-4, BD-105-3, BD-105-4, BD-110-3, BD-110-4

FIGURE C-1
Surface Water - Gross Beta - Stations BD-10 and BD-25 (C) Collected in the Vicinity of Braidwood Station, 2000 - 2016

BD-10 Kankaee River, Downstream



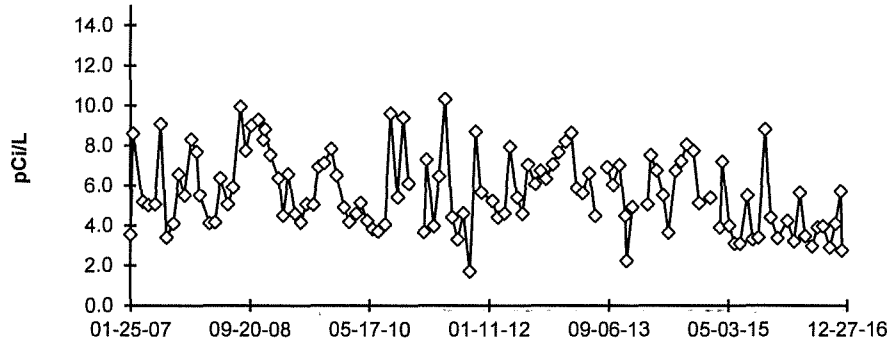
BD-25 (C) Kankakee River, Upstream



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

FIGURE C-2
Surface Water - Gross Beta - Stations BD-38 and BD-40 Collected in the Vicinity of Braidwood Station, 2007 - 2016

BD-38 Main Drainage Ditch



BD-40 Braidwood Station Cooling Lake

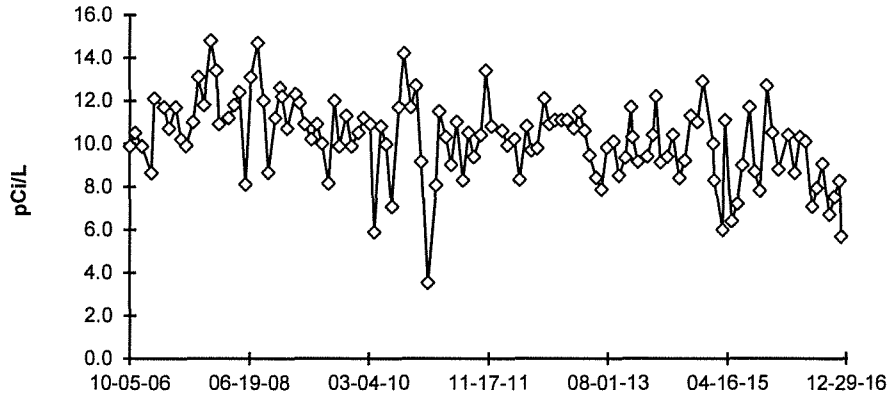
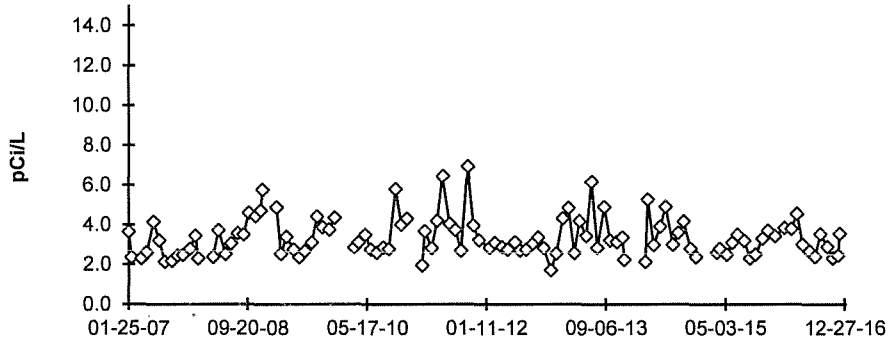
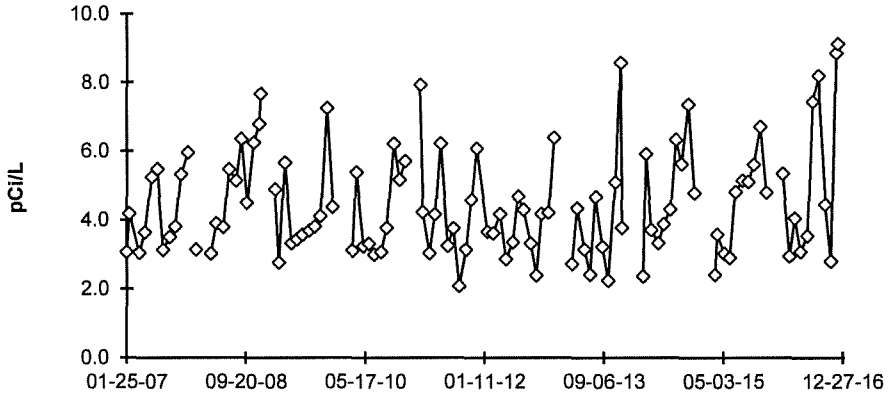


FIGURE C-3
Surface Water - Gross Beta - Stations BD-55 and BD-56 Collected in the Vicinity of Braidwood Station, 2007 - 2016

BD-55 North Pond Fatlan Site



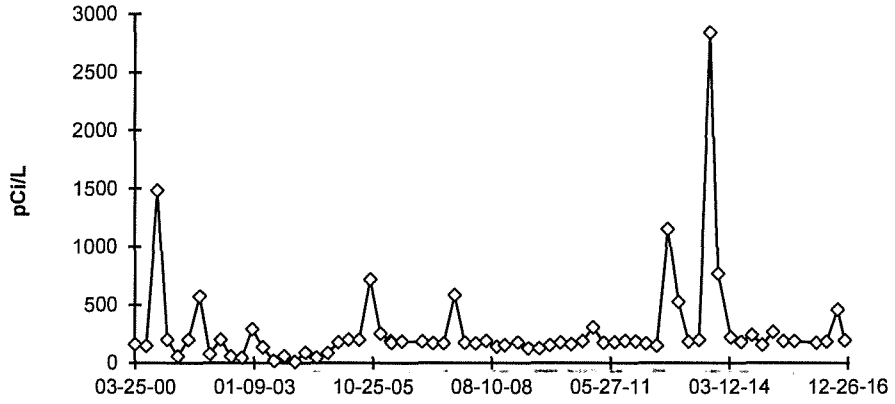
BD-56 South Pond Fatlan Site



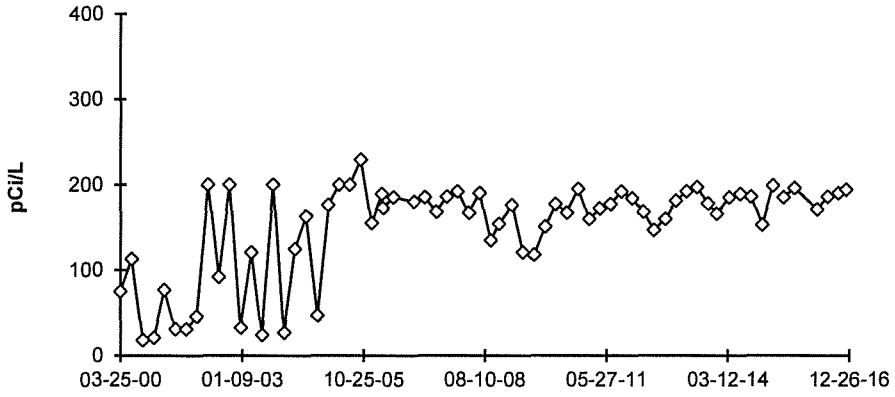
GAPS IN DATA ARE DUE TO SAMPLING POINTS BEING FROZEN AT TIME OF COLLECTION

FIGURE C-4
Surface Water - Tritium - Stations BD-10 and BD-25 (C) Collected in the Vicinity of Braidwood Station, 2000 - 2016

BD-10 Kankakee River, Downstream



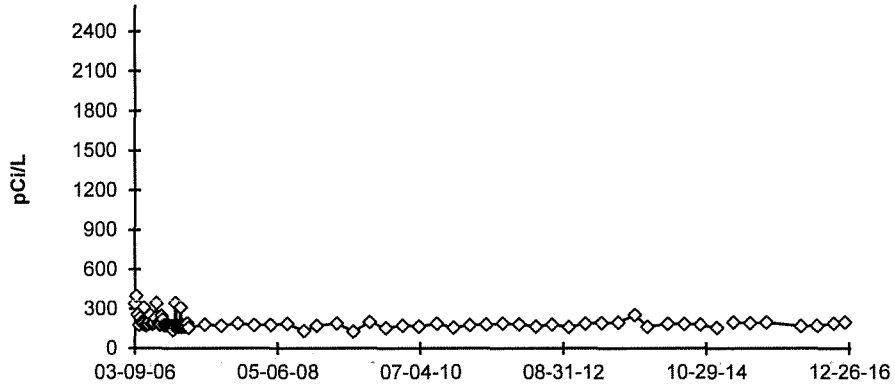
BD-25 (C) Kankakee River, Upstream



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

FIGURE C-5
Surface Water - Tritium - Stations BD-38 and BD-40 Collected in the Vicinity of Braidwood Station, 2006 - 2016

BD-38 Main Drainage Ditch



BD-40 Braidwood Station Cooling Lake

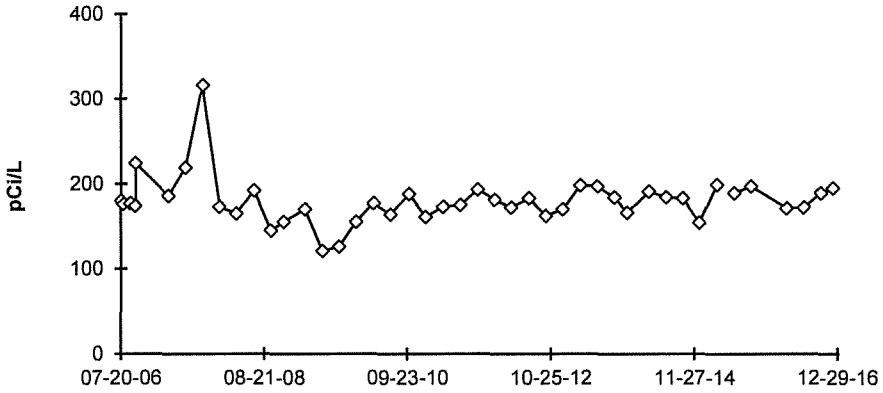
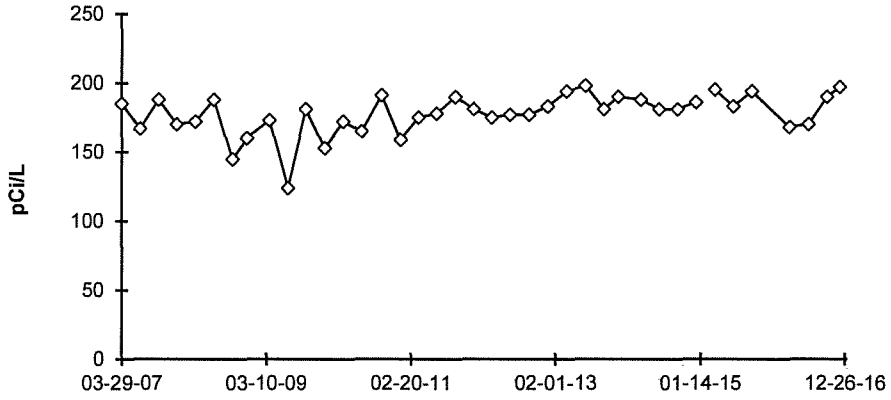


FIGURE C-6
Surface Water - Tritium - Stations BD-55 and BD-56 Collected in the Vicinity of Braidwood Station, 2007 - 2016

BD-55 North Pond Fatlan Site



BD-56 South Pond Fatlan Site

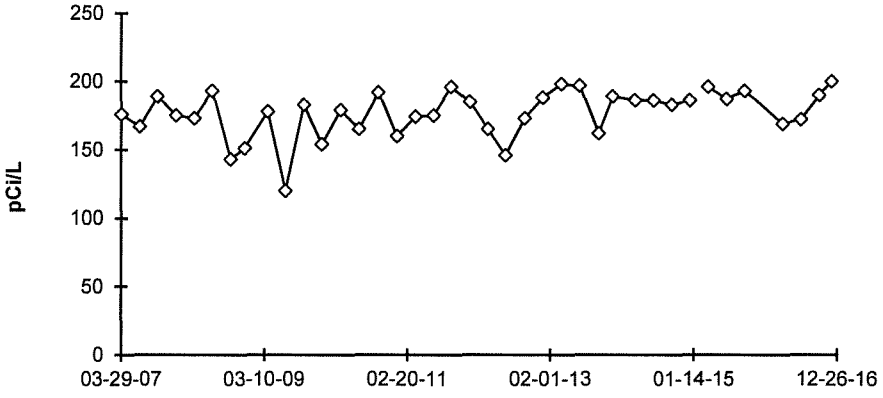
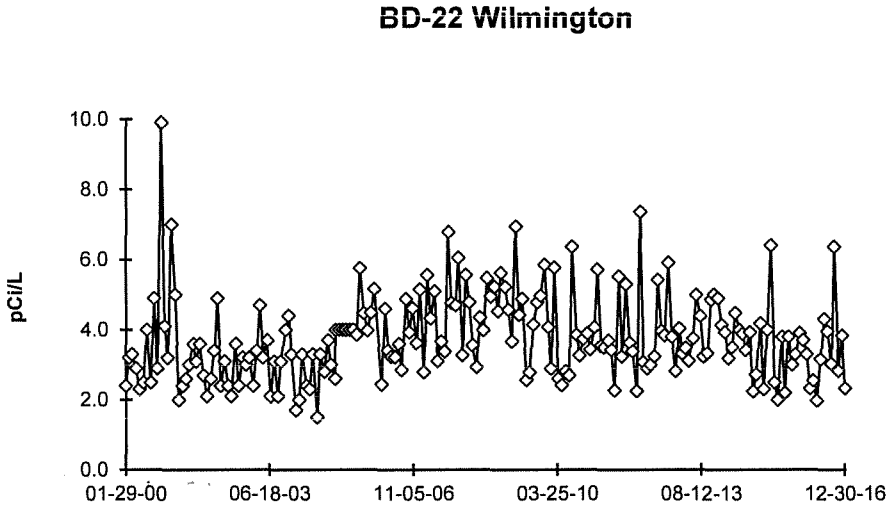
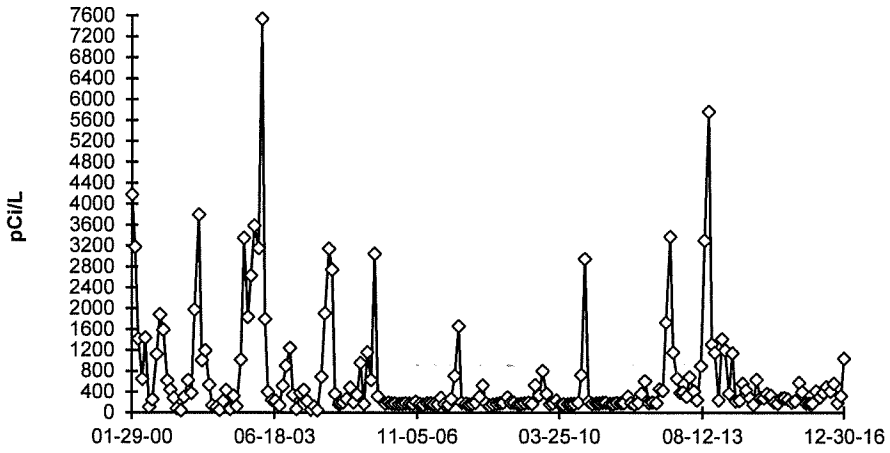


FIGURE C-7
Public Water - Gross Beta - Station BD-22
Collected in the Vicinity of Braidwood Station, 2000 - 2016



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

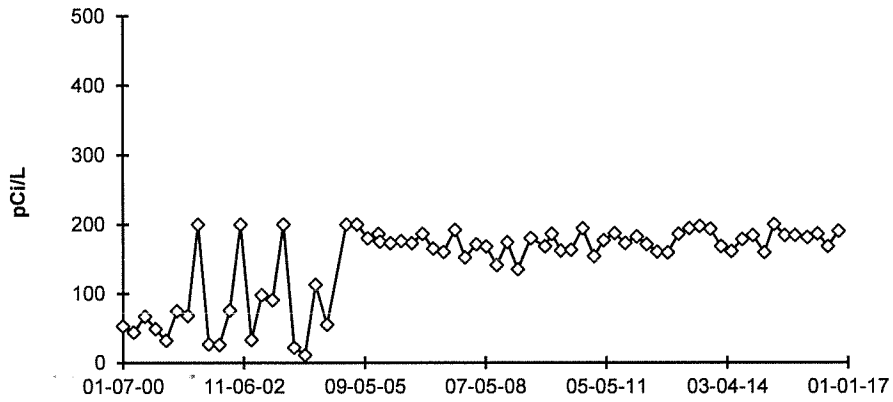
FIGURE C-8
Public Water - Tritium - Station BD-22
Collected in the Vicinity of Braidwood Station, 2000 - 2016



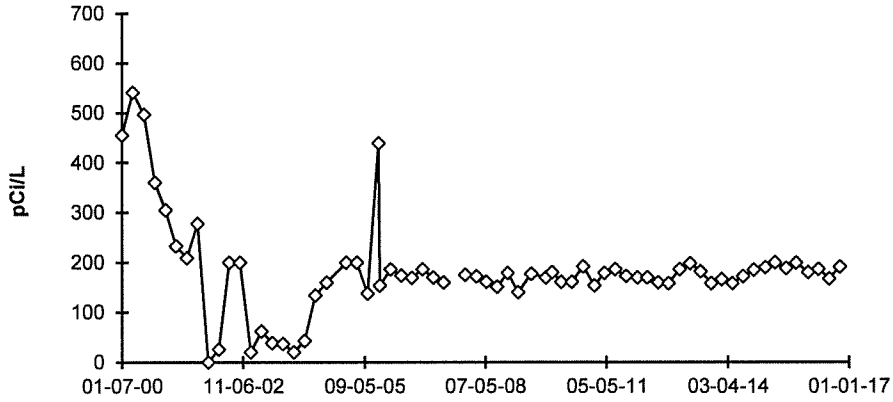
DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JUNE 2005

FIGURE C-9
Ground/Well Water - Tritium - Stations BD-13 and BD-34 Collected in the Vicinity of Braidwood Station, 2000 - 2016

BD-13 Braidwood City Hall Well



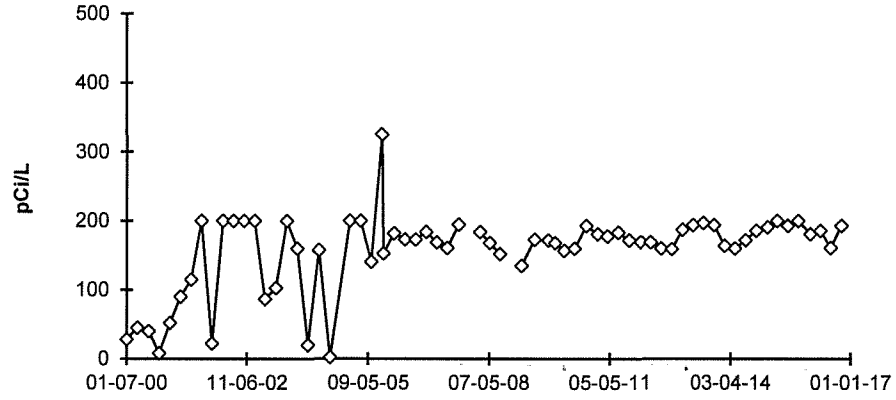
BD-34 Gibson Well



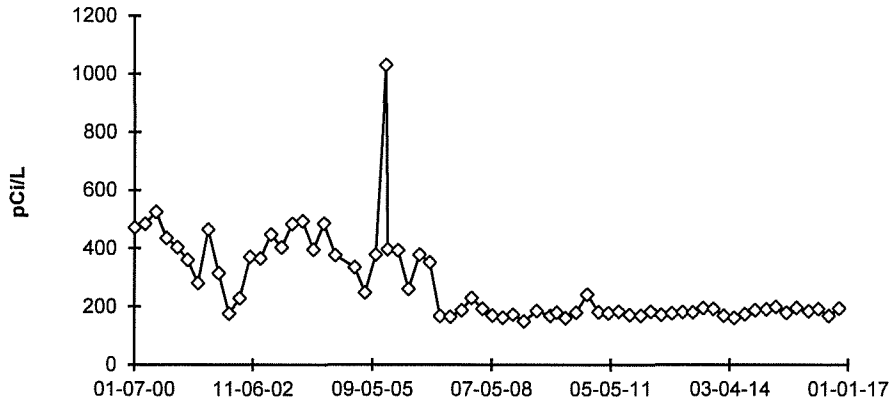
DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY.

FIGURE C-10
Ground/Well Water - Tritium - Stations BD-35 and BD-36 Collected in the Vicinity of Braidwood Station, 2000 - 2016

BD-35 Joly Well

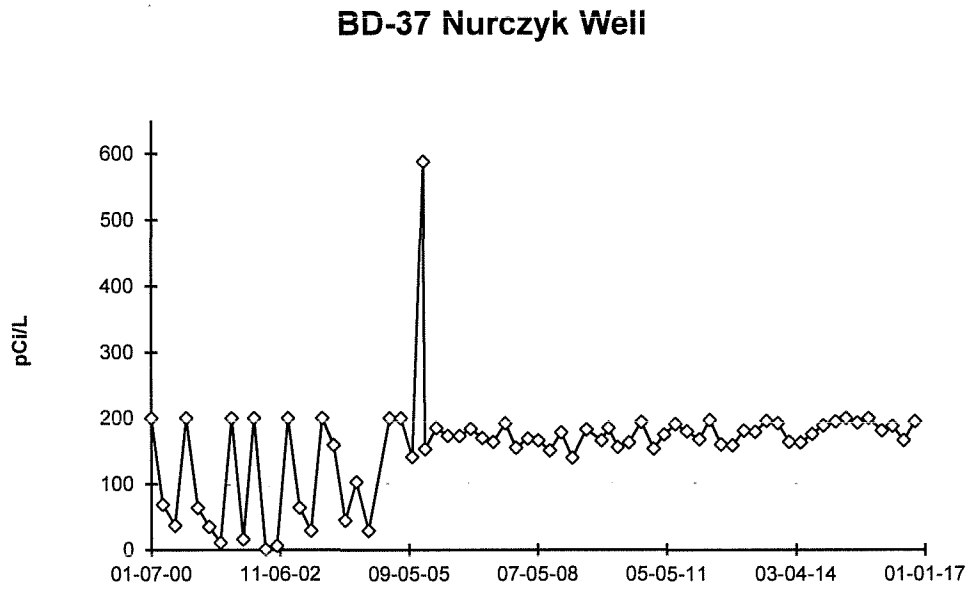


BD-36 Hutton Well



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

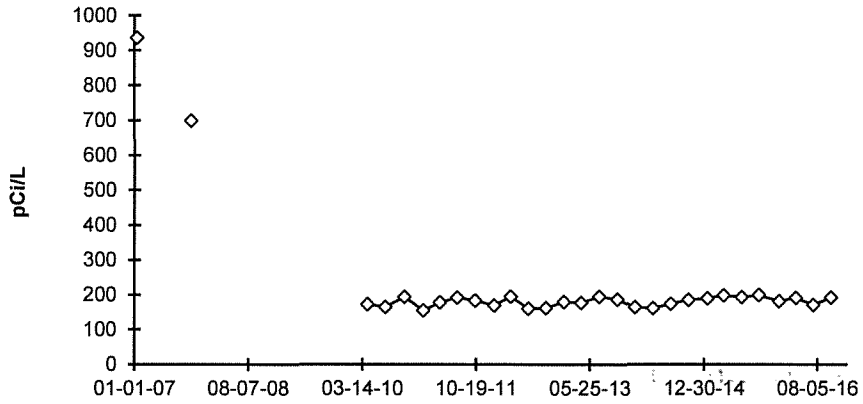
FIGURE C-11
Ground/Well Water - Tritium - Station BD-37
Collected in the Vicinity of Braidwood Station, 2000 - 2016



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

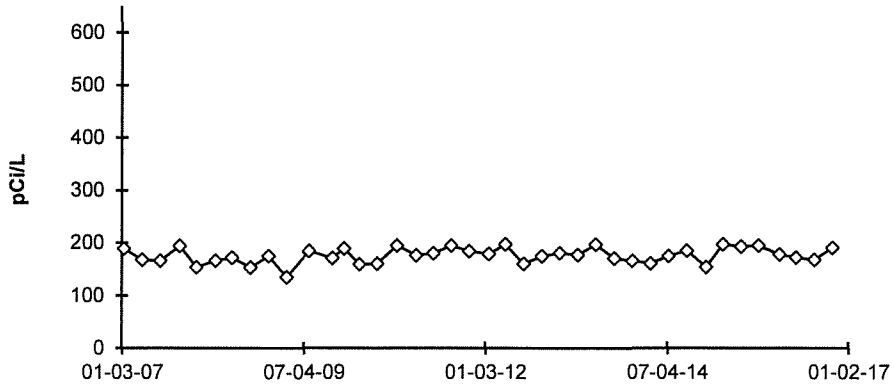
FIGURE C-12
Ground/Well Water - Tritium - Station BD-50 and BD-51 Collected in the Vicinity of Braidwood Station, 2007 - 2016

BD-50 Skole Well



STATION BD-50 WAS INITIALLY DISCONTINUED ON 10/18/07 AND RESUMED ON 04/08/10

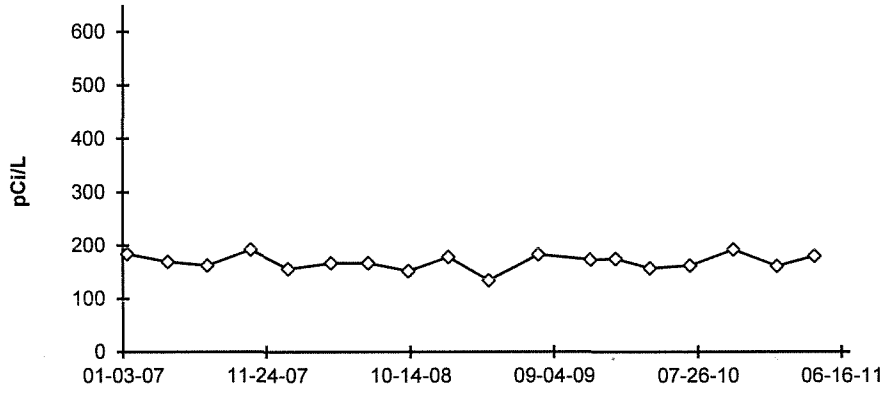
BD-51 Fatlan Well



NEW STATIONS BD-50 AND BD-51 ADDED IN 2007

FIGURE C-13
Ground/Well Water - Tritium - Stations BD-53 and BD-54 Collected in the Vicinity of Braidwood Station, 2007 - 2016

BD-53 Pheips Well*



**BD-53 was removed from the program during the 3rd quarter of 2011*

BD-54 Cash Well

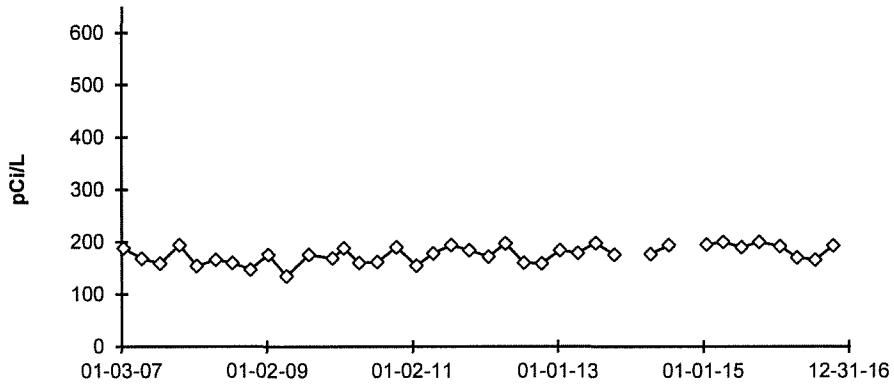
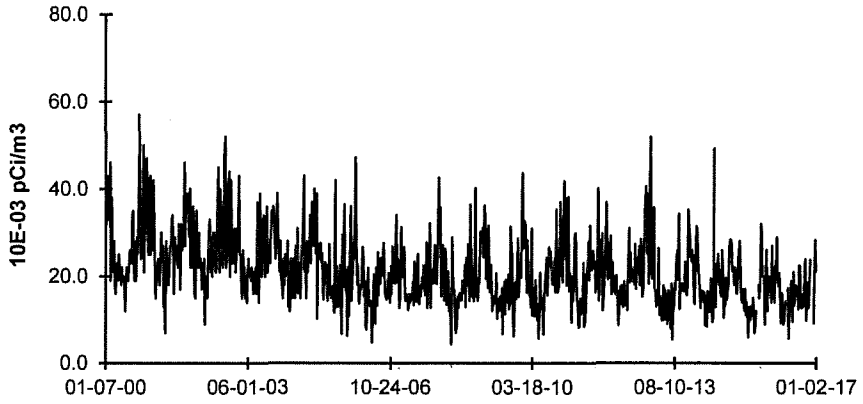


FIGURE C-14
Air Particulate - Gross Beta- Stations BD-03 (C) and BD-06 Collected in the Vicinity of Braidwood Station, 2000 - 2016

BD-03 (C) County Line Road



BD-06 Godley

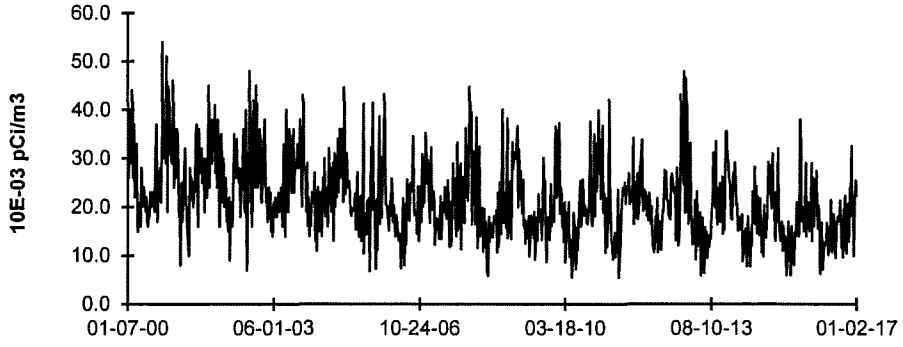
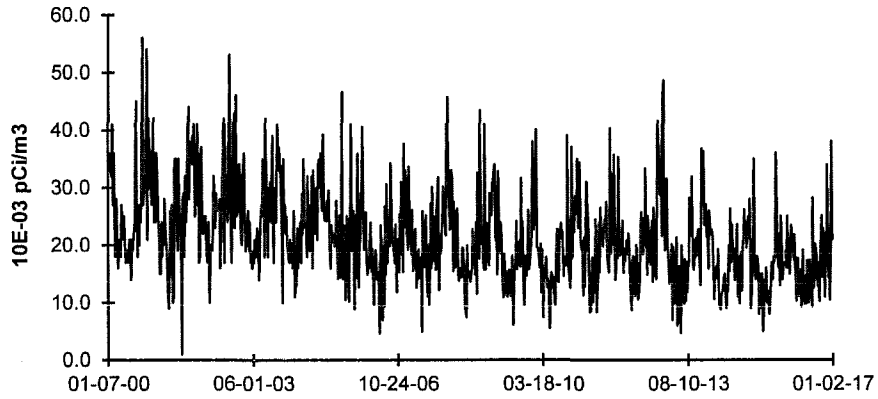


FIGURE C-15
Air Particulate - Gross Beta- Stations BD-19 and BD-20 Collected in the Vicinity of Braidwood Station, 2000 - 2016

BD-19 Near Field, NW



BD-20 Near Field, N

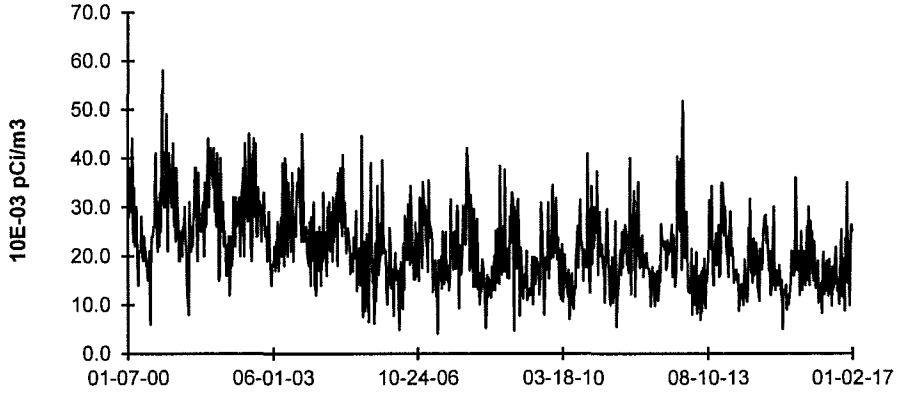


FIGURE C-16
Air Particulate - Gross Beta- Station BD-21
Collected in the Vicinity of Braidwood Station, 2000 - 2016

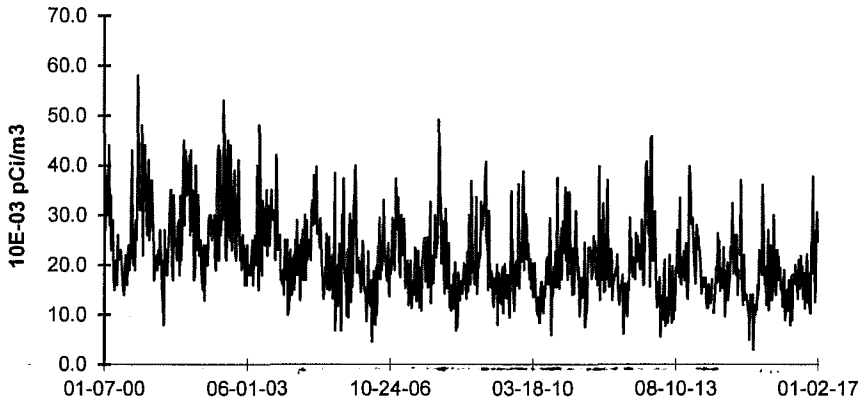
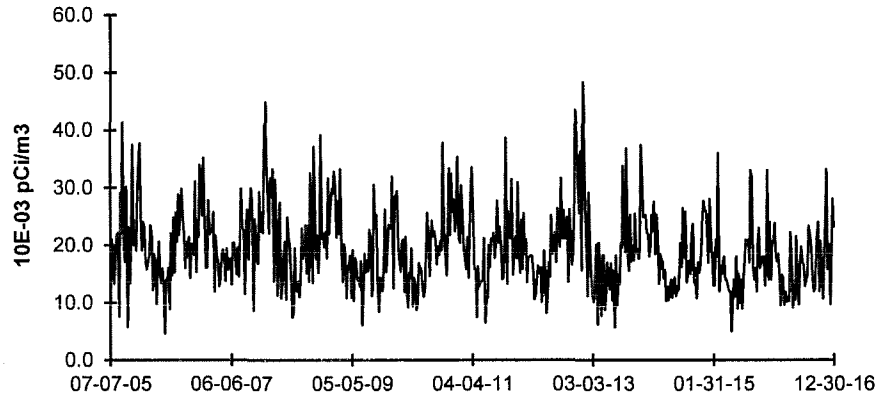


FIGURE C-17
Air Particulate - Gross Beta- Stations BD-02 and BD-04 Collected in the Vicinity of Braidwood Station, 2005 - 2016

BD-02 Near Field, NW



BD-04 Near Field, N

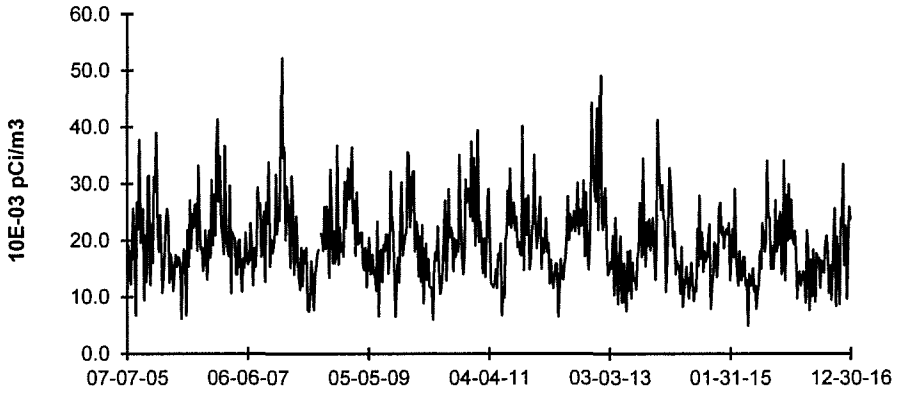
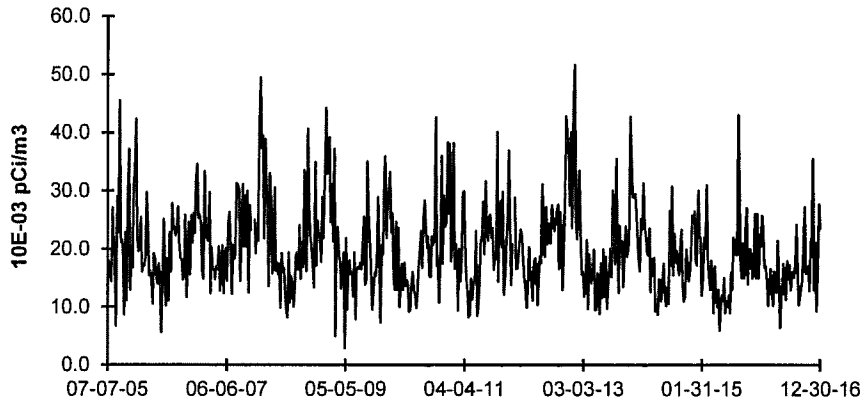


FIGURE C-18
Air Particulate - Gross Beta- Station BD-05
Collected in the Vicinity of Braidwood Station, 2005 - 2016



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APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

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TABLE D-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2016	E11476	Milk	Sr-89	pCi/L	97	86.7	1.12	A
			Sr-90	pCi/L	15	11.4	1.32	N(2)
	E11477	Milk	I-131	pCi/L	85.9	82.2	1.05	A
			Ce-141	pCi/L	106	98.4	1.08	A
			Cr-51	pCi/L	255	243	1.05	A
			Cs-134	pCi/L	134	130	1.03	A
			Cs-137	pCi/L	174	161	1.08	A
			Co-58	pCi/L	123	117	1.05	A
			Mn-54	pCi/L	141	117	1.21	W
			Fe-59	pCi/L	152	131	1.16	A
			Zn-65	pCi/L	193	179	1.08	A
			Co-60	pCi/L	259	244	1.06	A
	E11479	AP	Ce-141	pCi	69	81.1	0.85	A
			Cr-51	pCi	242	201	1.20	W
			Cs-134	pCi	98.1	107.0	0.92	A
			Cs-137	pCi	136	133	1.02	A
			Co-58	pCi	91.9	97	0.95	A
			Mn-54	pCi	98.6	96.2	1.02	A
			Fe-59	pCi	98.8	108	0.91	A
			Zn-65	pCi	131	147	0.89	A
			Co-60	pCi	209	201	1.04	A
	E11478	Charcoal	I-131	pCi	85.3	88.3	0.97	A
	E11480	Water	Fe-55	pCi/L	1800	1666	1.08	A
June 2016	E11537	Milk	Sr-89	pCi/L	94.4	94.4	1.00	A
			Sr-90	pCi/L	13.4	15.4	0.87	A
	E11538	Milk	I-131	pCi/L	96.8	94.5	1.02	A
			Ce-141	pCi/L	129	139	0.93	A
			Cr-51	pCi/L	240	276	0.87	A
			Cs-134	pCi/L	157	174	0.90	A
			Cs-137	pCi/L	117	120	0.98	A
			Co-58	pCi/L	131	142	0.92	A
			Mn-54	pCi/L	128	125	1.02	A
			Fe-59	pCi/L	132	122	1.08	A
			Zn-65	pCi/L	235	235	1.00	A
			Co-60	pCi/L	169	173	0.98	A
June 2016	E11539	Charcoal	I-131	pCi	86.1	89.4	0.96	A
	E11540	AP	Ce-141	pCi	105	99.8	1.05	A
			Cr-51	pCi	216	198.0	1.09	A
			Cs-134	pCi	113	125	0.90	A
			Cs-137	pCi	94.5	86.6	1.09	A
			Co-58	pCi	101	102	0.99	A
			Mn-54	pCi	88.8	90.2	0.98	A
			Fe-59	pCi	82	87.5	0.94	A
			Zn-65	pCi	174	169	1.03	A
			Co-60	pCi	143	124	1.15	A
	E11541	Water	Fe-55	pCi/L	164	186	0.88	A

TABLE D-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
September 2016	E11609	Milk	Sr-89	pCi/L	90	90.9	0.99	A
			Sr-90	pCi/L	13.3	13.7	0.97	A
	E11610	Milk	I-131	pCi/L	80.4	71.9	1.12	A
			Ce-141	pCi/L	81.3	93	0.87	A
			Cr-51	pCi/L	198	236	0.84	A
			Cs-134	pCi/L	122	136	0.90	A
			Cs-137	pCi/L	119	119	1.00	A
			Co-58	pCi/L	92.2	97.4	0.95	A
			Mn-54	pCi/L	156	152	1.03	A
			Fe-59	pCi/L	97.5	90.6	1.08	A
			Zn-65	pCi/L	189	179	1.06	A
			Co-60	pCi/L	131	135	0.97	A
	E11611	Charcoal	I-131	pCi	52.4	59.9	0.87	A
	E11612	AP	Ce-141	pCi	67.5	63.6	1.06	A
			Cr-51	pCi	192	161.0	1.19	A
			Cs-134	pCi	91.4	92.6	0.99	A
			Cs-137	pCi	93.9	80.8	1.16	A
			Co-58	pCi	66	66.4	0.99	A
			Mn-54	pCi	104	104	1.00	A
			Fe-59	pCi	60.5	61.8	0.98	A
			Zn-65	pCi	140	122	1.15	A
			Co-60	pCi	119	91.9	1.29	W
	E11613	Water	Fe-55	pCi/L	1990	1670	1.19	A
	E11614	Soil	Ce-141	pCi/g	0.153	0.175	0.87	A
			Cr-51	pCi/g	0.482	0.441	1.09	A
			Cs-134	pCi/g	0.270	0.254	1.06	A
			Cs-137	pCi/g	0.313	0.299	1.05	A
			Co-58	pCi/g	0.177	0.182	0.97	A
			Mn-54	pCi/g	0.340	0.285	1.19	A
			Fe-59	pCi/g	0.206	0.17	1.21	W
			Zn-65	pCi/g	0.388	0.335	1.16	A
			Co-60	pCi/g	0.284	0.252	1.13	A
December 2016	E11699	Milk	Sr-89	pCi/L	95	74.2	1.28	W
			Sr-90	pCi/L	14.7	10	1.47	N(3)
	E11700	Milk	I-131	pCi/L	97.5	97.4	1.00	A
			Ce-141	pCi/L	136	143	0.95	A
			Cr-51	pCi/L	247	280	0.88	A
			Cs-134	pCi/L	164	178	0.92	A
			Cs-137	pCi/L	120	126	0.95	A
			Co-58	pCi/L	139	146	0.95	A
			Mn-54	pCi/L	126	129	0.98	A
			Fe-59	pCi/L	114	125	0.91	A
			Zn-65	pCi/L	237	244	0.97	A
			Co-60	pCi/L	168	178	0.94	A
	E11701	Charcoal	I-131	pCi	95.6	98	0.98	A

TABLE D-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2016	E11702	AP	Ce-141	pCi	91.7	97.7	0.94	A
			Cr-51	pCi	210	192.0	1.09	A
			Cs-134	pCi	122	122	1.00	A
			Cs-137	pCi	93.9	86.4	1.09	A
			Co-58	pCi	92	100	0.92	A
			Mn-54	pCi	93.7	88.5	1.06	A
			Fe-59	pCi	84.9	84.5	1.00	A
			Zn-65	pCi	176	167	1.05	A
			Co-60	pCi	151	122	1.24	W
	E11702	AP	Sr-89	pCi	79.1	92	0.86	A
			Sr-90	pCi	10	12.5	0.80	A
	E11703	Water	Fe-55	pCi/L	2180	1800	1.21	W

(a) Teledyne Brown Engineering reported result.

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

(c) Ratio of Teledyne Brown Engineering to Analytics results.

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

(2) NCR 16-26 was initiated

(3) NCR 16-35 was initiated

TABLE D-2 **DOE's MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)**
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2016	16-MaW34	Water	Am-241	Bq/L	0.008		(1)	A
			Ni-63	Bq/L	12.4	12.3	8.6-16.0	A
			Pu-238	Bq/L	1.4900	1.2440	0.871-1.617	A
			Pu-239/240	Bq/L	0.729	0.641	0.449-0.833	A
	16-MaS34	Soil	Ni-63	Bq/kg	1140	1250.0	875-1625	A
			Sr-90	Bq/kg	8.15		(1)	A
	16-RdF34	AP	U-234/233	Bq/sample	0.1620	0.1650	0.116-0.215	A
			U-238	Bq/sample	0.163	0.172	0.120-0.224	A
	16-GrF34	AP	Gr-A	Bq/sample	0.608	1.20	0.36-2.04	A
			Gr-B	Bq/sample	0.8060	0.79	0.40-1.19	A
	16-RdV34	Vegetation	Cs-134	Bq/sample	10.10	10.62	7.43-13.81	A
			Cs-137	Bq/sample	6.0	5.62	3.93-7.31	A
			Co-57	Bq/sample	13.3000	11.8	8.3-15.3	A
			Co-60	Bq/sample	0.013		(1)	A
			Mn-54	Bq/sample	0.0150		(1)	A
			Sr-90	Bq/sample	0.301		(1)	N(4)
			Zn-65	Bq/sample	10.500	9.6	6.7-12.5	A
September 2016	16-MaW35	Water	Am-241	Bq/L	0.626	0.814	.570-1058	W
			Ni-63	Bq/L	12.4	17.2	12.0-22.4	A
			Pu-238	Bq/L	1.23	1.13	0.79-1.47	W
			Pu-239/240	Bq/L	0.0318	0.013	(1)	A
	16-MaS35	Soil	Ni-63	Bq/kg	724	990	693-1287	A
			Sr-90	Bq/kg	747	894	626-1162	A
	16-RdF35	AP	U-234/233	Bq/sample	0.160	0.15	0.105-0.195	A
			U-238	Bq/sample	0.157	0.156	0.109-0.203	A
	16-RdV35	Vegetation	Cs-134	Bq/sample	-0.103		(1)	A
			Cs-137	Bq/sample	5.64	5.54	3.88-7.20	A
			Co-57	Bq/sample	7.38	6.81	4.77-8.85	A
			Co-60	Bq/sample	4.81	4.86	3.40-6.32	A
			Mn-54	Bq/sample	7.4	7.27	5.09-9.45	A
			Sr-90	Bq/sample	0.774	0.80	0.56-1.04	A
			Zn-65	Bq/sample	5.46	5.4	3.78-7.02	A

(1) False positive test.

(a) Teledyne Brown Engineering reported result.

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

(c) DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.

(4)NCR 16-14 was initiated

TABLE D-3

ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
May 2016	RAD-105	Water	Sr-89	pCi/L	48.9	48.2	37.8 - 55.6	A
			Sr-90	pCi/L	25.0	28.5	20.7 - 33.1	A
			Ba-133	pCi/L	53.1	58.8	48.7 - 64.9	A
			Cs-134	pCi/L	40.9	43.3	34.6 - 47.6	A
			Cs-137	pCi/L	84.8	78.4	70.6 - 88.9	A
			Co-60	pCi/L	108	102	91.8 - 114	A
			Zn-65	pCi/L	226	214	193 - 251	A
			Gr-A	pCi/L	38.9	62.7	32.9 - 77.8	A
			Gr-B	pCi/L	41.9	39.2	26.0 - 46.7	A
			I-131	pCi/L	24.1	26.6	22.1 - 31.3	A
			U-Nat	pCi/L	4.68	4.64	3.39 - 5.68	A
			H-3	pCi/L	7720	7840	6790 - 8620	A
November 2016	RAD-107	Water	Sr-89	pCi/L	43.0	43.3	33.4-50.5	A
			Sr-90	pCi/L	30.0	33.6	24.6-38.8	A
			Ba-133	pCi/L	47.8	54.9	45.4-60.7	A
			Cs-134	pCi/L	72.9	81.8	67.0-90.0	A
			Cs-137	pCi/L	189	210	189-233	A
			Co-60	pCi/L	58.4	64.5	58.0-73.4	A
			Zn-65	pCi/L	243	245	220-287	A
			Gr-A	pCi/L	37.2	68.4	35.9-84.5	A
			Gr-B	pCi/L	35.1	33.9	22.1-41.6	A
			I-131	pCi/L	23.5	26.3	21.9-31.0	A
			U-Nat	pCi/L	49.2	51.2	41.6-56.9	A
			H-3	pCi/L	918	9820	8540-10800	N(5)
	MRAD-25	AP	Gr-A	pCi/Filter	56.8	71.2	23.9-111	A

(a) Teledyne Brown Engineering reported result.

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

(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. N=not acceptable. Reported result falls outside of the Control Limits. CE=check for Error. Reported result falls within the Control Limits and outside of the Warning Limit.

(5) NCR 16-34 was initiated

TABLE D-4 **ERA STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM[a]**

MRAD Study, ENVIRONMENTAL, INC., 2016

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory Result	ERA Result	Control Limits	Acceptance
ERAP-1101	3/14/2016	Am-241	37.3	45.9	28.3 - 62.1	Pass
ERAP-1101	3/14/2016	Co-60	637	623	482 - 778	Pass
ERAP-1101	3/14/2016	Cs-134	251	304	193 - 377	Pass
ERAP-1101	3/14/2016	Cs-137	1,273	1,150	864 - 1,510	Pass
ERAP-1101	3/14/2016	Fe-55	< 162	126	39.1 - 246	Pass
ERAP-1101	3/14/2016	Mn-54	< 2.64	< 50.0	0.00 - 50.0	Pass
ERAP-1101	3/14/2016	Pu-238	68.0	70.5	48.3 - 92.7	Pass
ERAP-1101	3/14/2016	Pu-239/240	54.1	54.8	39.70 - 71.60	Pass
ERAP-1101	3/14/2016	Sr-90	139	150	73.3 - 225.0	Pass
ERAP-1101	3/14/2016	U-233/234	59.3	64.8	40.2 - 97.7	Pass
ERAP-1101	3/14/2016	U-238	55.5	64.2	41.5 - 88.8	Pass
ERAP-1101	3/14/2016	Zn-65	428	356	255 - 492	Pass
ERAP-1101	3/14/2016	Gr. Alpha	98.0	70.1	23.5 - 109	Pass
ERAP-1101	3/14/2016	Gr. Beta	78.6	54.4	34.4 - 79.3	Pass
ERSO-1105	3/14/2016	Am-241	1,030	1,360	796 - 1,770	Pass
ERSO-1105	3/14/2016	Ac-228	1,540	1,240	795 - 1,720	Pass
ERSO-1105	3/14/2016	Bi-212	1,550	1,240	330 - 1,820	Pass
ERSO-1105	3/14/2016	Bi-214	3,100	3,530	2,130 - 5,080	Pass
ERSO-1105	3/14/2016	Co-60	5,600	5,490	3,710 - 7,560	Pass
ERSO-1105	3/14/2016	Cs-134	3,030	3,450	2,260 - 4,140	Pass
ERSO-1105	3/14/2016	Cs-137	4,440	4,310	3,300 - 5,550	Pass
ERSO-1105	3/14/2016	K-40	10,300	10,600	7,740 - 14,200	Pass
ERSO-1105	3/14/2016	Mn-54	< 50.8	< 1000	0.0 - 1,000	Pass
ERSO-1105	3/14/2016	Pb-212	1,140	1,240	812 - 1,730	Pass
ERSO-1105	3/14/2016	Pb-214	3,190	3,710	2,170 - 5,530	Pass
ERSO-1105	3/14/2016	Pu-238	680	658	396 - 908	Pass
ERSO-1105	3/14/2016	Pu-239/240	460	496	324 - 0,685	Pass
ERSO-1105	3/14/2016	Sr-90	7,740	8,560	3,260 - 13,500	Pass
ERSO-1105	3/14/2016	Th-234	3,630	3,430	1,080 - 6,450	Pass
ERSO-1105	3/14/2016	U-233/234	3,090	3,460	2,110 - 4,430	Pass
ERSO-1105	3/14/2016	U-238	3,280	3,430	2,120 - 4,350	Pass
ERSO-1105	3/14/2016	Zn-65	2,940	2,450	1,950 - 3,260	Pass
ERW-1115	3/14/2016	Gr. Alpha	105.0	117.0	41.5 - 181.0	Pass
ERW-1115	3/14/2016	Gr. Beta	76.2	75.5	43.2 - 112.0	Pass
ERW-1117	3/14/2016	H-3	8,870	8,650	5,800 - 12,300	Pass
ERVE-1108	3/14/2016	Am-241	1,930	2,120	1,300 - 2,820	Pass
ERVE-1108	3/14/2016	Cm-244	1,294	1,560	764 - 2,430	Pass
ERVE-1108	3/14/2016	Co-60	1,164	1,100	759 - 1,540	Pass
ERVE-1108	3/14/2016	Cs-134	1,056	1,070	687 - 1,390	Pass
ERVE-1108	3/14/2016	Cs-137	930	838	608 - 1,170	Pass
ERVE-1108	3/14/2016	K-40	32,200	31,000	22,400 - 43,500	Pass
ERVE-1108	3/14/2016	Mn-54	< 24.5	< 300	0.00 - 300	Pass
ERVE-1108	3/14/2016	Zn-65	3,320	2,820	2,030 - 3,960	Pass

TABLE D-4 **ERA STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM[a]**

MRAD Study, ENVIRONMENTAL, INC., 2016

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory Result	ERA Result	Control Limits	Acceptance
ERVE-1108	3/14/2016	Pu-238	3,410	2,810	1,680 - 3,850	Pass
ERVE-1108	3/14/2016	Pu-239/240	4,120	3,640	2,230 - 5,010	Pass
ERVE-1108	3/14/2016	Sr-90	8,120	8,710	4,960 - 11,500	Pass
ERVE-1108	3/14/2016	U-233/234	4,350	4,160	2,740 - 5,340	Pass
ERVE-1108	3/14/2016	U-238	4,220	4,120	2,750 - 5,230	Pass
ERW-1111	3/14/2016	Am-241	113	121	81.5 - 162	Pass
ERW-1111	3/14/2016	Co-60	1,120	1,050	912 - 1,230	Pass
ERW-1111	3/14/2016	Cs-134	806	842	618 - 968	Pass
ERW-1111	3/14/2016	Cs-137	1,190	1,100	934 - 1,320	Pass
ERW-1111	3/14/2016	Mn-54	< 5.89	< 100	0.00 - 100	Pass
ERW-1111	3/14/2016	Pu-238	159	138	102 - 172	Pass
ERW-1111	3/14/2016	Pu-239/240	113	98.7	76.6 - 124	Pass
ERW-1111	3/14/2016	U-233/234	46.9	52.7	39.6 - 68.0	Pass
ERW-1111	3/14/2016	U-238	50.4	52.3	39.9 - 64.2	Pass
ERW-1111	3/14/2016	Zn-65	1,160	1,010	842 - 1,270	Pass
ERW-1111	3/14/2016	Fe-55	1,600	1,650	984 - 2,240	Pass
ERW-1111	3/14/2016	Sr-90	430	434	283 - 574	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the Environmental Measurements Laboratory Quality Assessment Program (EML).

[b] Laboratory codes as follows: ERW (water), ERAP (air filter), ERSO (soil), ERVE (vegetation). Results are reported in units of pCi/L, except for air filters (pCi/Filter), vegetation and soil (pCi/kg).

[c] Results are presented as the known values, expected laboratory precision (1 sigma, 1 determination) and control limits as provided by ERA.

TABLE D-5 **DOE's Mixed Analyte Performance Evaluation Program (MAPEP)**
ENVIRONMENTAL, INC., 2016

			Concentration [a]			
Lab Code [b]	Reference Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
MASO-1053	2/1/2016	Ni-63	1,206 ± 20	1250	875 - 1625	Pass
MASO-1053	2/1/2016	Sr-90	0.65 ± 1.27	0.00	NA [c]	Pass
MASO-1053	2/1/2016	Tc-99	0.1 ± 5.5	0.0	NA [c]	Pass
MASO-1053	2/1/2016	Cs-134	908 ± 26	1030	721 - 1339	Pass
MASO-1053	2/1/2016	Cs-137	0.10 ± 6.20	0.00	NA [c]	Pass
MASO-1053	2/1/2016	Co-57	1058 ± 26	992	694 - 1290	Pass
MASO-1053	2/1/2016	Co-60	1229 ± 28	1190	833 - 1547	Pass
MASO-1053	2/1/2016	Mn-54	1235 ± 43	1160	812 - 1508	Pass
MASO-1053	2/1/2016	Zn-65	753 ± 64	692	484 - 900	Pass
MASO-1053	2/1/2016	K-40	753 ± 140	607	425 - 789	Pass
MASO-1053	2/1/2016	Am-241	79 ± 6	103	72 - 134	Pass
MASO-1053	2/1/2016	Pu-238	73.9 ± 9.2	63.6	44.5 - 82.7	Pass
MASO-1053	2/1/2016	Pu-239/240	0.76 ± 1.34	0.21	NA [d]	Pass
MASO-1053	2/1/2016	U-234/233	45.0 ± 5.1	45.9	32.1 - 59.7	Pass
MASO-1053	2/1/2016	U-238	129 ± 9	146	102 - 190	Pass
MAW-989	2/1/2016	Am-241	0.018 ± 0.015	0.00	NA [c]	Pass
MAW-989	2/1/2016	H-3	0.2 ± 2.8	0.0	NA [c]	Pass
MAW-989	2/1/2016	Ni-63	12.8 ± 2.7	12.3	8.6 - 16.0	Pass
MAW-989	2/1/2016	Sr-90	8.70 ± 1.20	8.74	6.12 - 11.36	Pass
MAW-989	2/1/2016	Tc-99	-1.1 ± 0.6	0.0	NA [c]	Pass
MAW-989	2/1/2016	Cs-134	15.5 ± 0.3	16.1	11.3 ± 20.9	Pass
MAW-989	2/1/2016	Cs-137	23.7 ± 0.5	21.2	14.8 - 27.6	Pass
MAW-989[e]	2/1/2016	Co-57	1.38 ± 0.12	0.00	NA [c]	Fail
MAW-989	2/1/2016	Co-60	12.5 ± 0.3	11.8	8.3 - 15.3	Pass
MAW-989	2/1/2016	Mn-54	12.2 ± 0.4	11.1	7.8 - 14.4	Pass
MAW-989	2/1/2016	Zn-65	15.7 ± 0.7	13.6	9.5 - 17.7	Pass
MAW-989	2/1/2016	K-40	288 ± 5	251	176 - 326	Pass
MAW-989	2/1/2016	Fe-55	17.3 ± 7.0	16.2	11.3 - 21.1	Pass
MAW-989	2/1/2016	Ra-226	0.710 ± 0.070	0.718	0.503 - 0.933	Pass
MAW-989	2/1/2016	Pu-238	1.280 ± 0.110	1.244	0.871 ± 1.617	Pass
MAW-989	2/1/2016	Pu-239/240	0.640 ± 0.080	0.641	0.449 - 0.833	Pass
MAW-989	2/1/2016	U-234/233	1.39 ± 0.12	1.48	1.04 - 1.92	Pass
MAW-989	2/1/2016	U-238	1.43 ± 0.12	1.53	1.07 - 1.99	Pass
MAW-893	2/1/2016	Gross Alpha	0.600 ± 0.050	0.673	0.202 - 1.144	Pass
MAW-893	2/1/2016	Gross Beta	2.10 ± 0.06	2.15	1.08 - 3.23	Pass
MAW-896	2/1/2016	I-129	3.67 ± 0.20	3.85	2.70 - 5.01	Pass
MAAP-1056	2/1/2016	Gross Alpha	0.39 ± 0.05	1.20	0.36 - 2.04	Pass
MAAP-1056	2/1/2016	Gross Beta	1.03 ± 0.07	0.79	0.40 - 1.19	Pass
MAAP-1057	2/1/2016	Sr-90	1.34 ± 0.15	1.38	0.97 ± 1.79	Pass
MAAP-1057	2/1/2016	Cs-134	-0.01 ± 0.03	0.00	NA [c]	Pass
MAAP-1057	2/1/2016	Cs-137	2.57 ± 0.10	2.30	1.61 - 2.99	Pass

TABLE D-5 **DOE's Mixed Analyte Performance Evaluation Program (MAPEP)**
ENVIRONMENTAL, INC., 2016

			Concentration [a]			
Lab Code [b]	Reference Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
MAAP-1057	2/1/2016	Co-57	3.01 ± 0.06	2.94	2.06 - 3.82	Pass
MAAP-1057	2/1/2016	Co-60	4.28 ± 0.10	4.02	2.81 - 5.23	Pass
MAAP-1057	2/1/2016	Mn-54	4.90 ± 0.13	4.53	3.17 - 5.89	Pass
MAAP-1057	2/1/2016	Zn-65	4.09 ± 0.18	3.57	2.50 - 4.64	Pass
MAAP-1057	2/1/2016	Am-241	0.059 ± 0.015	0.0805	0.0564 - 0.1047	Pass
MAAP-1057	2/1/2016	Pu-238	0.066 ± 0.020	0.0637	0.0446 - 0.0828	Pass
MAAP-1057	2/1/2016	Pu-239/240	0.074 ± 0.020	0.099	NA [d]	Pass
MAAP-1057	2/1/2016	U-234/233	0.151 ± 0.026	0.165	0.116 - 0.215	Pass
MAAP-1057	2/1/2016	U-238	0.160 ± 0.026	0.172	0.120 - 0.224	Pass
MAVE-1050	2/1/2016	Cs-134	9.83 ± 0.19	10.62	7.43 - 13.81	Pass
MAVE-1050	2/1/2016	Cs-137	6.06 ± 0.19	5.62	3.93 - 7.31	Pass
MAVE-1050	2/1/2016	Co-57	13.8 ± 0.2	11.8	8.3 - 15.3	Pass
MAVE-1050	2/1/2016	Co-60	0.022 ± 0.040	0.00	NA [c]	Pass
MAVE-1050	2/1/2016	Mn-54	0.009 ± 0.044	0.000	NA [c]	Pass
MAVE-1050	2/1/2016	Zn-65	10.67 ± 0.39	9.60	6.70 - 12.50	Pass
MASO-4780[f]	8/1/2016	Ni-63	648 ± 14	990	693 - 1287	Fail
MASO-4780[g]	8/1/2016	Ni-63	902 ± 46	990	693 - 1287	Pass
MASO-4780	8/1/2016	Sr-90	757 ± 16	894	626 - 1162	Pass
MASO-4780	8/1/2016	Tc-99	559 ± 12	556	389 - 723	Pass
MASO-4780	8/1/2016	Cs-134	0.93 ± 2.92	0.00	NA [c]	Pass
MASO-4780	8/1/2016	Cs-137	1061 ± 12	1067	747 - 1387	Pass
MASO-4780	8/1/2016	Co-57	1178 ± 8	1190	833 - 1547	Pass
MASO-4780	8/1/2016	Co-60	841 ± 9	851	596 - 1106	Pass
MASO-4780	8/1/2016	Mn-54	0.69 ± 2.53	0.00	NA [c]	Pass
MASO-4780	8/1/2016	Zn-65	724 ± 19	695	487 - 904	Pass
MASO-4780	8/1/2016	K-40	566 ± 52	588	412 - 764	Pass
MASO-4780	8/1/2016	Am-241	0.494 ± 0.698	0.000	NA [c]	Pass
MASO-4780	8/1/2016	Pu-238	69.7 ± 7.4	70.4	49.3 - 91.5	Pass
MASO-4780	8/1/2016	Pu-239/240	53.9 ± 6.3	53.8	37.7 - 69.9	Pass
MASO-4780[h]	8/1/2016	U-233/234	46.8 ± 3.9	122	85 - 159	Fail
MASO-4780[h]	8/1/2016	U-238	46.6 ± 3.9	121	85 - 157	Fail
MAW-4776	8/1/2016	I-129	4.40 ± 0.20	4.54	3.18 - 5.90	Pass
MAVE-4782	8/1/2016	Cs-134	-0.01 ± 0.05	0.00	NA [c]	Pass
MAVE-4782	8/1/2016	Cs-137	6.18 ± 0.20	5.54	3.88 - 7.20	Pass
MAVE-4782	8/1/2016	Co-57	8.13 ± 0.16	6.81	4.77 - 8.85	Pass
MAVE-4782	8/1/2016	Co-60	5.30 ± 0.15	4.86	3.40 - 6.32	Pass
MAVE-4782	8/1/2016	Mn-54	8.08 ± 0.24	7.27	5.09 - 9.45	Pass
MAVE-4782	8/1/2016	Zn-65	6.24 ± 0.36	5.40	3.78 - 7.02	Pass
MAAP-4784	8/1/2016	Sr-90	1.18 ± 0.10	1.03	0.72 - 1.34	Pass
MAAP-4784	8/1/2016	Cs-134	1.58 ± 0.08	2.04	1.43 - 2.65	Pass

TABLE D-5 **DOE's Mixed Analyte Performance Evaluation Program (MAPEP)**
ENVIRONMENTAL, INC., 2016

			Concentration [a]			
Lab Code [b]	Reference Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
MAAP-4784	8/1/2016	Cs-137	1.85 ± 0.09	1.78	1.25 - 2.31	Pass
MAAP-4784	8/1/2016	Co-57	2.39 ± 0.52	2.48	1.74 - 3.22	Pass
MAAP-4784	8/1/2016	Co-60	3.22 ± 0.08	3.26	2.28 - 4.24	Pass
MAAP-4784	8/1/2016	Mn-54	2.82 ± 0.12	2.75	1.93 - 3.58	Pass
MAAP-4784	8/1/2016	Zn-65	-0.015 ± 0.062	0.00	NA [c]	Pass
MAAP-4784	8/1/2016	Am-241	-0.001 ± 0.006	0.00	NA [c]	Pass
MAAP-4784	8/1/2016	Pu-238	0.075 ± 0.022	0.069	0.049 - 0.090	Pass
MAAP-4784	8/1/2016	Pu-239/240	0.048 ± 0.015	0.054	0.038 - 0.070	Pass
MAAP-4784	8/1/2016	U-234/233	0.151 ± 0.036	0.150	0.105 - 0.195	Pass
MAAP-4784	8/1/2016	U-238	0.147 ± 0.034	0.156	0.109 - 0.203	Pass
MAW-4778	8/1/2016	H-3	365 ± 11	334	234 - 434	Pass
MAW-4778	8/1/2016	Fe-55	23.6 ± 16.3	21.5	15.1 ± 28.0	Pass
MAW-4778	8/1/2016	Ni-63	17.0 ± 2.8	17.2	12.0 ± 22.4	Pass
MAW-4778	8/1/2016	Sr-90	0.17 ± 0.28	0.00	NA [c]	Pass
MAW-4778	8/1/2016	Tc-99	9.50 ± 0.41	11.60	8.10 - 15.10	Pass
MAW-4778	8/1/2016	Cs-134	22.6 ± 0.4	23.9	16.7 - 31.1	Pass
MAW-4778	8/1/2016	Cs-137	0.018 ± 0.117	0.00	NA [c]	Pass
MAW-4778	8/1/2016	Co-57	27.6 ± 0.2	27.3	19.1 ± 35.5	Pass
MAW-4778	8/1/2016	Co-60	0.018 ± 0.090	0.00	NA [c]	Pass
MAW-4778	8/1/2016	Mn-54	16.2 ± 0.4	14.8	10.4 - 19.2	Pass
MAW-4778	8/1/2016	Zn-65	19.3 ± 0.7	17.4	12.2 - 22.6	Pass
MAW-4778	8/1/2016	K-40	286 ± 6	252	176 - 328	Pass
MAW-4778	8/1/2016	Ra-226	1.48 ± 0.09	1.33	0.93 - 1.73	Pass
MAW-4778	8/1/2016	Pu-238	1.09 ± 0.13	1.13	0.79 - 1.47	Pass
MAW-4778	8/1/2016	Pu-239/240	0.003 ± 0.011	0.016	NA [d]	Pass
MAW-4778	8/1/2016	U-234/233	1.80 ± 0.13	1.86	1.30 - 2.42	Pass
MAW-4778	8/1/2016	U-238	1.77 ± 0.13	1.92	1.34 - 2.50	Pass
MAW-4778	8/1/2016	Am-241	0.678 ± 0.086	0.814	0.570 ± 1.058	Pass

[a] Results are reported in units of Bq/kg (soil), Bq/L (water) or Bq/total sample (filters, vegetation).

[b] Laboratory codes as follows: MAW (water), MAAP (air filter), MASO (soil), MAVE (vegetation).

[c] MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP. A known value of "zero" indicates an analysis was included in the testing series as a "false positive". MAPEP does not provide control limits.

[d] Provided in the series for "sensitivity evaluation". MAPEP does not provide control limits.

[e] The laboratory properly identified the Sn-75 interfering peak in the vicinity of Co-57 and stated so in the comment field. MAPEP requires results to be reported as an activity with an uncertainty. Since the calculated uncertainty was less than the activity MAPEP interpreted the submitted result as a "false positive" resulting in a failure.

[f] Original analysis for Ni-63 failed.

[g] Reanalysis with a smaller aliquot resulted in acceptable results. An investigation is in process to identify better techniques for analyzing samples with complex matrices.

[h] MAPEP states that samples contain two fractions of Uranium; one that is soluble in concentrated HNO^3 and HCl acid and one that is "fundamentally insoluble in these acids". They also state that HF treatment can not assure complete dissolution. Results are consistent with measuring the soluble form.

TABLE D-6 Interlaboratory Comparison Crosscheck Program, Environmental Resource Associates (ERA)[a]
RAD Study, ENVIRONMENTAL, INC., 2016

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result	ERA Result	Control Limits	Acceptance
ERW-1392	4/4/2016	Sr-89	43.5 ± 4.3	48.2	37.8 - 55.6	Pass
ERW-1392	4/4/2016	Sr-90	27.5 ± 1.9	28.5	20.7 - 33.1	Pass
ERW-1394 [b]	4/4/2016	Ba-133	65.2 ± 3.8	58.8	48.7 - 64.9	Fail
ERW-1394 [c]	4/4/2016	Ba-133	57.8 ± 5.3	58.8	48.7 - 64.9	Pass
ERW-1394	4/4/2016	Cs-134	43.7 ± 3.0	43.3	34.6 - 47.6	Pass
ERW-1394	4/4/2016	Cs-137	86.1 ± 5.3	78.4	70.6 - 88.9	Pass
ERW-1394	4/4/2016	Co-60	108 ± 44	102	91.8 - 114	Pass
ERW-1394	4/4/2016	Zn-65	240 ± 13	214	193 - 251	Pass
ERW-1397	4/4/2016	Gr. Alpha	52.0 ± 2.2	62.7	32.9 - 77.8	Pass
ERW-1397	4/4/2016	Gr. Beta	33.9 ± 1.2	39.2	26.0 - 46.7	Pass
ERW-1400	4/4/2016	I-131	24.7 ± 0.6	26.6	22.1 - 31.3	Pass
ERW-1402	4/4/2016	Ra-226	15.6 ± 0.5	15.2	11.3 - 17.4	Pass
ERW-1402	4/4/2016	Ra-228	5.28 ± 0.76	5.19	3.12 - 6.93	Pass
ERW-1403	4/4/2016	Uranium	4.02 ± 0.42	4.64	3.39 - 5.68	Pass
ERW-1405	4/4/2016	H-3	8,150 ± 270	7,840	6,790 - 8,620	Pass
SPW-2845	7/7/2015	Ba-133	60.3 ± 5.7	64.7	53.9 - 71.2	Pass
SPW-2845	7/7/2015	Cs-134	48.8 ± 9.3	50.1	40.3 - 55.1	Pass
SPW-2845	7/7/2015	Cs-137	101 ± 8	89.8	80.8 - 101	Pass
SPW-2845	7/7/2015	Co-60	65.1 ± 5.8	59.9	53.9 - 68.4	Pass
SPW-2845	7/7/2015	Zn-65	288 ± 29	265	238 - 310	Pass
ERW-3485	7/11/2016	Sr-89	43.3 ± 6.5	53.3	42.3 - 60.9	Pass
ERW-3485	7/11/2016	Sr-90	39.0 ± 2.8	39.2	28.8 - 45.1	Pass
ERW-3487	7/11/2016	Ba-133	83.3 ± 4.9	82.9	69.7 - 91.2	Pass
ERW-3487	7/11/2016	Cs-134	62.5 ± 4.4	65.3	53.1 - 71.8	Pass
ERW-3487	7/11/2016	Cs-137	98.1 ± 5.6	95.2	85.7 - 107	Pass
ERW-3487	7/11/2016	Co-60	122 ± 5	117	105 - 131	Pass
ERW-3487	7/11/2016	Zn-65	124 ± 9	113	102 - 134	Pass
ERW-3490	7/11/2016	Gr. Alpha	46.6 ± 2.2	48.1	25.0 - 60.5	Pass
ERW-3490	7/11/2016	Gr. Beta	26.8 ± 1.1	28.6	18.2 - 36.4	Pass
ERW-3492	7/11/2016	I-131	23.7 ± 1.0	24.9	20.7 - 29.5	Pass
ERW-3493	7/11/2016	Ra-226	12.9 ± 0.4	12.3	9.2 - 14.2	Pass
ERW-3493	7/11/2016	Ra-228	5.8 ± 0.8	5.8	3.5 - 7.6	Pass
ERW-3493	7/11/2016	Uranium	32.8 ± 0.8	25.2	28.4 - 39.3	Pass
ERW-3495	7/11/2016	H-3	12,400 ± 334	12,400	10,800 - 13,600	Pass

[a] Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the crosscheck program for proficiency testing in drinking water conducted by Environmental Resources Associates (ERA).

[b] No reason determined for failure of Ba-133 result.

[c] The result of reanalysis (Compare to original result, footnoted "b" above).

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APPENDIX E

EFFLUENT REPORT

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INTRODUCTION

Braidwood Station, a two-unit PWR station, is located in Will County, Illinois, fifteen (15) miles south-southwest of Joliet, Illinois. Each reactor is designed to have a capacity of 3,587 thermal megawatts. Unit No. 1 went critical on May 29, 1987, and Unit No. 2 went critical on March 8, 1988. The station has been designed to keep releases to the environment at levels below those specified in the regulations.

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

Environmental monitoring is conducted by sampling at indicator and control (background) locations in the vicinity of Braidwood Station to measure changes in radiation or radioactivity levels that may be attributable to station operations. If significant changes attributable to Braidwood Station are measured, these changes are correlated with effluent releases. An environmental monitoring program is conducted which also includes all potential pathways at the site. Gaseous pathways include ground plane (direct), inhalation, vegetation, meat, and milk. Liquid pathways include potable water and freshwater fish. The critical pathway for 2016 gaseous dose was vegetation. The critical pathway for 2016 liquid dose was potable water.

SUMMARY

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

The maximally exposed individual's total body dose due to gaseous and liquid emissions from licensed activities at Braidwood Station is 1.93E+00 mrem.

The assessment of radiation doses to the public is performed in accordance with the ODCM. The results of these analyses confirm that the station is operating in compliance with 10 CFR 50 Appendix I, 10 CFR 20 and 40 CFR 190.

1.0 EFFLUENTS

1.1 Gaseous Effluents to the Atmosphere

Measured concentrations of noble gases, radioiodine, C-14, tritium, and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1.

A total of 1.50E-01 curies of fission and activation gases were released with a maximum quarterly average release rate of 6.01E-03 µCi/sec for Unit 1 and 6.01E-03 µCi/sec for Unit 2.

A total of 7.11E-04 curies of radioiodine were released during the year with a maximum average quarterly release rate of 2.89E-05 µCi/sec for Unit 1 and 6.05E-05 µCi/sec for Unit 2.

A total of 0.00E+00 curies of beta-gamma emitters were released as airborne particulate matter with a maximum average release rate of <LLD µCi/sec for Unit 1 and <LLD µCi/sec for Unit 2. Alpha-emitting radionuclides were below the lower limit of detection (LLD) for the year.

A total of 2.13E+02 curies of tritium were released with a maximum average quarterly release rate of 4.55E+00 µCi/sec for Unit 1 and 5.98E+00 µCi/sec for Unit 2.

A total of 8.84E+00 curies of C-14 was released with a maximum average quarterly release rate of 1.61E-01 µCi/sec from Unit 1 and 1.49E-01 µCi/sec from Unit 2.

Alpha-emitting radionuclides were less than the LLD for the year.

1.2 Liquids Released to Kankakee River

A total of 4.44E+10 liters of radioactive liquid wastes (prior to dilution) containing 2.98E-02 curies (excluding tritium, noble gases and alpha) were discharged from the station. These wastes were released at a maximum quarterly diluted average concentration of 1.13E-09 µCi/ml. Alpha-emitting radionuclides were less than the LLD for the year. A total of 3.40E+03 curies of tritium were released from the station. Quarterly release activities are given in Table 1.2-1.

2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped by truck to the Energy Solutions and Waste Control Specialists disposal facilities and various waste processors.

For details, refer to the Braidwood Station 2016 Radioactive Effluent Release Report.

3.0 DOSE TO MAN

3.1 Gaseous Effluent Pathways

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways. Based on measured effluents and average meteorological data, the maximum total body dose to an individual would be 4.03E-01 mrem for the year (Table 3.1-1) with an occupancy or shielding factor of 0.7 used. The maximum total body dose based on measured effluents and concurrent meteorological data would be 5.37E-01 mrem (Table 3.4-1).

3.1.1 Noble Gases

3.1.1.1 Gamma Dose

Offsite Gamma air and total body dose rates are shown in Table 3.1-1 and were calculated based on measured effluents and average meteorological data. The maximum gamma air dose was 1.36E-06 mrad (Table 3.1-1) based on measured effluents and average meteorological data and 2.28E-06 mrad based on concurrent meteorological date (Table 3.4-1).

3.1.1.2 Beta Air and Skin Dose

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate due to the effect of the beta particle energies, thickness of inert skin and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 7.0 mg/cm^2 and an occupancy factor of 1.0 is used. Based on measured effluents and average meteorological data, the skin dose from beta and gamma radiation for the year was 3.45E-6 mrem (Table 3.1-1). The skin dose from beta and gamma radiation for the year was 3.78E-06 mrem based on concurrent

meteorological data (Table 3.4-1).

The maximum offsite beta air dose for the year was 6.03E-06 mrad (Table 3.1-1) based on measured effluents and average meteorological data and 6.22E-06 mrad based on concurrent meteorological data (Table 3.4-1).

3.1.2 Radioactive Iodine & Particulate

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine. I-131 released during routine operation of the station may be made available to man resulting in a dose to the thyroid. C-14 is also included in this category. C-14 exhibits a capacity to concentrate in bone. C-14 is released in gaseous form and is absorbed into vegetation through photosynthesis. The principal pathways of interest for C-14 are the consumption of vegetation by humans and milk from which animals have ingested C-14 through the consumption of vegetation. With the inclusion of C-14 in plant effluent calculations, human dose in this category is primarily driven by the release of C-14 from the plant.

The hypothetical dose to the maximum exposed individual living near the station via ingestion of milk and vegetation was calculated. The dose contributions included in the section include tritium. The source of milk and vegetation was assumed to be at the nearest site boundary with the cows pastured and vegetation grown from May through October. The maximum dose from radioactive iodine and particulate (including C-14 and tritium) to any organ was 1.86E+00 mrem (child/bone) based on measured effluents and average meteorological data and 2.45E+00 mrem based on concurrent meteorological data. The maximum dose from radioactive iodine and particulate (including C-14) to the whole body was 4.03E-01 mrem (child) based on measured effluents and average meteorological data and 5.37E-01 mrem based on concurrent meteorological data.

3.2 Liquid Effluent Pathways

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while on the shoreline. Not all of these pathways are significant or applicable at a given time or station but a reasonable approximation of the dose can be made by

adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC developed equations were used to calculate the doses to the whole body, lower GI tracts, thyroid, bone and skin; specific parameters for use in the equations are given in the Braidwood Offsite Dose Calculation Manual. The maximum whole body dose and any organ dose for the year was 7.37E-02 mrem (Table 3.2-1 [child]) and 7.38E-02 mrem, respectively (Table 3.2-1 [child]).

3.3 Assessment of Dose to Member of Public

During the period January to December, 2016, Braidwood Station did not exceed the following limits as shown in Table 3.1-1 and Table 3.2-1 (based on annual average meteorological data), Table 3.4-1 (based on concurrent meteorological data), and Table 3.3-1:

- The RETS limits on dose or dose commitment to an individual due to radioactive materials in liquid effluents from each reactor unit (1.5 mrem to the whole body or 5 mrem to any organ during any calendar year; 3 mrem to the whole body or 10 mrem to any organ during the calendar year).
- The RETS limits on air dose in noble gases released in gaseous effluents to a member of the public from each reactor unit (5 mrads for gamma radiation or 10 mrad for beta radiation during any calendar quarter; 10 mrad for gamma radiation or 20 mrad for beta radiation during a calendar year).
- The RETS limits on dose to a member of the public due to iodine-131, iodine-133, tritium, and radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released from each reactor unit (7.5 mrem to any organ during any calendar quarter; 15 mrem to any organ during any calendar year).
- The 10 CFR 20 limit on Total Effective Dose Equivalent to individual members of the public (100 mrem) during any calendar year.

4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each calendar quarter of the year is given in Appendix F. The data are presented as cumulative joint frequency distributions of the wind direction for the 203' level and wind speed class by atmospheric stability class determined from the temperature difference between the 199' and 30' levels. Data recovery

for these measurements was 99.8% during 2016.

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APPENDIX E-1

DATA TABLES AND FIGURES

Table 1.1-1

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2016
GAS RELEASES
UNIT 1 (Docket Number 50-456)
SUMMATION OF ALL RELEASES

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error%
A. Fission and Activation Gas Releases						
1. Total Release Activity	Ci	<LLD	2.28E-03	4.78E-02	2.49E-02	7.59E+00
2. Average Release Rate	mCi/sec	N/A	2.90E-04	6.01E-03	3.13E-03	
3. Percent of ODCM Limit – gamma	%	N/A	3.63E-07	8.96E-06	4.22E-06	
4. Percent of ODCM Limit - beta	%	N/A	8.80E-07	1.95E-05	9.81E-06	
B. Iodine Releases						
1. Total Iodine	Ci	<LLD	2.38E-08	2.30E-04	<LLD	3.32E+01
2. Average Release Rate	mCi/sec	N/A	3.02E-09	2.89E-05	N/A	
3. Percent of ODCM Limit	%	N/A	2.47E-09	8.04E-02	N/A	
c. Particulate (> 8 day half-life) Releases						
1. Particulates with half-lives > 8 days	Ci	<LLD	<LLD	<LLD	<LLD	1.98E+01
2. Average Release Rate	mCi/sec	N/A	N/A	N/A	N/A	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
4. Gross Alpha Radioactivity	Ci	N/A	N/A	N/A	N/A	
D. Tritium Releases						
1. Total Release Activity	Ci	1.91E+01	1.35E+01	3.26E+01	3.62E+01	8.07E+00
2. Average Release Rate	mCi/sec	2.43E+00	1.72E+00	4.10E+00	4.55E+00	
3. Percent of ODCM Limit	%	3.72E-02	2.63E-02	6.33E-02	7.03E-02	
E. Gross Alpha Releases						
1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	1.98E+01
2. Average Release Rate	mCi/sec	N/A	N/A	N/A	N/A	
3. Percent of ODCM limit	%	N/A	N/A	N/A	N/A	
F. Carbon-14 Releases						
1. Total Release Activity	Ci	1.11E+00	1.26E+00	1.02E+00	9.39E-01	
2. Average Release Rate	mCi/sec	1.42E-01	1.61E-01	1.29E-01	1.18E-01	

Note: LLD Values are included in Appendix A of this report.

Table 1.1-1

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2016
GAS RELEASES
UNIT 2 (Docket Number 50-457)
SUMMATION OF ALL RELEASES

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error%
A. Fission and Activation Gas Releases						
1. Total Activity Released	Ci	<LLD	2.28E-03	4.78E-02	2.49E-02	7.59E+00
2. Average Release Rate	mCi/sec	N/A	2.90E-04	6.01E-03	3.13E-03	
3. Percent of ODCM Limit - gamma	%	N/A	3.63E-07	8.96E-06	4.22E-06	
4. Percent of ODCM Limit - beta	%	N/A	8.80E-07	1.95E-05	9.81E-06	
B. Iodine Releases						
1. Total Iodine	Ci	<LLD	<LLD	4.81E-04	<LLD	3.32E+01
2. Average Release Rate	mCi/sec	N/A	N/A	6.05E-05	N/A	
3. Percent of ODCM Limit	%	N/A	N/A	5.01E-05	N/A	
C. Particulate (> 8 day half-life) Releases						
1. Particulates with half-lives > 8 days	Ci	<LLD	<LLD	<LLD	<LLD	1.98E+01
2. Average Release Rate	mCi/sec	N/A	N/A	N/A	N/A	
3. Percent of OCDM Limit	%	N/A	N/A	N/A	N/A	
4. Gross Alpha Radioactivity	Ci	N/A	N/A	N/A	N/A	
D. Tritium Releases						
1. Total Release Activity	Ci	1.52E+01	1.67E+01	4.76E+01	3.21E+01	8.07E+00
2. Average Release Rate	mCi/sec	1.93E+00	2.13E+00	5.98E+00	4.04E+00	
3. Percent of ODCM Limit	%	2.95E-02	3.25E-02	9.25E-02	6.25E-02	
E. Gross Alpha Releases						
1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	1.98E+01
2. Average Release Rate	mCi/sec	N/A	N/A	N/A	N/A	
3. Percent of ODCM Limit	%	N/A	N/A	N/A	N/A	
F. Carbon-14 Releases						
1. Total Release Activity	Ci	1.17E+00	1.12E+00	1.11E+00	1.11E+00	
2. Average Release Rate	mCi/sec	1.49E-01	1.42E-01	1.39E-01	1.40E-01	

Note: LLD Values are included in Appendix A of this report.

Table 1.2-1

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2016
LIQUID RELEASES
UNIT 1 (Docket Number 50-456)
SUMMATION OF ALL RELEASES

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error %
A. Fission and Activation Products						
1. Total Release	Ci	3.05E-04	3.89E-05	9.07E-03	5.46E-03	2.64E+00
2. Average Diluted Concentration	mCi/ml	4.18E-11	7.20E-12	1.13E-09	6.58E-10	
3. Percent of applicable limit	%	*	*	*	*	
B. Tritium						
1. Total Release	Ci	1.45E+02	2.84E+02	8.16E+02	4.50E+02	5.85E+00
2. Average Diluted Concentration	mCi/ml	1.99E-05	5.26E-05	1.01E-04	5.43E-05	
3. % of Limit (1E-2 μCi/ml)	%	1.99E-01	5.26E-01	1.01E+00	5.43E-01	
C. Dissolved Noble Gases						
1. Total Release	Ci	<LLD	<LLD	7.72E-07	3.80E-05	2.64E+00
2. Average Diluted Concentration	mCi/ml	N/A	N/A	9.58E-14	4.59E-12	
3. % of Limit (2E-4 μCi/ml)	%	N/A	N/A	4.79E-08	2.30E-06	
D. Gross Alpha						
A. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	1.47E+01
E. Volume of Waste Released (prior to dilution)	liters	6.11E+09	3.87E+09	6.13E+09	6.10E+09	
F. Volume of Dilution Water	liters	7.29E+09	5.40E+09	8.06E+09	8.29E+09	

Note: LLD Values are included in Appendix A of this report.

Note: % Limit Values are included in Appendix C 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.

Table 1.2-1

BRAIDWOOD NUCLEAR POWER STATION
ANNUAL EFFLUENT REPORT FOR 2016
LIQUID RELEASES
UNIT 2 (Docket Number 50-457)
SUMMATION OF ALL RELEASES

	Units	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Est. Total Error %
A. Fission and Activation Products						
1. Total Release	Ci	3.05E-04	3.89E-05	9.07E-03	5.46E-03	2.64E+00
2. Average Diluted Concentration	mCi/ml	4.18E-11	7.20E-12	1.13E-09	6.58E-10	
3. Percent of applicable limit	%	*	*	*	*	
B. Tritium						
1. Total Release	Ci	1.45E+02	2.84E+02	8.16E+02	4.50E+02	5.85E+00
2. Average Diluted Concentration	mCi/ml	1.99E-05	5.26E-05	1.01E-04	5.43E-05	
3. % of Limit (1E-2 μCi/ml)	%	1.99E-01	5.26E-01	1.01E+00	5.43E-01	
C. Dissolved Noble Gases						
1. Total Activity Released	Ci	<LLD	<LLD	7.72E-07	3.80E-05	2.64E+00
2. Average Diluted Concentration	mCi/ml	N/A	N/A	9.58E-14	4.59E-12	
3. % of Limit (2E-4 μCi/ml)	%	N/A	N/A	4.79E-08	2.30E-08	
D. Gross Alpha						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	1.47E+01
E. Volume of Waste Released (prior to dilution)	liters	6.11E+09	3.87E+09	6.13E+09	6.10E+09	
F. Volume of Dilution Water	liters	7.29E+09	5.40E+09	8.06E+09	8.29E+09	

Note: LLD Values are included in Appendix A of this report.

Note: % Limit Values are included in Appendix C of this report.

*This limit is equal to 10 times the concentration values in Appendix B, Table 2, Column 2 to 10CFR20.1001-2402, 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.

Table 3.1-1

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========================================
RELEASE AND DOSE SUMMARY REPORT PARAMETERS
========================================
Date.................: 3/22/2017 10:49:40 AM
Database.............: BWDOpenEMS_PROD
Username.............: Admin

Permit Type..........: Gas
Start Date...........: 01/01/2016
End Date.............: 12/31/2016
Unit.................: Unit 1 Braidwood
Scaling Factor.......: 1.000
Dose Projection Option: No Dose Projection
Prorate Option.......: Doses Not Prorated for period
                       Only Permits which have a release start date in the start/end period are
                       included with no pro-rating.
Sum By...............: Receptor, Pathway, and Nuclide
Include Open Permits..: No
Release Sources......: U1/U2 Gas Abnormal Batch Rel
                       U1/U2 Gas Abnormal Cont Rel
                       Unit 1 Containment Purge
                       Unit 1 DDAF Batch Rel
                       Unit 1 Stack
                       Waste Gas Decay Tank - A
                       Waste Gas Decay Tank - B
                       Waste Gas Decay Tank - C
                       Waste Gas Decay Tank - D
                       Waste Gas Decay Tank - E
                       Waste Gas Decay Tank - F

Pathways.............: Cow Milk
                       Ground Plane
                       Inhalation
                       Meat
                       Vegetation

Receptors............: Critical Receptor / Adult
                       Critical Receptor / Child
                       Critical Receptor / Infant
                       Critical Receptor / Teenager
                       Site Boundary / Adult
                       Site Boundary / Child
                       Site Boundary / Infant
                       Site Boundary / Teenager

Nuclides.............: H-3,C-14,Br-82,Cd-109,I-131,I-132,I-133,Xe-133,Xe-135

================================
RELEASE TOTALS BY RELEASE MODE
================================
Release Mode.........: Mixed
Release Duration.....: 5.559e+05 minutes
Release Volume.......: 7.871e+10 cf
Average Flowrate.....: 1.416e+05 cfm

.............Nuclide Detail.............
         Activity   Avg Conc   Avg Conc/
Nuclide  (uCi)      (uCi/mL)   ECL|MPC
-------  ---------  ---------  ---------
H-3      1.014e+08  4.549e-08  6.147e-06
C-14     4.342e+06  1.948e-09  5.265e-07
I-131    1.101e+01  4.939e-15  1.335e-09
I-132    2.187e+02  9.811e-14  8.838e-10
I-133    1.430e-01  6.414e-17  4.334e-12
Xe-133   7.264e+04  3.259e-11  2.936e-09
Xe-135   2.270e+03  1.018e-12  2.752e-10
-------  ---------  ---------  ---------
TOTAL :  1.058e+08              6.679e-06
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Table 3.1-1 (cont'd)

NOBLE GAS DOSES BY RECEPTOR (Total Body, Skin Dose = mRem Gamma, Beta Dose = mRad)

Receptor Name: Critical Receptor / Adult
Receptor Name: Critical Receptor / Child
Receptor Name: Critical Receptor / Infant
Receptor Name: Critical Receptor / Teenager

Nuclide	Total Bod	Skin	Gamma	Beta
Xe-133	4.821e-07	1.461e-06	5.789e-07	2.808e-06
Xe-135	9.275e-08	2.646e-07	9.839e-08	2.056e-07
TOTAL:	5.749e-07	1.726e-06	6.773e-07	3.013e-06

Receptor Name: Site Boundary / Adult
Receptor Name: Site Boundary / Child
Receptor Name: Site Boundary / Infant
Receptor Name: Site Boundary / Teenager

Nuclide	Total Bod	Skin	Gamma	Beta
Xe-133	4.821e-07	3.350e-06	5.789e-07	9.289e-06
Xe-135	9.275e-08	6.234e-07	9.839e-08	6.801e-07
TOTAL:	5.749e-07	3.973e-06	6.773e-07	9.969e-06

ORGAN DOSES BY RECEPTOR (Dose = mRem)

Receptor Name: Critical Receptor / Adult

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	1.624e-03	1.624e-03	1.624e-03	1.624e-03	1.624e-03	1.624e-03	0.000e+00
	C-14	5.802e-02	1.160e-02	1.160e-02	1.160e-02	1.160e-02	1.160e-02	1.160e-02	0.000e+00
	I-131	1.697e-06	2.428e-06	1.392e-06	7.959e-04	4.162e-06	0.000e+00	6.405e-07	0.000e+00
	I-132	1.876e-14	5.017e-14	1.755e-14	1.755e-12	7.992e-14	0.000e+00	9.424e-15	0.000e+00
	I-133	2.888e-10	5.022e-10	1.531e-10	7.381e-08	8.767e-10	0.000e+00	4.514e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-131	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	0.000e+00
	I-132	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	0.000e+00
	I-133	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	2.680e-03	2.680e-03	2.680e-03	2.680e-03	2.680e-03	2.680e-03	0.000e+00
	C-14	2.909e-03	5.450e-04	5.450e-04	5.450e-04	5.450e-04	5.450e-04	5.450e-04	0.000e+00
	I-131	1.021e-08	1.451e-08	8.307e-09	4.822e-06	2.484e-08	0.000e+00	2.545e-09	0.000e+00
	I-132	9.338e-09	2.624e-08	9.338e-09	9.177e-07	4.170e-08	0.000e+00	3.268e-09	0.000e+00
	I-133	4.547e-11	7.790e-11	2.379e-11	1.132e-08	1.358e-10	0.000e+00	4.674e-11	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Meat									
	H-3	0.000e+00	6.905e-04	6.905e-04	6.905e-04	6.905e-04	6.905e-04	6.905e-04	0.000e+00
	C-14	5.323e-02	1.065e-02	1.065e-02	1.065e-02	1.065e-02	1.065e-02	1.065e-02	0.000e+00
	I-131	6.136e-08	8.831e-08	5.046e-08	2.884e-05	1.508e-07	0.000e+00	2.322e-08	0.000e+00
	I-132	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	I-133	2.756e-17	4.789e-17	1.460e-17	7.039e-15	8.342e-17	0.000e+00	4.305e-17	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00

Table 3.1-1 (cont'd)

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Vegetation									
	H-3	0.000e+00	4.815e-03	4.815e-03	4.815e-03	4.815e-03	4.815e-03	4.815e-03	0.000e+00
	C-14	1.434e-01	2.861e-02	2.861e-02	2.861e-02	2.861e-02	2.861e-02	2.861e-02	0.000e+00
	I-131	4.628e-07	6.595e-07	3.796e-07	2.168e-04	1.135e-06	0.000e+00	1.749e-07	0.000e+00
	I-132	6.357e-12	1.697e-11	5.946e-12	5.946e-10	2.711e-11	0.000e+00	3.190e-12	0.000e+00
	I-133	1.549e-10	2.696e-10	8.193e-11	3.962e-08	4.700e-10	0.000e+00	2.421e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		2.575e-01	6.122e-02	6.122e-02	6.226e-02	6.122e-02	6.121e-02	6.122e-02	0.000e+00

Receptor Name: Critical Receptor / Child

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	3.348e-03	3.348e-03	3.348e-03	3.348e-03	3.348e-03	3.348e-03	0.000e+00
	C-14	2.637e-01	5.259e-02	5.259e-02	5.259e-02	5.259e-02	5.259e-02	5.259e-02	0.000e+00
	I-131	7.455e-06	7.512e-06	4.272e-06	2.483e-03	1.233e-05	0.000e+00	6.709e-07	0.000e+00
	I-132	7.872e-14	1.447e-13	6.653e-14	6.710e-12	2.210e-13	0.000e+00	1.697e-13	0.000e+00
	I-133	1.281e-09	1.586e-09	5.996e-10	2.942e-07	2.644e-09	0.000e+00	6.383e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-131	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	0.000e+00
	I-132	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	0.000e+00
	I-133	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	2.389e-03	2.389e-03	2.389e-03	2.389e-03	2.389e-03	2.389e-03	0.000e+00
	C-14	5.738e-03	1.076e-03	1.076e-03	1.076e-03	1.076e-03	1.076e-03	1.076e-03	0.000e+00
	I-131	1.949e-08	1.949e-08	1.106e-08	6.564e-06	3.193e-08	0.000e+00	1.151e-09	0.000e+00
	I-132	1.707e-08	3.276e-08	1.513e-08	1.562e-06	5.031e-08	0.000e+00	2.576e-08	0.000e+00
	I-133	8.737e-11	1.068e-10	4.053e-11	2.026e-08	1.779e-10	0.000e+00	2.884e-11	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Meat									
	H-3	0.000e+00	5.001e-04	5.001e-04	5.001e-04	5.001e-04	5.001e-04	5.001e-04	0.000e+00
	C-14	8.455e-02	1.694e-02	1.694e-02	1.694e-02	1.694e-02	1.694e-02	1.694e-02	0.000e+00
	I-131	9.462e-08	9.519e-08	5.419e-08	3.154e-05	1.565e-07	0.000e+00	8.487e-09	0.000e+00
	I-132	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	I-133	4.283e-17	5.288e-17	2.004e-17	9.832e-15	8.789e-17	0.000e+00	2.130e-17	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Vegetation									
	H-3	0.000e+00	8.547e-03	8.547e-03	8.547e-03	8.547e-03	8.547e-03	8.547e-03	0.000e+00
	C-14	5.594e-01	1.120e-01	1.120e-01	1.120e-01	1.120e-01	1.120e-01	1.120e-01	0.000e+00
	I-131	8.200e-07	8.258e-07	4.685e-07	2.724e-04	1.353e-06	0.000e+00	7.340e-08	0.000e+00
	I-132	1.017e-11	1.868e-11	8.589e-12	8.669e-10	2.859e-11	0.000e+00	2.199e-11	0.000e+00
	I-133	2.622e-10	3.247e-10	1.229e-10	6.026e-08	5.407e-10	0.000e+00	1.311e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		9.135e-01	1.974e-01	1.974e-01	2.002e-01	1.974e-01	1.974e-01	1.974e-01	0.000e+00

Table 3.1-1 (cont'd)

Receptor Name: Critical Receptor / Infant

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	5.076e-03	5.076e-03	5.076e-03	5.076e-03	5.076e-03	5.076e-03	0.000e+00
	C-14	5.163e-01	1.101e-01	1.101e-01	1.101e-01	1.101e-01	1.101e-01	1.101e-01	0.000e+00
	I-131	1.560e-05	1.835e-05	8.085e-06	6.021e-03	2.145e-05	0.000e+00	6.537e-07	0.000e+00
	I-132	1.629e-13	3.315e-13	1.185e-13	1.549e-11	3.702e-13	0.000e+00	2.688e-13	0.000e+00
	I-133	2.704e-09	3.940e-09	1.154e-09	7.165e-07	4.633e-09	0.000e+00	6.666e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-131	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	0.000e+00
	I-132	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	0.000e+00
	I-133	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	1.373e-03	1.373e-03	1.373e-03	1.373e-03	1.373e-03	1.373e-03	0.000e+00
	C-14	4.236e-03	8.487e-04	8.487e-04	8.487e-04	8.487e-04	8.487e-04	8.487e-04	0.000e+00
	I-131	1.536e-08	1.799e-08	7.942e-09	5.997e-06	2.099e-08	0.000e+00	4.295e-10	0.000e+00
	I-132	1.360e-08	2.850e-08	1.014e-08	1.360e-06	3.180e-08	0.000e+00	1.529e-08	0.000e+00
	I-133	6.947e-11	1.011e-10	2.947e-11	1.874e-08	1.179e-10	0.000e+00	1.137e-11	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		5.205e-01	1.174e-01	1.174e-01	1.235e-01	1.174e-01	1.174e-01	1.174e-01	0.000e+00

Receptor Name: Critical Receptor / Teenager

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	2.112e-03	2.112e-03	2.112e-03	2.112e-03	2.112e-03	2.112e-03	0.000e+00
	C-14	1.071e-01	2.142e-02	2.142e-02	2.142e-02	2.142e-02	2.142e-02	2.142e-02	0.000e+00
	I-131	3.079e-06	4.312e-06	2.317e-06	1.256e-03	7.397e-06	0.000e+00	8.544e-07	0.000e+00
	I-132	3.326e-14	8.703e-14	3.121e-14	2.928e-12	1.367e-13	0.000e+00	3.793e-14	0.000e+00
	I-133	5.273e-10	8.938e-10	2.726e-10	1.251e-07	1.572e-09	0.000e+00	6.770e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-131	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	9.863e-08	0.000e+00
	I-132	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	1.424e-07	0.000e+00
	I-133	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	1.825e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	2.706e-03	2.706e-03	2.706e-03	2.706e-03	2.706e-03	2.706e-03	0.000e+00
	C-14	4.156e-03	7.784e-04	7.784e-04	7.784e-04	7.784e-04	7.784e-04	7.784e-04	0.000e+00
	I-131	1.434e-08	1.990e-08	1.070e-08	5.916e-06	3.404e-08	0.000e+00	2.630e-09	0.000e+00
	I-132	1.280e-08	3.526e-08	1.272e-08	1.216e-06	5.570e-08	0.000e+00	1.022e-08	0.000e+00
	I-133	6.421e-11	1.079e-10	3.274e-11	1.537e-08	1.889e-10	0.000e+00	5.421e-11	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Meat									
	H-3	0.000e+00	4.106e-04	4.106e-04	4.106e-04	4.106e-04	4.106e-04	4.106e-04	0.000e+00
	C-14	4.491e-02	8.983e-03	8.983e-03	8.983e-03	8.983e-03	8.983e-03	8.983e-03	0.000e+00
	I-131	5.115e-08	7.168e-08	3.848e-08	2.087e-05	1.233e-07	0.000e+00	1.416e-08	0.000e+00
	I-132	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	I-133	2.302e-17	3.910e-17	1.192e-17	5.452e-15	6.852e-17	0.000e+00	2.957e-17	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00

Table 3.1-1 (cont'd)

Vegetation								
	H-3	0.000e+00	5.486e-03	5.486e-03	5.486e-03	5.486e-03	5.486e-03	0.000e+00
	C-14	2.318e-01	4.651e-02	4.651e-02	4.651e-02	4.651e-02	4.651e-02	0.000e+00
	I-131	4.404e-07	6.193e-07	3.314e-07	1.801e-04	1.061e-06	0.000e+00	1.221e-07	0.000e+00
	I-132	5.730e-12	1.504e-11	5.377e-12	5.046e-10	2.358e-11	0.000e+00	6.527e-12	0.000e+00
	I-133	1.438e-10	2.443e-10	7.448e-11	3.411e-08	4.283e-10	0.000e+00	1.847e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		3.879e-01	8.841e-02	8.841e-02	8.987e-02	8.842e-02	8.841e-02	8.841e-02	0.000e+00

Receptor Name: Site Boundary / Adult

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	8.866e-03	8.866e-03	8.866e-03	8.866e-03	8.866e-03	8.866e-03	0.000e+00
	C-14	9.624e-03	1.803e-03	1.803e-03	1.803e-03	1.803e-03	1.803e-03	1.803e-03	0.000e+00
	I-131	3.378e-08	4.799e-08	2.748e-08	1.595e-05	8.218e-08	0.000e+00	8.419e-09	0.000e+00
	I-132	3.089e-08	8.682e-08	3.089e-08	3.036e-06	1.379e-07	0.000e+00	1.081e-08	0.000e+00
	I-133	1.504e-10	2.577e-10	7.870e-11	3.744e-08	4.492e-10	0.000e+00	1.546e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		9.624e-03	1.067e-02	1.067e-02	1.069e-02	1.067e-02	1.067e-02	1.067e-02	0.000e+00

Receptor Name: Site Boundary / Child

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	7.903e-03	7.903e-03	7.903e-03	7.903e-03	7.903e-03	7.903e-03	0.000e+00
	C-14	1.898e-02	3.559e-03	3.559e-03	3.559e-03	3.559e-03	3.559e-03	3.559e-03	0.000e+00
	I-131	6.448e-08	6.448e-08	3.660e-08	2.172e-05	1.056e-07	0.000e+00	3.807e-09	0.000e+00
	I-132	5.646e-08	1.084e-07	5.007e-08	5.166e-06	1.664e-07	0.000e+00	8.522e-08	0.000e+00
	I-133	2.890e-10	3.535e-10	1.341e-10	6.704e-08	5.885e-10	0.000e+00	9.542e-11	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.898e-02	1.146e-02	1.146e-02	1.149e-02	1.146e-02	1.146e-02	1.146e-02	0.000e+00

Receptor Name: Site Boundary / Infant

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	4.544e-03	4.544e-03	4.544e-03	4.544e-03	4.544e-03	4.544e-03	0.000e+00
	C-14	1.401e-02	2.808e-03	2.808e-03	2.808e-03	2.808e-03	2.808e-03	2.808e-03	0.000e+00
	I-131	5.081e-08	5.952e-08	2.628e-08	1.984e-05	6.944e-08	0.000e+00	1.421e-09	0.000e+00
	I-132	4.501e-08	9.427e-08	3.356e-08	4.501e-06	1.052e-07	0.000e+00	5.060e-08	0.000e+00
	I-133	2.298e-10	3.343e-10	9.751e-11	6.199e-08	3.900e-10	0.000e+00	3.761e-11	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.401e-02	7.352e-03	7.352e-03	7.376e-03	7.352e-03	7.352e-03	7.352e-03	0.000e+00

Table 3.1-1 (cont'd)

Receptor Name: Site Boundary / Teenager

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	8.952e-03	8.952e-03	8.952e-03	8.952e-03	8.952e-03	8.952e-03	0.000e+00
	C-14	1.375e-02	2.575e-03	2.575e-03	2.575e-03	2.575e-03	2.575e-03	2.575e-03	0.000e+00
	I-131	4.746e-08	6.582e-08	3.539e-08	1.957e-05	1.126e-07	0.000e+00	8.700e-09	0.000e+00
	I-132	4.234e-08	1.166e-07	4.208e-08	4.021e-06	1.843e-07	0.000e+00	3.382e-08	0.000e+00
	I-133	2.124e-10	3.570e-10	1.083e-10	5.084e-08	6.251e-10	0.000e+00	1.793e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.375e-02	1.153e-02	1.153e-02	1.155e-02	1.153e-02	1.153e-02	1.153e-02	0.000e+00

==========
RELEASE AND DOSE SUMMARY REPORT PARAMETERS
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Date.....: 3/22/2017 11:47:27 AM
Database.....: BWDOpenEMS_PROD
Username.....: Admin

Permit Type.....: Gas
Start Date.....: 01/01/2016
End Date.....: 12/31/2016
Unit.....: Unit 2 Braidwood
Scaling Factor.....: 1.000
Dose Projection Option: No Dose Projection
Prorate Option.....: Doses Not Prorated for period
Only Permits which have a release start date in the start/end period are included with no pro-rating.
Sum By.....: Receptor, Pathway, and Nuclide
Include Open Permits..: No
Release Sources.....: U1/U2 Gas Abnormal Batch Rel
U1/U2 Gas Abnormal Cont Rel
Unit 2 Containment Purge
Unit 2 DDAF Batch Rel
Unit 2 Stack
Waste Gas Decay Tank - A
Waste Gas Decay Tank - B
Waste Gas Decay Tank - C
Waste Gas Decay Tank - D
Waste Gas Decay Tank - E
Waste Gas Decay Tank - F

Pathways.....: Cow Milk
Ground Plane
Inhalation
Meat
Vegetation

Receptors.....: Critical Receptor / Adult
Critical Receptor / Child
Critical Receptor / Infant
Critical Receptor / Teenager
Site Boundary / Adult
Site Boundary / Child
Site Boundary / Infant
Site Boundary / Teenager

Nuclides.....: H-3,C-14,Br-82,Cd-109,I-131,I-132,I-133,Xe-133,Xe-135

Table 3.1-1 (cont'd)

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==============================
RELEASE TOTALS BY RELEASE MODE
==============================
Release Mode.....: Mixed
Release Duration.....: 5.438e+05 minutes
Release Volume.....: 7.084e+10 cf
Average Flowrate.....: 1.303e+05 cfm

.............Nuclide Detail.............
         Activity   Avg Conc   Avg Conc/
Nuclide  (uCi)      (uCi/mL)   ECL|MPC
-------  ---------  ---------  ---------
H-3      1.116e+08  5.561e-08  7.515e-06
C-14     4.500e+06  2.243e-09  6.063e-07
I-132    4.812e+02  2.399e-13  2.161e-09
I-133    8.111e-04  4.043e-19  2.732e-14
Xe-133   7.264e+04  3.621e-11  3.262e-09
Xe-135   2.270e+03  1.131e-12  3.058e-10
-------  ---------  ---------  ---------
TOTAL :  1.161e+08              8.127e-06


================================================================================
NOBLE GAS DOSES BY RECEPTOR (Total Body, Skin Dose = mRem  Gamma, Beta Dose = mRad)
================================================================================

Receptor Name: Critical Receptor / Adult
Receptor Name: Critical Receptor / Child
Receptor Name: Critical Receptor / Infant
Receptor Name: Critical Receptor / Teenager
Nuclide  Total Bod  Skin       Gamma      Beta
-------  ---------  ---------  ---------  ---------
Xe-133   4.821e-07  1.461e-06  5.789e-07  2.808e-06
Xe-135   9.275e-08  2.646e-07  9.839e-08  2.056e-07
-------  ---------  ---------  ---------  ---------
TOTAL:   5.749e-07  1.726e-06  6.773e-07  3.013e-06

Receptor Name: Site Boundary / Adult
Receptor Name: Site Boundary / Child
Receptor Name: Site Boundary / Infant
Receptor Name: Site Boundary / Teenager
Nuclide  Total Bod  Skin       Gamma      Beta
-------  ---------  ---------  ---------  ---------
Xe-133   4.821e-07  3.350e-06  5.789e-07  9.289e-06
Xe-135   9.275e-08  6.234e-07  9.839e-08  6.801e-07
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TOTAL:   5.749e-07  3.973e-06  6.773e-07  9.969e-06


======================================
ORGAN DOSES BY RECEPTOR (Dose = mRem)
======================================

Receptor Name: Critical Receptor / Adult
Pathway   Nuclide Bone      Liver     Total Bod Thyroid   Kidney    Lung      GI-Lli    Skin
------------------------------ ------- --------- --------- --------- --------- --------- ---------
Cow Milk
          H-3     0.000e+00 1.787e-03 1.787e-03 1.787e-03 1.787e-03 1.787e-03 1.787e-03 0.000e+00
          C-14    6.013e-02 1.203e-02 1.203e-02 1.203e-02 1.203e-02 1.203e-02 1.203e-02 0.000e+00
          I-132   4.129e-14 1.104e-13 3.863e-14 3.863e-12 1.759e-13 0.000e+00 2.074e-14 0.000e+00
          I-133   1.638e-12 2.849e-12 8.688e-13 4.188e-10 4.974e-12 0.000e+00 2.561e-12 0.000e+00
          Xe-133  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
          Xe-135  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
------------------------------ -------: --------- --------- --------- --------- --------- ---------
Ground Plane
          I-132   3.134e-07 3.134e-07 3.134e-07 3.134e-07 3.134e-07 3.134e-07 3.134e-07 0.000e+00
          I-133   1.035e-12 1.035e-12 1.035e-12 1.035e-12 1.035e-12 1.035e-12 1.035e-12 0.000e+00
          Xe-133  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
          Xe-135  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
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Table 3.1-1 (cont'd)

Inhalation								
	H-3	0.000e+00	2.949e-03	2.949e-03	2.949e-03	2.949e-03	2.949e-03	0.000e+00
	C-14	3.015e-03	5.649e-04	5.649e-04	5.649e-04	5.649e-04	5.649e-04	0.000e+00
	I-132	2.055e-08	5.775e-08	2.055e-08	2.019e-06	9.176e-08	0.000e+00	7.192e-09	0.000e+00
	I-133	2.580e-13	4.419e-13	1.350e-13	6.420e-11	7.704e-13	0.000e+00	2.652e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Meat								
	H-3	0.000e+00	7.598e-04	7.598e-04	7.598e-04	7.598e-04	7.598e-04	7.598e-04	0.000e+00
	C-14	5.516e-02	1.103e-02	1.103e-02	1.103e-02	1.103e-02	1.103e-02	1.103e-02	0.000e+00
	I-132	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	I-133	1.563e-19	2.717e-19	8.282e-20	3.993e-17	4.733e-19	0.000e+00	2.442e-19	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Vegetation								
	H-3	0.000e+00	5.298e-03	5.298e-03	5.298e-03	5.298e-03	5.298e-03	5.298e-03	0.000e+00
	C-14	1.486e-01	2.965e-02	2.965e-02	2.965e-02	2.965e-02	2.965e-02	2.965e-02	0.000e+00
	I-132	1.399e-11	3.735e-11	1.309e-11	1.309e-09	5.966e-11	0.000e+00	7.019e-12	0.000e+00
	I-133	8.789e-13	1.530e-12	4.648e-13	2.248e-10	2.666e-12	0.000e+00	1.373e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		2.669e-01	6.407e-02	6.407e-02	6.407e-02	6.407e-02	6.407e-02	6.407e-02	0.000e+00

Receptor Name: Critical Receptor / Child

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	3.684e-03	3.684e-03	3.684e-03	3.684e-03	3.684e-03	3.684e-03	0.000e+00
	C-14	2.733e-01	5.450e-02	5.450e-02	5.450e-02	5.450e-02	5.450e-02	5.450e-02	0.000e+00
	I-132	1.732e-13	3.184e-13	1.464e-13	1.477e-11	4.863e-13	0.000e+00	3.735e-13	0.000e+00
	I-133	7.268e-12	9.000e-12	3.402e-12	1.669e-09	1.500e-11	0.000e+00	3.621e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-132	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	0.000e+00
	I-133	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	2.629e-03	2.629e-03	2.629e-03	2.629e-03	2.629e-03	2.629e-03	0.000e+00
	C-14	5.947e-03	1.115e-03	1.115e-03	1.115e-03	1.115e-03	1.115e-03	1.115e-03	0.000e+00
	I-132	3.755e-08	7.210e-08	3.330e-08	3.437e-06	1.107e-07	0.000e+00	5.669e-08	0.000e+00
	I-133	4.957e-13	6.061e-13	2.299e-13	1.150e-10	1.009e-12	0.000e+00	1.636e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Meat									
	H-3	0.000e+00	5.504e-04	5.504e-04	5.504e-04	5.504e-04	5.504e-04	5.504e-04	0.000e+00
	C-14	8.763e-02	1.756e-02	1.756e-02	1.756e-02	1.756e-02	1.756e-02	1.756e-02	0.000e+00
	I-132	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	I-133	2.430e-19	3.000e-19	1.137e-19	5.578e-17	4.986e-19	0.000e+00	1.209e-19	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Vegetation									
	H-3	0.000e+00	9.405e-03	9.405e-03	9.405e-03	9.405e-03	9.405e-03	9.405e-03	0.000e+00
	C-14	5.798e-01	1.161e-01	1.161e-01	1.161e-01	1.161e-01	1.161e-01	1.161e-01	0.000e+00
	I-132	2.239e-11	4.111e-11	1.890e-11	1.908e-09	6.292e-11	0.000e+00	4.838e-11	0.000e+00
	I-133	1.487e-12	1.842e-12	6.972e-13	3.418e-10	3.068e-12	0.000e+00	7.437e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00

Table 3.1-1 (cont'd)

ALL PATHWAYS/NUCLIDES TOTAL:	9.467e-01	2.056e-01	2.056e-01	2.056e-01	2.056e-01	2.056e-01	2.056e-01	0.000e+00

Receptor Name: Critical Receptor / Infant

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	5.586e-03	5.586e-03	5.586e-03	5.586e-03	5.586e-03	5.586e-03	0.000e+00
	C-14	5.351e-01	1.141e-01	1.141e-01	1.141e-01	1.141e-01	1.141e-01	1.141e-01	0.000e+00
	I-132	3.585e-13	7.295e-13	2.607e-13	3.409e-11	8.147e-13	0.000e+00	5.916e-13	0.000e+00
	I-133	1.534e-11	2.235e-11	6.550e-12	4.065e-09	2.628e-11	0.000e+00	3.782e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-132	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	0.000e+00
	I-133	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	1.511e-03	1.511e-03	1.511e-03	1.511e-03	1.511e-03	1.511e-03	0.000e+00
	C-14	4.390e-03	8.796e-04	8.796e-04	8.796e-04	8.796e-04	8.796e-04	8.796e-04	0.000e+00
	I-132	2.994e-08	6.271e-08	2.232e-08	2.994e-06	6.997e-08	0.000e+00	3.366e-08	0.000e+00
	I-133	3.941e-13	5.733e-13	1.672e-13	1.063e-10	6.689e-13	0.000e+00	6.450e-14	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		5.395e-01	1.221e-01	1.221e-01	1.221e-01	1.221e-01	1.221e-01	1.221e-01	0.000e+00

Receptor Name: Critical Receptor / Teenager

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Cow Milk									
	H-3	0.000e+00	2.325e-03	2.325e-03	2.325e-03	2.325e-03	2.325e-03	2.325e-03	0.000e+00
	C-14	1.110e-01	2.220e-02	2.220e-02	2.220e-02	2.220e-02	2.220e-02	2.220e-02	0.000e+00
	I-132	7.320e-14	1.915e-13	6.869e-14	6.443e-12	3.008e-13	0.000e+00	8.348e-14	0.000e+00
	I-133	2.992e-12	5.071e-12	1.547e-12	7.099e-10	8.916e-12	0.000e+00	3.841e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Ground Plane									
	I-132	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	3.134e-07	0.000e+00
	I-133	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	1.035e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Inhalation									
	H-3	0.000e+00	2.978e-03	2.978e-03	2.978e-03	2.978e-03	2.978e-03	2.978e-03	0.000e+00
	C-14	4.307e-03	8.067e-04	8.067e-04	8.067e-04	8.067e-04	8.067e-04	8.067e-04	0.000e+00
	I-132	2.817e-08	7.759e-08	2.799e-08	2.675e-06	1.226e-07	0.000e+00	2.250e-08	0.000e+00
	I-133	3.643e-13	6.121e-13	1.857e-13	8.719e-11	1.072e-12	0.000e+00	3.076e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Meat									
	H-3	0.000e+00	4.518e-04	4.518e-04	4.518e-04	4.518e-04	4.518e-04	4.518e-04	0.000e+00
	C-14	4.655e-02	9.310e-03	9.310e-03	9.310e-03	9.310e-03	9.310e-03	9.310e-03	0.000e+00
	I-132	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	I-133	1.306e-19	2.218e-19	6.761e-20	3.093e-17	3.888e-19	0.000e+00	1.678e-19	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00

Table 3.1-1 (cont'd)

Vegetation								
	H-3	0.000e+00	6.037e-03	6.037e-03	6.037e-03	6.037e-03	6.037e-03	6.037e-03	0.000e+00
	C-14	2.402e-01	4.821e-02	4.821e-02	4.821e-02	4.821e-02	4.821e-02	4.821e-02	0.000e+00
	I-132	1.261e-11	3.309e-11	1.183e-11	1.111e-09	5.189e-11	0.000e+00	1.436e-11	0.000e+00
	I-133	8.155e-13	1.386e-12	4.226e-13	1.935e-10	2.430e-12	0.000e+00	1.048e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		4.020e-01	9.231e-02	9.231e-02	9.232e-02	9.231e-02	9.231e-02	9.231e-02	0.000e+00

Receptor Name: Site Boundary / Adult

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	9.756e-03	9.756e-03	9.756e-03	9.756e-03	9.756e-03	9.756e-03	0.000e+00
	C-14	9.974e-03	1.869e-03	1.869e-03	1.869e-03	1.869e-03	1.869e-03	1.869e-03	0.000e+00
	I-132	6.798e-08	1.911e-07	6.798e-08	6.681e-06	3.036e-07	0.000e+00	2.379e-08	0.000e+00
	I-133	8.535e-13	1.462e-12	4.465e-13	2.124e-10	2.549e-12	0.000e+00	8.772e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		9.975e-03	1.163e-02	1.162e-02	1.163e-02	1.163e-02	1.162e-02	1.162e-02	0.000e+00

Receptor Name: Site Boundary / Child

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	8.696e-03	8.696e-03	8.696e-03	8.696e-03	8.696e-03	8.696e-03	0.000e+00
	C-14	1.967e-02	3.688e-03	3.688e-03	3.688e-03	3.688e-03	3.688e-03	3.688e-03	0.000e+00
	I-132	1.242e-07	2.385e-07	1.102e-07	1.137e-05	3.663e-07	0.000e+00	1.875e-07	0.000e+00
	I-133	1.640e-12	2.005e-12	7.606e-13	3.803e-10	3.339e-12	0.000e+00	5.413e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.968e-02	1.238e-02	1.238e-02	1.240e-02	1.238e-02	1.238e-02	1.238e-02	0.000e+00

Receptor Name: Site Boundary / Infant

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	5.000e-03	5.000e-03	5.000e-03	5.000e-03	5.000e-03	5.000e-03	0.000e+00
	C-14	1.452e-02	2.910e-03	2.910e-03	2.910e-03	2.910e-03	2.910e-03	2.910e-03	0.000e+00
	I-132	9.904e-08	2.075e-07	7.384e-08	9.904e-06	2.315e-07	0.000e+00	1.113e-07	0.000e+00
	I-133	1.304e-12	1.897e-12	5.532e-13	3.517e-10	2.213e-12	0.000e+00	2.134e-13	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.452e-02	7.911e-03	7.911e-03	7.920e-03	7.911e-03	7.910e-03	7.911e-03	0.000e+00

Receptor Name: Site Boundary / Teenager

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Inhalation									
	H-3	0.000e+00	9.851e-03	9.851e-03	9.851e-03	9.851e-03	9.851e-03	9.851e-03	0.000e+00
	C-14	1.425e-02	2.669e-03	2.669e-03	2.669e-03	2.669e-03	2.669e-03	2.669e-03	0.000e+00
	I-132	9.318e-08	2.567e-07	9.260e-08	8.849e-06	4.055e-07	0.000e+00	7.443e-08	0.000e+00
	I-133	1.205e-12	2.025e-12	6.144e-13	2.885e-10	3.546e-12	0.000e+00	1.017e-12	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Xe-135	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.425e-02	1.252e-02	1.252e-02	1.253e-02	1.252e-02	1.252e-02	1.252e-02	0.000e+00

Table 3.2-1

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========================================
RELEASE AND DOSE SUMMARY REPORT PARAMETERS
========================================
Date.................: 4/12/2017 11:58:20 AM
Database.............: BWDOpenEMS_PROD
Username.............: Admin

Permit Type..........: Liquid
Start Date...........: 01/01/2016
End Date.............: 12/31/2016
Unit.................: Unit 1 Braidwood
Scaling Factor.......: 1.000
Dose Projection Option: No Dose Projection
Prorate Option.......: Doses Not Prorated for period
                       Only Permits which have a release start date in the start/end period are included
                       with no pro-rating.
Sum By...............: Receptor, Pathway, and Nuclide
Include Open Permits..: No
Release Sources......: Circ Water Blowdown
                       Condensate Polisher Sump
                       Liquid Release Tank 0WX01T
                       Liquid Release Tank 0WX26T
                       Waste Water Treatment

Pathways.............: Potable Water
                       Sport Freshwater Fish

Receptors............: Liquid Receptor / Adult
                       Liquid Receptor / Child
                       Liquid Receptor / Infant
                       Liquid Receptor / Teenager

Nuclides.............: H-3,Cr-51,Mn-54,Fe-55,Fe-59,Co-57,Co-58,Co-60,Zn-65
                       Zr-95,Nb-95,Nb-97,Ag-110m,Sn-113,Sb-124,Sb-125,Te-123m

================================
RELEASE TOTALS BY DISCHARGE POINT
================================
Discharge Point......: Kankakee River
Release Duration.....: 8.946e+04 minutes
Release Volume.......: 1.043e+06 gal
Average Flowrate.....: 1.166e+01 gpm
Dilution Volume......: 1.803e+09 gal
Average Dil Flowrate..: 2.016e+04 gpm
```

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	1.470e+09	3.724e-01	1.007e-02	2.153e-04	5.818e-06
Cr-51	1.263e+03	3.199e-07	1.729e-08	1.849e-10	9.993e-12
Mn-54	2.485e+02	6.295e-08	5.671e-08	3.638e-11	3.278e-11
Fe-55	4.208e+03	1.066e-06	2.881e-07	6.161e-10	1.665e-10
Fe-59	2.758e+01	6.987e-09	1.888e-08	4.038e-12	1.091e-11
Co-57	2.135e+01	5.409e-09	2.437e-09	3.127e-12	1.408e-12
Co-58	1.629e+03	4.126e-07	5.576e-07	2.385e-10	3.223e-10
Co-60	6.107e+03	1.547e-06	1.394e-05	8.942e-10	8.056e-09
Zr-95	2.538e+01	6.429e-09	8.687e-09	3.716e-12	5.021e-12
Nb-95	1.943e+02	4.922e-08	4.434e-08	2.845e-11	2.563e-11
Nb-97	3.120e+02	7.904e-08	7.121e-09	4.568e-11	4.116e-12
Ag-110m	2.594e+02	6.572e-08	2.960e-07	3.799e-11	1.711e-10
Sn-113	3.922e+01	9.936e-09	8.951e-09	5.743e-12	5.174e-12
Sb-124	2.463e+01	6.240e-09	2.409e-08	3.607e-12	1.393e-11
Sb-125	4.866e+02	1.233e-07	1.111e-07	7.125e-11	6.419e-11
Te-123m	1.600e+01	4.054e-09	N/A	2.343e-12	N/A
Te-132	4.139e+00	1.048e-09	3.148e-09	6.060e-13	1.820e-12
Xe-133	3.881e+01	9.831e-09	1.329e-09	5.682e-12	7.679e-13
TOTAL :	1.470e+09		1.008e-02		5.827e-06

Table 3.2-1 (cont'd)

Discharge Point.....: KR - Circ Water Blowdown
Release Duration.....: 2.847e+05 minutes
Release Volume.....: 5.855e+09 gal
Average Flowrate.....: 2.056e+04 gpm
Dilution Volume.....: 0.000e+00 gal
Average Dil Flowrate..: 0.000e+00 gpm

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	2.246e+08	1.013e-05	2.739e-07	1.013e-05	2.739e-07
TOTAL :	2.246e+08		2.739e-07		2.739e-07

Discharge Point.....: Braidwood Lake
Release Duration.....: 5.693e+05 minutes
Release Volume.....: 1.307e+07 gal
Average Flowrate.....: 2.296e+01 gpm
Dilution Volume.....: 0.000e+00 gal
Average Dil Flowrate..: 0.000e+00 gpm

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	9.192e+05	1.858e-05	5.021e-07	1.858e-05	5.021e-07
TOTAL :	9.192e+05		5.021e-07		5.021e-07

Discharge Point.....: ALL DISCHARGE POINTS
Release Duration.....: 9.435e+05 minutes
Release Volume.....: 5.869e+09 gal
Average Flowrate.....: 6.221e+03 gpm
Dilution Volume.....: 1.803e+09 gal
Average Dil Flowrate..: 1.911e+03 gpm

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	1.696e+09	7.632e-05	2.063e-06	5.838e-05	1.578e-06
Cr-51	1.263e+03	5.683e-11	3.072e-12	4.347e-11	2.350e-12
Mn-54	2.485e+02	1.118e-11	1.008e-11	8.556e-12	7.708e-12
Fe-55	4.208e+03	1.894e-10	5.118e-11	1.449e-10	3.915e-11
Fe-59	2.758e+01	1.241e-12	3.355e-12	9.496e-13	2.567e-12
Co-57	2.135e+01	9.611e-13	4.329e-13	7.352e-13	3.312e-13
Co-58	1.629e+03	7.331e-11	9.906e-11	5.608e-11	7.578e-11
Co-60	6.107e+03	2.749e-10	2.476e-09	2.103e-10	1.894e-09
Zr-95	2.538e+01	1.142e-12	1.543e-12	8.737e-13	1.181e-12
Nb-95	1.943e+02	8.745e-12	7.878e-12	6.690e-12	6.027e-12
Nb-97	3.120e+02	1.404e-11	1.265e-12	1.074e-11	9.678e-13
Ag-110m	2.594e+02	1.168e-11	5.260e-11	8.932e-12	4.024e-11
Sn-113	3.922e+01	1.765e-12	1.590e-12	1.350e-12	1.217e-12
Sb-124	2.463e+01	1.109e-12	4.281e-12	8.482e-13	3.275e-12
Sb-125	4.866e+02	2.190e-11	1.973e-11	1.675e-11	1.509e-11
Te-123m	1.600e+01	7.202e-13	N/A	5.509e-13	N/A
Te-132	4.139e+00	1.863e-13	5.594e-13	1.425e-13	4.279e-13
Xe-133	3.881e+01	1.747e-12	2.360e-13	1.336e-12	1.806e-13
TOTAL :	1.696e+09		2.065e-06		1.580e-06

Table 3.2-1 (cont'd)

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====================================
ORGAN DOSES BY RECEPTOR (Dose = mRem)
====================================

Receptor Name: Liquid Receptor / Adult
Pathway    Nuclide Bone      Liver     Total Bod Thyroid   Kidney    Lung      GI-Lli    Skin
-------------------------- ------- --------- --------- --------- --------- --------- ---------
Potable Water
           H-3     0.000e+00 2.597e-02 2.597e-02 2.597e-02 2.597e-02 2.597e-02 2.597e-02 0.000e+00
           Cr-51   0.000e+00 0.000e+00 3.552e-11 2.126e-11 7.837e-12 4.715e-11 8.929e-09 0.000e+00
           Mn-54   0.000e+00 9.306e-09 1.771e-09 0.000e+00 2.769e-09 0.000e+00 2.848e-08 0.000e+00
           Fe-55   1.243e-07 8.586e-08 2.004e-08 0.000e+00 0.000e+00 4.804e-08 4.934e-08 0.000e+00
           Fe-59   1.200e-09 2.818e-09 1.081e-09 0.000e+00 0.000e+00 7.883e-10 9.399e-09 0.000e+00
           Co-57   0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Co-58   0.000e+00 1.383e-08 3.097e-08 0.000e+00 0.000e+00 0.000e+00 2.802e-07 0.000e+00
           Co-60   0.000e+00 1.074e-07 2.369e-07 0.000e+00 0.000e+00 0.000e+00 2.017e-06 0.000e+00
           Zr-95   1.747e-11 5.613e-12 3.788e-12 0.000e+00 8.793e-12 0.000e+00 1.778e-08 0.000e+00
           Nb-95   1.220e-11 6.810e-12 3.660e-12 0.000e+00 6.734e-12 0.000e+00 4.133e-08 0.000e+00
           Nb-97   1.539e-13 3.891e-14 1.421e-14 0.000e+00 4.540e-14 0.000e+00 1.436e-10 0.000e+00
           Ag-110m 3.604e-10 3.333e-10 1.980e-10 0.000e+00 6.547e-10 0.000e+00 1.364e-07 0.000e+00
           Sn-113  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Sb-124  1.061e-09 2.005e-11 4.206e-10 2.573e-12 0.000e+00 8.261e-10 3.013e-08 0.000e+00
           Sb-125  8.244e-09 9.211e-11 1.962e-09 8.382e-12 0.000e+00 6.356e-09 9.073e-08 0.000e+00
           Te-123m 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Te-132  3.587e-11 2.321e-11 2.177e-11 2.560e-11 2.239e-10 0.000e+00 1.095e-09 0.000e+00
           Xe-133  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
-------------------------- -------: --------- --------- --------- --------- --------- ---------
Sport Freshwater Fish
           H-3     0.000e+00 2.681e-03 2.681e-03 2.681e-03 2.681e-03 2.681e-03 2.681e-03 0.000e+00
           Cr-51   0.000e+00 0.000e+00 8.158e-10 4.888e-10 1.805e-10 1.086e-09 2.056e-07 0.000e+00
           Mn-54   0.000e+00 4.286e-07 8.171e-08 0.000e+00 1.272e-07 0.000e+00 1.311e-06 0.000e+00
           Fe-55   1.430e-06 9.891e-07 2.304e-07 0.000e+00 0.000e+00 5.521e-07 5.674e-07 0.000e+00
           Fe-59   1.383e-08 3.244e-08 1.244e-08 0.000e+00 0.000e+00 9.066e-09 1.082e-07 0.000e+00
           Co-57   0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Co-58   0.000e+00 7.961e-08 1.785e-07 0.000e+00 0.000e+00 0.000e+00 1.615e-06 0.000e+00
           Co-60   0.000e+00 6.177e-07 1.363e-06 0.000e+00 0.000e+00 0.000e+00 1.161e-05 0.000e+00
           Zr-95   6.636e-12 2.129e-12 1.441e-12 0.000e+00 3.346e-12 0.000e+00 6.746e-09 0.000e+00
           Nb-95   4.228e-08 2.346e-08 1.267e-08 0.000e+00 2.327e-08 0.000e+00 1.428e-04 0.000e+00
           Nb-97   5.312e-10 1.343e-10 4.905e-11 0.000e+00 1.567e-10 0.000e+00 4.956e-07 0.000e+00
           Ag-110m 9.534e-11 8.820e-11 5.238e-11 0.000e+00 1.732e-10 0.000e+00 3.604e-08 0.000e+00
           Sn-113  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Sb-124  1.221e-10 2.307e-12 4.840e-11 2.961e-13 0.000e+00 9.506e-11 3.466e-09 0.000e+00
           Sb-125  9.486e-10 1.060e-11 2.258e-10 9.645e-13 0.000e+00 7.313e-10 1.044e-08 0.000e+00
           Te-123m 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Te-132  1.650e-09 1.068e-09 1.006e-09 1.177e-09 1.027e-08 0.000e+00 5.052e-08 0.000e+00
           Xe-133  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
-------------------------- -------: --------- --------- --------- --------- --------- ---------
ALL PATHWAYS/NUCLIDES TOTAL:
                   1.625e-06 2.866e-02 2.866e-02 2.866e-02 2.866e-02 2.866e-02 2.882e-02 0.000e+00

Receptor Name: Liquid Receptor / Child
Pathway    Nuclide Bone      Liver     Total Bod Thyroid   Kidney    Lung      GI-Lli    Skin
-------------------------- ------- --------- --------- --------- --------- --------- ---------
Potable Water
           H-3     0.000e+00 3.512e-02 3.512e-02 3.512e-02 3.512e-02 3.512e-02 3.512e-02 0.000e+00
           Cr-51   0.000e+00 0.000e+00 8.286e-11 4.612e-11 1.259e-11 8.415e-11 4.407e-09 0.000e+00
           Mn-54   0.000e+00 1.527e-08 4.051e-09 0.000e+00 4.267e-09 0.000e+00 1.282e-08 0.000e+00
           Fe-55   3.630e-07 1.928e-07 5.978e-08 0.000e+00 0.000e+00 1.089e-07 3.565e-08 0.000e+00
           Fe-59   3.191e-09 5.158e-09 2.566e-09 0.000e+00 0.000e+00 1.502e-09 5.371e-09 0.000e+00
           Co-57   0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Co-58   0.000e+00 2.338e-08 7.149e-08 0.000e+00 0.000e+00 0.000e+00 1.365e-07 0.000e+00
           Co-60   0.000e+00 1.855e-07 5.477e-07 0.000e+00 0.000e+00 0.000e+00 1.028e-06 0.000e+00
           Zr-95   4.673e-11 1.026e-11 9.124e-12 0.000e+00 1.468e-11 0.000e+00 1.070e-08 0.000e+00
           Nb-95   3.093e-11 1.201e-11 8.607e-12 0.000e+00 1.135e-11 0.000e+00 2.223e-08 0.000e+00
           Nb-97   4.469e-13 8.074e-14 3.769e-14 0.000e+00 8.959e-14 0.000e+00 2.492e-08 0.000e+00
           Ag-110m 8.474e-10 5.725e-10 4.578e-10 0.000e+00 1.066e-09 0.000e+00 6.807e-08 0.000e+00
           Sn-113  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Sb-124  2.939e-09 3.812e-11 1.030e-09 6.486e-12 0.000e+00 1.631e-09 1.837e-08 0.000e+00
           Sb-125  2.304e-08 1.776e-10 4.826e-09 2.133e-11 0.000e+00 1.284e-08 5.502e-08 0.000e+00
           Te-123m 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
           Te-132  1.006e-10 4.450e-11 5.374e-11 6.476e-11 4.128e-10 0.000e+00 4.477e-10 0.000e+00
           Xe-133  0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00 0.000e+00
```

Table 3.2-1 (cont'd)

Sport Freshwater Fish								
H-3	0.000e+00	1.706e-03	1.706e-03	1.706e-03	1.706e-03	1.706e-03	1.706e-03	0.000e+00
Cr-51	0.000e+00	0.000e+00	8.993e-10	4.991e-10	1.362e-10	9.122e-10	4.773e-08	0.000e+00
Mn-54	0.000e+00	3.298e-07	8.778e-08	0.000e+00	9.238e-08	0.000e+00	2.769e-07	0.000e+00
Fe-55	1.967e-06	1.043e-06	3.239e-07	0.000e+00	0.000e+00	5.891e-07	1.932e-07	0.000e+00
Fe-59	1.728e-08	2.792e-08	1.396e-08	0.000e+00	0.000e+00	8.096e-09	2.911e-08	0.000e+00
Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Co-58	0.000e+00	6.319e-08	1.937e-07	0.000e+00	0.000e+00	0.000e+00	3.686e-07	0.000e+00
Co-60	0.000e+00	5.019e-07	1.481e-06	0.000e+00	0.000e+00	0.000e+00	2.775e-06	0.000e+00
Zr-95	8.322e-12	1.830e-12	1.629e-12	0.000e+00	2.618e-12	0.000e+00	1.908e-09	0.000e+00
Nb-95	5.022e-08	1.958e-08	1.400e-08	0.000e+00	1.835e-08	0.000e+00	3.613e-05	0.000e+00
Nb-97	7.256e-10	1.311e-10	6.119e-11	0.000e+00	1.455e-10	0.000e+00	4.046e-05	0.000e+00
Ag-110m	1.055e-10	7.132e-11	5.692e-11	0.000e+00	1.331e-10	0.000e+00	8.474e-09	0.000e+00
Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Sb-124	1.590e-10	2.063e-12	5.573e-11	3.510e-13	0.000e+00	8.825e-11	9.943e-10	0.000e+00
Sb-125	1.247e-09	9.612e-12	2.612e-10	1.154e-12	0.000e+00	6.948e-10	2.978e-09	0.000e+00
Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Te-132	2.177e-09	9.652e-10	1.164e-09	1.403e-09	8.968e-09	0.000e+00	9.721e-09	0.000e+00
Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:	2.432e-06	3.683e-02	3.683e-02	3.682e-02	3.682e-02	3.682e-02	3.691e-02	0.000e+00

Receptor Name: Liquid Receptor / Infant

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Potable Water									
	H-3	0.000e+00	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	0.000e+00
	Cr-51	0.000e+00	0.000e+00	8.543e-11	5.556e-11	1.214e-11	1.079e-10	2.486e-09	0.000e+00
	Mn-54	0.000e+00	1.830e-08	4.149e-09	0.000e+00	4.061e-09	0.000e+00	6.733e-09	0.000e+00
	Fe-55	2.848e-07	1.837e-07	4.913e-08	0.000e+00	0.000e+00	8.978e-08	2.326e-08	0.000e+00
	Fe-59	3.855e-09	6.727e-09	2.645e-09	0.000e+00	0.000e+00	1.994e-09	3.217e-09	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	3.025e-08	7.541e-08	0.000e+00	0.000e+00	0.000e+00	7.532e-08	0.000e+00
	Co-60	0.000e+00	2.461e-07	5.791e-07	0.000e+00	0.000e+00	0.000e+00	5.839e-07	0.000e+00
	Zr-95	5.364e-11	1.305e-11	9.263e-12	0.000e+00	1.407e-11	0.000e+00	6.498e-09	0.000e+00
	Nb-95	3.736e-11	1.542e-11	8.900e-12	0.000e+00	1.107e-11	0.000e+00	1.296e-08	0.000e+00
	Nb-97	6.031e-16	1.286e-16	4.638e-17	0.000e+00	1.005e-16	0.000e+00	4.060e-11	0.000e+00
	Ag-110m	1.014e-09	7.402e-10	4.892e-10	0.000e+00	1.058e-09	0.000e+00	3.842e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	3.666e-09	5.396e-11	1.136e-09	9.730e-12	0.000e+00	2.295e-09	1.131e-08	0.000e+00
	Sb-125	2.560e-08	2.477e-10	5.265e-09	3.205e-11	0.000e+00	1.482e-08	3.413e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	1.342e-10	6.633e-11	6.188e-11	9.789e-11	4.148e-10	0.000e+00	2.451e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		3.191e-07	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	0.000e+00

Receptor Name: Liquid Receptor / Teenager

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Potable Water									
	H-3	0.000e+00	1.824e-02	1.824e-02	1.824e-02	1.824e-02	1.824e-02	1.824e-02	0.000e+00
	Cr-51	0.000e+00	0.000e+00	3.360e-11	1.869e-11	7.387e-12	4.798e-11	5.646e-09	0.000e+00
	Mn-54	0.000e+00	8.396e-09	1.664e-09	0.000e+00	2.505e-09	0.000e+00	1.722e-08	0.000e+00
	Fe-55	1.193e-07	8.478e-08	1.974e-08	0.000e+00	0.000e+00	5.369e-08	3.674e-08	0.000e+00
	Fe-59	1.134e-09	2.645e-09	1.022e-09	0.000e+00	0.000e+00	8.349e-10	6.261e-09	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	1.258e-08	2.909e-08	0.000e+00	0.000e+00	0.000e+00	1.740e-07	0.000e+00
	Co-60	0.000e+00	9.844e-08	2.220e-07	0.000e+00	0.000e+00	0.000e+00	1.284e-06	0.000e+00
	Zr-95	1.656e-11	5.226e-12	3.594e-12	0.000e+00	7.687e-12	0.000e+00	1.206e-08	0.000e+00
	Nb-95	1.126e-11	6.271e-12	3.452e-12	0.000e+00	6.072e-12	0.000e+00	2.677e-08	0.000e+00
	Nb-97	1.518e-13	3.769e-14	1.376e-14	0.000e+00	4.407e-14	0.000e+00	9.000e-10	0.000e+00
	Ag-110m	3.225e-10	3.052e-10	1.861e-10	0.000e+00	5.822e-10	0.000e+00	8.571e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	1.025e-09	1.888e-11	3.997e-10	2.324e-12	0.000e+00	8.948e-10	2.065e-08	0.000e+00
	Sb-125	7.979e-09	8.719e-11	1.866e-09	7.625e-12	0.000e+00	7.014e-09	6.210e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	3.471e-11	2.197e-11	2.067e-11	2.321e-11	2.108e-10	0.000e+00	6.983e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00

Table 3.2-1 (cont'd)

Sport Freshwater Fish								
H-3	0.000e+00	2.061e-03	2.061e-03	2.061e-03	2.061e-03	2.061e-03	2.061e-03	0.000e+00
Cr-51	0.000e+00	0.000e+00	8.415e-10	4.689e-10	1.850e-10	1.208e-09	1.420e-07	0.000e+00
Mn-54	0.000e+00	4.208e-07	8.357e-08	0.000e+00	1.253e-07	0.000e+00	8.641e-07	0.000e+00
Fe-55	1.498e-06	1.063e-06	2.478e-07	0.000e+00	0.000e+00	6.739e-07	4.608e-07	0.000e+00
Fe-59	1.422e-08	3.323e-08	1.283e-08	0.000e+00	0.000e+00	1.048e-08	7.857e-08	0.000e+00
Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Co-58	0.000e+00	7.907e-08	1.821e-07	0.000e+00	0.000e+00	0.000e+00	1.089e-06	0.000e+00
Co-60	0.000e+00	6.177e-07	1.392e-06	0.000e+00	0.000e+00	0.000e+00	8.059e-06	0.000e+00
Zr-95	6.857e-12	2.162e-12	1.488e-12	0.000e+00	3.180e-12	0.000e+00	5.005e-09	0.000e+00
Nb-95	4.256e-08	2.365e-08	1.296e-08	0.000e+00	2.289e-08	0.000e+00	1.012e-04	0.000e+00
Nb-97	5.714e-10	1.419e-10	5.179e-11	0.000e+00	1.659e-10	0.000e+00	3.388e-06	0.000e+00
Ag-110m	9.307e-11	8.809e-11	5.357e-11	0.000e+00	1.677e-10	0.000e+00	2.478e-08	0.000e+00
Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Sb-124	1.286e-10	2.369e-12	5.016e-11	2.917e-13	0.000e+00	1.123e-10	2.591e-09	0.000e+00
Sb-125	1.001e-09	1.094e-11	2.342e-10	9.569e-13	0.000e+00	8.802e-10	7.793e-09	0.000e+00
Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Te-132	1.746e-09	1.102e-09	1.041e-09	1.164e-09	1.061e-08	0.000e+00	3.498e-08	0.000e+00
Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:								
	1.688e-06	2.031e-02	2.031e-02	2.031e-02	2.031e-02	2.031e-02	2.042e-02	0.000e+00

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==========================================
RELEASE AND DOSE SUMMARY REPORT PARAMETERS
==========================================
Date.................: 4/12/2017 12:40:58 PM
Database.............: BWDOpenEMS_PROD
Username.............: Admin

Permit Type..........: Liquid
Start Date...........: 01/01/2016
End Date.............: 12/31/2016
Unit.................: Unit 2 Braidwood
Scaling Factor.......: 1.000
Dose Projection Option: No Dose Projection
Prorate Option.......: Doses Not Prorated for period
                       Only Permits which have a release start date in the start/end period are included
                        with no pro-rating.
Sum By...............: Receptor, Pathway, and Nuclide
Include Open Permits..: No
Release Sources......: Circ Water Blowdown
                       Condensate Polisher Sump
                       Liquid Release Tank 0WX01T
                       Liquid Release Tank 0WX26T
                       Waste Water Treatment

Pathways.............: Potable Water
                       Sport Freshwater Fish

Receptors............: Liquid Receptor / Adult
                       Liquid Receptor / Child
                       Liquid Receptor / Infant
                       Liquid Receptor / Teenager

Nuclides.............: H-3,Cr-51,Mn-54,Fe-55,Fe-59,Co-57,Co-58,Co-60,Zn-65
                       Zr-95,Nb-95,Nb-97,Ag-110m,Sn-113,Sb-124,Sb-125,Te-123m

==================================
RELEASE TOTALS BY DISCHARGE POINT
==================================
Discharge Point......: Kankakee River
Release Duration.....: 8.946e+04 minutes
Release Volume.......: 1.043e+06 gal
Average Flowrate.....: 1.166e+01 gpm
Dilution Volume......: 1.803e+09 gal
Average Dil Flowrate..: 2.016e+04 gpm
```

Table 3.2-1 (cont'd)

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	1.470e+09	3.724e-01	1.007e-02	2.153e-04	5.818e-06
Cr-51	1.263e+03	3.199e-07	1.729e-08	1.849e-10	9.993e-12
Mn-54	2.485e+02	6.295e-08	5.671e-08	3.638e-11	3.278e-11
Fe-55	4.208e+03	1.066e-06	2.881e-07	6.161e-10	1.665e-10
Fe-59	2.758e+01	6.987e-09	1.888e-08	4.038e-12	1.091e-11
Co-57	2.135e+01	5.409e-09	2.437e-09	3.127e-12	1.408e-12
Co-58	1.629e+03	4.126e-07	5.576e-07	2.385e-10	3.223e-10
Co-60	6.107e+03	1.547e-06	1.394e-05	8.942e-10	8.056e-09
Zr-95	2.538e+01	6.429e-09	8.687e-09	3.716e-12	5.021e-12
Nb-95	1.943e+02	4.922e-08	4.434e-08	2.845e-11	2.563e-11
Nb-97	3.120e+02	7.904e-08	7.121e-09	4.568e-11	4.116e-12
Ag-110m	2.594e+02	6.572e-08	2.960e-07	3.799e-11	1.711e-10
Sn-113	3.922e+01	9.936e-09	8.951e-09	5.743e-12	5.174e-12
Sb-124	2.463e+01	6.240e-09	2.409e-08	3.607e-12	1.393e-11
Sb-125	4.866e+02	1.233e-07	1.111e-07	7.125e-11	6.419e-11
Te-123m	1.600e+01	4.054e-09	N/A	2.343e-12	N/A
Te-132	4.139e+00	1.048e-09	3.148e-09	6.060e-13	1.820e-12
Xe-133	3.881e+01	9.831e-09	1.329e-09	5.682e-12	7.679e-13
TOTAL :	1.470e+09		1.008e-02		5.827e-06

Discharge Point.....: KR - Circ Water Blowdown
Release Duration.....: 2.847e+05 minutes
Release Volume.....: 5.855e+09 gal
Average Flowrate.....: 2.056e+04 gpm
Dilution Volume.....: 0.000e+00 gal
Average Dil Flowrate..: 0.000e+00 gpm

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	2.246e+08	1.013e-05	2.739e-07	1.013e-05	2.739e-07
TOTAL :	2.246e+08		2.739e-07		2.739e-07

Discharge Point.....: Braidwood Lake
Release Duration.....: 5.693e+05 minutes
Release Volume.....: 1.307e+07 gal
Average Flowrate.....: 2.296e+01 gpm
Dilution Volume.....: 0.000e+00 gal
Average Dil Flowrate..: 0.000e+00 gpm

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	9.192e+05	1.858e-05	5.021e-07	1.858e-05	5.021e-07
TOTAL :	9.192e+05		5.021e-07		5.021e-07

Discharge Point.....: ALL DISCHARGE POINTS
Release Duration.....: 9.435e+05 minutes
Release Volume.....: 5.869e+09 gal
Average Flowrate.....: 6.221e+03 gpm
Dilution Volume.....: 1.803e+09 gal
Average Dil Flowrate..: 1.911e+03 gpm

Table 3.2-1 (cont'd)

.....Nuclide Detail.....

Nuclide	Activity (uCi)	Avg Conc (uCi/mL)	Avg Conc/ ECL|MPC	Dil Conc (uCi/mL)	Dil Conc/ ECL|MPC
H-3	1.696e+09	7.632e-05	2.063e-06	5.838e-05	1.578e-06
Cr-51	1.263e+03	5.683e-11	3.072e-12	4.347e-11	2.350e-12
Mn-54	2.485e+02	1.118e-11	1.008e-11	8.556e-12	7.708e-12
Fe-55	4.208e+03	1.894e-10	5.118e-11	1.449e-10	3.915e-11
Fe-59	2.758e+01	1.241e-12	3.355e-12	9.496e-13	2.567e-12
Co-57	2.135e+01	9.611e-13	4.329e-13	7.352e-13	3.312e-13
Co-58	1.629e+03	7.331e-11	9.906e-11	5.608e-11	7.578e-11
Co-60	6.107e+03	2.749e-10	2.476e-09	2.103e-10	1.894e-09
Zr-95	2.538e+01	1.142e-12	1.543e-12	8.737e-13	1.181e-12
Nb-95	1.943e+02	8.745e-12	7.878e-12	6.690e-12	6.027e-12
Nb-97	3.120e+02	1.404e-11	1.265e-12	1.074e-11	9.678e-13
Ag-110m	2.594e+02	1.168e-11	5.260e-11	8.932e-12	4.024e-11
Sn-113	3.922e+01	1.765e-12	1.590e-12	1.350e-12	1.217e-12
Sb-124	2.463e+01	1.109e-12	4.281e-12	8.482e-13	3.275e-12
Sb-125	4.866e+02	2.190e-11	1.973e-11	1.675e-11	1.509e-11
Te-123m	1.600e+01	7.202e-13	N/A	5.509e-13	N/A
Te-132	4.139e+00	1.863e-13	5.594e-13	1.425e-13	4.279e-13
Xe-133	3.881e+01	1.747e-12	2.360e-13	1.336e-12	1.806e-13
TOTAL :	1.696e+09		2.065e-06		1.580e-06

ORGAN DOSES BY RECEPTOR (Dose = mRem)

Receptor Name: Liquid Receptor / Adult

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Potable Water									
	H-3	0.000e+00	2.597e-02	2.597e-02	2.597e-02	2.597e-02	2.597e-02	2.597e-02	0.000e+00
	Cr-51	0.000e+00	0.000e+00	3.552e-11	2.126e-11	7.837e-12	4.715e-11	8.929e-09	0.000e+00
	Mn-54	0.000e+00	9.306e-09	1.771e-09	0.000e+00	2.769e-09	0.000e+00	2.848e-08	0.000e+00
	Fe-55	1.243e-07	8.586e-08	2.004e-08	0.000e+00	0.000e+00	4.804e-08	4.934e-08	0.000e+00
	Fe-59	1.200e-09	2.818e-09	1.081e-09	0.000e+00	0.000e+00	7.883e-10	9.399e-09	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	1.383e-08	3.097e-08	0.000e+00	0.000e+00	0.000e+00	2.802e-07	0.000e+00
	Co-60	0.000e+00	1.074e-07	2.369e-07	0.000e+00	0.000e+00	0.000e+00	2.017e-06	0.000e+00
	Zr-95	1.747e-11	5.613e-12	3.788e-12	0.000e+00	8.793e-12	0.000e+00	1.778e-08	0.000e+00
	Nb-95	1.220e-11	6.810e-12	3.660e-12	0.000e+00	6.734e-12	0.000e+00	4.133e-08	0.000e+00
	Nb-97	1.539e-13	3.891e-14	1.421e-14	0.000e+00	4.540e-14	0.000e+00	1.436e-10	0.000e+00
	Ag-110m	3.604e-10	3.333e-10	1.980e-10	0.000e+00	6.547e-10	0.000e+00	1.364e-07	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	1.061e-09	2.005e-11	4.206e-10	2.573e-12	0.000e+00	8.261e-10	3.013e-08	0.000e+00
	Sb-125	8.244e-09	9.211e-11	1.962e-09	8.382e-12	0.000e+00	6.356e-09	9.073e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	3.587e-11	2.321e-11	2.177e-11	2.560e-11	2.239e-10	0.000e+00	1.095e-09	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Sport Freshwater Fish									
	H-3	0.000e+00	2.681e-03	2.681e-03	2.681e-03	2.681e-03	2.681e-03	2.681e-03	0.000e+00
	Cr-51	0.000e+00	0.000e+00	8.158e-10	4.888e-10	1.805e-10	1.086e-09	2.056e-07	0.000e+00
	Mn-54	0.000e+00	4.286e-07	8.171e-08	0.000e+00	1.272e-07	0.000e+00	1.311e-06	0.000e+00
	Fe-55	1.430e-06	9.891e-07	2.304e-07	0.000e+00	0.000e+00	5.521e-07	5.674e-07	0.000e+00
	Fe-59	1.383e-08	3.244e-08	1.244e-08	0.000e+00	0.000e+00	9.066e-09	1.082e-07	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	7.961e-08	1.785e-07	0.000e+00	0.000e+00	0.000e+00	1.615e-06	0.000e+00
	Co-60	0.000e+00	6.177e-07	1.363e-06	0.000e+00	0.000e+00	0.000e+00	1.161e-05	0.000e+00
	Zr-95	6.636e-12	2.129e-12	1.441e-12	0.000e+00	3.346e-12	0.000e+00	6.746e-09	0.000e+00
	Nb-95	4.228e-08	2.346e-08	1.267e-08	0.000e+00	2.327e-08	0.000e+00	1.428e-04	0.000e+00
	Nb-97	5.312e-10	1.343e-10	4.905e-11	0.000e+00	1.567e-10	0.000e+00	4.956e-07	0.000e+00
	Ag-110m	9.534e-11	8.820e-11	5.238e-11	0.000e+00	1.732e-10	0.000e+00	3.604e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	1.221e-10	2.307e-12	4.840e-11	2.961e-13	0.000e+00	9.506e-11	3.466e-09	0.000e+00
	Sb-125	9.486e-10	1.060e-11	2.258e-10	9.645e-13	0.000e+00	7.313e-10	1.044e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	1.650e-09	1.068e-09	1.006e-09	1.177e-09	1.027e-08	0.000e+00	5.052e-08	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		1.625e-06	2.866e-02	2.866e-02	2.866e-02	2.866e-02	2.866e-02	2.882e-02	0.000e+00

Table 3.2-1 (cont'd)

Receptor Name: Liquid Receptor / Child

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Potable Water									
	H-3	0.000e+00	3.512e-02	3.512e-02	3.512e-02	3.512e-02	3.512e-02	3.512e-02	0.000e+00
	Cr-51	0.000e+00	0.000e+00	8.286e-11	4.612e-11	1.259e-11	8.415e-11	4.407e-09	0.000e+00
	Mn-54	0.000e+00	1.527e-08	4.051e-09	0.000e+00	4.267e-09	0.000e+00	1.282e-08	0.000e+00
	Fe-55	3.630e-07	1.928e-07	5.978e-08	0.000e+00	0.000e+00	1.089e-07	3.565e-08	0.000e+00
	Fe-59	3.191e-09	5.158e-09	2.566e-09	0.000e+00	0.000e+00	1.502e-09	5.371e-09	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	2.338e-08	7.149e-08	0.000e+00	0.000e+00	0.000e+00	1.365e-07	0.000e+00
	Co-60	0.000e+00	1.855e-07	5.477e-07	0.000e+00	0.000e+00	0.000e+00	1.028e-06	0.000e+00
	Zr-95	4.673e-11	1.026e-11	9.124e-12	0.000e+00	1.468e-11	0.000e+00	1.070e-08	0.000e+00
	Nb-95	3.093e-11	1.201e-11	8.607e-12	0.000e+00	1.135e-11	0.000e+00	2.223e-08	0.000e+00
	Nb-97	4.469e-13	8.074e-14	3.769e-14	0.000e+00	8.959e-14	0.000e+00	2.492e-08	0.000e+00
	Ag-110m	8.474e-10	5.725e-10	4.578e-10	0.000e+00	1.066e-09	0.000e+00	6.807e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	2.939e-09	3.812e-11	1.030e-09	6.486e-12	0.000e+00	1.631e-09	1.837e-08	0.000e+00
	Sb-125	2.304e-08	1.776e-10	4.826e-09	2.133e-11	0.000e+00	1.284e-08	5.502e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	1.006e-10	4.450e-11	5.374e-11	6.476e-11	4.128e-10	0.000e+00	4.477e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Sport Freshwater Fish									
	H-3	0.000e+00	1.706e-03	1.706e-03	1.706e-03	1.706e-03	1.706e-03	1.706e-03	0.000e+00
	Cr-51	0.000e+00	0.000e+00	8.993e-10	4.991e-10	1.362e-10	9.122e-10	4.773e-08	0.000e+00
	Mn-54	0.000e+00	3.298e-07	8.778e-08	0.000e+00	9.238e-08	0.000e+00	2.769e-07	0.000e+00
	Fe-55	1.967e-06	1.043e-06	3.239e-07	0.000e+00	0.000e+00	5.891e-07	1.932e-07	0.000e+00
	Fe-59	1.728e-08	2.792e-08	1.396e-08	0.000e+00	0.000e+00	8.096e-09	2.911e-08	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	6.319e-08	1.937e-07	0.000e+00	0.000e+00	0.000e+00	3.686e-07	0.000e+00
	Co-60	0.000e+00	5.019e-07	1.481e-06	0.000e+00	0.000e+00	0.000e+00	2.775e-06	0.000e+00
	Zr-95	8.322e-12	1.830e-12	1.629e-12	0.000e+00	2.618e-12	0.000e+00	1.908e-09	0.000e+00
	Nb-95	5.022e-08	1.958e-08	1.400e-08	0.000e+00	1.835e-08	0.000e+00	3.613e-05	0.000e+00
	Nb-97	7.256e-10	1.311e-10	6.119e-11	0.000e+00	1.455e-10	0.000e+00	4.046e-05	0.000e+00
	Ag-110m	1.055e-10	7.132e-11	5.692e-11	0.000e+00	1.331e-10	0.000e+00	8.474e-09	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	1.590e-10	2.063e-12	5.573e-11	3.510e-13	0.000e+00	8.825e-11	9.943e-10	0.000e+00
	Sb-125	1.247e-09	9.612e-12	2.612e-10	1.154e-12	0.000e+00	6.948e-10	2.978e-09	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	2.177e-09	9.652e-10	1.164e-09	1.403e-09	8.968e-09	0.000e+00	9.721e-09	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		2.432e-06	3.683e-02	3.683e-02	3.682e-02	3.682e-02	3.682e-02	3.691e-02	0.000e+00

Receptor Name: Liquid Receptor / Infant

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Potable Water									
	H-3	0.000e+00	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	0.000e+00
	Cr-51	0.000e+00	0.000e+00	8.543e-11	5.556e-11	1.214e-11	1.079e-10	2.486e-09	0.000e+00
	Mn-54	0.000e+00	1.830e-08	4.149e-09	0.000e+00	4.061e-09	0.000e+00	6.733e-09	0.000e+00
	Fe-55	2.848e-07	1.837e-07	4.913e-08	0.000e+00	0.000e+00	8.978e-08	2.326e-08	0.000e+00
	Fe-59	3.855e-09	6.727e-09	2.645e-09	0.000e+00	0.000e+00	1.994e-09	3.217e-09	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	3.025e-08	7.541e-08	0.000e+00	0.000e+00	0.000e+00	7.532e-08	0.000e+00
	Co-60	0.000e+00	2.461e-07	5.791e-07	0.000e+00	0.000e+00	0.000e+00	5.839e-07	0.000e+00
	Zr-95	5.364e-11	1.305e-11	9.263e-12	0.000e+00	1.407e-11	0.000e+00	6.498e-09	0.000e+00
	Nb-95	3.736e-11	1.542e-11	8.900e-12	0.000e+00	1.107e-11	0.000e+00	1.296e-08	0.000e+00
	Nb-97	6.031e-16	1.286e-16	4.638e-17	0.000e+00	1.005e-16	0.000e+00	4.060e-11	0.000e+00
	Ag-110m	1.014e-09	7.402e-10	4.892e-10	0.000e+00	1.058e-09	0.000e+00	3.842e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	3.666e-09	5.396e-11	1.136e-09	9.730e-12	0.000e+00	2.295e-09	1.131e-08	0.000e+00
	Sb-125	2.560e-08	2.477e-10	5.265e-09	3.205e-11	0.000e+00	1.482e-08	3.413e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	1.342e-10	6.633e-11	6.188e-11	9.789e-11	4.148e-10	0.000e+00	2.451e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:		3.191e-07	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	3.449e-02	0.000e+00

Table 3.2-1 (cont'd)

Receptor Name: Liquid Receptor / Teenager

Pathway	Nuclide	Bone	Liver	Total Bod	Thyroid	Kidney	Lung	GI-Lli	Skin
Potable Water									
	H-3	0.000e+00	1.824e-02	1.824e-02	1.824e-02	1.824e-02	1.824e-02	1.824e-02	0.000e+00
	Cr-51	0.000e+00	0.000e+00	3.360e-11	1.869e-11	7.387e-12	4.798e-11	5.646e-09	0.000e+00
	Mn-54	0.000e+00	8.396e-09	1.664e-09	0.000e+00	2.505e-09	0.000e+00	1.722e-08	0.000e+00
	Fe-55	1.193e-07	8.478e-08	1.974e-08	0.000e+00	0.000e+00	5.369e-08	3.674e-08	0.000e+00
	Fe-59	1.134e-09	2.645e-09	1.022e-09	0.000e+00	0.000e+00	8.349e-10	6.261e-09	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	1.258e-08	2.909e-08	0.000e+00	0.000e+00	0.000e+00	1.740e-07	0.000e+00
	Co-60	0.000e+00	9.844e-08	2.220e-07	0.000e+00	0.000e+00	0.000e+00	1.284e-06	0.000e+00
	Zr-95	1.656e-11	5.226e-12	3.594e-12	0.000e+00	7.687e-12	0.000e+00	1.206e-08	0.000e+00
	Nb-95	1.126e-11	6.271e-12	3.452e-12	0.000e+00	6.072e-12	0.000e+00	2.677e-08	0.000e+00
	Nb-97	1.518e-13	3.769e-14	1.376e-14	0.000e+00	4.407e-14	0.000e+00	9.000e-10	0.000e+00
	Ag-110m	3.225e-10	3.052e-10	1.861e-10	0.000e+00	5.822e-10	0.000e+00	8.571e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	1.025e-09	1.888e-11	3.997e-10	2.324e-12	0.000e+00	8.948e-10	2.065e-08	0.000e+00
	Sb-125	7.979e-09	8.719e-11	1.866e-09	7.625e-12	0.000e+00	7.014e-09	6.210e-08	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	3.471e-11	2.197e-11	2.067e-11	2.321e-11	2.108e-10	0.000e+00	6.983e-10	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
Sport Freshwater Fish									
	H-3	0.000e+00	2.061e-03	2.061e-03	2.061e-03	2.061e-03	2.061e-03	2.061e-03	0.000e+00
	Cr-51	0.000e+00	0.000e+00	8.415e-10	4.689e-10	1.850e-10	1.208e-09	1.420e-07	0.000e+00
	Mn-54	0.000e+00	4.208e-07	8.357e-08	0.000e+00	1.253e-07	0.000e+00	8.641e-07	0.000e+00
	Fe-55	1.498e-06	1.063e-06	2.478e-07	0.000e+00	0.000e+00	6.739e-07	4.608e-07	0.000e+00
	Fe-59	1.422e-08	3.323e-08	1.283e-08	0.000e+00	0.000e+00	1.048e-08	7.857e-08	0.000e+00
	Co-57	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Co-58	0.000e+00	7.907e-08	1.821e-07	0.000e+00	0.000e+00	0.000e+00	1.089e-06	0.000e+00
	Co-60	0.000e+00	6.177e-07	1.392e-06	0.000e+00	0.000e+00	0.000e+00	8.059e-06	0.000e+00
	Zr-95	6.857e-12	2.162e-12	1.488e-12	0.000e+00	3.180e-12	0.000e+00	5.005e-09	0.000e+00
	Nb-95	4.256e-08	2.365e-08	1.296e-08	0.000e+00	2.289e-08	0.000e+00	1.012e-04	0.000e+00
	Nb-97	5.714e-10	1.419e-10	5.179e-11	0.000e+00	1.659e-10	0.000e+00	3.388e-06	0.000e+00
	Ag-110m	9.307e-11	8.809e-11	5.357e-11	0.000e+00	1.677e-10	0.000e+00	2.478e-08	0.000e+00
	Sn-113	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Sb-124	1.286e-10	2.369e-12	5.016e-11	2.917e-13	0.000e+00	1.123e-10	2.591e-09	0.000e+00
	Sb-125	1.001e-09	1.094e-11	2.342e-10	9.569e-13	0.000e+00	8.802e-10	7.793e-09	0.000e+00
	Te-123m	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
	Te-132	1.746e-09	1.102e-09	1.041e-09	1.164e-09	1.061e-08	0.000e+00	3.498e-08	0.000e+00
	Xe-133	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00	0.000e+00
ALL PATHWAYS/NUCLIDES TOTAL:									
		1.688e-06	2.031e-02	2.031e-02	2.031e-02	2.031e-02	2.031e-02	2.042e-02	0.000e+00

Table 3-3.1

Braidwood Nuclear Station

Unit 1

10 CFR 20 Compliance Assessment

Period of Assessment: 1/1/16 through 12/31/16
Calculated: 04/19/17

10 CFR 20.1301(a)(1) Compliance

Total Effective Dose Equivalent (TEDE)	mrem/year	2.33E+00
10 CFR 20.1301(a)(1) limit	mrem/year	100.00
	% of limit	2.33%

Compliance Summary

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
TEDE (mrem)	5.90E-01	6.58E-01	5.72E-01	5.13E-01	2.33E+00

Table 3-3.1 (cont.)

Braidwood Nuclear Station

Unit 2

10 CFR 20 Compliance Assessment

Period of Assessment: 1/1/16 through 12/31/16
Calculated: 04/19/17

10 CFR 20.1301(a)(1) Compliance

Total Effective Dose Equivalent (TEDE)	mrem/year	2.40E+00
10 CFR 20.1301(a)(1) limit	mrem/year	100.00
	% of limit	2.40%

Compliance Summary

	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
TEDE (mrem)	6.11E-01	5.92E-01	6.20E-01	5.78E-01	2.40E+00

Table 3.4-1

Meteorological Data

The Braidwood Station meteorological monitoring program produced 52,584 hours of valid data out of a possible 52,704 parameter hours during 2016 (366 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 (10.74%) and fell into the 3.6 - 7.5 mph wind speed class (40.34%). 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 0.12% of the time. Stability based on the 199 - 30 ft. differential temperature most frequently fell into the slightly stable classification (35.77%).

The following are the maximum annual calculated cumulative offsite doses resulting from Braidwood Station airborne releases in 2016 based on concurrent meteorological data:

Unit 1:

Dose	Maximum Value	Sector Affected
gamma air (1)	1.140×10^{-6} mrad	North
beta air (2)	3.110×10^{-6} mrad	North
whole body (3)	2.630×10^{-1} mrem	North
skin (4)	1.890×10^{-6} mrem	North
organ (5) (child-bone)	$1.200 \times 10^{+0}$ mrem	North

Unit 1 Compliance Status

10 CFR 50 Appendix I	Yearly Objective	% of Appendix I
gamma air	10.0 mrad	0.00E+00
beta air	20.0 mrad	0.00E+00
whole body	5.0 mrem	5.26E+00
skin	15.0 mrem	0.00E+00
organ	15.0 mrem	8.00E+00

Unit 2:

Dose	Maximum Value	Sector Affected
gamma air (1)	1.140×10^{-6} mrad	North
beta air (2)	3.110×10^{-6} mrad	North
whole body (3)	2.740×10^{-1} mrem	North
skin (4)	1.890×10^{-6} mrem	North
organ (5) (child-bone)	$1.250 \times 10^{+0}$ mrem	North

Unit 2 Compliance Status

10 CFR 50 Appendix I	Yearly Objective	% of Appendix I
gamma air	10.0 mrad	0.00E+00
beta air	20.0 mrad	0.00E+00
whole body	5.0 mrem	5.48E+00
skin	15.0 mrem	0.00E+00
organ	15.0 mrem	8.33E+00

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

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APPENDIX F

METEOROLOGICAL DATA

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Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	1	0	0	0	2
E	0	2	0	0	0	0	2
ESE	0	1	3	2	0	0	6
SE	0	3	3	0	0	0	6
SSE	0	1	0	0	0	0	1
S	0	0	0	2	0	0	2
SSW	0	0	0	4	1	0	5
SW	0	0	2	2	0	0	4
WSW	0	1	2	3	0	1	7
W	0	1	2	8	1	4	16
WNW	0	2	14	3	0	0	19
NW	0	6	12	2	0	0	20
NNW	0	1	3	1	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	19	43	27	2	5	96

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
ENE	0	5	2	0	0	0	7
E	0	3	0	0	0	0	3
ESE	0	0	0	0	0	0	0
SE	0	2	0	0	0	0	2
SSE	0	3	1	0	0	0	4
S	0	1	1	3	0	0	5
SSW	0	3	3	1	0	0	7
SW	0	2	3	0	2	0	7
WSW	0	2	4	0	1	3	10
W	0	3	3	0	1	0	7
WNW	0	2	4	1	0	0	7
NW	0	5	3	0	0	0	8
NNW	0	0	3	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	0	31	29	5	4	3	72

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	4	0	0	0	0	4
E	0	2	0	0	0	0	2
ESE	0	2	1	0	0	0	3
SE	0	3	1	3	0	0	7
SSE	0	1	0	0	0	0	1
S	0	1	2	2	0	0	5
SSW	0	0	2	1	3	0	6
SW	0	1	5	3	2	0	11
WSW	0	5	9	1	1	0	16
W	0	2	2	2	1	0	7
WNW	0	6	11	4	0	0	21
NW	0	3	2	1	0	0	6
NNW	1	1	5	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	1	32	42	17	7	0	99

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	21	14	6	1	0	47
NNE	3	22	7	7	1	0	40
NE	6	22	14	1	0	0	43
ENE	8	16	18	0	0	0	42
E	13	19	0	2	0	0	34
ESE	2	12	12	2	0	0	28
SE	4	15	21	5	0	0	45
SSE	1	21	16	0	0	0	38
S	0	10	31	13	0	0	54
SSW	0	3	12	26	13	0	54
SW	1	8	25	15	2	0	51
WSW	4	15	17	14	1	0	51
W	6	22	24	28	5	1	86
WNW	7	42	96	3	0	0	148
NW	9	44	45	6	0	0	104
NNW	5	22	48	19	2	0	96
Variable	0	0	0	0	0	0	0
Total	74	314	400	147	25	1	961

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	13	15	1	0	0	0	29
NNE	11	14	2	0	0	0	27
NE	3	2	1	0	0	0	6
ENE	20	18	1	0	0	0	39
E	21	13	3	1	0	0	38
ESE	4	31	3	1	0	0	39
SE	3	32	14	3	0	0	52
SSE	0	35	21	4	0	0	60
S	2	17	65	19	0	0	103
SSW	1	10	40	41	5	0	97
SW	5	26	52	5	0	0	88
WSW	5	14	20	4	0	0	43
W	6	28	8	5	1	0	48
WNW	11	39	18	1	1	0	70
NW	13	20	3	2	0	0	38
NNW	9	30	1	0	0	0	40
Variable	0	0	0	0	0	0	0
Total	127	344	253	86	7	0	817

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	0	0	0	0	0	5
NNE	3	1	0	0	0	0	4
NE	7	1	0	0	0	0	8
ENE	13	0	0	0	0	0	13
E	14	0	0	0	0	0	14
ESE	7	1	0	0	0	0	8
SE	0	3	0	0	0	0	3
SSE	2	0	0	0	0	0	2
S	1	0	0	0	0	0	1
SSW	1	0	5	1	0	0	7
SW	0	0	1	1	0	0	2
WSW	2	4	0	0	0	0	6
W	5	12	0	0	0	0	17
WNW	3	5	0	0	0	0	8
NW	5	1	0	0	0	0	6
NNW	3	0	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	71	28	6	2	0	0	107

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

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

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	2	0	0	0	3
E	0	2	0	0	0	0	2
ESE	0	0	0	2	3	0	5
SE	0	1	5	0	0	0	6
SSE	0	1	0	0	0	0	1
S	0	0	0	0	2	0	2
SSW	0	0	0	1	1	4	6
SW	0	0	0	2	1	0	3
WSW	0	0	4	1	2	1	8
W	0	2	1	4	6	5	18
WNW	0	0	7	7	8	1	23
NW	0	0	8	6	2	0	16
NNW	0	0	0	1	1	0	2
Variable	0	0	0	0	0	0	0
Total	0	7	27	25	26	11	96

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
ENE	0	4	3	0	0	0	7
E	0	1	2	0	0	0	3
ESE	0	1	0	0	0	0	1
SE	0	1	2	0	0	0	3
SSE	0	4	0	0	0	0	4
S	0	0	1	0	3	0	4
SSW	0	1	4	1	1	2	9
SW	0	0	4	1	0	0	5
WSW	0	1	4	0	0	4	9
W	0	0	4	3	0	1	8
WNW	0	3	3	1	2	0	9
NW	0	1	2	4	1	0	8
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	17	30	11	7	7	72

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	1	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	3	2	0	0	0	5
E	0	2	0	0	0	0	2
ESE	0	1	0	1	0	0	2
SE	0	0	3	0	3	0	6
SSE	0	0	1	1	0	0	2
S	0	2	0	2	1	1	6
SSW	0	2	0	1	1	5	9
SW	0	2	2	7	0	0	11
WSW	0	2	8	3	0	1	14
W	0	0	2	5	1	1	9
WNW	0	3	4	7	5	0	19
NW	0	2	2	5	1	1	11
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	20	25	33	12	9	99

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	8	27	4	4	2	49
NNE	2	7	13	10	4	4	40
NE	5	8	19	14	2	0	48
ENE	5	10	9	7	0	0	31
E	2	7	17	3	0	2	31
ESE	1	3	8	12	9	2	35
SE	0	6	16	10	4	3	39
SSE	3	3	15	16	2	0	39
S	1	3	8	23	15	5	55
SSW	0	2	5	16	14	25	62
SW	0	1	17	13	7	1	39
WSW	2	9	13	16	8	5	53
W	3	12	15	26	16	12	84
WNW	4	25	21	72	38	1	161
NW	2	16	20	58	22	1	119
NNW	3	7	20	29	11	6	76
Variable	0	0	0	0	0	0	0
Total	37	127	243	329	156	69	961

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	13	12	3	0	0	28
NNE	2	3	13	3	0	0	21
NE	0	6	4	1	0	0	11
ENE	2	19	15	1	0	0	37
E	1	10	16	5	2	1	35
ESE	0	5	15	10	3	1	34
SE	0	5	22	21	4	2	54
SSE	0	3	25	29	3	4	64
S	1	3	9	50	37	7	107
SSW	0	2	13	48	35	16	114
SW	1	10	16	32	6	0	65
WSW	0	8	9	24	4	3	48
W	1	6	18	18	3	4	50
WNW	1	6	22	30	1	2	62
NW	1	7	29	5	1	3	46
NNW	1	13	23	4	0	0	41
Variable	0	0	0	0	0	0	0
Total	11	119	261	284	99	43	817

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	1	4	1	0	0	8
NNE	1	3	2	1	0	0	7
NE	1	3	3	0	0	0	7
ENE	1	6	4	0	0	0	11
E	1	2	6	1	0	0	10
ESE	0	3	7	2	0	0	12
SE	0	0	3	1	0	0	4
SSE	1	2	2	0	0	0	5
S	0	0	0	0	0	0	0
SSW	0	0	1	0	2	2	5
SW	0	0	0	2	2	0	4
WSW	1	1	1	1	0	0	4
W	0	1	6	2	0	0	9
WNW	0	0	7	8	0	0	15
NW	1	0	2	3	0	0	6
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	9	22	48	22	4	2	107

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: 14

Braidwood Generating Station

Period of Record: January - March, 2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

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

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: 14

Braidwood Generating Station

Period of Record: April - June, 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	7	0	0	0	9
NNE	0	0	7	0	0	0	7
NE	1	1	11	1	0	0	14
ENE	1	7	1	0	0	0	9
E	1	13	1	0	0	0	15
ESE	1	15	7	0	0	0	23
SE	2	16	11	0	0	0	29
SSE	1	14	2	0	0	0	17
S	1	13	8	3	0	0	25
SSW	0	1	7	3	2	0	13
SW	0	3	8	5	1	0	17
WSW	0	7	12	3	0	0	22
W	0	3	17	2	0	0	22
WNW	0	15	28	3	0	0	46
NW	1	11	8	0	0	0	20
NNW	0	6	17	2	0	0	25
Variable	0	0	0	0	0	0	0
Total	9	127	152	22	3	0	313

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

Period of Record: April - June, 2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	1	0	0	0	4
NNE	0	2	6	0	0	0	8
NE	0	4	8	0	0	0	12
ENE	0	1	0	0	0	0	1
E	1	7	0	0	0	0	8
ESE	0	7	0	0	0	0	7
SE	0	7	1	0	0	0	8
SSE	0	0	0	0	0	0	0
S	1	7	1	0	0	0	9
SSW	1	4	3	0	0	0	8
SW	0	5	1	2	1	0	9
WSW	1	2	1	0	0	0	4
W	0	4	2	0	0	0	6
WNW	0	6	13	2	0	0	21
NW	0	2	3	0	0	0	5
NNW	0	0	1	2	0	0	3
Variable	0	0	0	0	0	0	0
Total	4	61	41	6	1	0	113

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

Period of Record: April - June, 2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	8	3	0	0	0	11
NNE	0	7	4	0	0	0	11
NE	0	5	8	0	0	0	13
ENE	1	1	2	0	0	0	4
E	2	5	0	0	0	0	7
ESE	0	4	1	0	0	0	5
SE	1	10	3	0	0	0	14
SSE	0	2	3	0	0	0	5
S	0	2	5	1	0	0	8
SSW	0	4	2	3	0	0	9
SW	0	1	2	4	1	0	8
WSW	0	1	3	0	0	0	4
W	1	4	4	0	0	0	9
WNW	0	5	5	2	0	0	12
NW	1	2	1	2	1	0	7
NNW	0	4	3	1	0	0	8
Variable	0	0	0	0	0	0	0
Total	6	65	49	13	2	0	135

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

Period of Record: April - June, 2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	21	26	1	0	0	52
NNE	2	24	23	0	0	0	49
NE	2	54	41	3	0	0	100
ENE	8	35	24	0	0	0	67
E	5	15	7	0	0	0	27
ESE	1	13	9	0	0	0	23
SE	2	20	10	2	0	0	34
SSE	4	25	9	5	0	0	43
S	1	22	23	9	0	0	55
SSW	0	12	19	17	1	0	49
SW	0	7	28	9	3	0	47
WSW	1	15	9	0	0	0	25
W	1	7	10	1	1	0	20
WNW	5	13	18	3	3	0	42
NW	4	15	15	5	0	0	39
NNW	2	16	9	4	0	0	31
Variable	0	0	0	0	0	0	0
Total	42	314	280	59	8	0	703

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

Period of Record: April - June, 2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	10	5	2	0	0	0	17
NNE	6	8	0	0	0	0	14
NE	6	14	0	0	0	0	20
ENE	23	30	0	0	0	0	53
E	29	18	1	0	0	0	48
ESE	12	43	6	0	0	0	61
SE	11	20	6	0	0	0	37
SSE	4	26	9	0	0	0	39
S	1	28	31	1	0	0	61
SSW	1	9	15	2	0	0	27
SW	3	24	27	4	0	0	58
WSW	3	23	5	1	0	0	32
W	8	20	5	1	0	0	34
WNW	18	26	11	0	0	1	56
NW	13	9	6	0	0	0	28
NNW	6	13	5	1	0	0	25
Variable	0	0	0	0	0	0	0
Total	154	316	129	10	0	1	610

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

Period of Record: April - June, 2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	1	0	0	0	0	5
NNE	6	0	0	0	0	0	6
NE	3	0	0	0	0	0	3
ENE	9	1	0	0	0	0	10
E	29	5	0	0	0	0	34
ESE	21	11	0	0	0	0	32
SE	4	2	0	0	0	0	6
SSE	8	3	0	0	0	0	11
S	3	0	0	0	0	0	3
SSW	3	4	0	0	0	0	7
SW	1	2	1	0	0	0	4
WSW	7	12	0	0	0	0	19
W	16	6	0	0	0	0	22
WNW	18	0	0	0	0	0	18
NW	13	1	0	0	0	0	14
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	147	48	1	0	0	0	196

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 Generating Station

Period of Record: April - June, 2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	0	0	0	0	0	3
NNE	2	0	0	0	0	0	2
NE	8	0	0	0	0	0	8
ENE	4	0	0	0	0	0	4
E	14	3	0	0	0	0	17
ESE	6	0	0	0	0	0	6
SE	3	0	0	0	0	0	3
SSE	0	0	0	0	0	0	0
S	2	0	0	0	0	0	2
SSW	1	0	0	0	0	0	1
SW	1	1	0	0	0	0	2
WSW	7	5	0	0	0	0	12
W	15	2	0	0	0	0	17
WNW	13	1	0	0	0	0	14
NW	7	0	0	0	0	0	7
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	87	12	0	0	0	0	99

Hours of calm in this stability class: 13
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Braidwood Generating Station

Period of Record: April - June, 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	7	1	0	0	9
NNE	0	0	5	4	1	0	10
NE	0	1	2	6	0	0	9
ENE	1	4	4	0	0	0	9
E	0	10	4	2	0	0	16
ESE	1	4	15	5	0	0	25
SE	1	14	13	4	0	0	32
SSE	0	5	3	2	0	0	10
S	1	4	13	5	4	1	28
SSW	0	1	1	8	2	2	14
SW	0	1	5	6	1	1	14
WSW	0	2	7	9	2	0	20
W	0	2	11	13	2	0	28
WNW	0	2	18	20	9	0	49
NW	0	4	12	9	1	0	26
NNW	0	1	4	8	1	0	14
Variable	0	0	0	0	0	0	0
Total	4	56	124	102	23	4	313

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

Period of Record: April - June, 2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	1	0	0	4
NNE	0	1	6	4	0	0	11
NE	0	0	4	2	0	0	6
ENE	0	0	1	0	0	0	1
E	0	5	2	0	0	0	7
ESE	0	6	5	0	0	0	11
SE	0	3	4	1	0	0	8
SSE	0	0	0	0	0	0	0
S	0	1	4	0	1	0	6
SSW	0	4	3	2	1	0	10
SW	0	2	2	2	0	1	7
WSW	0	4	2	1	0	0	7
W	0	2	1	1	0	0	4
WNW	0	2	5	8	4	2	21
NW	0	0	1	2	1	0	4
NNW	0	0	3	1	2	0	6
Variable	0	0	0	0	0	0	0
Total	0	30	46	25	9	3	113

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

Period of Record: April - June, 2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	6	4	0	0	15
NNE	0	2	6	4	0	0	12
NE	0	2	4	1	0	0	7
ENE	0	2	3	0	0	0	5
E	1	2	2	1	0	0	6
ESE	0	3	2	2	0	0	7
SE	0	5	4	3	0	0	12
SSE	0	3	2	1	0	0	6
S	0	0	1	4	2	1	8
SSW	0	1	3	1	3	1	9
SW	0	1	1	2	1	1	6
WSW	0	1	3	2	0	0	6
W	0	1	3	3	0	0	7
WNW	0	4	1	2	5	1	13
NW	0	1	1	1	2	1	6
NNW	0	4	4	2	0	0	10
Variable	0	0	0	0	0	0	0
Total	1	37	46	33	13	5	135

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

Period of Record: April - June, 2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	9	20	22	0	0	52
NNE	1	7	37	20	0	0	65
NE	1	15	43	30	3	0	92
ENE	4	14	21	10	0	0	49
E	2	6	8	9	6	0	31
ESE	0	6	10	5	6	0	27
SE	1	7	13	9	8	0	38
SSE	0	4	18	8	4	1	35
S	1	3	14	19	18	3	58
SSW	0	3	15	16	15	6	55
SW	0	1	11	20	2	3	37
WSW	0	5	11	8	1	0	25
W	1	2	5	8	3	1	20
WNW	1	8	7	18	12	4	50
NW	0	10	9	9	8	3	39
NNW	1	10	9	7	3	0	30
Variable	0	0	0	0	0	0	0
Total	14	110	251	218	89	21	703

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

Period of Record: April - June, 2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	9	3	0	0	15
NNE	0	4	14	0	0	0	18
NE	1	10	21	1	0	0	33
ENE	0	14	26	0	0	0	40
E	0	5	25	15	4	0	49
ESE	0	5	15	23	5	0	48
SE	0	6	32	7	0	0	45
SSE	0	4	12	15	4	0	35
S	0	4	15	39	5	0	63
SSW	0	2	12	27	3	0	44
SW	0	3	19	16	3	1	42
WSW	0	2	19	6	1	0	28
W	0	4	20	8	1	1	34
WNW	0	4	13	30	3	1	51
NW	1	4	18	10	3	0	36
NNW	0	5	18	6	0	0	29
Variable	0	0	0	0	0	0	0
Total	2	79	288	206	32	3	610

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

Period of Record: April - June, 2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	3	5	0	0	0	9
NNE	0	0	3	0	0	0	3
NE	0	1	1	0	0	0	2
ENE	0	7	1	0	0	0	8
E	1	3	15	8	0	0	27
ESE	0	1	11	16	0	0	28
SE	0	2	12	0	0	0	14
SSE	1	1	6	1	0	0	9
S	0	1	4	0	0	0	5
SSW	2	2	4	1	0	0	9
SW	0	4	5	2	0	0	11
WSW	1	3	5	7	0	0	16
W	0	4	8	4	0	0	16
WNW	0	6	8	2	0	0	16
NW	0	5	12	1	0	0	18
NNW	0	2	4	1	0	0	7
Variable	0	0	0	0	0	0	0
Total	6	45	104	43	0	0	198

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

Period of Record: April - June, 2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	4	0	0	0	4
NNE	1	1	0	0	0	0	2
NE	2	2	1	0	0	0	5
ENE	1	2	2	0	0	0	5
E	1	0	2	4	0	0	7
ESE	1	0	5	2	0	0	8
SE	0	1	4	1	0	0	6
SSE	1	4	0	0	0	0	5
S	1	2	0	0	0	0	3
SSW	2	2	3	0	0	0	7
SW	2	1	0	1	0	0	4
WSW	1	6	0	0	0	0	7
W	1	4	8	9	0	0	22
WNW	1	3	7	4	0	0	15
NW	0	2	3	0	0	0	5
NNW	0	2	5	0	0	0	7
Variable	0	0	0	0	0	0	0
Total	15	32	44	21	0	0	112

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

Period of Record: July - September 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	0	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	2	5	0	0	0	0	7
ENE	3	7	0	0	0	0	10
E	5	13	0	0	0	0	18
ESE	5	17	0	0	0	0	22
SE	6	16	1	0	0	0	23
SSE	5	15	0	0	0	0	20
S	3	20	22	0	0	0	45
SSW	0	11	19	9	0	0	39
SW	1	5	19	5	0	0	30
WSW	1	9	7	0	0	0	17
W	0	16	10	10	0	0	36
WNW	1	13	13	0	0	0	27
NW	0	6	1	0	0	0	7
NNW	1	14	0	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	33	170	92	24	0	0	319

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	3	0	0	0	5
NNE	0	0	1	0	0	0	1
NE	1	6	2	0	0	0	9
ENE	1	5	0	0	0	0	6
E	4	7	0	0	0	0	11
ESE	0	3	0	0	0	0	3
SE	2	9	0	0	0	0	11
SSE	1	4	0	0	0	0	5
S	2	5	5	0	0	0	12
SSW	0	5	11	1	0	0	17
SW	1	2	6	2	0	0	11
WSW	1	3	1	0	0	0	5
W	1	7	10	0	0	0	18
WNW	0	8	1	0	0	0	9
NW	2	1	0	0	0	0	3
NNW	0	2	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	16	69	40	3	0	0	128

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	4	4	0	0	0	11
NNE	0	3	3	0	0	0	6
NE	3	10	4	0	0	0	17
ENE	6	1	1	0	0	0	8
E	5	5	0	0	0	0	10
ESE	7	7	0	0	0	0	14
SE	5	1	0	0	0	0	6
SSE	3	6	0	0	0	0	9
S	4	4	3	0	0	0	11
SSW	0	2	4	4	0	0	10
SW	0	4	3	1	0	0	8
WSW	0	8	5	0	0	0	13
W	1	7	3	1	0	0	12
WNW	0	4	3	0	0	0	7
NW	1	2	1	0	0	0	4
NNW	2	2	1	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	40	70	35	6	0	0	151

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	7	8	1	0	0	20
NNE	9	33	15	0	0	0	57
NE	6	49	13	0	0	0	68
ENE	16	23	1	0	0	0	40
E	25	22	0	0	0	0	47
ESE	13	2	1	0	0	0	16
SE	7	7	1	0	0	0	15
SSE	6	30	2	0	0	0	38
S	4	25	14	0	0	0	43
SSW	3	4	28	2	0	0	37
SW	6	20	29	1	0	0	56
WSW	6	29	5	0	0	0	40
W	8	18	10	1	0	0	37
WNW	7	14	6	0	0	0	27
NW	7	6	0	0	0	0	13
NNW	5	8	5	0	0	0	18
Variable	0	0	0	0	0	0	0
Total	132	297	138	5	0	0	572

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: 5

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	7	8	0	0	0	21
NNE	13	14	2	0	0	0	29
NE	26	20	2	0	0	0	48
ENE	27	19	0	0	0	0	46
E	49	4	0	0	0	0	53
ESE	22	16	0	0	0	0	38
SE	14	33	0	0	0	0	47
SSE	23	44	2	0	0	0	69
S	12	71	13	0	0	0	96
SSW	2	24	12	0	0	0	38
SW	8	22	6	1	0	0	37
WSW	15	33	2	1	0	0	51
W	15	17	2	0	0	0	34
WNW	26	9	2	0	0	0	37
NW	14	3	0	0	0	0	17
NNW	18	6	0	0	0	0	24
Variable	0	0	0	0	0	0	0
Total	290	342	51	2	0	0	685

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: 5

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	7	1	0	0	0	0	8
NNE	2	0	0	0	0	0	2
NE	8	0	0	0	0	0	8
ENE	15	1	0	0	0	0	16
E	31	0	0	0	0	0	31
ESE	20	4	0	0	0	0	24
SE	7	2	0	0	0	0	9
SSE	3	6	0	0	0	0	9
S	3	2	0	0	0	0	5
SSW	4	5	0	0	0	0	9
SW	11	3	1	0	0	0	15
WSW	13	8	0	0	0	0	21
W	27	8	0	0	0	0	35
WNW	19	1	0	0	0	0	20
NW	6	0	0	0	0	0	6
NNW	12	0	0	0	0	0	12
Variable	0	0	0	0	0	0	0
Total	188	41	1	0	0	0	230

Hours of calm in this stability class: 13
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	0	0	0	0	0	4
NNE	5	0	0	0	0	0	5
NE	7	0	0	0	0	0	7
ENE	16	0	0	0	0	0	16
E	13	0	0	0	0	0	13
ESE	5	0	0	0	0	0	5
SE	1	0	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	3	0	0	0	0	0	3
SSW	2	1	0	0	0	0	3
SW	1	0	0	0	0	0	1
WSW	1	0	0	0	0	0	1
W	5	0	0	0	0	0	5
WNW	7	0	0	0	0	0	7
NW	2	0	0	0	0	0	2
NNW	5	0	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	77	1	0	0	0	0	78

Hours of calm in this stability class: 21
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	0	0	0	3
NNE	0	1	0	0	0	0	1
NE	0	6	2	0	0	0	8
ENE	1	3	3	0	0	0	7
E	0	12	9	0	0	0	21
ESE	3	14	6	0	0	0	23
SE	1	15	3	1	0	0	20
SSE	0	15	7	2	0	0	24
S	0	12	14	17	0	0	43
SSW	1	3	14	19	11	0	48
SW	0	2	11	6	0	0	19
WSW	2	2	11	4	0	0	19
W	0	7	11	9	11	0	38
WNW	0	6	11	7	4	0	28
NW	0	6	7	0	0	0	13
NNW	0	0	4	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	8	105	115	65	26	0	319

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	3	0	0	4
NNE	0	0	1	0	0	0	1
NE	0	2	6	1	0	0	9
ENE	0	4	2	0	0	0	6
E	2	4	5	0	0	0	11
ESE	1	1	3	0	0	0	5
SE	0	4	5	0	0	0	9
SSE	1	3	2	0	0	0	6
S	1	3	3	4	1	0	12
SSW	0	2	7	10	0	0	19
SW	0	0	3	3	1	0	7
WSW	0	2	0	1	0	0	3
W	1	5	5	8	0	0	19
WNW	1	4	4	0	0	0	9
NW	1	5	0	0	0	0	6
NNW	0	0	1	1	0	0	2
Variable	0	0	0	0	0	0	0
Total	8	39	48	31	2	0	128

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	4	2	0	0	8
NNE	0	6	3	2	0	0	11
NE	5	3	5	3	0	0	16
ENE	2	5	0	0	0	0	7
E	5	6	1	0	0	0	12
ESE	1	6	2	0	0	0	9
SE	2	4	3	0	0	0	9
SSE	1	2	4	2	0	0	9
S	1	1	3	3	1	0	9
SSW	0	3	2	3	3	0	11
SW	0	1	5	0	0	0	6
WSW	0	6	8	2	0	0	16
W	0	4	3	2	1	0	10
WNW	0	2	1	4	0	0	7
NW	0	3	2	0	0	0	5
NNW	0	2	2	2	0	0	6
Variable	0	0	0	0	0	0	0
Total	19	54	48	25	5	0	151

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	7	8	8	1	0	24
NNE	0	17	29	18	0	0	64
NE	1	7	36	8	0	0	52
ENE	3	23	14	0	0	0	40
E	2	20	22	0	0	0	44
ESE	5	11	4	2	0	0	22
SE	4	5	3	2	0	0	14
SSE	0	12	12	14	0	0	38
S	0	5	19	16	2	0	42
SSW	0	3	7	41	2	0	53
SW	3	5	25	8	1	0	42
WSW	1	17	22	4	1	0	45
W	2	13	11	7	1	0	34
WNW	5	4	12	5	5	0	31
NW	1	7	5	2	0	0	15
NNW	3	3	3	5	0	0	14
Variable	0	0	0	0	0	0	0
Total	30	159	232	140	13	0	574

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	9	10	6	1	0	27
NNE	1	8	16	3	0	0	28
NE	2	14	36	6	0	0	58
ENE	0	25	17	0	0	0	42
E	0	10	28	3	0	0	41
ESE	0	10	17	11	0	0	38
SE	1	8	17	11	0	0	37
SSE	3	10	23	17	1	0	54
S	0	6	53	43	1	0	103
SSW	2	6	26	24	0	0	58
SW	1	10	25	8	1	0	45
WSW	1	12	24	5	1	1	44
W	1	7	16	5	1	0	30
WNW	2	14	16	6	0	0	38
NW	0	8	8	3	0	0	19
NNW	0	6	15	6	0	0	27
Variable	0	0	0	0	0	0	0
Total	15	163	347	157	6	1	689

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	4	11	1	0	0	17
NNE	1	2	3	0	0	0	6
NE	3	3	0	0	0	0	6
ENE	2	1	0	0	0	0	3
E	3	2	13	3	0	0	21
ESE	1	6	9	5	0	0	21
SE	1	5	9	2	0	0	17
SSE	1	7	3	0	0	0	11
S	1	5	5	1	0	0	12
SSW	2	2	8	0	0	0	12
SW	1	15	7	1	0	0	24
WSW	2	8	9	2	0	0	21
W	1	3	8	11	0	0	23
WNW	0	7	16	6	0	0	29
NW	0	3	8	0	0	0	11
NNW	0	5	4	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	20	78	113	32	0	0	243

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

Braidwood Generating Station

Period of Record: July - September, 2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	3	0	0	0	0	4
NNE	4	2	0	0	0	0	6
NE	1	1	0	0	0	0	2
ENE	3	5	0	0	0	0	8
E	4	5	1	0	0	0	10
ESE	3	3	0	0	0	0	6
SE	5	7	3	0	0	0	15
SSE	6	4	1	0	0	0	11
S	2	2	0	0	0	0	4
SSW	1	4	3	0	0	0	8
SW	1	2	1	0	0	0	4
WSW	1	4	0	0	0	0	5
W	0	0	1	0	0	0	1
WNW	1	7	4	0	0	0	12
NW	0	1	0	0	0	0	1
NNW	1	1	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	34	51	14	0	0	0	99

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

Braidwood Generating Station

Period of Record: October - December 2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	0	0	0	2
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	3	0	0	0	0	3
ESE	0	2	0	0	0	0	2
SE	1	1	1	0	0	0	3
SSE	0	2	0	0	0	0	2
S	0	1	7	2	0	0	10
SSW	0	2	5	0	0	0	7
SW	0	2	8	0	0	0	10
WSW	0	0	1	1	0	0	2
W	0	0	4	1	0	0	5
WNW	0	3	10	0	0	0	13
NW	0	6	1	0	0	0	7
NNW	0	4	4	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	1	26	43	4	0	0	74

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

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	2	0	0	0	0	2
SE	1	1	1	0	0	0	3
SSE	0	3	0	0	0	0	3
S	1	3	5	0	0	0	9
SSW	0	3	1	3	0	0	7
SW	0	6	3	3	0	0	12
WSW	0	0	3	1	0	0	4
W	0	0	5	1	0	0	6
WNW	0	4	6	1	0	0	11
NW	1	1	1	0	0	0	3
NNW	0	4	2	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	3	29	28	9	0	0	69

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

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	5	0	0	0	0	6
NNE	0	3	1	0	0	0	4
NE	2	1	1	0	0	0	4
ENE	2	0	0	0	0	0	2
E	1	1	0	0	0	0	2
ESE	0	0	1	0	0	0	1
SE	0	5	1	0	0	0	6
SSE	0	2	2	0	0	0	4
S	0	1	4	2	0	0	7
SSW	0	1	4	3	0	0	8
SW	0	1	5	2	0	0	8
WSW	0	3	3	1	0	0	7
W	2	0	5	2	0	0	9
WNW	1	8	7	1	0	0	17
NW	2	4	0	0	0	0	6
NNW	1	4	1	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	12	39	35	11	0	0	97

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: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	11	6	0	0	0	23
NNE	8	10	17	0	0	0	35
NE	8	8	1	0	0	0	17
ENE	7	11	0	0	0	0	18
E	12	21	4	0	0	0	37
ESE	2	12	8	0	0	0	22
SE	5	16	39	0	0	0	60
SSE	1	19	24	8	0	0	52
S	2	7	54	26	0	0	89
SSW	3	2	16	23	4	0	48
SW	3	14	27	14	0	0	58
WSW	3	18	36	4	0	0	61
W	6	38	32	17	0	0	93
WNW	11	41	57	43	1	0	153
NW	10	22	15	0	0	0	47
NNW	3	26	19	0	0	0	48
Variable	0	0	0	0	0	0	0
Total	90	276	355	135	5	0	861

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 2
Hours of missing stability measurements in all stability classes: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	10	14	1	0	0	0	25
NNE	6	13	1	0	0	0	20
NE	6	8	0	0	0	0	14
ENE	10	8	0	0	0	0	18
E	27	5	0	0	0	0	32
ESE	14	17	7	0	0	0	38
SE	6	27	7	2	0	0	42
SSE	11	31	10	4	0	0	56
S	1	48	56	14	0	0	119
SSW	1	17	34	16	7	0	75
SW	3	33	33	8	1	0	78
WSW	5	17	10	3	0	0	35
W	12	30	28	4	0	0	74
WNW	28	43	23	2	0	0	96
NW	18	13	4	0	0	0	35
NNW	16	15	1	0	0	0	32
Variable	0	0	0	0	0	0	0
Total	174	339	215	53	8	0	789

Hours of calm in this stability class: 8
Hours of missing wind measurements in this stability class: 7
Hours of missing stability measurements in all stability classes: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	0	0	0	0	2
NNE	4	1	0	0	0	0	5
NE	3	0	0	0	0	0	3
ENE	5	0	0	0	0	0	5
E	20	0	0	0	0	0	20
ESE	21	1	0	0	0	0	22
SE	7	5	0	0	0	0	12
SSE	2	2	0	0	0	0	4
S	2	2	0	0	0	0	4
SSW	6	16	10	0	0	0	32
SW	5	17	1	0	0	0	23
WSW	10	13	0	0	0	0	23
W	15	10	0	0	0	0	25
WNW	10	4	0	0	0	0	14
NW	7	0	0	0	0	0	7
NNW	6	0	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	125	71	11	0	0	0	207

Hours of calm in this stability class: 7
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 34 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	0	0	0	0	0	4
NNE	2	0	0	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	2	0	0	0	0	0	2
E	8	0	0	0	0	0	8
ESE	6	2	0	0	0	0	8
SE	3	0	0	0	0	0	3
SSE	1	0	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	1	0	1	0	0	0	2
SW	1	0	0	0	0	0	1
WSW	0	9	0	0	0	0	9
W	3	1	0	0	0	0	4
WNW	9	0	0	0	0	0	9
NW	5	0	0	0	0	0	5
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	47	12	1	0	0	0	60

Hours of calm in this stability class: 21
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Extremely Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	1	3	0	0	0	4
ESE	0	1	0	0	0	0	1
SE	1	2	1	0	0	0	4
SSE	0	0	2	1	0	0	3
S	0	1	1	5	1	1	9
SSW	0	0	3	1	0	0	4
SW	0	1	2	5	0	0	8
WSW	0	1	0	1	1	0	3
W	0	0	1	1	1	0	3
WNW	0	2	7	6	1	0	16
NW	0	2	4	5	0	0	11
NNW	0	1	2	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	1	12	26	26	4	1	70

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

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Moderately Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	0	1	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	1	1	0	0	0	2
SE	0	1	1	1	0	0	3
SSE	0	2	1	0	0	0	3
S	0	2	0	4	0	1	7
SSW	0	3	1	1	0	2	7
SW	0	1	4	5	0	0	10
WSW	0	0	0	2	1	0	3
W	0	0	4	1	3	0	8
WNW	0	1	4	3	0	0	8
NW	0	1	2	2	0	0	5
NNW	0	1	5	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	0	16	23	20	4	3	66

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

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Slightly Unstable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	3	0	0	0	6
NNE	0	4	0	1	1	0	6
NE	0	1	0	0	0	0	1
ENE	0	1	0	0	0	0	1
E	0	0	1	0	0	0	1
ESE	0	1	1	1	0	0	3
SE	0	1	4	2	0	0	7
SSE	0	2	0	1	0	0	3
S	0	0	0	4	1	2	7
SSW	0	1	2	4	0	1	8
SW	1	1	3	5	1	0	11
WSW	1	0	2	3	0	0	6
W	0	0	3	3	0	0	6
WNW	1	5	7	5	1	1	20
NW	1	3	2	1	0	0	7
NNW	1	1	2	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	5	24	30	30	4	4	97

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: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Neutral - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	4	9	9	7	0	0	29
NNE	2	4	10	13	1	0	30
NE	1	9	5	0	0	0	15
ENE	4	4	6	0	0	0	14
E	3	10	18	9	3	0	43
ESE	2	0	6	7	4	1	20
SE	2	4	16	29	10	0	61
SSE	0	9	13	25	16	2	65
S	1	1	12	40	18	8	80
SSW	5	1	3	13	20	8	50
SW	0	5	13	23	11	0	52
WSW	1	11	14	30	10	0	66
W	0	17	31	20	7	9	84
WNW	1	17	30	45	31	22	146
NW	1	10	18	15	13	2	59
NNW	3	7	21	15	1	0	47
Variable	0	0	0	0	0	0	0
Total	30	118	225	291	145	52	861

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

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Slightly Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	4	13	5	0	0	25
NNE	0	1	13	1	0	0	15
NE	1	4	15	2	0	0	22
ENE	0	7	4	0	0	0	11
E	1	5	16	3	0	0	25
ESE	0	8	18	8	4	0	38
SE	1	7	5	21	2	2	38
SSE	1	10	15	27	6	4	63
S	0	1	21	55	28	13	118
SSW	1	1	9	44	25	9	89
SW	1	4	29	28	5	0	67
WSW	2	4	19	12	1	1	39
W	2	7	24	20	2	1	56
WNW	2	10	28	30	20	1	91
NW	4	13	13	20	3	0	53
NNW	3	15	20	9	0	0	47
Variable	0	0	0	0	0	0	0
Total	22	101	262	285	96	31	797

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 7
Hours of missing stability measurements in all stability classes: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Moderately Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	5	0	0	0	8
NNE	0	4	2	0	0	0	6
NE	1	0	3	0	0	0	4
ENE	1	0	1	0	0	0	2
E	0	0	11	3	0	0	14
ESE	0	2	9	4	0	0	15
SE	0	4	12	1	0	0	17
SSE	1	1	6	2	0	0	10
S	0	1	3	0	0	0	4
SSW	0	3	7	3	0	0	13
SW	1	8	12	16	0	0	37
WSW	1	7	9	2	0	0	19
W	0	3	14	5	0	0	22
WNW	0	1	9	5	0	0	15
NW	0	2	8	3	0	0	13
NNW	0	1	5	1	0	0	7
Variable	0	0	0	0	0	0	0
Total	5	40	116	45	0	0	206

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 8
Hours of missing stability measurements in all stability classes: 4

Braidwood Generating Station

Period of Record: October - December2016
Stability Class - Extremely Stable - 199Ft-30Ft Delta-T (F)
Winds Measured at 203 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	7	3	0	0	0	12
NNE	0	2	1	0	0	0	3
NE	2	1	0	0	0	0	3
ENE	0	1	0	0	0	0	1
E	1	1	3	1	0	0	6
ESE	0	1	1	2	0	0	4
SE	0	1	1	1	0	0	3
SSE	1	1	1	0	0	0	3
S	1	3	1	0	0	0	5
SSW	2	4	1	0	0	0	7
SW	2	1	0	0	0	0	3
WSW	0	3	2	4	0	0	9
W	1	0	2	0	0	0	3
WNW	0	0	5	1	0	0	6
NW	2	1	1	0	0	0	4
NNW	0	4	4	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	14	31	26	9	0	0	80

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: 4

APPENDIX G

ERRATA DATA

There is no errata data for 2016.

APPENDIX H

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

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Docket No: 50-456
50-457

BRAIDWOOD STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report

1 January through 31 December 2016

Prepared By
Teledyne Brown Engineering
Environmental Services

Braidwood Station
Braceville, IL 60407

May 2017

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Table Of Contents

Appendices

I. Summary and Conclusions

In 2016, Exelon continued a comprehensive program that evaluates the impact of station operations on groundwater and surface water in the vicinity of Braidwood Station. This evaluation involved numerous station personnel and contractor support personnel. This report covers groundwater and surface water samples collected from the environment, both on and off station property, in 2016. During that time period, 362 analyses were performed on 137 samples from 36 locations.

In assessing all the data gathered for this report, it was concluded that the operation of Braidwood Station had no adverse radiological impact on the environment.

Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) as specified in the Offsite Dose Calculation Manual (ODCM) in any of the groundwater or surface water samples. In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection 10 times less than Braidwood's ODCM and 100 times less than federal regulation.

Strontium-89/90 (Sr-89/90) was not detected at a concentration greater than the LLD of 10.0 and 1.0 picocuries per liter (pCi/L) respectively in any of the groundwater samples tested.

No tritium was detected in the groundwater or surface water samples at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Low levels of tritium were detected in groundwater and surface water at concentrations greater than the LLD of 200 pCi/L in 66 of 140 analyses. The tritium concentrations ranged from 181 ± 116 pCi/L to 1,690 ± 235 pCi/L. The tritium that was detected in the groundwater or surface water is believed to be the result of isolated historical releases and/or background from external sources greater than 200 pCi/L.

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater and surface water samples throughout the sampling year in 2016. Gross Alpha (dissolved) was not detected in any surface water samples and was detected in 4 groundwater samples. The concentrations ranged from 19.5 to 96.3 pCi/L. Gross Alpha (suspended) was not detected in surface water samples and was detected in 3 groundwater samples. The concentrations ranged from 1.8 to 2.5 pCi/L. Gross Beta (dissolved) was detected in 1 surface water and 27 groundwater samples. The concentrations ranged from 1.0 to 90.9 pCi/L. Gross Beta (suspended) was detected in 1 surface water and 2 groundwater samples. The concentrations ranged from 1.8 to 2.1 pCi/L.

Hard-To-Detect analyses were performed on one groundwater sample in 2016. The analyses included Americium-241 (Am-241), Cerium-242 (Cm-242, Cerium

243/244 (Cm-243/244), Plutonium-238 (Pu-238), Plutonium-239/240 (Pu-239/240), Uranium-234 (U-234), Uranium-235 (U-235) and Uranium-238 (U-238). U-234 was detected in the sample at a concentration of 2.3 pCi/L. All other hard-to-detect nuclides were not detected at concentrations greater than their respective MDCs.

II. Introduction

Braidwood Station, a two-unit PWR station is located in Will County, Illinois, fifteen (15) miles south-southwest of Joliet, Illinois. Each reactor is designed to have a capacity of 3,587 thermal megawatts. Units No. 1 went critical on May 29, 1987 and Unit No. 2 went critical on March 8, 1988. The station has been designed to keep releases to the environment at levels below those specified in the regulations.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Environmental Inc. Midwest Labs (EIML) on samples collected in 2016.

A. Objective of the Radiological Groundwater Protection Program (RGPP)

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

1. Identify suitable locations to monitor and evaluate potential impacts from station operations to preclude radiological impact to the environment and potential drinking water sources;

2. Understand the local hydrogeologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface;

3. Perform routine water sampling and radiological analysis of water from selected locations;

4. Report new leaks, spills, or other detections with potential radiological significance to stakeholders in a timely manner;

5. Regularly assess analytical results to identify adverse trends;

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

The objectives identified have been implemented at Braidwood Station as discussed below:

1. Exelon identified locations to monitor and evaluated potential impacts from station operations

2. The Braidwood Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the surface and shallow subsurface are updated based on ongoing measurements
3. Braidwood Station will continue to perform routine sampling and

radiological analysis of water from selected locations

4. Braidwood Station has implemented procedures to identify and report new leaks, spills, or other detections with potential radiological significance in a timely manner

5. Braidwood Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends

C. Program Description

1. Sample Collection

Sample locations can be found in Table A-1 and Figures A-1 through A-3, Appendix A.

Groundwater and Surface Water

Samples of groundwater and surface water are collected, managed, transported and analyzed in accordance with EPA methods. Sample locations, sample collection frequencies and analytical frequencies are managed in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management and shipment of samples as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs as well as nuclear industry audits. Station personnel review and evaluate all analytical data as it is received. Additionally, analytical data results are reviewed by an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

D. Characteristics of Tritium (H-3)

Tritium is a radioactive isotope of hydrogen. Its chemical properties are the same as hydrogen. Tritiated water behaves the same as ordinary water in both the environment and the body. Tritiated water can be taken into the body by drinking water, breathing air, eating food or absorption through the skin. Once tritiated water enters the body, it disperses quickly and is uniformly distributed. Tritiated water is excreted primarily through urine with a clearance rate characterized by an effective biological half-life of about 14 days. With such a short biological half-life, an acute ingestion would be cleared rapidly. Organically bound tritium (tritium that is incorporated into carbon containing compounds) can remain in the body for a longer period. Tritium is produced naturally in the upper atmosphere when cosmic rays interact with air molecules. Tritium is also produced during nuclear

weapons explosions, as a by-product in reactors producing electricity and in special production reactors. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface and therefore tritiated water will travel at the same velocity as non tritiated groundwater.

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by Teledyne Brown Engineering (TBE) and Environmental Incorporated Midwest Laboratory (EIML) to analyze the environmental samples for radioactivity for the Braidwood Station RGPP in 2016.

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

1. Concentrations of gamma emitters in groundwater and surface water
2. Concentrations of strontium in groundwater and surface water
3. Concentrations of tritium in groundwater and surface water
4. Concentrations of Gross Alpha and Gross Beta (Dissolved and Suspended) in groundwater and surface water
5. Concentrations of Am-241 in groundwater
6. Concentrations of Cm-242 and Cm-243/244 in groundwater
7. Concentrations of Pu-238 and Pu-239/240 in groundwater
8. Concentrations of U-234, U-235 and U-238 in groundwater
9. Concentrations of Fe-55 in groundwater
10. Concentrations of Ni-63 in groundwater

B. Data Interpretation

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

the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

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

2. Laboratory Measurements Uncertainty

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

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

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

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

   For groundwater and surface water 14 nuclides, Be-7, K-40, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, I-131, Cs-134, Cs-137, Ba-140 and La-140 were reported.

C. Background Analysis

A pre-operational radiological environmental monitoring program (pre-operational REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, marine life and foodstuffs. The results of the monitoring were detailed in the report entitled, Environmental Radiological Monitoring for Braidwood Nuclear Power Station Commonwealth Edison Company, Annual Report 1986, May

1987.

1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others.

a. Tritium Production

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

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

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected worldwide from 1960 to 2014. RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2016. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations

peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

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

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

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

IV. Results and Discussion

A. Missed Samples

There was one missed sample from VB-2-5D for Quarter 4 in 2016 due to miscommunication between the program owner and the vendor sample collector.

B. Groundwater Results

Groundwater

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

Tritium

Samples from all locations were analyzed for tritium activity. Tritium values ranged from the lower detection limit to 1,690 pCi/L. (Table B-I.1, Appendix B).

Strontium

Sr-89 and Sr-90 were analyzed for in 29 samples. Sr-89 was less than the required detection limit of 10.0 pCi/liter. Sr-90 was less than the required detection limit of 1.0 pCi/liter (Table B-I.1, Appendix B).

Gross Alpha and Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples. Gross Alpha (dissolved) was detected in 4 groundwater samples. The concentrations ranged from 19.5 to 96.3 pCi/L. Gross Alpha (suspended) was detected in 3 groundwater samples. The concentrations ranged from 1.8 to 2.5 pCi/L. Gross Beta (dissolved) was detected in 27 groundwater samples. The concentrations ranged from 1.0 to 90.9 pCi/L. Gross Beta (suspended) was detected in 3 groundwater samples. The concentrations ranged from 1.8 to 2.1 pCi/L. (Table B-I.1, Appendix B).

Hard-To-Detect

Hard-To-Detect analyses were performed on one groundwater sample in 2016. The analyses included Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235 and U-238. The naturally-occurring isotope U-234 was detected in the sample at a concentration of 2.3 pCi/L. All other hard-to-detect nuclides were not detected at concentrations greater than their respective MDCs. (Table B-I.3, Appendix B).

Gamma Emitters

Naturally-occurring K-40 was detected in one sample at a concentration of 58 pCi/L. No other gamma-emitting nuclides were detected in any of the samples analyzed. (Table B–I.2, Appendix B)

C. Surface Water Results

Surface Water

Samples were collected from two surface water locations throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below:

Tritium

Samples from all locations were analyzed for tritium activity. All results were less than the minimum detection limit (Table B-II.1, Appendix B).

Strontium

Sr-89 and Sr-90 were analyzed in two samples. Sr-89 was less than the required detection limit of 10.0 pCi/liter. Sr-90 was less than the required detection limit of 1.0 pCi/liter (Table B-II.1, Appendix B).

Gross Alpha and Beta (dissolved and suspended)

Two surface water samples for analyzed for Gross Alpha (dissolved and suspended) and Gross Beta (dissolved and suspended). Gross Alpha (dissolved) and Gross Alpha (suspended) were not detected in any surface water samples. Gross Beta (dissolved) was detected in 1 surface water sample at a concentration of 7.3 pCi/L. Gross Beta (suspended) was detected in 1 groundwater sample at a concentration of 2.0 pCi/L. (Table B-II.1, Appendix B).

Gamma Emitters

Two surface water samples were analyzed for gamma emitters. No gamma-emitting nuclides were detected in any of the samples analyzed (Table B–II.2, Appendix B).

D. Summary of Results – Inter-Laboratory Comparison Program

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

E. Leaks, Spills, and Releases

There are no new previously unidentified leaks or plumes at Braidwood Station.

F. Trends and Analyses

Monitoring of remediation activities indicate that tritium concentrations in affected areas have remained relatively unchanged since 2010.

G. Investigations

No investigations took place in 2016 as a result of groundwater sample results.

H. Actions Taken

1. Compensatory Actions

   No compensatory actions were initiated in 2016.

2. Installation of Monitoring Wells

   No new monitoring wells were installed in 2016.

3. Actions to Recover/Reverse Plumes

   No actions were undertaken to recover/reverse plumes in 2016.

4. Well Reduction Efforts

   Sampling and monitoring of various well locations was ceased during the third quarter 2015. These wells were used during and after remediation activities completed under the March 11, 2010 Consent Order. On March 28, 2013 the Illinois EPA confirmed that remediation was complete at the sites subject to the March 11, 2010 Consent Order within letters sent to Exelon. In these same letters the Illinois EPA approved termination of pumping in recovery wells, cessation of sampling of most of the monitoring wells and the abandonment of wells not being used at these remediation sites.

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APPENDIX A

LOCATION DESIGNATION

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Braidwood Station, 2016

Station Code	Sample Description
BL-03	Monitoring Well
BL-06	Monitoring Well
BL-06D	Monitoring Well
BL-09D	Monitoring Well
BL-10D	Monitoring Well
BL-11	Monitoring Well
BL-11D	Monitoring Well
BL-12D	Monitoring Well
BL-13D	Monitoring Well
BL-14D	Monitoring Well
BL-15D	Monitoring Well
BL-16D	Monitoring Well
BL-17D	Monitoring Well
BL-18D	Monitoring Well
BL-21	Monitoring Well
BL-22	Monitoring Well
BL-23	Monitoring Well
BL-24	Monitoring Well
BL-25	Monitoring Well
BL-26	Monitoring Well
BL-27	Monitoring Well
D-2D	Surface Water
D-3D	Surface water
DITCH (DS-2)	Surface Water
EXELON POND	Surface Water
F-1D	Monitoring Well
F-3D	Monitoring Well
F-3DR	Monitoring Well
F-4D	Monitoring Well
F-5D	Monitoring Well
F-6D	Monitoring Well
F-8D	Monitoring Well
F-9D	Monitoring Well
MW-102R	Monitoring Well
MW-103	Monitoring Well
MW-105	Monitoring Well
MW-105D	Monitoring Well
MW-106D	Monitoring Well
MW-107	Monitoring Well
MW-109D	Monitoring Well
MW-11	Monitoring Well
MW-110	Monitoring Well
MW-111	Monitoring Well
MW-111DR	Monitoring Well
MW-112D	Monitoring Well
MW-113	Monitoring Well
MW-113DR	Monitoring Well
MW-13	Monitoring Well
MW-130D	Monitoring Well
MW-131D	Monitoring Well
MW-132D	Monitoring Well

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Braidwood Station, 2016

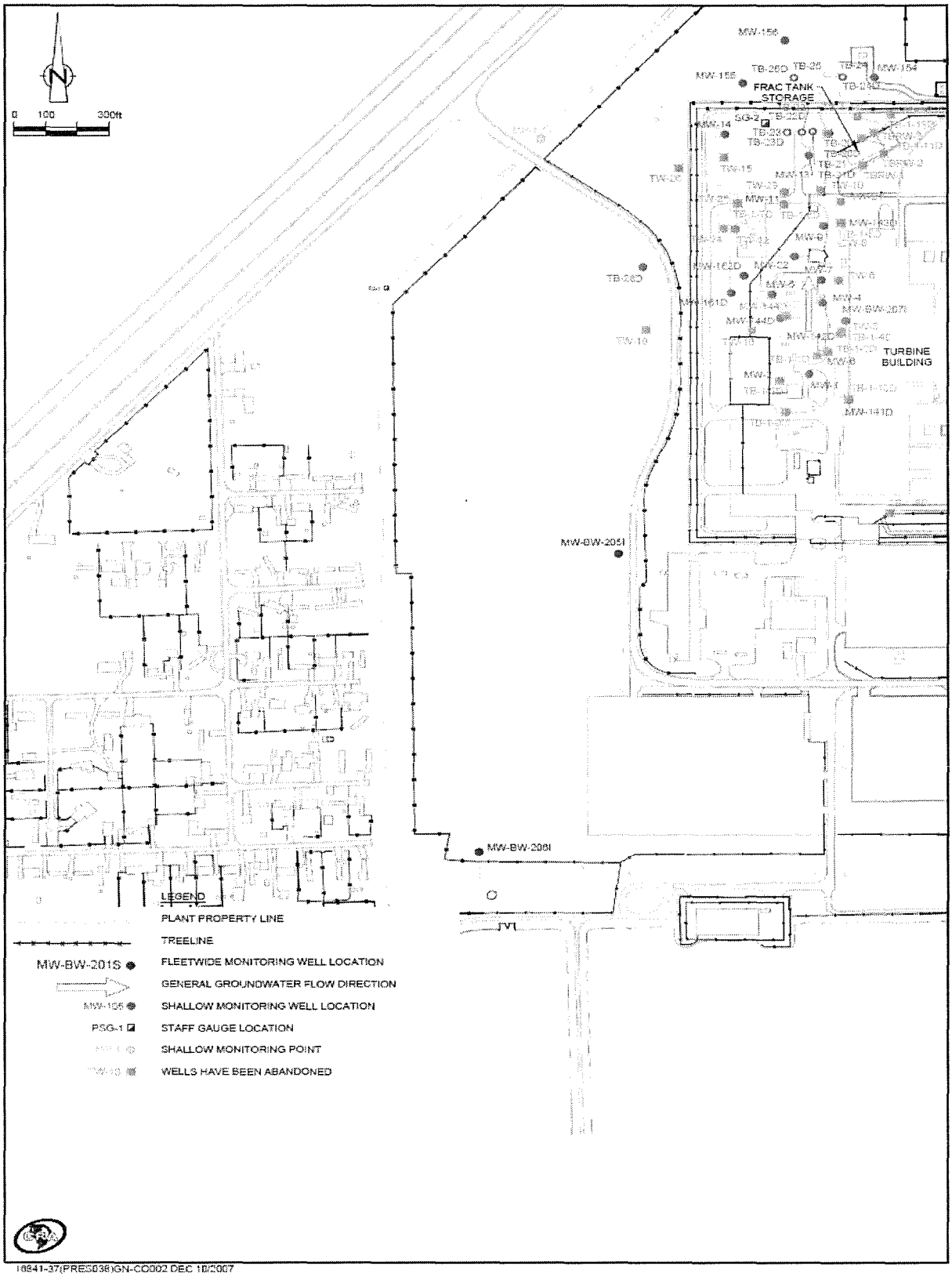
Station Code	Sample Description
MW-133D	Monitoring Well
MW-134D	Monitoring Well
MW-135D	Monitoring Well
MW-136D	Monitoring Well
MW-137D	Monitoring Well
MW-138D	Monitoring Well
MW-139D	Monitoring Well
MW-14	Monitoring Well
MW-140D	Monitoring Well
MW-141D	Monitoring Well
MW-142D	Monitoring Well
MW-143D	Monitoring Well
MW-144D	Monitoring Well
MW-145D	Monitoring Well
MW-154	Monitoring Well
MW-155	Monitoring Well
MW-156	Monitoring Well
MW-158D	Monitoring Well
MW-159D	Monitoring Well
MW-160D	Monitoring Well
MW-161D	Monitoring Well
MW-162D	Monitoring Well
MW-2	Monitoring Well
MW-22	Monitoring Well
MW-4	Monitoring Well
MW-5	Monitoring Well
MW-6	Monitoring Well
MW-7	Monitoring Well
MW-9	Monitoring Well
MW-BW-201BD	Monitoring Well
MW-BW-201I	Monitoring Well
MW-BW-201S	Monitoring Well
MW-BW-202I	Monitoring Well
MW-BW-202S	Monitoring Well
MW-BW-203I	Monitoring Well
MW-BW-203S	Monitoring Well
MW-BW-204I	Monitoring Well
MW-BW-205I	Monitoring Well
MW-BW-206I	Monitoring Well
MW-BW-207I	Monitoring Well
MW-BW-208BD	Monitoring Well
OWM31P	Monitoring Well
P-2D	Monitoring Well
P-4D	Monitoring Well
P-5D	Monitoring Well
P-13D	Monitoring Well
P-14D	Monitoring Well
RW-10	Monitoring Well
RW-5	Monitoring Well

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Braidwood Station, 2016

Station Code	Sample Description
RW-6	Monitoring Well
RW-7	Monitoring Well
RW-8	Monitoring Well
RW-9	Monitoring Well
S-1D	Monitoring Well
S-2D	Monitoring Well
S-4	Monitoring Well
S-4D	Monitoring Well
S-5	Monitoring Well
S-6	Monitoring Well
S-7D	Monitoring Well
S-8	Monitoring Well
S-8DR	Monitoring Well
SG-BW-105	Surface Water
SG-BW-106	Surface Water
SW-101	Surface Water
SW-102 POINT C	Surface Water
SW-103	Surface Water
SW-104 A DITCH	Surface Water
TB-20	Monitoring Well
TB-20D	Monitoring Well
TB-21	Monitoring Well
TB-21D	Monitoring Well
TB-22	Monitoring Well
TB-22D	Monitoring Well
TB-23	Monitoring Well
TB-23D	Monitoring Well
TB-24	Monitoring Well
TB-24D	Monitoring Well
TB-25	Monitoring Well
TB-25D	Monitoring Well
TB-26D	Monitoring Well
VB10-1	Monitoring Well
VB10-1R	Monitoring Well
VB1-1	Monitoring Well
VB1-10	Monitoring Well
VB1-10D	Monitoring Well
VB11-1	Monitoring Well
VB1-11	Monitoring Well
VB1-11D	Monitoring Well
VB1-12D	Monitoring Well
VB1-2	Monitoring Well
VB1-2D	Monitoring Well
VB1-3	Monitoring Well
VB1-3D	Monitoring Well
VB1-4	Monitoring Well
VB1-4D	Monitoring Well
VB1-5	Monitoring Well
VB1-5D	Monitoring Well

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Braidwood Station, 2016

Station Code	Sample Description
VB1-6	Monitoring Well
VB1-6D	Monitoring Well
VB1-7	Monitoring Well
VB1-7D	Monitoring Well
VB1-8	Monitoring Well
VB1-8D	Monitoring Well
VB1-9	Monitoring Well
VB1-9D	Monitoring Well
VB2-10	Monitoring Well
VB2-10D	Monitoring Well
VB2-11	Monitoring Well
VB2-11D	Monitoring Well
VB2-12	Monitoring Well
VB2-12D	Monitoring Well
VB2-13	Monitoring Well
VB2-13D	Monitoring Well
VB2-14	Monitoring Well
VB2-14D	Monitoring Well
VB2-15D	Monitoring Well
VB2-16	Monitoring Well
VB2-16D	Monitoring Well
VB2-17	Monitoring Well
VB2-17D	Monitoring Well
VB2-2D	Monitoring Well
VB2-5D	Monitoring Well
VB2-6D	Monitoring Well
VB2-7D	Monitoring Well
VB2-9D	Monitoring Well
VB3-10D	Monitoring Well
VB3-2	Monitoring Well
VB3-4D	Monitoring Well
VB3-7D	Monitoring Well
VB3-9D	Monitoring Well
VB4-1	Monitoring Well
VB4-5D	Monitoring Well
VB4-6D	Monitoring Well
VB5-2	Monitoring Well
VB6-1	Monitoring Well
VB7-1	Monitoring Well
VB8-2R	Monitoring Well
VB9-1	Monitoring Well



16841-37(PRES038)GN-CD002 DEC 10/2007

Figure A-1
Sampling Locations near the Site Boundary of Braidwood Station, 2016

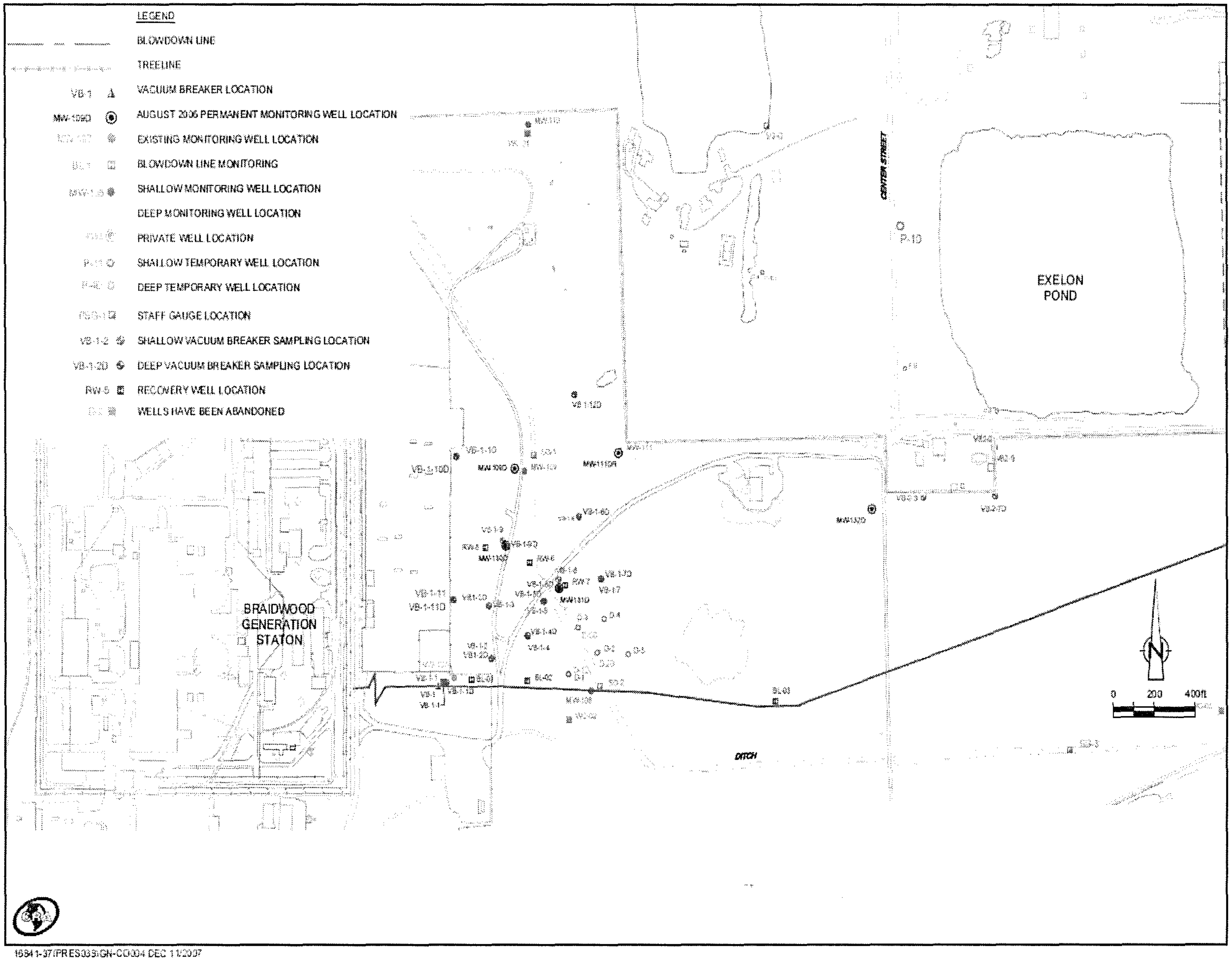


Figure A-2
Intermediate Sampling Locations of the Braidwood Station, 2016

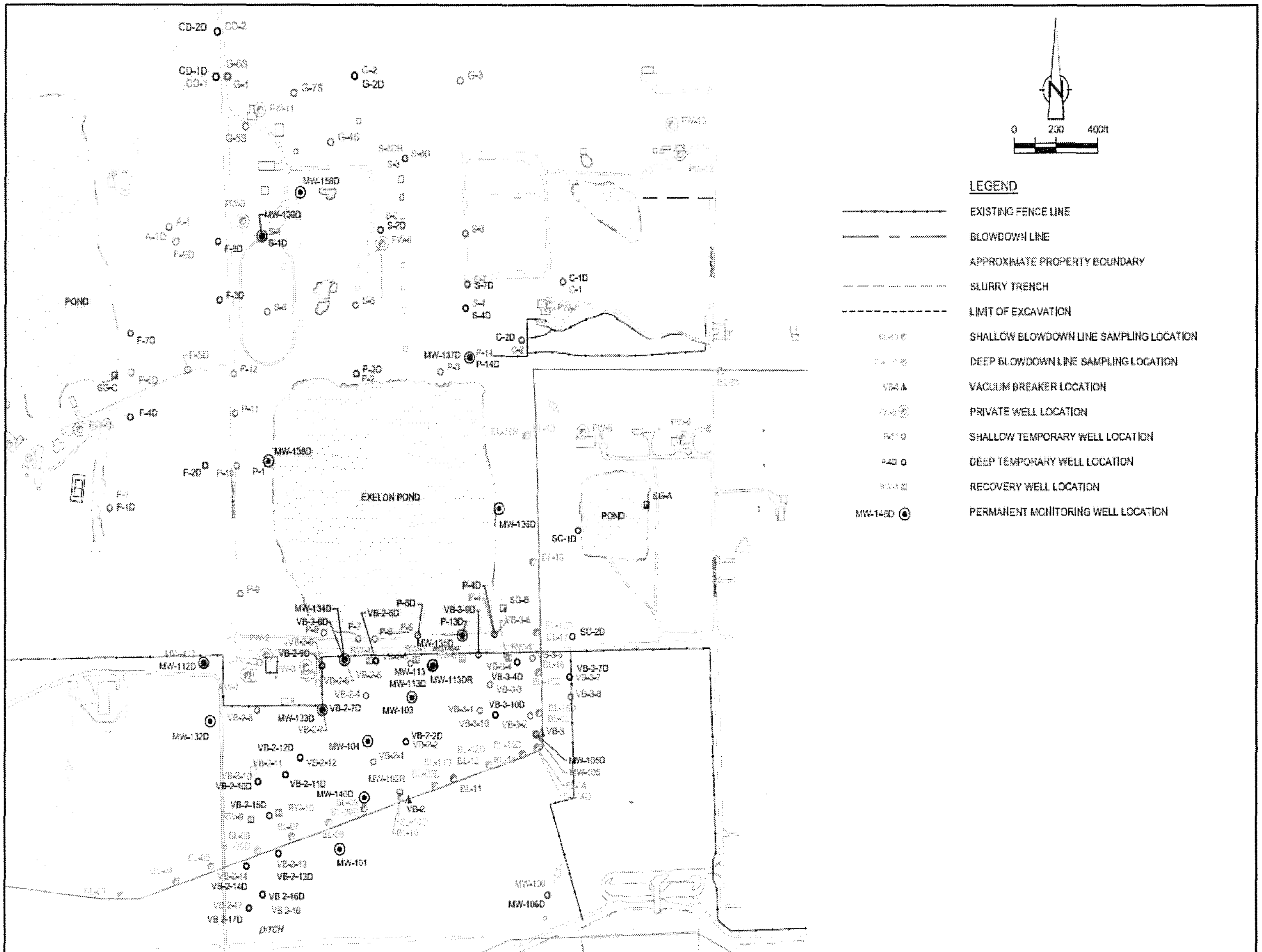


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Figure A-3
Distant Sampling Locations of the Braidwood Station, 2016

APPENDIX B

DATA TABLES

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TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITIY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-2	02/23/16	651 ± 149						
MW-2	06/07/16	287 ± 125	< 5.8	< 0.6	< 1.6	< 0.5	5.4 ± 1.0	< 1.3
MW-2	09/21/16	249 ± 120						
MW-2	10/12/16	386 ± 139						
MW-4	02/29/16	1150 ± 194						
MW-4	06/08/16	703 ± 146	< 3.6	< 0.5	< 3.0	< 0.5	4.8 ± 1.6	< 1.4
MW-4	09/21/16	628 ± 137						
MW-4	10/12/16	417 ± 143						
MW-5	02/29/16	364 ± 137						
MW-5	06/08/16	458 ± 132	< 4.7	< 0.6	< 0.7	< 0.5	2.0 ± 0.7	< 1.4
MW-5	09/20/16	239 ± 120						
MW-5	10/15/16	303 ± 137						
MW-6	02/22/16	1050 ± 181						
MW-6	06/07/16	769 ± 150	< 5.8	< 0.8	< 2.8	< 0.5	3.5 ± 1.5	< 1.4
MW-6	09/21/16	902 ± 158						
MW-6	10/02/16	770 ± 154						
MW-7	02/29/16	1060 ± 186						
MW-7	06/07/16	505 ± 135	< 6.4	< 0.7	< 1.0	< 0.5	4.0 ± 1.0	< 1.4
MW-7	09/20/16	446 ± 132						
MW-7	10/15/16	442 ± 140						
MW-11	02/29/16	441 ± 139						
MW-11	06/18/16	251 ± 130	< 8.7	< 0.7	< 2.9	< 1.0	< 2.8	< 1.6
MW-11	09/26/16	200 ± 120						
MW-11	10/13/16	< 195						
MW-102R	03/16/16	< 184						
MW-102R	05/05/16	< 177						
MW-102R	09/24/16	< 176						
MW-102R	10/22/16	< 190						
MW-141D	02/23/16	469 + 139						
MW-141D	06/07/16	375 ± 129	< 4.4	< 0.5	< **9.8**	< 3.1	26.4 ± 5.9	< 3.8
MW-141D	09/21/16	447 ± 129						
MW-141D	10/02/16	611 ± 147						
MW-142D	03/15/16	1690 ± 235						
MW-142D	06/11/16	1630 ± 227	< 6.0	< 0.8	< **4.8**	< 0.5	19.0 ± 2.1	< 1.3
MW-142D	09/28/16	1560 ± 218						
MW-142D	10/19/16	1400 + 207						
MW-143D	02/23/16	< 193						
MW-143D	06/18/16	< 190	< 3.3	< 0.2	< 2.8	< 0.5	13.8 ± 1.8	< 1.3
MW-143D	09/25/16	225 ± 119						
MW-143D	10/15/16	243 ± 132						
MW-144D	02/29/16	700 ± 154						
MW-144D	06/08/16	595 ± 138	< 5.3	< 0.8	< 0.9	< 0.5	4.8 ± 0.9	< 1.3
MW-144D	09/20/16	844 ± 153						
MW-144D	10/15/16	697 ± 156						
MW-145D	03/15/16	< 174						
MW-145D	06/14/16	< 180						
MW-145D	09/06/16	< 192						
MW-145D	12/14/16	< 194	< 5.6	< 0.9	< 0.9	< 0.7	1.0 ± 0.6	< 1.9
MW-154	03/23/16	< 196	< 8.1	< 0.3	< 0.5	< 0.6	2.4 ± 0.6	< 1.7
MW-154	06/23/16	< 191	< 9.1	< 0.6	< 0.9	< 0.5	2.8 ± 0.7	< 1.3
MW-154	09/25/16	< 176	< 5.5	< 0.6	< 0.6	< 0.7	1.2 ± 0.6	< 1.4
MW-154	10/23/16	< 190	< 5.1	< 0.6	< 0.5	< 0.5	1.7 ± 0.6	< 1.5
MW-155	03/23/16	< 198	< 6.6	< 0.6	< **3.6**	< 0.6	13.3 ± 1.9	< 1.7
MW-155	06/23/16	< 175	< 4.8	< 0.7	< 1.3	< 0.5	3.4 ± 0.8	< 1.3
MW-155	09/24/16	181 ± 116	< 4.3	< 0.4	< 1.2	< 0.7	4.2 ± 1.0	< 1.4
MW-155	10/23/16	< 194	< 3.3	< 0.8	< 1.2	< 0.5	4.2 ± 0.9	< 1.5

BOLD *Values = Unable to meet detection limit due to high solids content.*

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITIY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
MW-159D	03/11/16		256 ± 125						
MW-159D	06/23/16		< 192	< 4.0	< 0.3	< **5.1**	< 0.7	12.1 ± 1.8	< 2.3
MW-159D	09/25/16	*Original*	315 ± 123	< 4.1	< 0.3	< 1.9	1.8 ± 0.9	6.1 ± 1.5	1.8 ± 1.0
MW-159D	09/25/16	*Reanalysis*					2.3 ± 1.0		2.1 ± 1.1
MW-159D	10/22/16		283 ± 132	< 4.0	< 0.6	< 2.2	2.5 ± 0.9	6.5 ± 1.3	< 1.5
MW-162D	02/29/16		722 ± 155						
MW-162D	06/18/16		353 ± 132	< 8.0	< 0.6	< 3.0	< 1.0	< 2.9	< 1.6
MW-162D	09/26/16		477 ± 132						
MW-162D	10/13/16		376 ± 136						
MW-BW-201S	03/11/16		401 ± 131						
MW-BW-201S	06/18/16		300 ± 131	< 5.4	< 0.8	< 1.3	< 0.5	7.2 ± 1.3	< 1.3
MW-BW-201S	09/25/16		215 ± 118						
MW-BW-201S	10/22/16		321 ± 134						
MW-BW-202S	03/15/16		326 ± 127						
MW-BW-202S	06/18/16		< 192	< 9.4	< 0.8	< **3.1**	< 1.7	9.6 ± 1.8	< 2.6
MW-BW-202S	09/25/16		238 ± 120						
MW-BW-202S	10/22/16		486 ± 141						
MW-BW-203S	03/11/16		199 ± 122						
MW-BW-203S	06/18/16		< 191	< 5.1	< 0.4	< **3.5**	< 1.0	< 3.3	< 1.6
MW-BW-203S	09/25/16		< 174						
MW-BW-203S	10/22/16		268 ± 130						
MW-BW-207I	02/22/16	*Original*	490 ± 142						
MW-BW-207I	02/22/16	*Reanalysis*	333 ± 184						
MW-BW-207I	06/08/16		955 ± 167	< 3.7	< 0.5	< **18.7**	< 2.8	23.1 ± 7.5	< 4.0
MW-BW-207I	09/28/16		997 ± 168						
MW-BW-207I	10/15/16		927 ± 164						
0WM31P	01/06/16		< 191						
0WM31P	06/22/16	*Original*	< 195	< 4.1	< 0.3	91.3 ± 12.8	< 0.5	88.3 ± 5.1	< 1.3
0WM31P	06/22/16	*Recount*				96.3 ± 13.9		90.9 ± 5.0	
0WM31P	09/28/16		< 192			41.3 ± 7.0	< 0.4		
0WM31P	10/15/16		< 190			19.5 ± 3.3	< 0.7		
P-13DR	03/15/16		< 173						
RW-6	03/18/16		410 ± 134						
RW-6	06/24/16		260 ± 125	< 5.2	< 0.4	< **5.0**	< 0.5	6.7 ± 1.5	< 1.3
RW-6	09/24/16		355 ± 123						
RW-6	10/22/16		262 ± 131						
VB1-1	03/23/16		< 199						
VB1-1	06/11/16		< 179						
VB1-1	09/28/16		< 189						
VB1-1	10/23/16		< 193						
VB1-9DR	03/15/16		< 176						
VB2-5DR	03/15/16		< 175						
VB2-5DR	06/14/16		283 ± 122						
VB2-5DR	09/06/16		240 ± 129						
VB3-2	03/18/16		< 189						
VB3-2	05/05/16		< 181						
VB3-2	09/24/16		< 175						
VB3-2	10/22/16		< 189						
VB5-2	03/15/16		< 174						
VB5-2	06/14/16		< 176						
VB5-2	09/06/16		< 192						
VB5-2	12/14/16		< 190						
VB6-1	03/15/16		< 176						
VB6-1	06/14/16		< 182						
VB6-1	09/06/16		< 195						
VB6-1	12/14/16		< 193						

BOLD *Values = Unable to meet detection limit due to high solids content.*

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITIY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
VB7-1	03/15/16		< 175						
VB7-1	06/14/16		< 180						
VB7-1	09/06/16		< 194						
VB7-1	12/14/16		< 193						
VB8-2R	03/15/16		< 169						
VB8-2R	06/14/16		< 177						
VB8-2R	09/06/16		< 192						
VB8-2R	12/14/16		< 194						
VB9-1	03/15/16		< 173						
VB9-1	06/14/16		< 176						
VB9-1	09/06/16		< 194						
VB9-1	12/14/16		< 194						
VB10-1R	03/15/16		< 170						
VB10-1R	06/14/16		< 180						
VB10-1R	09/06/16		< 190						
VB10-1R	12/14/16		< 191						
VB11-1	03/15/16	*Original*	207 ± 117						
VB11-1	03/15/16	*Recount*	< 192						
VB11-1	03/15/16	*Reanalysis*	< 198						
VB11-1	06/14/16		< 184						
VB11-1	09/06/16		< 197						
VB11-1	12/14/16		< 196						

TABLE B-I.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
MW-2	06/07/16	< 21	< 49	< 2	< 3	< 6	< 2	< 4	< 3	< 4	< 15	< 2	< 2	< 24	< 8
MW-4	06/08/16	< 10	< 16	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 8	< 1	< 1	< 12	< 4
MW-5	06/08/16	< 12	< 26	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 15	< 5
MW-6	06/07/16	< 18	< 39	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 12	< 2	< 2	< 21	< 7
MW-7	06/07/16	< 18	< 33	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 21	< 7
MW-11	06/18/16	< 17	< 13	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 1	< 2	< 19	< 7
MW-141D	06/07/16	< 20	< 37	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 22	< 7
MW-142D	06/11/16	< 30	< 77	< 3	< 3	< 8	< 3	< 6	< 4	< 6	< 14	< 3	< 4	< 28	< 9
MW-143D	06/18/16	< 16	< 14	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 1	< 2	< 20	< 6
MW-144D	06/08/16	< 12	< 9	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 14	< 4
MW-145D	12/14/16	< 40	< 49	< 6	< 5	< 10	< 5	< 10	< 6	< 8	< 7	< 5	< 6	< 22	< 7
MW-154	03/23/16	< 9	< 16	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 4	< 1	< 1	< 7	< 2
MW-154	06/23/16	< 25	< 19	< 3	< 3	< 6	< 3	< 5	< 3	< 5	< 15	< 2	< 3	< 25	< 10
MW-154	09/25/16	< 50	< 129	< 5	< 5	< 13	< 5	< 12	< 6	< 10	< 12	< 6	< 6	< 31	< 9
MW-154	10/23/16	< 25	< 20	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 12	< 2	< 3	< 22	< 7
MW-155	03/23/16	< 13	< 11	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 5	< 1	< 1	< 11	< 3
MW-155	06/23/16	< 26	< 22	< 2	< 3	< 6	< 2	< 4	< 3	< 5	< 15	< 2	< 2	< 23	< 8
MW-155	09/24/16	< 54	< 61	< 6	< 5	< 15	< 7	< 13	< 7	< 10	< 14	< 5	< 5	< 32	< 12
MW-155	10/23/16	< 27	< 19	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 14	< 3	< 3	< 25	< 6
MW-159D	03/11/16	< 16	< 28	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 9	< 2	< 2	< 16	< 6
MW-159D	06/23/16	< 17	< 32	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 10	< 2	< 2	< 17	< 6
MW-159D	09/25/16	< 52	< 80	< 7	< 6	< 15	< 7	< 13	< 8	< 11	< 14	< 6	< 6	< 41	< 12
MW-159D	10/22/16	< 23	< 37	< 2	< 2	< 6	< 2	< 5	< 3	< 5	< 14	< 2	< 3	< 22	< 8
MW-162D	06/18/16	< 18	58 ± 32	< 2	< 2	< 4	< 1	< 3	< 2	< 4	< 14	< 1	< 2	< 22	< 7
MW-BW-201S	06/18/16	< 16	< 39	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 13	< 2	< 2	< 21	< 7
MW-BW-202S	06/18/16	< 16	< 11	< 1	< 2	< 3	< 1	< 3	< 2	< 3	< 14	< 1	< 1	< 20	< 5
MW-BW-203S	06/18/16	< 19	< 17	< 2	< 2	< 5	< 2	< 3	< 2	< 4	< 14	< 2	< 2	< 24	< 8
MW-BW-207I	06/08/16	< 10	< 9	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 8	< 1	< 1	< 12	< 4
0WM31P	06/22/16	< 22	< 50	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 21	< 7
RW-6	06/24/16	< 18	< 33	< 2	< 2	< 5	< 2	< 3	< 2	< 3	< 13	< 2	< 2	< 21	< 7

TABLE B-I.3 CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTIOIN PROGRAM, BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238
0WM31P	06/22/16	< 0.1	< 0.1	< 0.1	< 0.2	< 0.1	2.3 ± 0.4	< 0.1	< 0.1

TABLE B-II.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
DS-2	03/16/16	< 184						
DS-2	05/05/16	< 179	< 6.1	< 0.9	< 1.5	< 0.4	7.3 ± 1.5	< 1.4
DS-2	09/22/16	< 174						
DS-2	10/08/16	< 191						
SW-102	03/16/16	< 186						
SW-102	06/11/16	< 181	< 4.3	< 0.4	< 2.3	< 0.6	< 1.7	2.0 ± 1.1

TABLE B-II.2

CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF BRAIDWOOD STATION, 2016

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
DS-2	05/05/16	< 17	< 29	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 14	< 1	< 2	< 21	< 7
SW-102	06/11/16	< 31	< 26	< 3	< 3	< 8	< 3	< 6	< 4	< 6	< 14	< 3	< 3	< 23	< 8