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U. S. Nuclear Regulatory Commission
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Dresden Nuclear Power Station, Units 1, 2, and 3
Facility Operating License No. DPR-2
Renewed Facility Operating License Nos. DPR-19 and DPR-25
NRC Docket Nos. 50-010, 50-237, and 50-249

Subject: Dresden Nuclear Power Station 2012 Annual Radiological Environmental Operating Report

Enclosed is the Exelon Dresden Nuclear Power Station 2012 Annual Radiological Environmental Operating Report, submitted in accordance with Section 6.9.A.3 of the Unit 1 Dresden Nuclear Power Station Technical Specifications and Section 5.6.2, "Annual Radiological Environmental Operating Report," of the Units 2 and 3 Technical Specifications. This report provides the results of the radiological environmental monitoring program for the 2012 calendar year.

In addition, Appendix F of the report contains the results of groundwater monitoring conducted in accordance with Exelon's Radiological Groundwater Protection Program, which is a voluntary program implemented in 2006. This information is being reported in accordance with a nuclear industry initiative.

Should you have any questions concerning this letter, please contact Hal Dodd, Regulatory Assurance Manager, at (815) 416-2800.

Respectfully,

David M. Czufin
Site Vice President
Dresden Nuclear Power Station

Attachment - Annual Radiological Environmental Operating Report

cc: Regional Administrator - NRC Region III
NRC Senior Resident - Dresden Nuclear Power Station

FSME20
IE25

Docket No: 50-010
50-237
50-249

DRESDEN NUCLEAR POWER STATION
UNITS 1, 2 and 3

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2012

Prepared By

Teledyne Brown Engineering
Environmental Services

ExelonGeneration.

Dresden Nuclear Power Station
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May 2013

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I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the Dresden Nuclear Power Station (DNPS) by Exelon covers the period 1 January 2012 through 31 December 2012. During that time period 2,048 analyses were performed on 1,633 samples. In assessing all the data gathered for this report it was concluded that the operation of DNPS had no adverse radiological impact on the environment.

Surface water samples were analyzed for concentrations of gross beta, tritium and gamma emitting nuclides. Ground water samples were analyzed for concentrations of tritium and gamma emitting nuclides. No anthropogenic gamma emitting nuclides were detected. Gross beta and tritium activities detected were consistent with those detected in previous years.

Fish (commercially and recreationally important species), and sediment samples were analyzed for concentrations of gamma emitting nuclides. No fission or activation products were detected in fish. Cesium-137 was detected in one sediment sample at a concentration consistent with levels observed in previous years. No power station produced fission or activation products were found in sediment.

Air particulate samples were analyzed for concentrations of gross beta and gamma emitting nuclides. Gross beta results at the indicator locations were consistent with those at the control location. No fission or activation products were detected.

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

Cow milk samples were analyzed for concentrations of I-131 and gamma emitting nuclides. All I-131 results were below the minimum detectable activity. Concentrations of naturally occurring K-40 were found. No fission or activation products were found.

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

Environmental gamma radiation measurements were performed quarterly using Optically Stimulated Luminescent Dosimetry (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 Thermoluminescent Dosimetry (TLD) were discontinued. This change may result in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation).

II. Introduction

The Dresden Nuclear Power Station (DNPS), consisting of one retired reactor and two operating boiling water reactors owned and operated by Exelon Corporation, is located in Grundy County, Illinois. Unit No. 1 went critical in 1960 and was retired in 1978. Unit No. 2 went critical on 16 June 1970. Unit No. 3 went critical on 02 November 1971. The site is located in northern Illinois, approximately 12 miles southwest of Joliet, Illinois at the confluence of the Des Plaines and Kankakee Rivers where they form the Illinois River.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Landauer on samples collected during the period 1 January 2012 through 31 December 2012.

An assessment of the station's radioactive effluent monitoring results and radiation dose via the principle pathways of exposure resulting from plant emissions of radioactivity including the maximum noble gas gamma and beta air doses in the unrestricted area, an annual summary of meteorological conditions including wind speed, wind direction and atmospheric stability and the result of the 40CFR190 uranium fuel cycle dose analysis for the calendar year are published in the station's Annual Radioactive Effluent Release Report.

A. Objective of the Radiological Environmental Monitoring Program (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 DNPS REMP were collected for Exelon Nuclear by Environmental Incorporated Midwest Laboratory (EIML). This section describes the general collection methods used by EIML to obtain environmental samples for the DNPS REMP in 2012. Sample locations and descriptions can be found in Appendix B, Table B–1 and Figures B–1 and B-2. The collection 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 (SW), ground water (GW), fish (FI) and sediment (SS). Samples were collected from three surface water locations (D-21, D-52 and D-57) and composited for analysis. Control locations were D-52 and D-57. Samples were collected quarterly or more frequently from two well water locations (D-23 and D-35). All samples were collected in new unused plastic bottles, which were rinsed with source water prior to collection. Fish samples comprising the flesh of channel catfish, largemouth bass, common carp and freshwater drum were collected semiannually at two locations, D-28 and D-46 (Control). Sediment samples composed of recently deposited substrate were collected at one location semiannually, D-27.

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate and airborne iodine (AP/AI). Airborne iodine and particulate samples were collected at fourteen locations (D-01, D-02, D-03, D-04, D-07, D-08, D-10, D-12, D-14, D-45, D–53, D-55, D-56 and D-58). The control location was D-12. 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

Milk (M) samples were collected biweekly at one control location (D-25) from May through October and monthly from November through April. There are no milking animals within 10 km of the site. 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 (FL) were collected annually in September at five locations (D-Control, D-Quad 1, D-Quad 2, D-Quad 3 and D-Quad 4). The control location was D-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 Dosimetry (OSLD) were deployed and Thermoluminescent Dosimetry (TLD) were discontinued. This change may result in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation).

Each location consisted of two OSLD sets. The OSLD locations were placed on and around the DNPS site as follows:

An inner ring consisting of 17 locations (D-58, D-101, D-102, D-103, D-104, D-105, D-106, D-107, D-108, D-109, D-110, D-111, D-112a, D-113, D-114, D-115 and D-116) at or near the site boundary.

An outer ring consisting of 16 locations (D-201, D-202, D-203, D-204, D-205, D-206, D-207, D-208, D-209, D-210, D-211, D-212, D-213, D-214, D-215 and D-216) approximately 5 to 10 km from the site.

Other locations consisting of OSLD sets at the 13 air sampler locations (D-01, D-02, D-03, D-04, D-07, D-08, D-10, D-14, D-45, D-53, D-55, D-56 and D-58).

The balance of one location (D-12) represents the control area OSLD set.

The OSLDs were exchanged quarterly and sent to Landauer for analysis.

B. Sample Analysis

This section describes the general analytical methodologies used by TBE and EIML to analyze the environmental samples for radioactivity for the DNPS REMP in 2012. The analytical procedures used by the laboratories are listed in Appendix B Table B-2.

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

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

2. Concentrations of gamma emitters in ground and surface water, air particulates, milk, fish, sediment and vegetation.

3. Concentrations of tritium in ground and surface water.

4. Concentrations of I-131 in air and milk.

5. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

For the purpose of this report, Dresden Nuclear Power Station was considered operational at initial criticality. In addition, data were compared to previous years' operational data for consistency and trending. Several factors were important in the interpretation of the data:

1. Lower Limit of Detection and Minimum Detectable Concentration

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

The minimum detectable concentration (MDC) is calculated the same as the LLD with the exception that the measurement is an after the fact estimate of the presence of activity.

2. Net Activity Calculation and Reporting of Results

Net activity for a sample was calculated by subtracting background activity from the sample activity. Since the REMP measures extremely small changes in radioactivity in the environment, background variations may result in sample activity being lower than the background activity effecting a negative number. An MDC

was reported in all cases where positive activity was not detected.

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

For ground and surface water and vegetation 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 fish, sediment, air particulate and milk 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 single analysis uncertainty.

D. Program Exceptions

For 2012 the DNPS REMP had a sample recovery rate in excess of 99%. Sample anomalies and missed samples are listed in the tables below:

Table D-1 LISTING OF SAMPLE ANOMALIES

Sample Type	Location Code	Collection Date	Reason
AP/I	D-01	01/06/12	No apparent reason for low reading of 144.4 hours.
AP/I	D-03	01/27/12	Low reading of 56.1 hours due to tripped circuit breaker. The collector had to reset breaker.
AP/I	D-03	02/10/12	Low reading of 44.5 hours; no electricity to pump; station notified. Collector moved pump to alternate circuit.
AP/I	D-07	02/17/12	No apparent reason for low reading of 131.0 hours.
AP/I	D-04	02/24/12	No apparent reason for low reading of 148.4 hours.

Table D-1 LISTING OF SAMPLE ANOMALIES (continued)

Sample Type	Location Code	Collection Date	Reason
AP/I	D-01	05/11/12	No apparent reason for low reading of 147.5 hours.
AP/I	D-01	05/11/12	No apparent reason for low reading of 149.7 hours.
AP/I	D-12	05/18/12	Low reading of 156.8 hours; ComEd working on substation.
AP/I	D-04	05/25/12	No apparent reason for low reading of 163.5 hours.
AP/I	D-03	06/01/12	Low reading of 152.6 hours; pump off due to thermal overload; pump restarted. Est. FL_A of 60 cfh.
OSLD	D-211-2	06/01/12	OSLD found on ground during monthly check; collector remounted.
AP/I	D-08	11/02/12	Holes in AP due to insects; collector sprayed area with insecticide.

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
OSLD	D-107-1	03/31/12	OSLDs missing during quarterly exchange. Collector placed new 2nd quarter OSLDs.
OSLD	D-204-1,2	05/04/12	OSLDs missing; major construction area; fence missing; collector will move OSLDs to permanent fence 200 feet east.
OSLD	D-204-1	05/11/12	Collector placed spares 3017155R-3016981R.
OSLD	D-204-2	05/11/12	Collector placed spares 3017156R-3016982R.

Table D-2 LISTING OF MISSED SAMPLES (continued)

Sample Type	Location Code	Collection Date	Reason
OSLD	D-205-1	09/28/12	One of two OSLDs missing during quarterly exchange; collector placed new 4th quarter OSLD.
AP/I	D-08	10/26/12	AP eaten or torn off by insects or birds; only quarter ring left.
OSLD	D-201-2	12/28/12	One of two OSLDs missing during quarterly exchange; collector placed new 1st quarter 2013 OSLD.

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

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

E. Program Changes

No program changes in 2012.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were composited or taken weekly and composited for analysis at three locations (D-21, D-52 and D-57). Of these locations only D-21, located downstream, could be affected by Dresden's effluent releases. The following analyses were performed:

Gross Beta

Monthly composites from all locations were analyzed for

concentrations of gross beta (Table C–I.1, Appendix C). Gross Beta was detected in all samples. The values ranged from 2.6 to 12.8 pCi/l. Concentrations detected were consistent with those detected in previous years (Figures C-1, C–2 and C–3, Appendix C).

Tritium

Quarterly composites from all locations were analyzed for tritium activity (Table C–I.2, Appendix C). Four samples at indicator station D-21 were positive for tritium. The values ranged from 295 to 749 pCi/L. Three samples at control station D-57 were positive for tritium. The values ranged from 154 to 1440 pCi/L. Concentrations detected were consistent with those detected in previous years (Figures C–4, C–5 and C-6, Appendix C).

Gamma Spectrometry

Monthly composites from all locations were analyzed for gamma emitting nuclides (Table C–I.3, Appendix C). No nuclides were detected and all required LLDs were met.

2. Ground Water

Quarterly or more frequent grab samples were collected at two locations (D-23 and D-35). These locations could be affected by Dresden's effluent releases and by sources upstream on the Kankakee River. The following analyses were performed:

Tritium

All samples were analyzed for tritium activity (Table C–II.1, Appendix C). Tritium was detected in 12 of 16 samples. The concentrations ranged from 258 to 444 pCi/l. Concentrations detected were consistent with those detected in previous years (Figure C–7, Appendix C).

Gamma Spectrometry

All samples were analyzed for gamma emitting nuclides (Table C–II.2, Appendix C). No nuclides were detected and all required LLDs were met.

3. Fish

Fish samples comprised of channel catfish, largemouth bass, common carp and freshwater drum were collected at two locations (D-28 and D-46) semiannually. Location D-28 could be affected by Dresden's effluent releases. The following analysis was performed:

Gamma Spectrometry

The edible portion of fish samples from both locations was analyzed for gamma emitting nuclides (Table C–III.1, Appendix C). Naturally occurring K-40 was found at all stations. No fission or activation products were detected.

4. Sediment

Aquatic sediment samples were collected at one location (D-27) semiannually. This downstream location could be affected by Dresden's effluent releases. The following analysis was performed:

Gamma Spectrometry

Sediment samples from the location were analyzed for gamma emitting nuclides (Table C–IV.1, Appendix C). Cesium-137 was detected in one sample at a concentration of 65 pCi/kg dry. The activity detected was consistent with those detected in previous years and is likely due to fallout from above-ground nuclear weapons testing. No other fission or activation products were detected.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from 14 locations on a weekly basis. The 14 locations were separated into four groups: On-site samplers (D-01, D-02 and D-03), Near-field samplers within 4 km of the site (D-04, D-07, D-45, D-53, D-56 and D-58), Far-field samplers between 4 and 10 km from the site (D-08, D-10, D-14 and

D-55) and the Control sampler between 10 and 30 km from the site (D-12). The following analyses were performed:

Gross Beta

Weekly samples were analyzed for concentrations of beta emitters (Table C–V.1 and C–V.2, Appendix C).

Detectable gross beta activity was observed at all locations. Comparison of results among the four groups aid in determining the effects, if any, resulting from the operation of DNPS. The results from the On-Site locations ranged from 8 to 53 E-3 pCi/m^3 with a mean of 19 E-3 pCi/m^3. The results from the Near-Field locations ranged from 6 to 51 E-3 pCi/m^3 with a mean of 20 E-3 pCi/m^3. The results from the Far-Field locations ranged from 8 to 59 E-3 pCi/m^3 with a mean of 21 E–3 pCi/m^3. The results from the Control location ranged from 9 to 51 E-3 pCi/m^3 with a mean of 20 E-3 pCi/m^3. Comparison of the 2012 air particulate data with previous years data indicate no effects from the operation of DNPS. In addition a comparison of the weekly mean values for 2012 indicate no notable differences among the four groups (Figures C–8 through C-14, Appendix C).

Gamma Spectrometry

Samples were composited quarterly and analyzed for gamma emitting nuclides (Table C–V.3, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was detected in 54 of 56 samples and ranged from 32.0 to 116 E-3 pCi/m^3. Naturally occurring K-40 was detected in one of 56 samples at a concentration of 23.2 E-3 pCi/m^3. No anthropogenic nuclides were detected and all required LLDs were met. These samples were consistent with historical quarterly results. All other nuclides were less than the MDC.

b. Airborne Iodine

Continuous air samples were collected from 14 locations (D-01, D-02, D-03, D-04, D-07, D-08, D-10, D-12, D-14, D-45, D-53, D-55, D-56 and D-58) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). All results were less than the MDC for I-131.

2. Terrestrial

a. Milk

There are no indicator locations within 10 kilometers of the station. Samples were collected from one control location (D-25) biweekly May through October and monthly November through April. The following analyses were performed:

Iodine-131

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

Gamma Spectrometry

Each milk sample was analyzed for concentrations of gamma emitting nuclides (Table C–VII.2, Appendix C).

Naturally occurring K-40 activity was found in all samples. No other nuclides were detected and all required LLDs were met.

b. Food Products

Food product samples were collected at five locations (D-Control, D-Quad 1, D-Quad 2, D-Quad 3 and D-Quad 4) when available. Four locations, (D-Quad 1, D-Quad 2, D-Quad 3 and D-Quad 4) could be affected by Dresden's effluent releases. The following analysis was performed:

Gamma Spectrometry

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

C. Ambient Gamma Radiation

Beginning in 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry (OSLD) were deployed and Thermoluminescent Dosimetry (TLD) were discontinued. This change

may result in a step change in readings, up or down, depending on site characteristics. The relative comparison to control locations remains valid. OSLD technology is different than that used in a TLD but has the same purpose (to measure direct radiation). Forty-six OSLD locations were established around the site. Results of OSLD measurements are listed in Tables C–IX.1 to C–IX.3, Appendix C.

Most OSLD measurements were below 30 mR/quarter, with a range of 15 to 34.3 mR/quarter. A comparison of the Inner Ring, Outer Ring and Other locations' data to the Control Location data, indicate that the ambient gamma radiation levels from the Control location (D-12-01and D-12-02) were comparable.

D. Land Use Survey

A Land Use Survey conducted on August 26, 2012 around the Dresden Nuclear Power Station (DNPS) was performed by EIML for Exelon Nuclear to comply with Section 12.6.2 of the Dresden Offsite Dose Calculation Manual (ODCM). The purpose of the survey was to document the nearest resident or industrial facility, milk producing animal, and livestock in each of the sixteen 22 ½ degree sectors within 10 km around the site. There were no changes required to the DNPS REMP as a result of this survey. The results of this survey are summarized below.

Distance in Miles from the DNPS Reactor Buildings			
Sector	Residence Miles	Livestock Miles	Milk Farm Miles
A N	1.5	1.4	-
B NNE	0.8	6.0	-
C NE	0.8	5.8	-
D ENE	0.7	1.7	-
E E	1.1	-	-
F ESE	1.0	-	-
G SE	0.6	-	-
H SSE	0.5	-	-
J S	0.5	-	16.0
K SSW	3.3	-	-
L SW	3.6	-	11.4
M WSW	5.8	-	-
N W	3.5	0.5	-
P WNW	3.7	0.5	-
Q NW	2.6	0.5	-
R NNW	0.8	1.0	-

E. Errata Data

No errata data was discovered in 2012.

F. Summary of Results – Inter-Laboratory Comparison Program

The primary laboratory 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, 12 out of 18 analytes met the specified acceptance criteria. Six analytes (Co-60, Gross Alpha, Gross Beta, Sr-89, Sr-90 and Zn-65) did not meet the specified acceptance criteria for the following reason:

1. Teledyne Brown Engineering's MAPEP March 2012 Co-60 in soil result of 7.61 Bq/kg was higher than the known value of 1.56 Bq/kg, resulting in a found to known ratio of 4.88 on a sensitivity evaluation. NCR 12-08 was initiated to investigate this failure. No cause could be found for the failure. TBE is monitoring the Co-60 in soil analyses on a case-to-case basis.

2. Teledyne Brown Engineering's MAPEP March 2012 Zn-65 in AP result of 4.19 Bq/sample was higher than the known value of 2.99 Bq/sample, exceeding the upper control limit of 3.89 Bq/sample. NCR 12-08 was initiated to investigate this failure. No cause could be found for the failure and is considered an anomaly specific to the MAPEP sample. The first and second quarter 2012 Analytics AP Zn-65 analyses were acceptable.

3. Teledyne Brown Engineering's MAPEP September 2012 Sr-90 in water result of 19.6 pCi/L was higher than the known value of 12.2 pCi/L, exceeding the upper control limit of 15.9 pCi/L. NCR 12-11 was initiated to investigate this failure. An incorrect aliquot was entered into LIMS. Using the correct aliquot, the result would have fallen within the acceptance range.

4. Teledyne Brown Engineering's ERA May 2012 Gross Alpha in water result of 82.4 pCi/L was higher than the known value of 62.9 pCi/L, which exceeded the upper control limit of 78.0 pCi/L. NCR 12-05 was initiated to investigate this failure. The G-1 detector is slightly biased high for Th-230 based measurements. The G-1 detector is used only for ERA samples. The detector was recalibrated.

5. Teledyne Brown Engineering's ERA November 2012 Gross Beta in water result of 59.3 pCi/L was higher than the known value of 39.2 pCi/L, which exceeded the upper control limit of 46.7 pCi/L. NCR 12-13 was initiated to investigate this failure. The rerun result of 44.8 fell within the control limits. It appears an incorrect aliquot was entered into LIMS.

6. Teledyne Brown Engineering's ERA November 2012 Sr-89 in water result of 46.5 pCi/L was higher than the known value of 39.1 pCi/L, which exceeded the upper control limit of 46.1 pCi/L. NCR 12-13

was initiated to investigate this failure. The found to known ratio was 1.19, which TBE considers acceptable with warning.

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR DRESDEN NUCLEAR POWER STATION, 2012

NAME OF FACILITY: DRESDEN
LOCATION OF FACILITY: MORRIS IL
DOCKET NUMBER: 50-010 50-237 & 50-249
REPORTING PERIOD: ANNUAL 2012

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	36	4	8 (12/12) (2.6/11.1)	7.5 (24/24) (4.1/12.8)	9.2 (12/12) (7.1/12.8)	D-52 CONTROL DESPLAINES RIVER - UPSTREAM 1.1 MILES ESE OF SITE	0
	H-3	12	2000	441 (4/4) (295/749)	693 (3/8) (154/1440)	693 (3/4) (154/1440)	D-57 CONTROL KANKAKEE RIVER AT WILL ROAD(CONTROL) 2.0 MILES SE OF SITE	0
	GAMMA	36						
	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

* THE MEAN AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING BOTH THE MDAs AND THE POSITIVE VALUES
FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR DRESDEN NUCLEAR POWER STATION, 2012

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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)	I-131		15	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
GROUND WATER (PCI/LITER)	H-3	16	2000	327 (12/16) (258/444)	NA	327 (12/12) (258/444)	D-23 INDICATOR THORSEN WELL 0.7 MILES S OF SITE	0
	GAMMA	16						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0

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GROUND WATER (PCI/LITER)	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

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GROUND WATER (PCI/LITER)	LA-140		15	<LLD	NA	-		0
FISH (PCI/KG WET)	GAMMA	8						
	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0

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FISH (PCI/KG WET)	CS-137		150	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
SEDIMENT (PCI/KG DRY)	GAMMA	2						
	MN-54		NA	<LLD	NA	-		0
	CO-58		NA	<LLD	NA	-		0
	FE-59		NA	<LLD	NA	-		0
	CO-60		NA	<LLD	NA	-		0
	ZN-65		NA	<LLD	NA	-		0
	NB-95		NA	<LLD	NA	-		0

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SEDIMENT (PCI/KG DRY)	ZR-95		NA	<LLD	NA	-		0
	CS-134		150	<LLD	NA	-		0
	CS-137		180	65 (1/2)	NA	65 (1/2)	D-27 INDICATOR DRESDEN LOCK AND DAM - DOWNSTREAM 0.8 MILES NW OF SITE	0
	BA-140		NA	<LLD	NA	-		0
	LA-140		NA	<LLD	NA	-		0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	727	10	20 (674/675) (6/59)	20 (52/52) (9/51)	22 (52/52) (11/59)	D-55 INDICATOR RIDGE ROAD 4.3 MILES N OF SITE	0
	GAMMA	56						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0

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AIR PARTICULATE (E-3 PCI/CU.METER)	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 (E-3 PCI/CU.METER)	GAMMA I-131	727	70	<LLD	<LLD	-		0

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MILK (PCI/LITER)	I-131	19	1	NA	<LLD	-		0
	GAMMA	19						
	MN-54		NA	NA	<LLD	-		0
	CO-58		NA	NA	<LLD	-		0
	FE-59		NA	NA	<LLD	-		0
	CO-60		NA	NA	<LLD	-		0
	ZN-65		NA	NA	<LLD	-		0
	NB-95		NA	NA	<LLD	-		0
	ZR-95		NA	NA	<LLD	-		0
	CS-134		15	NA	<LLD	-		0

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LOCATION OF FACILITY: MORRIS IL **REPORTING PERIOD:** ANNUAL 2012

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MILK (PCI/LITER)	CS-137		18	NA	<LLD	-		0
	LA-140		15	NA	<LLD	-		0
VEGETATION (PCI/KG WET)	GAMMA	10						
	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

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DOCKET NUMBER: 50-010 50-237 & 50-249
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VEGETATION (PCI/KG WET)	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
DIRECT RADIATION (MREM/QTR.)	OSLD-QUARTERLY	364	NA	24.5 (356/356) (15/34.3)	22 (8/8) (16/26.8)	29.3 (4/4) (21/33.7)	D-110-3 INDICATOR 0.9 MILES SSW	0

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APPENDIX B

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

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TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Dresden Nuclear Power Station, 2012

Location	Location Description	Distance & Direction From Site
A. Surface Water		
D-21	Illinois River at EJ&E Bridge (indicator)	1.4 miles WNW
D-52	DesPlaines River at Will Road, Upstream (control)	1.1 miles ESE
D-57	Kankakee River at Will Road (control)	2.0 miles SE
B. Ground/Well Water		
D-23	Thorsen Well, Dresden Road (indicator)	0.7 miles S
D-35	Dresden Lock and Dam (indicator)	0.8 miles NW
C. Milk - bi-weekly / monthly		
D-25	Biros Farm (control)	11.4 miles SW
D. Air Particulates / Air Iodine		
D-01	Onsite Station 1 (indicator)	0.8 miles NW
D-02	Onsite Station 2 (indicator)	0.3 miles NNE
D-03	Onsite Station 3 (indicator)	0.4 miles S
D-04	Collins Road, on Station property(indicator)	0.8 miles W
D-07	Clay Products, Dresden Road (indicator)	2.6 miles S
D-08	Jugtown Road, Prairie Parks (indicator)	3.8 miles SW
D-10	Goose Lake Road, Goose Lake Village (indicator)	3.5 miles SSW
D-12	Quarry Road, Lisbon (control)	10.5 miles NW
D-14	Center Street, Channahon (indicator)	3.7 miles NE
D-45	McKinley Woods Road, Channahon (indicator)	1.7 miles ENE
D-53	Will Road at Hollyhock (indicator)	2.1 miles SSE
D-55	Ridge Road, Minooka (indicator)	4.3 miles N
D-56	Will Road, Wildfeather (indicator)	1.7 miles SE
D-58	Will Road, Marina (indicator)	1.1 miles ESE
E. Fish		
D-28	Dresden Pool of Illinois River, Downstream (indicator)	0.9 miles NNW
D-46	DesPlaines River, Upstream (control)	1.2 miles ESE
F. Sediment		
D-27	Illinois River at Dresden Lock and Dam, Downstream (indicator)	0.8 miles NW
G. Vegetation		
Quadrant 1	Chris Locknar	2.8 miles NE
Quadrant 2	Robert Pagliano	3.2 miles SSE
Quadrant 3	Jim Bloom	3.9 miles SSW
Quadrant 4	J.D. Carmichael	1.6 miles NNW
Control	Glasscock Farm	12.8 miles ENE

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, Dresden Nuclear Power Station, 2012

Location	Location Description	Distance & Direction From Site
H. Environmental Dosimetry - OSLD		
Inner Ring		
D-58-1 and -2		1.1 miles ESE
D-101-1 and -2		1.0 miles N
D-102-1 and -2		1.3 miles NNE
D-103-1 and -2		1.2 miles NE
D-104-1 and -2		1.7 miles ENE
D-105-1 and -2		1.5 miles E
D-106-1 and -2		1.1 miles ESE
D-107-1 and -2		1.4 miles SE
D-108-1 and -2		1.9 miles SSE
D-109-1 and -2		0.8 miles S
D-110-3 and -4		0.9 miles SSW
D-111-1 and -2		0.6 miles SW
D-112A-1 and -2		0.7 miles WSW
D-113-1 and -2		0.9 miles W
D-114-1 and -2		0.9 miles WNW
D-115-1 and -2		0.8 miles NW
D-116-1 and -2		1.0 miles NNW
Outer Ring		
D-201-1 and -2		4.8 miles N
D-202-1 and -2		5.1 miles NNE
D-203-1 and -2		4.7 miles NE
D-204-1 and -2		5.0 miles ENE
D-205-1 and -2		4.0 miles E
D-206-1 and -2		3.5 miles ESE
D-207-1 and -2		4.2 miles SE
D-208-1 and -2		4.9 miles SSE
D-209-1 and -2		4.1 miles S
D-210-1 and -2		4.9 miles SSW
D-211-1 and -2		4.8 miles SW
D-212-3 and -4		6.0 miles WSW
D-213-1 and -2		4.5 miles W
D-214-1 and -2		5.0 miles WNW
D-215-1 and -2		4.8 miles NW
D-216-1 and -2		4.9 miles NNW
Other Locations		
D-01-1 and -2	Onsite 1	0.8 miles NW
D-02-1 and -2	Onsite 2	0.3 miles NNE
D-03-1 and -2	Onsite 3	0.4 miles S
D-04-1 and -2	Collins Road, on Station property	0.8 miles W
D-07-1 and -2	Clay Products, Dresden Road	2.6 miles S
D-08-1 and -2	Jugtown Road, Prairie Parks	3.8 miles SW
D-10-1 and -2	Goose Lake Road, Goose Lake Village	3.5 miles SSW
D-14-1 and -2	Center Street, Channahon	3.7 miles NE
D-45-1 and -2	McKinley Woods Road, Channahon	1.7 miles ENE
D-53-1 and -2	Will Road at Hollyhock	2.1 miles SSE
D-55-1 and -2	Ridge Road, Minooka	4.3 miles N
D-56-1 and -2	Will Road, Wildfeather	1.7 miles SE
D-58-1 and -2	Will Road, Marina	1.1 miles ESE
Control		
D-12-1 and -2	Lisbon	10.5 miles NW

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Dresden Nuclear Power Station, 2012

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite sample or monthly composite from weekly grab samples.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual TBE, TBE-2023 Compositing of samples EIML-COMP-01 procedure for compositing water and milk samples	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis
Surface Water	Gross Beta	Monthly composite sample or monthly composite from weekly grab samples.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual TBE, TBE-2023 Compositing of samples EIML-COMP-01 procedure for compositing water and milk samples	2 gallon	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices
Surface Water	Tritium	Quarterly composite of monthly composite samples.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual TBE, TBE-2023 Compositing of samples EIML-COMP-01 procedure for compositing water and milk samples	500 ml	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Ground Water	Gamma Spectroscopy	Quarterly grab samples.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis
Ground Water	Tritium	Quarterly grab samples.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	500 ml	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Fish	Gamma Spectroscopy	Samples collected twice annually via electroshocking or other techniques	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	1000 grams (wet)	TBE, TBE-2007 Gamma emitting radioisotope analysis
Sediment	Gamma Spectroscopy	Semi-annual grab samples	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	500 grams (dry)	TBE, TBE-2007 Gamma emitting radioisotope analysis

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, Dresden Nuclear Power Station, 2012

Sample Medium	Analysis	Sampling Method	Collection Procedure Number	Sample Size	Analytical Procedure Number
Dredging Spoils	Gamma Spectroscopy	Annual grab samples if dredging occurred within 1 mile of Dresden Station during the year.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	500 grams (dry)	TBE, TBE-2007 Gamma emitting radioisotope analysis
Air Particulates	Gross Beta	One-week of continuous air sampling through glass fiber filter paper	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2023 Compositing of samples Env. Inc., AP-03 Procedure for compositing air particulate filters for gamma spectroscopic analysis	13 filters	TBE, TBE-2007 Gamma emitting radioisotope analysis
Air Iodine	Gamma Spectroscopy	One- or two-week composite of continuous air sampling through charcoal filter	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	1 filter (approximately 280 cubic meters weekly)	TBE, TBE-2007 Gamma emitting radioisotope analysis
Milk	I-131	Bi-weekly grab sample May through October. Monthly all other times	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	2 gallon	TBE, TBE-2012 Radioiodine in various matrices
Milk	Gamma Spectroscopy	Bi-weekly grab sample May through October. Monthly all other times	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	2 gallon	TBE, TBE-2007 Gamma emitting radioisotope analysis
Food Products	Gamma Spectroscopy	Annual grab samples.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	1000 grams	TBE, TBE-2007 Gamma emitting radioisotope analysis
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements.	EIML-SPM-1, Environmental Incorporated Midwest Laboratory Sampling Procedures Manual	2 dosimeters at each location	Landauer Incorporated, Procedure numbers L294H and L320A

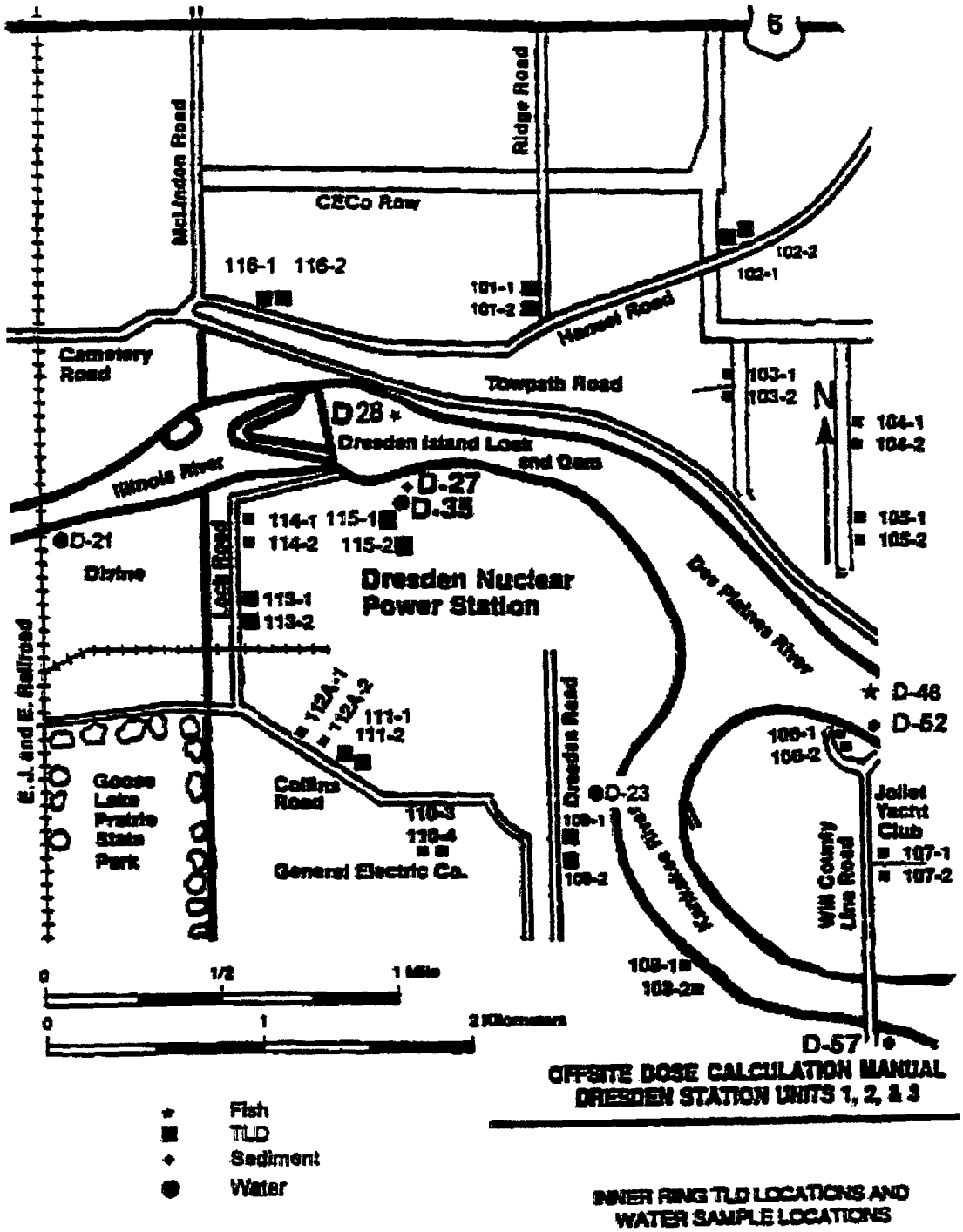

Figure B-1
Dresden Station Inner Ring OSLD Locations, Fish, Water, and Sediment Location, 2012

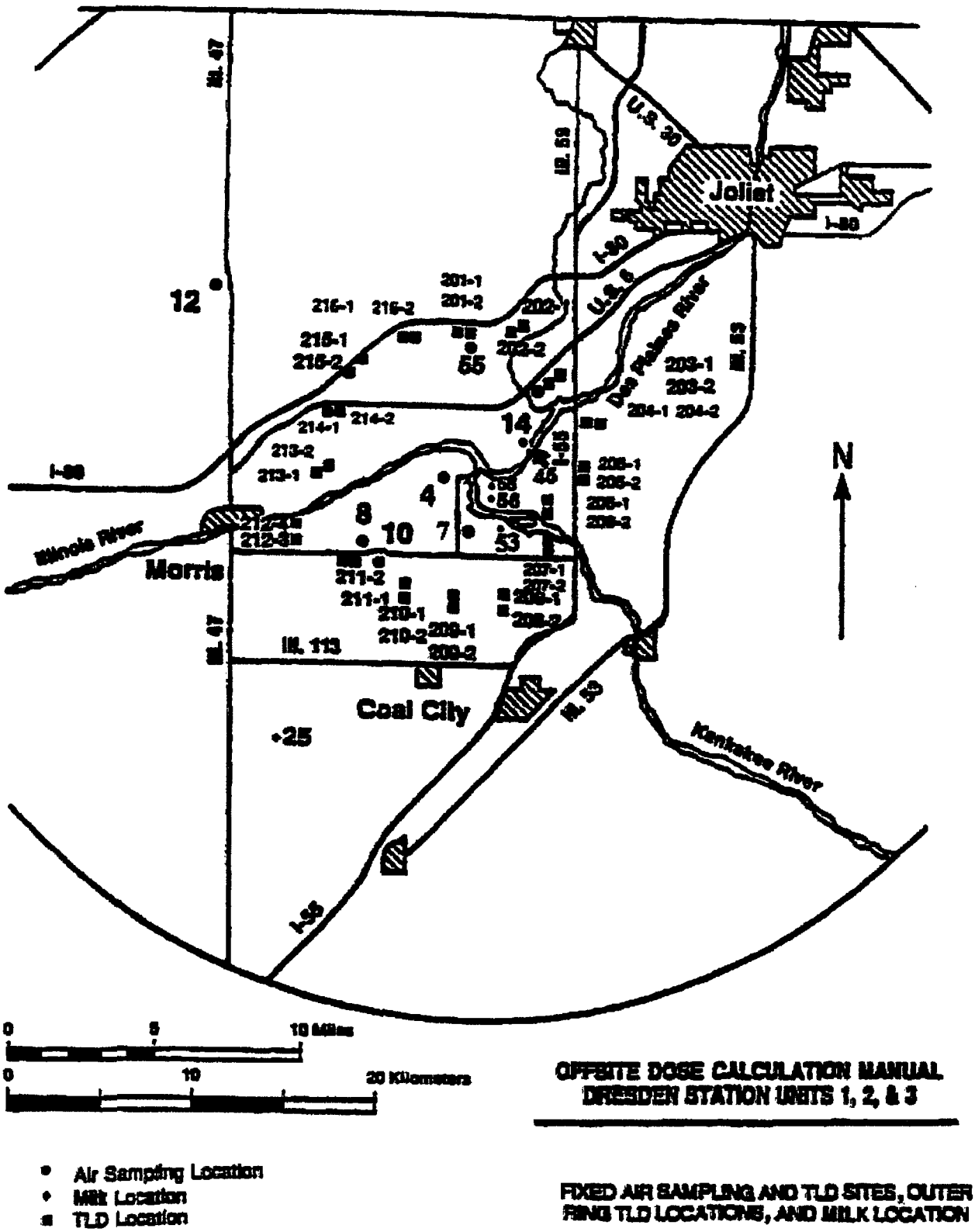

Figure B-2
Dresden Station Fixed Air Sampling and
OSLD Sites, Outer Ring OSLD Locations and Milk Location, 2012

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 DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	D-21 INDICATOR	D-52 CONTROL	D-57 CONTROL
01/06/12 - 01/27/12	7.8 ± 1.7	9.0 ± 1.8	11.6 ± 1.8
02/03/12 - 02/24/12	8.7 ± 2.2	8.4 ± 2.4	6.1 ± 2.0
03/02/12 - 03/30/12	6.3 ± 1.7	9.2 ± 1.9	4.4 ± 1.5
04/06/12 - 04/27/12	10.7 ± 2.1	12.8 ± 2.3	4.9 ± 1.8
05/04/12 - 05/25/12	2.6 ± 0.9	8.7 ± 1.7	5.6 ± 1.5
05/25/12 - 06/29/12	10.4 ± 1.7	7.1 ± 1.5	4.1 ± 1.3
06/29/12 - 07/27/12	6.2 ± 1.5	8.6 ± 1.7	5.7 ± 1.5
08/03/12 - 08/31/12	5.7 ± 1.7	7.3 ± 1.8	5.2 ± 1.7
09/07/12 - 09/28/12	11.1 ± 1.9	10.9 ± 1.8	5.7 ± 1.6
10/05/12 - 10/26/12	9.6 ± 1.8	8.0 ± 1.7	5.9 ± 1.6
11/02/12 - 11/30/12	10.5 ± 1.8	12.2 ± 1.9	5.1 ± 1.5
12/07/12 - 12/28/12	5.9 ± 1.9	8.0 ± 1.9	4.5 ± 1.8
MEAN	8.0 ± 5.3	9.2 ± 3.7	5.7 ± 3.9

Table C-I.2 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	D-21 INDICATOR	D-52 CONTROL	D-57 CONTROL
01/06/12 - 03/30/12	295 ± 119	< 170	485 ± 130
04/06/12 - 06/29/12	362 ± 134	< 182	154 ± 101
07/06/12 - 09/28/12	358 ± 111	< 160	1440 ± 195
10/05/12 - 12/28/12	749 ± 148	< 183	< 180
MEAN	441 ± 415	-	693 ± 1336

Table C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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
	D-21 INDICATOR												
	12/30/11 - 01/27/12	< 6	< 6	< 12	< 5	< 10	< 6	< 10	< 13	< 6	< 6	< 32	< 6
	01/27/12 - 02/24/12	< 3	< 3	< 7	< 3	< 6	< 4	< 6	< 9	< 3	< 3	< 18	< 6
	02/24/12 - 03/30/12	< 5	< 6	< 9	< 5	< 12	< 5	< 11	< 10	< 5	< 6	< 23	< 6
	03/30/12 - 04/27/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 3
	04/27/12 - 05/25/12	< 6	< 4	< 11	< 7	< 9	< 6	< 10	< 13	< 6	< 4	< 38	< 13
	05/25/12 - 06/29/12	< 4	< 3	< 11	< 5	< 8	< 5	< 8	< 12	< 4	< 4	< 27	< 9
	06/29/12 - 07/27/12	< 5	< 5	< 12	< 5	< 11	< 5	< 9	< 14	< 5	< 6	< 30	< 10
	07/27/12 - 08/31/12	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 8	< 3	< 3	< 17	< 5
	08/31/12 - 09/28/12	< 4	< 4	< 9	< 4	< 9	< 5	< 8	< 14	< 4	< 4	< 34	< 12
	09/28/12 - 10/26/12	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 11	< 4
	10/26/12 - 11/30/12	< 4	< 4	< 8	< 4	< 9	< 5	< 7	< 10	< 4	< 4	< 24	< 9
	11/30/12 - 12/28/12	< 4	< 4	< 11	< 5	< 12	< 6	< 8	< 13	< 4	< 4	< 33	< 12
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
	D-52 CONTROL												
	01/06/12 - 01/27/12	< 5	< 5	< 10	< 6	< 9	< 6	< 8	< 8	< 5	< 5	< 20	< 6
	02/03/12 - 02/24/12	< 3	< 2	< 5	< 2	< 5	< 3	< 5	< 7	< 2	< 3	< 17	< 4
	03/02/12 - 03/30/12	< 5	< 4	< 9	< 4	< 8	< 4	< 7	< 8	< 4	< 4	< 20	< 5
	04/06/12 - 04/27/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 10	< 3
	05/04/12 - 05/25/12	< 4	< 4	< 9	< 5	< 9	< 4	< 9	< 13	< 4	< 4	< 27	< 6
	06/29/12 - 06/29/12	< 3	< 4	< 7	< 3	< 6	< 3	< 6	< 9	< 3	< 4	< 22	< 6
	07/06/12 - 07/27/12	< 4	< 6	< 10	< 5	< 10	< 4	< 8	< 12	< 4	< 5	< 27	< 6
	08/03/12 - 08/31/12	< 5	< 5	< 13	< 5	< 11	< 5	< 9	< 13	< 6	< 5	< 29	< 11
	09/07/12 - 09/28/12	< 4	< 4	< 10	< 4	< 8	< 5	< 7	< 14	< 4	< 4	< 33	< 11
	10/05/12 - 10/26/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 10	< 3
	11/02/12 - 11/30/12	< 3	< 3	< 8	< 3	< 9	< 4	< 7	< 10	< 4	< 4	< 19	< 7
	12/07/12 - 12/28/12	< 5	< 5	< 9	< 5	< 9	< 5	< 9	< 15	< 5	< 5	< 32	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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
	D-57 CONTROL												
	12/30/11 - 01/27/12	< 5	< 6	< 9	< 5	< 8	< 6	< 9	< 9	< 5	< 5	< 25	< 4
	01/27/12 - 02/24/12	< 3	< 4	< 9	< 4	< 7	< 4	< 7	< 8	< 3	< 3	< 21	< 7
	02/24/12 - 03/30/12	< 6	< 7	< 12	< 6	< 12	< 6	< 9	< 9	< 6	< 6	< 29	< 9
	03/30/12 - 04/27/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 1	< 2	< 9	< 3
	04/27/12 - 05/25/12	< 5	< 4	< 9	< 5	< 9	< 4	< 8	< 11	< 4	< 6	< 28	< 8
	05/25/12 - 06/29/12	< 5	< 5	< 10	< 4	< 11	< 5	< 8	< 14	< 4	< 5	< 29	< 9
	06/29/12 - 07/27/12	< 5	< 4	< 11	< 4	< 10	< 5	< 9	< 12	< 4	< 4	< 28	< 9
	07/27/12 - 08/31/12	< 6	< 6	< 13	< 6	< 13	< 7	< 12	< 14	< 6	< 6	< 35	< 12
	08/31/12 - 09/28/12	< 5	< 5	< 10	< 4	< 9	< 5	< 8	< 14	< 4	< 5	< 35	< 10
	09/28/12 - 10/26/12	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 5	< 2	< 2	< 12	< 4
	10/26/12 - 11/30/12	< 4	< 4	< 9	< 3	< 8	< 4	< 7	< 9	< 4	< 4	< 19	< 6
	11/30/12 - 12/28/12	< 5	< 5	< 10	< 5	< 9	< 5	< 9	< 13	< 5	< 5	< 31	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-II.1 **CONCENTRATIONS OF TRITIUM IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	D-23	D-35
01/13/12 - 01/13/12	261 ± 125	< 186
02/10/12 - 02/10/12	292 ± 122	
03/09/12 - 03/09/12	311 ± 124	
04/13/12 - 04/13/12	308 ± 127	< 180
05/11/12 - 05/11/12	258 ± 126	
06/08/12 - 06/08/12	393 ± 119	
07/13/12 - 07/13/12	444 ± 125	< 160
08/10/12 - 08/10/12	336 ± 127	
09/14/12 - 09/14/12	386 ± 134	
10/12/12 - 10/12/12	284 ± 114	< 156
11/09/12 - 11/09/12	294 ± 120	
12/14/12 - 12/14/12	357 ± 123	
MEAN	327 ± 115	-

Tables C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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
D-23	01/13/12 - 01/13/12	< 5	< 4	< 12	< 8	< 10	< 4	< 9	< 13	< 4	< 6	< 33	< 10
	02/10/12 - 02/10/12	< 4	< 4	< 8	< 4	< 7	< 4	< 7	< 10	< 4	< 4	< 26	< 7
	03/09/12 - 03/09/12	< 4	< 4	< 8	< 4	< 7	< 4	< 6	< 7	< 3	< 4	< 18	< 5
	04/13/12 - 04/13/12	< 3	< 3	< 7	< 3	< 6	< 3	< 6	< 8	< 3	< 3	< 18	< 6
	05/11/12 - 05/11/12	< 5	< 5	< 10	< 5	< 10	< 5	< 10	< 13	< 5	< 6	< 31	< 11
	06/08/12 - 06/08/12	< 4	< 3	< 9	< 4	< 8	< 4	< 6	< 12	< 3	< 3	< 22	< 6
	07/13/12 - 07/13/12	< 4	< 5	< 9	< 4	< 11	< 5	< 9	< 11	< 4	< 5	< 26	< 10
	08/10/12 - 08/10/12	< 3	< 3	< 6	< 4	< 7	< 4	< 6	< 5	< 3	< 3	< 15	< 6
	09/14/12 - 09/14/12	< 5	< 5	< 13	< 6	< 10	< 5	< 9	< 14	< 5	< 7	< 36	< 9
	10/12/12 - 10/12/12	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 5	< 2	< 2	< 12	< 4
	11/09/12 - 11/09/12	< 4	< 3	< 7	< 3	< 7	< 4	< 6	< 9	< 3	< 3	< 18	< 7
	12/14/12 - 12/14/12	< 2	< 2	< 5	< 2	< 5	< 3	< 4	< 7	< 2	< 2	< 16	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
D-35	01/13/12 - 01/13/12	< 4	< 5	< 11	< 6	< 9	< 5	< 9	< 12	< 5	< 5	< 27	< 11
	04/13/12 - 04/13/12	< 4	< 4	< 10	< 4	< 9	< 5	< 8	< 10	< 4	< 4	< 20	< 7
	07/13/12 - 07/13/12	< 5	< 5	< 10	< 5	< 8	< 4	< 8	< 12	< 4	< 5	< 30	< 9
	10/12/12 - 10/12/12	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 4	< 2	< 2	< 10	< 3
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-III.1

CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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
D-28 INDICATOR												
Freshwater Drum	05/10/12	< 45	< 47	< 120	< 48	< 105	< 57	< 86	< 51	< 46	< 271	< 96
Largemouth Bass	05/10/12	< 60	< 57	< 125	< 54	< 111	< 64	< 110	< 56	< 53	< 424	< 98
Common Carp	10/01/12	< 49	< 66	< 143	< 43	< 108	< 53	< 105	< 53	< 56	< 558	< 185
Largemouth Bass	10/01/12	< 68	< 63	< 181	< 71	< 142	< 73	< 127	< 42	< 64	< 685	< 146
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-46 CONTROL												
Channel Catfish	05/10/12	< 44	< 50	< 108	< 43	< 103	< 56	< 88	< 42	< 57	< 338	< 96
Largemouth Bass	05/10/12	< 62	< 48	< 105	< 66	< 122	< 64	< 106	< 49	< 57	< 470	< 184
Common Carp	10/01/12	< 83	< 96	< 201	< 87	< 144	< 107	< 169	< 76	< 84	< 956	< 239
Largemouth Bass	10/01/12	< 53	< 74	< 153	< 57	< 111	< 71	< 120	< 58	< 50	< 591	< 96
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-IV.1 **CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PC/KG DRY ± 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
D-27	05/11/12	< 58	< 57	< 120	< 69	< 120	< 63	< 106	< 55	< 67	< 344	< 110
	10/05/12	< 61	< 62	< 162	< 57	< 136	< 72	< 110	< 54	65 ± 44	< 494	< 192
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-V.1 **CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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

COLLECTION	ONSITE LOCATION			NEAR FIELD LOCATION					
PERIOD	D-01	D-02	D-03	D-04	D-07	D-45	D-53	D-56	D-58
12/30/11 - 01/06/12	17 ± 5	18 ± 4	17 ± 4	20 ± 5	19 ± 5	17 ± 4	18 ± 4	20 ± 5	19 ± 4
01/06/12 - 01/13/12	17 ± 4	20 ± 4	20 ± 4	22 ± 5	16 ± 4	22 ± 5	19 ± 4	22 ± 5	21 ± 4
01/13/12 - 01/20/12	20 ± 5	25 ± 5	12 ± 4	23 ± 5	23 ± 5	21 ± 4	22 ± 5	21 ± 5	20 ± 5
01/20/12 - 01/27/12	26 ± 5	28 ± 5	21 ± 10	23 ± 5	30 ± 5	26 ± 5	27 ± 5	28 ± 5	26 ± 5
01/27/12 - 02/03/12	16 ± 4	15 ± 4	17 ± 4	18 ± 4	18 ± 4	15 ± 4	16 ± 4	18 ± 4	19 ± 4
02/03/12 - 02/10/12	18 ± 5	25 ± 5	26 ± 8	22 ± 5	15 ± 5	25 ± 5	20 ± 5	23 ± 5	21 ± 5
02/10/12 - 02/17/12	15 ± 4	11 ± 4	19 ± 4	15 ± 4	21 ± 6	15 ± 4	16 ± 4	15 ± 4	13 ± 4
02/17/12 - 02/24/12	15 ± 4	16 ± 4	14 ± 4	14 ± 4	18 ± 4	19 ± 4	18 ± 4	18 ± 4	18 ± 4
02/24/12 - 03/02/12	18 ± 4	23 ± 5	19 ± 4	21 ± 4	20 ± 4	17 ± 4	19 ± 4	19 ± 4	22 ± 5
03/02/12 - 03/09/12	17 ± 4	21 ± 5	16 ± 4	14 ± 4	20 ± 4	18 ± 4	17 ± 4	14 ± 4	20 ± 5
03/09/12 - 03/16/12	8 ± 4	11 ± 4	9 ± 4	15 ± 4	16 ± 4	20 ± 5	20 ± 5	17 ± 4	14 ± 4
03/16/12 - 03/23/12	14 ± 4	13 ± 4	18 ± 4	16 ± 4	17 ± 4	14 ± 4	15 ± 4	13 ± 4	13 ± 4
03/23/12 - 03/30/12	13 ± 4	10 ± 4	16 ± 4	11 ± 4	14 ± 4	12 ± 4	13 ± 4	15 ± 4	10 ± 4
03/30/12 - 04/06/12	12 ± 4	10 ± 4	8 ± 4	10 ± 4	8 ± 4	13 ± 4	11 ± 4	11 ± 4	9 ± 4
04/06/12 - 04/13/12	12 ± 4	13 ± 4	15 ± 4	16 ± 5	15 ± 5	13 ± 4	14 ± 4	12 ± 4	15 ± 5
04/13/12 - 04/20/12	18 ± 4	18 ± 4	18 ± 4	20 ± 4	21 ± 4	19 ± 4	16 ± 4	17 ± 4	18 ± 4
04/20/12 - 04/27/12	10 ± 4	10 ± 4	9 ± 4	11 ± 4	6 ± 4	13 ± 5	8 ± 4	9 ± 4	10 ± 4
04/27/12 - 05/04/12	15 ± 4	17 ± 4	22 ± 5	24 ± 5	20 ± 5	18 ± 4	15 ± 4	18 ± 4	19 ± 4
05/04/12 - 05/11/12	8 ± 4	8 ± 4	14 ± 4	11 ± 4	8 ± 4	10 ± 4	12 ± 4	10 ± 4	11 ± 4
05/11/12 - 05/18/12	14 ± 4	11 ± 4	16 ± 4	14 ± 4	16 ± 4	15 ± 4	12 ± 4	13 ± 4	13 ± 4
05/18/12 - 05/25/12	17 ± 4	23 ± 5	19 ± 5	20 ± 5	23 ± 5	23 ± 5	18 ± 4	20 ± 5	18 ± 4
05/25/12 - 06/01/12	12 ± 4	10 ± 4	9 ± 4	11 ± 5	14 ± 4	12 ± 4	13 ± 4	8 ± 4	12 ± 4
06/01/12 - 06/08/12	11 ± 4	14 ± 4	15 ± 4	12 ± 4	12 ± 4	16 ± 4	12 ± 4	11 ± 4	11 ± 4
06/08/12 - 06/15/12	14 ± 4	15 ± 4	16 ± 4	16 ± 4	14 ± 4	14 ± 4	14 ± 4	12 ± 4	10 ± 4
06/15/12 - 06/22/12	16 ± 4	18 ± 4	18 ± 4	9 ± 4	14 ± 4	16 ± 4	15 ± 4	19 ± 4	19 ± 4
06/22/12 - 06/29/12	19 ± 4	22 ± 5	18 ± 4	19 ± 4	18 ± 4	18 ± 4	21 ± 4	18 ± 4	19 ± 4
06/29/12 - 07/06/12	28 ± 5	32 ± 5	25 ± 5	28 ± 5	26 ± 5	27 ± 5	27 ± 5	25 ± 5	30 ± 5
07/06/12 - 07/13/12	22 ± 5	17 ± 4	15 ± 4	17 ± 4	18 ± 4	23 ± 5	19 ± 4	16 ± 4	19 ± 4
07/13/12 - 07/20/12	19 ± 4	21 ± 5	21 ± 5	20 ± 5	23 ± 5	19 ± 4	22 ± 5	20 ± 5	22 ± 5
07/20/12 - 07/27/12	19 ± 5	17 ± 4	25 ± 5	21 ± 5	20 ± 5	21 ± 5	20 ± 5	21 ± 5	24 ± 5
07/27/12 - 08/03/12	20 ± 5	21 ± 5	20 ± 5	24 ± 5	19 ± 4	17 ± 4	16 ± 4	16 ± 4	17 ± 4
08/03/12 - 08/10/12	22 ± 5	23 ± 5	22 ± 5	19 ± 5	19 ± 5	19 ± 5	17 ± 4	17 ± 4	19 ± 4
08/10/12 - 08/17/12	22 ± 5	21 ± 4	23 ± 5	20 ± 4	20 ± 4	16 ± 4	20 ± 4	19 ± 4	18 ± 4
08/17/12 - 08/24/12	17 ± 4	22 ± 5	21 ± 4	23 ± 5	20 ± 4	19 ± 4	21 ± 4	21 ± 4	23 ± 5
08/24/12 - 08/31/12	36 ± 5	36 ± 5	33 ± 5	33 ± 5	37 ± 5	35 ± 5	36 ± 5	36 ± 5	37 ± 5
08/31/12 - 09/07/12	20 ± 5	19 ± 5	21 ± 5	16 ± 4	19 ± 5	20 ± 5	20 ± 5	20 ± 5	16 ± 4
09/07/12 - 09/14/12	18 ± 4	20 ± 4	19 ± 4	21 ± 5	21 ± 5	19 ± 5	20 ± 5	21 ± 5	19 ± 5
09/14/12 - 09/21/12	23 ± 5	22 ± 4	25 ± 5	22 ± 5	21 ± 5	18 ± 4	21 ± 5	17 ± 4	23 ± 5
09/21/12 - 09/28/12	16 ± 4	18 ± 4	21 ± 4	21 ± 4	22 ± 4	19 ± 4	19 ± 4	20 ± 4	18 ± 4
09/28/12 - 10/05/12	23 ± 5	25 ± 5	22 ± 5	23 ± 5	23 ± 5	22 ± 5	26 ± 5	28 ± 5	22 ± 5
10/05/12 - 10/12/12	17 ± 4	17 ± 4	14 ± 4	16 ± 4	18 ± 4	15 ± 4	14 ± 4	17 ± 4	14 ± 4
10/12/12 - 10/19/12	24 ± 5	25 ± 5	28 ± 5	28 ± 5	28 ± 5	25 ± 5	25 ± 5	24 ± 5	27 ± 5
10/19/12 - 10/26/12	20 ± 5	21 ± 5	20 ± 5	19 ± 5	15 ± 5	24 ± 5	16 ± 5	17 ± 5	23 ± 5
10/26/12 - 11/02/12	10 ± 4	13 ± 4	15 ± 4	16 ± 4	14 ± 4	15 ± 4	12 ± 4	17 ± 4	15 ± 4
11/02/12 - 11/09/12	16 ± 5	16 ± 5	16 ± 5	16 ± 5	15 ± 5	14 ± 5	14 ± 5	15 ± 5	15 ± 5
11/09/12 - 11/16/12	22 ± 5	21 ± 5	21 ± 5	23 ± 5	27 ± 5	22 ± 5	22 ± 5	25 ± 5	28 ± 5
11/16/12 - 11/23/12	45 ± 6	48 ± 6	53 ± 6	49 ± 6	50 ± 6	46 ± 6	48 ± 6	47 ± 6	51 ± 6
11/23/12 - 11/30/12	28 ± 5	18 ± 5	26 ± 5	27 ± 5	28 ± 5	23 ± 5	31 ± 5	28 ± 5	28 ± 5
11/30/12 - 12/07/12	24 ± 5	24 ± 5	27 ± 5	33 ± 5	26 ± 5	28 ± 5	27 ± 5	28 ± 5	32 ± 5
12/07/12 - 12/14/12	15 ± 4	20 ± 5	23 ± 5	24 ± 5	36 ± 6	22 ± 5	19 ± 5	23 ± 5	21 ± 5
12/14/12 - 12/21/12	33 ± 5	34 ± 5	32 ± 5	39 ± 6	39 ± 6	34 ± 5	28 ± 5	34 ± 5	35 ± 5
12/21/12 - 12/28/12	24 ± 5	26 ± 5	25 ± 5	24 ± 5	22 ± 5	23 ± 5	24 ± 5	24 ± 5	21 ± 5
MEAN	19 ± 14	20 ± 14	20 ± 14	20 ± 15	20 ± 15	20 ± 13	19 ± 14	19 ± 14	20 ± 15

Table C-V.1 **CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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

COLLECTION PERIOD	FAR FIELD LOCATION				CONTROL LOCATION
	D-08	D-10	D-14	D-55	D-12
12/30/11 - 01/06/12	20 ± 5	19 ± 5	20 ± 5	21 ± 5	15 ± 4
01/06/12 - 01/13/12	25 ± 5	23 ± 5	25 ± 5	22 ± 5	24 ± 5
01/13/12 - 01/20/12	25 ± 5	25 ± 5	21 ± 4	27 ± 5	24 ± 5
01/20/12 - 01/27/12	28 ± 5	31 ± 5	31 ± 5	28 ± 5	26 ± 5
01/27/12 - 02/03/12	18 ± 4	14 ± 4	16 ± 4	14 ± 4	15 ± 4
02/03/12 - 02/10/12	24 ± 5	21 ± 5	25 ± 5	25 ± 5	23 ± 5
02/10/12 - 02/17/12	18 ± 4	17 ± 4	15 ± 4	16 ± 4	13 ± 4
02/17/12 - 02/24/12	18 ± 4	17 ± 4	17 ± 4	22 ± 5	16 ± 4
02/24/12 - 03/02/12	21 ± 4	19 ± 4	25 ± 5	17 ± 4	20 ± 4
03/02/12 - 03/09/12	16 ± 4	16 ± 4	21 ± 5	14 ± 4	16 ± 4
03/09/12 - 03/16/12	16 ± 4	21 ± 5	22 ± 5	16 ± 4	17 ± 5
03/16/12 - 03/23/12	17 ± 4	14 ± 4	15 ± 4	15 ± 4	13 ± 4
03/23/12 - 03/30/12	14 ± 4	12 ± 4	14 ± 4	15 ± 4	12 ± 4
03/30/12 - 04/06/12	10 ± 4	13 ± 4	14 ± 4	11 ± 4	9 ± 4
04/06/12 - 04/13/12	16 ± 5	13 ± 4	13 ± 4	15 ± 5	16 ± 5
04/13/12 - 04/20/12	19 ± 4	20 ± 4	19 ± 4	19 ± 4	18 ± 4
04/20/12 - 04/27/12	10 ± 4	9 ± 4	10 ± 4	13 ± 5	10 ± 4
04/27/12 - 05/04/12	17 ± 4	20 ± 5	20 ± 5	17 ± 4	20 ± 5
05/04/12 - 05/11/12	8 ± 4	8 ± 4	9 ± 4	11 ± 4	10 ± 4
05/11/12 - 05/18/12	14 ± 4	17 ± 4	17 ± 4	14 ± 4	15 ± 4
05/18/12 - 05/25/12	16 ± 4	20 ± 5	19 ± 4	22 ± 5	19 ± 4
05/25/12 - 06/01/12	17 ± 5	11 ± 4	9 ± 4	13 ± 4	11 ± 4
06/01/12 - 06/08/12	11 ± 4	11 ± 4	13 ± 4	12 ± 4	12 ± 4
06/08/12 - 06/15/12	12 ± 4	16 ± 4	14 ± 4	14 ± 4	13 ± 4
06/15/12 - 06/22/12	20 ± 4	19 ± 4	17 ± 4	16 ± 4	17 ± 4
06/22/12 - 06/29/12	22 ± 5	23 ± 5	21 ± 5	20 ± 4	17 ± 4
06/29/12 - 07/06/12	32 ± 5	29 ± 5	28 ± 5	27 ± 5	30 ± 5
07/06/12 - 07/13/12	22 ± 5	17 ± 4	20 ± 4	15 ± 4	18 ± 4
07/13/12 - 07/20/12	22 ± 5	23 ± 4	25 ± 5	21 ± 5	25 ± 5
07/20/12 - 07/27/12	23 ± 5	20 ± 5	23 ± 5	22 ± 5	22 ± 5
07/27/12 - 08/03/12	21 ± 5	17 ± 4	23 ± 5	22 ± 5	23 ± 5
08/03/12 - 08/10/12	20 ± 5	22 ± 5	19 ± 5	22 ± 5	21 ± 5
08/10/12 - 08/17/12	22 ± 5	23 ± 5	24 ± 5	20 ± 4	20 ± 4
08/17/12 - 08/24/12	22 ± 5	19 ± 4	22 ± 5	22 ± 5	23 ± 5
08/24/12 - 08/31/12	37 ± 5	34 ± 5	40 ± 6	39 ± 6	36 ± 5
08/31/12 - 09/07/12	17 ± 4	20 ± 5	19 ± 5	19 ± 5	25 ± 5
09/07/12 - 09/14/12	23 ± 5	22 ± 5	20 ± 5	25 ± 5	19 ± 5
09/14/12 - 09/21/12	23 ± 5	23 ± 5	22 ± 5	28 ± 5	25 ± 5
09/21/12 - 09/28/12	22 ± 4	21 ± 4	20 ± 4	25 ± 5	21 ± 4
09/28/12 - 10/05/12	26 ± 5	27 ± 5	24 ± 5	30 ± 5	23 ± 5
10/05/12 - 10/12/12	17 ± 4	18 ± 4	19 ± 4	19 ± 4	14 ± 4
10/12/12 - 10/19/12	21 ± 5	31 ± 5	26 ± 5	25 ± 5	23 ± 5
10/19/12 - 10/26/12	(1)	16 ± 5	19 ± 5	20 ± 5	16 ± 5
10/26/12 - 11/02/12	< 5	16 ± 4	15 ± 4	14 ± 4	13 ± 4
11/02/12 - 11/09/12	8 ± 3	17 ± 5	17 ± 5	20 ± 5	15 ± 5
11/09/12 - 11/16/12	24 ± 5	24 ± 5	23 ± 5	31 ± 6	23 ± 5
11/16/12 - 11/23/12	40 ± 6	48 ± 6	48 ± 6	59 ± 7	51 ± 6
11/23/12 - 11/30/12	25 ± 5	27 ± 5	28 ± 5	34 ± 5	30 ± 5
11/30/12 - 12/07/12	27 ± 5	29 ± 5	27 ± 5	34 ± 5	31 ± 5
12/07/12 - 12/14/12	24 ± 5	22 ± 5	21 ± 5	25 ± 5	13 ± 4
12/14/12 - 12/21/12	40 ± 6	41 ± 6	35 ± 5	33 ± 5	32 ± 5
12/21/12 - 12/28/12	23 ± 5	25 ± 5	23 ± 5	24 ± 5	24 ± 5
MEAN*	21 ± 14	21 ± 15	21 ± 14	22 ± 17	20 ± 15

* THE MEAN AND 2 STANDARD DEVIATION ARE CALCULATED USING THE POSITIVE VALUES
(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-V.2 **MONTHLY AND MEAN VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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

GROUP I - ON-SITE LOCATIONS				GROUP II - NEAR-FIELD LOCATIONS				GROUP III - FAR-FIELD LOCATIONS				GROUP IV - CONTROL LOCATION			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
12/30/11 - 02/03/12	12	28	19 ± 9	12/30/11 - 02/03/12	15	30	21 ± 8	12/30/11 - 02/03/12	14	31	23 ± 10	12/30/11 - 02/03/12	15	26	21 ± 11
02/03/12 - 03/02/12	11	26	18 ± 9	02/03/12 - 03/02/12	13	25	19 ± 6	02/03/12 - 03/02/12	15	25	20 ± 7	02/03/12 - 03/02/12	13	23	18 ± 8
03/02/12 - 03/30/12	8	21	14 ± 8	03/02/12 - 03/30/12	10	20	15 ± 6	03/02/12 - 03/30/12	12	22	16 ± 6	03/02/12 - 03/30/12	12	17	14 ± 5
03/30/12 - 05/04/12	8	22	14 ± 8	03/30/12 - 05/04/12	6	24	14 ± 9	03/30/12 - 05/04/12	9	20	15 ± 8	03/30/12 - 05/04/12	9	20	15 ± 10
05/04/12 - 06/01/12	8	23	13 ± 10	05/04/12 - 06/01/12	8	23	14 ± 9	05/04/12 - 06/01/12	8	22	14 ± 9	05/04/12 - 06/01/12	10	19	14 ± 8
06/01/12 - 06/29/12	11	22	16 ± 6	06/01/12 - 06/29/12	9	21	15 ± 7	06/01/12 - 06/29/12	11	23	16 ± 8	06/01/12 - 06/29/12	12	17	15 ± 5
06/29/12 - 08/03/12	15	32	21 ± 9	06/29/12 - 08/03/12	16	30	21 ± 8	06/29/12 - 08/03/12	15	32	23 ± 8	06/29/12 - 08/03/12	18	30	24 ± 8
08/03/12 - 08/31/12	17	36	25 ± 13	08/03/12 - 08/31/12	16	37	23 ± 15	08/03/12 - 08/31/12	19	40	26 ± 15	08/03/12 - 08/31/12	20	36	25 ± 15
08/31/12 - 09/28/12	16	25	20 ± 5	08/31/12 - 09/28/12	16	23	20 ± 4	08/31/12 - 09/28/12	17	28	22 ± 5	08/31/12 - 09/28/12	19	25	22 ± 6
09/28/12 - 11/02/12	10	28	20 ± 10	09/28/12 - 11/02/12	12	28	20 ± 10	09/28/12 - 11/02/12	14	31	21 ± 11	09/28/12 - 11/02/12	13	23	18 ± 9
11/02/12 - 11/30/12	16	53	27 ± 27	11/02/12 - 11/30/12	14	51	29 ± 25	11/02/12 - 11/30/12	8	59	29 ± 27	11/02/12 - 11/30/12	15	51	30 ± 31
11/30/12 - 12/28/12	15	34	25 ± 11	11/30/12 - 12/28/12	19	39	28 ± 12	11/30/12 - 12/28/12	21	41	28 ± 13	11/30/12 - 12/28/12	13	32	25 ± 17
12/30/11 - 12/28/12	8	53	19 ± 14	12/30/11 - 12/28/12	6	51	20 ± 14	12/30/11 - 12/28/12	8	59	21 ± 15	12/30/11 - 12/28/12	9	51	20 ± 15

Table C-V.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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
D-01	12/30/11 - 03/30/12	< 3	< 4	< 8	< 2	< 6	< 4	< 8	< 3	< 3	< 88	< 24
	03/30/12 - 06/29/12	< 2	< 3	< 7	< 2	< 5	< 2	< 5	< 2	< 2	< 51	< 23
	06/29/12 - 09/28/12	< 4	< 4	< 13	< 4	< 8	< 5	< 9	< 4	< 3	< 154	< 56
	09/28/12 - 12/28/12	< 3	< 3	< 8	< 2	< 7	< 3	< 7	< 3	< 2	< 56	< 22
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-02	12/30/11 - 03/30/12	< 2	< 3	< 8	< 3	< 5	< 3	< 6	< 3	< 3	< 61	< 26
	03/30/12 - 06/29/12	< 2	< 2	< 5	< 3	< 4	< 2	< 5	< 2	< 2	< 53	< 19
	06/29/12 - 09/28/12	< 3	< 4	< 9	< 2	< 6	< 4	< 5	< 3	< 3	< 120	< 45
	09/28/12 - 12/28/12	< 3	< 4	< 9	< 3	< 7	< 3	< 5	< 2	< 2	< 47	< 21
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-03	12/30/11 - 03/30/12	< 4	< 5	< 11	< 3	< 8	< 5	< 7	< 3	< 3	< 67	< 22
	03/30/12 - 06/29/12	< 3	< 5	< 9	< 2	< 6	< 3	< 4	< 3	< 2	< 72	< 22
	06/29/12 - 09/28/12	< 3	< 4	< 15	< 3	< 7	< 4	< 8	< 3	< 2	< 130	< 53
	09/28/12 - 12/28/12	< 3	< 3	< 5	< 2	< 5	< 3	< 4	< 2	< 2	< 49	< 19
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-04	12/30/11 - 03/30/12	< 4	< 5	< 12	< 3	< 9	< 3	< 6	< 4	< 3	< 93	< 21
	03/30/12 - 06/29/12	< 3	< 3	< 11	< 3	< 6	< 4	< 7	< 3	< 3	< 88	< 36
	06/29/12 - 09/28/12	< 3	< 6	< 13	< 3	< 8	< 5	< 9	< 5	< 4	< 164	< 75
	09/28/12 - 12/28/12	< 3	< 3	< 9	< 2	< 6	< 3	< 6	< 3	< 3	< 48	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-07	12/30/11 - 03/30/12	< 2	< 3	< 7	< 3	< 5	< 3	< 6	< 2	< 2	< 49	< 27
	03/30/12 - 06/29/12	< 3	< 3	< 10	< 3	< 5	< 3	< 4	< 3	< 3	< 69	< 28
	06/29/12 - 09/28/12	< 2	< 3	< 9	< 3	< 8	< 4	< 6	< 3	< 2	< 108	< 30
	09/28/12 - 12/28/12	< 2	< 3	< 7	< 3	< 5	< 2	< 3	< 2	< 2	< 38	< 11
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-V.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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
D-08	12/30/11 - 03/30/12	< 2	< 2	< 8	< 2	< 5	< 3	< 5	< 2	< 2	< 57	< 15
	03/30/12 - 06/29/12	< 3	< 3	< 8	< 3	< 7	< 4	< 6	< 2	< 2	< 69	< 31
	06/29/12 - 09/28/12	< 2	< 3	< 7	< 2	< 6	< 3	< 6	< 2	< 2	< 100	< 39
	09/28/12 - 12/28/12	< 2	< 2	< 6	< 2	< 5	< 2	< 4	< 2	< 2	< 41	< 13
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-10	12/30/11 - 03/30/12	< 3	< 3	< 11	< 3	< 7	< 3	< 6	< 3	< 2	< 53	< 31
	03/30/12 - 06/29/12	< 3	< 4	< 8	< 2	< 7	< 4	< 8	< 3	< 3	< 70	< 23
	06/29/12 - 09/28/12	< 3	< 4	< 11	< 3	< 8	< 5	< 6	< 3	< 3	< 108	< 40
	09/28/12 - 12/28/12	< 2	< 3	< 8	< 2	< 8	< 3	< 6	< 3	< 2	< 46	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-12	12/30/11 - 03/30/12	< 3	< 4	< 7	< 4	< 7	< 4	< 6	< 3	< 2	< 66	< 27
	03/30/12 - 06/29/12	< 3	< 4	< 11	< 3	< 8	< 3	< 7	< 3	< 3	< 78	< 33
	06/29/12 - 09/28/12	< 3	< 3	< 8	< 2	< 7	< 4	< 7	< 3	< 3	< 120	< 30
	09/28/12 - 12/28/12	< 2	< 3	< 9	< 2	< 5	< 3	< 6	< 3	< 2	< 70	< 23
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-14	12/30/11 - 03/30/12	< 3	< 3	< 8	< 2	< 7	< 4	< 5	< 3	< 3	< 64	< 31
	03/30/12 - 06/29/12	< 2	< 2	< 6	< 2	< 5	< 3	< 5	< 2	< 2	< 51	< 20
	06/29/12 - 09/28/12	< 2	< 2	< 9	< 3	< 5	< 3	< 5	< 2	< 2	< 96	< 41
	09/28/12 - 12/28/12	< 3	< 3	< 8	< 3	< 6	< 2	< 5	< 2	< 2	< 41	< 20
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-45	12/30/11 - 03/30/12	< 3	< 4	< 10	< 3	< 6	< 4	< 7	< 3	< 2	< 72	< 32
	03/30/12 - 06/29/12	< 2	< 3	< 6	< 2	< 6	< 3	< 6	< 3	< 2	< 68	< 17
	06/29/12 - 09/28/12	< 2	< 3	< 10	< 3	< 7	< 4	< 7	< 2	< 2	< 104	< 61
	09/28/12 - 12/28/12	< 3	< 4	< 9	< 4	< 6	< 4	< 8	< 3	< 3	< 55	< 21
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-V.3

CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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
D-53	12/30/11 - 03/30/12	< 2	< 2	< 10	< 3	< 6	< 3	< 4	< 3	< 3	< 64	< 29
	03/30/12 - 06/29/12	< 2	< 3	< 6	< 3	< 5	< 2	< 4	< 3	< 2	< 54	< 18
	06/29/12 - 09/28/12	< 3	< 4	< 8	< 3	< 6	< 4	< 6	< 3	< 2	< 124	< 59
	09/28/12 - 12/28/12	< 3	< 4	< 9	< 3	< 9	< 4	< 8	< 4	< 4	< 51	< 20
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-55	12/30/11 - 03/30/12	< 4	< 3	< 9	< 2	< 5	< 4	< 6	< 3	< 2	< 81	< 12
	03/30/12 - 06/29/12	< 2	< 2	< 6	< 2	< 5	< 2	< 5	< 2	< 2	< 47	< 15
	06/29/12 - 09/28/12	< 3	< 5	< 13	< 3	< 9	< 5	< 8	< 4	< 3	< 172	< 52
	09/28/12 - 12/28/12	< 3	< 3	< 8	< 3	< 7	< 3	< 6	< 3	< 2	< 49	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-56	12/30/11 - 03/30/12	< 3	< 4	< 8	< 3	< 7	< 4	< 6	< 3	< 3	< 77	< 12
	03/30/12 - 06/29/12	< 3	< 3	< 9	< 3	< 6	< 4	< 7	< 3	< 2	< 79	< 28
	06/29/12 - 09/28/12	< 2	< 5	< 10	< 3	< 6	< 4	< 7	< 3	< 3	< 138	< 51
	09/28/12 - 12/28/12	< 3	< 4	< 9	< 3	< 6	< 4	< 6	< 2	< 2	< 49	< 26
	MEAN	-	-	-	-	-	-	-	-	-	-	-
D-58	12/30/11 - 03/30/12	< 2	< 3	< 9	< 3	< 5	< 3	< 6	< 2	< 2	< 53	< 15
	03/30/12 - 06/29/12	< 3	< 4	< 9	< 3	< 7	< 4	< 6	< 3	< 3	< 81	< 34
	06/29/12 - 09/28/12	< 3	< 3	< 7	< 2	< 7	< 5	< 7	< 3	< 2	< 110	< 32
	09/28/12 - 12/28/12	< 2	< 4	< 8	< 2	< 7	< 3	< 6	< 2	< 2	< 60	< 32
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VI.1 CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VI.1 **CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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

COLLECTION	FAR FIELD LOCATION				CONTROL LOCATION
PERIOD	D-08	D-10	D-14	D-55	D-12
12/30/11 - 01/06/12	< 47	< 47	< 47	< 40	< 47
01/06/12 - 01/13/12	< 14	< 32	< 33	< 39	< 32
01/13/12 - 01/20/12	< 60	< 60	< 58	< 44	< 60
01/20/12 - 01/27/12	< 19	< 45	< 45	< 43	< 45
01/27/12 - 02/03/12	< 16	< 37	< 38	< 32	< 38
02/03/12 - 02/10/12	< 12	< 28	< 27	< 26	< 28
02/10/12 - 02/17/12	< 21	< 51	< 51	< 36	< 51
02/17/12 - 02/24/12	< 9	< 26	< 26	< 30	< 26
02/24/12 - 03/02/12	< 13	< 25	< 26	< 24	< 25
03/02/12 - 03/09/12	< 15	< 37	< 37	< 31	< 37
03/09/12 - 03/16/12	< 27	< 32	< 33	< 42	< 34
03/16/12 - 03/23/12	< 13	< 32	< 32	< 28	< 32
03/23/12 - 03/30/12	< 14	< 32	< 33	< 57	< 32
03/30/12 - 04/06/12	< 16	< 39	< 39	< 26	< 39
12/30/11 - 04/13/12	< 40	< 17	< 40	< 33	< 40
04/13/12 - 04/20/12	< 8	< 18	< 18	< 13	< 18
04/20/12 - 04/27/12	< 30	< 30	< 30	< 23	< 13
04/27/12 - 05/04/12	< 22	< 39	< 39	< 58	< 39
05/04/12 - 05/11/12	< 40	< 40	< 17	< 36	< 40
05/11/12 - 05/18/12	< 14	< 33	< 33	< 21	< 35
05/18/12 - 05/25/12	< 36	< 36	< 36	< 25	< 36
05/25/12 - 06/01/12	< 18	< 54	< 55	< 66	< 54
06/01/12 - 06/08/12	< 55	< 55	< 57	< 38	< 55
06/08/12 - 06/15/12	< 11	< 27	< 27	< 17	< 27
06/15/12 - 06/22/12	< 17	< 43	< 43	< 23	< 43
06/22/12 - 06/29/12	< 21	< 57	< 61	< 55	< 59
06/29/12 - 07/06/12	< 35	< 35	< 34	< 43	< 35
07/06/12 - 07/13/12	< 28	< 66	< 67	< 49	< 66
07/13/12 - 07/20/12	< 36	< 34	< 36	< 44	< 36
07/20/12 - 07/27/12	< 17	< 41	< 41	< 33	< 41
07/27/12 - 08/03/12	< 21	< 50	< 50	< 30	< 50
08/03/12 - 08/10/12	< 11	< 26	< 26	< 26	< 26
08/10/12 - 08/17/12	< 12	< 29	< 29	< 18	< 29
08/17/12 - 08/24/12	< 14	< 33	< 33	< 23	< 33
08/24/12 - 08/31/12	< 18	< 42	< 43	< 28	< 42
08/31/12 - 09/07/12	< 18	< 42	< 43	< 31	< 43
09/07/12 - 09/14/12	< 12	< 28	< 28	< 19	< 28
09/14/12 - 09/21/12	< 18	< 43	< 43	< 37	< 43
09/21/12 - 09/28/12	< 20	< 47	< 48	< 29	< 48
09/28/12 - 10/05/12	< 22	< 52	< 52	< 33	< 52
10/05/12 - 10/12/12	< 19	< 50	< 50	< 47	< 50
10/12/12 - 10/19/12	< 13	< 32	< 32	< 24	< 32
10/19/12 - 10/26/12	< 27	< 11	< 27	< 24	< 27
10/26/12 - 11/02/12	< 14	< 33	< 34	< 26	< 34
11/02/12 - 11/09/12	< 45	< 45	< 46	< 30	< 19
11/09/12 - 11/16/12	< 22	< 53	< 53	< 41	< 53
11/16/12 - 11/23/12	< 44	< 42	< 18	< 39	< 42
11/23/12 - 11/30/12	< 18	< 42	< 42	< 36	< 42
11/30/12 - 12/07/12	< 21	< 21	< 22	< 32	< 22
12/07/12 - 12/14/12	< 21	< 49	< 50	< 37	< 50
12/14/12 - 12/21/12	< 28	< 28	< 28	< 43	< 28
12/21/12 - 12/28/12	< 35	< 35	< 36	< 28	< 35
MEAN	-	-	-	-	-

Table C-VII.1 **CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	CONTROL FARM D-25
01/05/12	< 0.6
02/02/12	< 0.6
03/01/12	< 0.5
04/05/12	< 0.4
05/03/12	< 0.5
05/17/12	< 0.5
05/31/12	< 0.5
06/14/12	< 0.8
06/26/12	< 0.5
07/13/12	< 0.7
07/26/12	< 0.8
08/09/12	< 0.7
08/23/12	< 0.7
09/06/12	< 0.8
09/20/12	< 0.6
10/04/12	< 0.8
10/18/12	< 0.7
11/01/12	< 0.7
12/07/12	< 0.5
MEAN	-

Table C-VII.2

CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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
D-25	01/05/12	< 9	< 9	< 23	< 12	< 20	< 11	< 16	< 9	< 9	< 43	< 13
	02/02/12	< 6	< 6	< 14	< 8	< 12	< 7	< 9	< 5	< 6	< 39	< 11
	03/01/12	< 4	< 4	< 11	< 5	< 10	< 4	< 8	< 4	< 4	< 24	< 8
	04/05/12	< 7	< 7	< 18	< 9	< 16	< 7	< 14	< 6	< 7	< 44	< 13
	05/03/12	< 9	< 7	< 13	< 5	< 17	< 9	< 15	< 7	< 8	< 52	< 12
	05/17/12	< 5	< 5	< 13	< 5	< 12	< 5	< 9	< 4	< 5	< 26	< 9
	05/31/12	< 5	< 5	< 14	< 7	< 13	< 5	< 8	< 4	< 5	< 31	< 10
	06/14/12	< 5	< 6	< 12	< 6	< 12	< 6	< 8	< 5	< 5	< 33	< 9
	06/26/12	< 6	< 7	< 17	< 8	< 15	< 7	< 12	< 6	< 6	< 31	< 10
	07/13/12	< 5	< 6	< 13	< 7	< 12	< 6	< 8	< 5	< 6	< 36	< 12
	07/26/12	< 6	< 6	< 15	< 8	< 14	< 7	< 12	< 5	< 6	< 50	< 13
	08/09/12	< 4	< 5	< 10	< 5	< 10	< 4	< 8	< 4	< 5	< 19	< 7
	08/23/12	< 5	< 5	< 14	< 7	< 12	< 7	< 11	< 4	< 6	< 38	< 12
	09/06/12	< 5	< 5	< 12	< 6	< 11	< 5	< 9	< 5	< 5	< 30	< 10
	09/20/12	< 8	< 8	< 17	< 8	< 15	< 8	< 14	< 6	< 8	< 42	< 13
	10/04/12	< 6	< 6	< 13	< 6	< 13	< 6	< 11	< 6	< 6	< 36	< 11
	10/18/12	< 6	< 5	< 13	< 7	< 13	< 6	< 10	< 5	< 6	< 37	< 11
	11/01/12	< 6	< 6	< 14	< 7	< 12	< 5	< 10	< 5	< 6	< 41	< 12
	12/07/12	< 5	< 4	< 13	< 6	< 10	< 5	< 10	< 4	< 5	< 29	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VIII.1 **CONCENTRATIONS OF GAMMA EMITTERS IN VEGETATION SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/KG WET ± 2 SIGMA

SITE	COLLECTION PERIOD	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
D-CONTROL													
Beet greens	09/15/12	< 15	< 17	< 41	< 16	< 35	< 19	< 26	< 39	< 14	< 14	< 83	< 12
Potatoes	09/15/12	< 10	< 11	< 32	< 17	< 29	< 15	< 21	< 26	< 12	< 13	< 66	< 22
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
D-QUAD 1													
Beets	09/22/12	< 12	< 13	< 33	< 16	< 28	< 13	< 22	< 31	< 11	< 13	< 79	< 20
Cabbage	09/22/12	< 17	< 17	< 36	< 19	< 34	< 18	< 33	< 54	< 14	< 22	< 97	< 34
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
D-QUAD 2													
Broccoli	09/22/12	< 18	< 18	< 40	< 23	< 44	< 20	< 35	< 49	< 16	< 21	< 116	< 34
Radishes	09/22/12	< 13	< 13	< 40	< 22	< 34	< 16	< 23	< 33	< 12	< 14	< 83	< 20
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
D-QUAD 3													
Beets	09/22/12	< 13	< 13	< 34	< 15	< 32	< 14	< 24	< 34	< 11	< 15	< 91	< 17
Cabbage	09/22/12	< 11	< 12	< 30	< 16	< 29	< 14	< 24	< 30	< 10	< 15	< 88	< 17
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
D-QUAD 4													
Cabbage	09/15/12	< 14	< 13	< 29	< 18	< 33	< 15	< 21	< 35	< 12	< 13	< 78	< 24
Potatoes	09/15/12	< 15	< 13	< 30	< 17	< 33	< 15	< 22	< 36	< 12	< 14	< 78	< 23
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IX.1 QUARTERLY OSLD RESULTS FOR DRESDEN NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
D-01-1	26.0 ± 8.6	20.0	29.1	29.1	25.8
D-01-2	26.1 ± 9.8	19.0	28.3	30.2	26.8
D-02-1	25.5 ± 11.5	18.0	30.0	30.0	23.8
D-02-2	25.8 ± 7.0	22.0	29.9	27.2	24.0
D-03-1	22.6 ± 7.3	18.0	25.9	25.1	21.2
D-03-2	22.2 ± 7.7	17.0	24.0	25.9	22.0
D-04-1	25.3 ± 8.0	21.0	27.5	29.7	23.0
D-04-2	26.1 ± 8.8	20.0	29.3	29.4	25.8
D-07-1	24.7 ± 7.9	20.0	27.8	28.1	22.7
D-07-2	24.1 ± 6.8	20.0	28.3	24.4	23.8
D-08-1	25.0 ± 11.4	18.0	29.8	29.5	22.6
D-08-2	25.0 ± 10.4	19.0	27.3	30.9	22.9
D-10-1	25.8 ± 10.1	19.0	30.5	28.7	25.1
D-10-2	25.7 ± 7.6	21.0	28.1	29.4	24.4
D-12-1	22.6 ± 7.8	18.0	24.6	26.8	20.9
D-12-2	21.4 ± 8.6	16.0	24.4	25.2	19.9
D-14-1	23.1 ± 7.7	18.0	24.9	27.0	22.5
D-14-2	23.8 ± 6.7	19.0	26.0	26.2	23.8
D-45-1	26.6 ± 8.5	22.0	29.6	30.7	24.0
D-45-2	26.9 ± 11.7	19.0	28.4	33.0	27.1
D-53-1	21.1 ± 9.3	15.0	23.6	25.6	20.3
D-53-2	21.1 ± 7.7	17.0	23.4	25.3	18.8
D-55-1	25.3 ± 12.0	18.0	30.4	30.0	22.8
D-55-2	23.5 ± 8.1	18.0	26.0	27.0	22.8
D-56-1	21.5 ± 8.1	17.0	25.2	24.6	19.0
D-56-2	21.4 ± 9.0	15.0	23.9	25.0	21.5
D-58-1	20.8 ± 9.3	15.0	23.6	25.3	19.1
D-58-2	21.5 ± 7.7	17.0	23.7	25.5	19.6
D-101-1	26.1 ± 6.4	23.0	29.4	(1)	25.8
D-101-2	23.1 ± 7.0	18.0	25.4	25.5	23.4
D-102-1	26.2 ± 12.8	18.0	32.9	29.0	24.8
D-102-2	27.4 ± 9.1	21.0	30.7	30.6	27.4
D-103-1	22.5 ± 8.6	17.0	26.5	25.3	21.3
D-103-2	24.8 ± 9.4	20.0	27.8	29.8	21.7
D-104-1	26.8 ± 7.2	22.0	28.3	30.5	26.2
D-104-2	26.7 ± 13.1	18.0	33.5	29.3	25.8
D-105-1	24.8 ± 7.2	20.0	26.4	28.4	24.5
D-105-2	24.6 ± 12.4	16.0	27.4	30.4	24.6
D-106-1	23.8 ± 6.0	20.0	25.0	27.1	23.1
D-106-2	21.1 ± 7.6	16.0	22.0	25.2	21.0
D-107-1	24.0 ± 5.5	(1)	25.2	26.0	20.9
D-107-2	21.8 ± 8.6	16.0	23.7	26.0	21.3
D-108-1	26.5 ± 7.9	21.0	28.6	29.9	26.4
D-108-2	23.6 ± 6.5	19.0	26.6	24.1	24.6
D-109-1	25.1 ± 9.5	20.0	30.8	26.8	22.6
D-109-2	25.8 ± 8.3	20.0	27.9	29.5	25.8
D-110-3	29.3 ± 11.4	21.0	32.2	33.7	30.1
D-110-4	28.5 ± 12.0	21.0	32.2	34.3	26.5
D-111-1	28.0 ± 8.6	22.0	30.1	31.8	28.1
D-111-2	26.1 ± 8.9	20.0	27.6	30.5	26.2

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-IX.1 QUARTERLY OSLD RESULTS FOR DRESDEN NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
D-113-1	22.2 ± 8.6	17.0	25.4	26.0	20.2
D-113-2	23.7 ± 9.2	19.0	26.7	28.4	20.5
D-114-1	22.5 ± 9.4	17.0	27.0	25.7	20.3
D-114-2	23.1 ± 8.6	17.0	25.1	26.9	23.5
D-115-1	24.8 ± 9.4	18.0	27.4	28.5	25.2
D-115-2	26.0 ± 7.9	21.0	26.9	30.6	25.4
D-116-1	27.2 ± 10.5	20.0	29.3	32.4	27.2
D-116-2	26.3 ± 8.2	22.0	29.1	30.5	23.7
D-201-1	28.0 ± 10.1	21.0	32.9	29.9	28.3
D-201-2	27.9 ± 10.2	21.0	32.9	30.2	27.5
D-202-1	27.7 ± 10.0	21.0	31.4	31.7	26.7
D-202-2	25.7 ± 10.8	18.0	28.1	30.5	26.1
D-203-1	25.6 ± 8.2	20.0	28.2	29.1	25.0
D-203-2	23.2 ± 8.6	17.0	25.5	26.7	23.5
D-204-1	23.9 ± 9.2	18.0	26.9	28.2	22.6
D-204-2	22.6 ± 8.0	17.0	25.2	25.8	22.4
D-205-1	24.5 ± 4.4	22.0	(1)	26.2	25.2
D-205-2	24.5 ± 5.7	23.0	(1)	27.8	22.8
D-206-1	24.3 ± 8.8	18.0	27.0	27.6	24.6
D-206-2	24.8 ± 8.8	20.0	28.4	28.6	22.1
D-207-1	23.6 ± 5.3	20.0	25.9	25.2	23.1
D-207-2	23.1 ± 9.5	17.0	26.2	27.5	21.7
D-208-1	21.4 ± 6.1	18.0	23.3	24.5	19.7
D-208-2	20.9 ± 7.7	17.0	23.7	24.6	18.1
D-209-1	21.1 ± 6.3	17.0	22.5	24.4	20.4
D-209-2	21.1 ± 6.6	17.0	23.7	23.8	19.9
D-210-1	24.1 ± 7.3	19.0	25.5	27.5	24.2
D-210-2	24.4 ± 8.0	19.0	25.8	28.5	24.3
D-211-1	25.2 ± 7.8	20.0	26.9	29.1	24.6
D-211-2	25.8 ± 8.2	20.0	28.5	28.8	25.7
D-212-3	21.6 ± 6.8	18.0	25.2	23.7	19.5
D-212-4	24.0 ± 5.1	21.0	25.7	26.5	22.9
D-213-1	21.7 ± 8.6	17.0	25.8	24.9	19.2
D-213-2	21.4 ± 7.4	17.0	23.5	25.3	19.8
D-214-1	27.8 ± 10.5	22.0	31.3	33.0	24.7
D-214-2	28.4 ± 10.6	21.0	32.7	31.6	28.1
D-215-1	28.8 ± 10.1	22.0	33.3	31.8	27.9
D-215-2	27.5 ± 8.1	22.0	29.5	31.3	27.0
D-216-1	23.8 ± 10.6	17.0	27.1	28.8	22.2
D-216-2	26.2 ± 8.9	20.0	28.1	30.4	26.2
D-112A-1	22.6 ± 7.8	18.0	24.8	26.7	20.8
D-112A-2	24.2 ± 8.9	18.0	27.3	27.6	23.9

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.2 MEAN QUARTERLY OSLD RESULTS FOR THE INNER RING, OUTER RING, OTHER AND CONTROL LOCATIONS FOR DRESDEN NUCLEAR POWER STATION, 2012

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

COLLECTION PERIOD	INNER RING ± 2 S.D.	OUTER RING	OTHER	CONTROL
JAN-MAR	19.0 ± 4.2	19.3 ± 3.9	18.8 ± 3.7	17.0 ± 2.8
APR-JUN	27.5 ± 5.6	27.4 ± 6.2	27.4 ± 4.6	24.5 ± 0.3
JUL-SEP	28.4 ± 5.3	27.9 ± 5.2	28.0 ± 4.7	26.0 ± 2.3
OCT-DEC	23.9 ± 5.5	23.6 ± 5.7	23.2 ± 4.3	20.4 ± 1.4

TABLE C-IX.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR DRESDEN NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF MREM/QUARTER

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
INNER RING	134	15	34.3	24.7 ± 9.0
OUTER RING	126	17	33	24.5 ± 8.7
OTHER	96	15	33	24.3 ± 8.6
CONTROL	8	16	27	22.0 ± 7.7

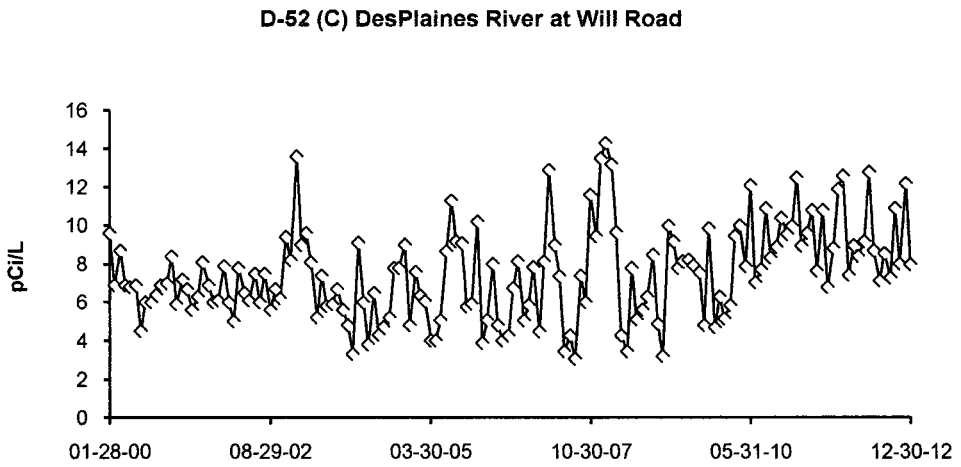
INNER RING LOCATIONS - D-101-1, D-101-2, D-102-1, D-102-2, D-103-1, D-103-2, D-104-1, D-104-2, D-105-1, D-105-2, D-106-1, D-106-2, D-107-1, D-107-2, D-108-1, D-108-2, D-109-1, D-109-2, D-110-3, D-110-4, D-111-1, D-111-2, D-112A-1, D-112A-2, D-113-1, D-113-2, D-114-1, D-114-2, D-115-1, D-115-2, D-116-1, D-116-2, D-58-1, D-58-2

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

OTHER LOCATIONS - D-01-1, D-01-2, D-02-1, D-02-2, D-03-1, D-03-2, D-04-1, D-04-2, D-07-1, D-07-2, D-08-1, D-08-2, D-10-1, D-10-2, D-14-1, D-14-2, D-45-1, D-45-2, D-53-1, D-53-2, D-55-1, D-55-2, D-56-1, D-56-2

CONTROL LOCATION - D-12-1, D-12-2

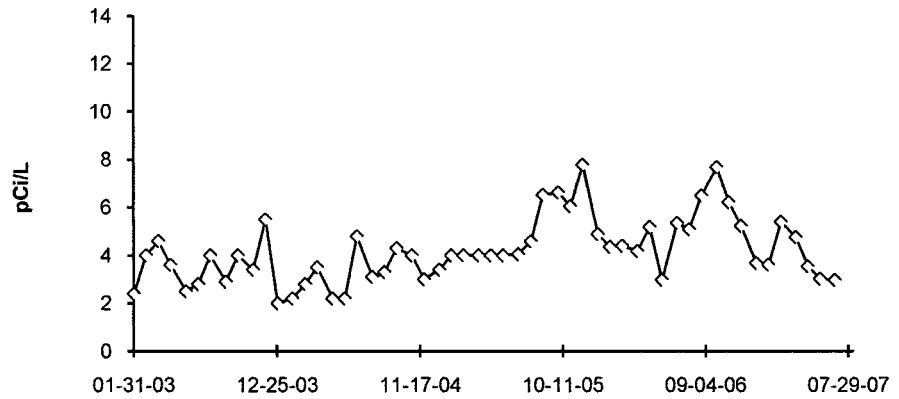
FIGURE C-1
SURFACE WATER - GROSS BETA - STATION
D-52 (C) COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012



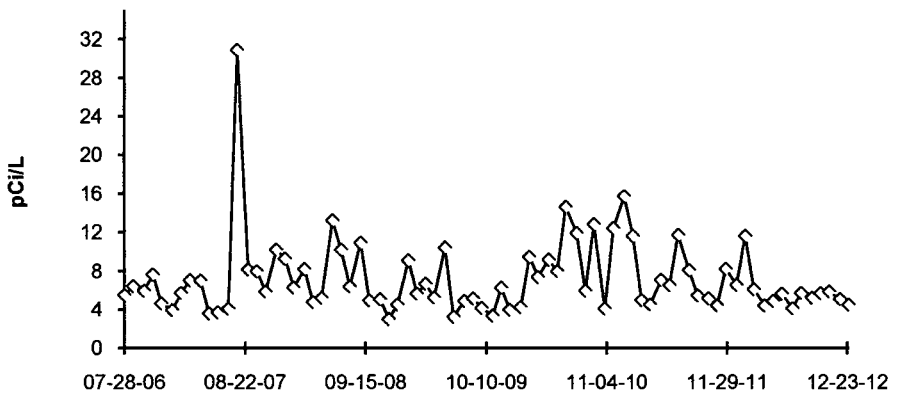
DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-2
SURFACE WATER - GROSS BETA - STATION D-54 (C) and D-57 (C) COLLECTED IN THE VICINITY OF DNPS, 2003 - 2012

D-54 (C) Kankakee River



D-57 (C) Kankakee River at Will Road

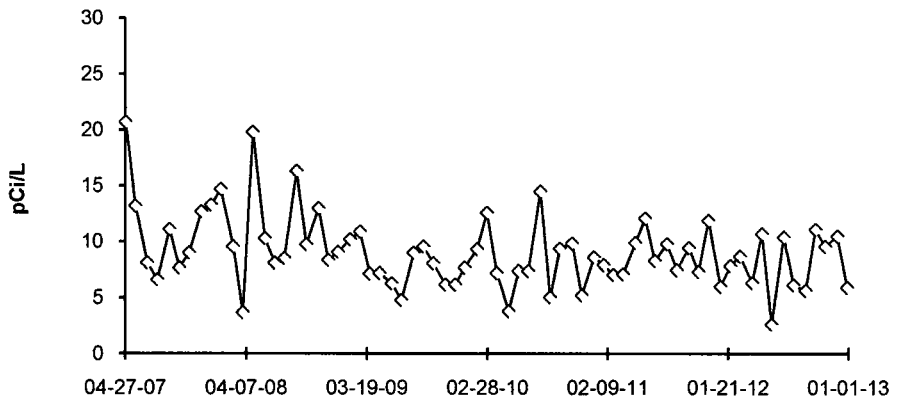


DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

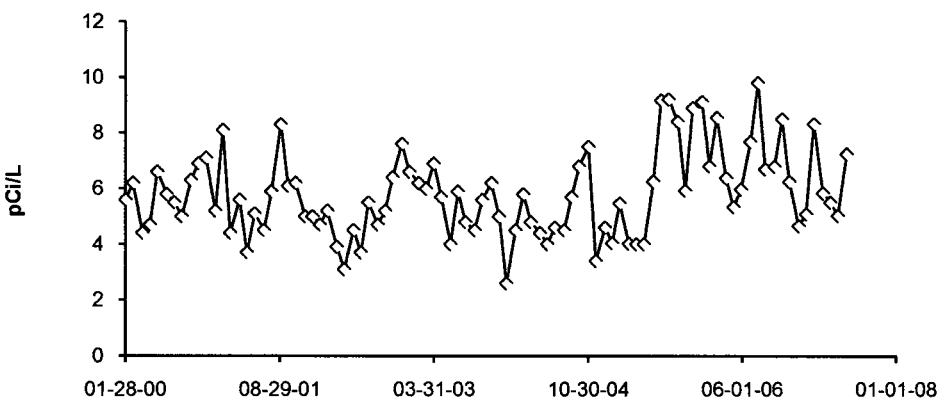
D-54 LOCATION REMOVED FROM PROGRAM JUNE 28, 2007 AND REPLACED WITH D-57

FIGURE C-3
SURFACE WATER - GROSS BETA - STATIONS D-21 and D-51
COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-21 Illinois River at EJ&E Bridge



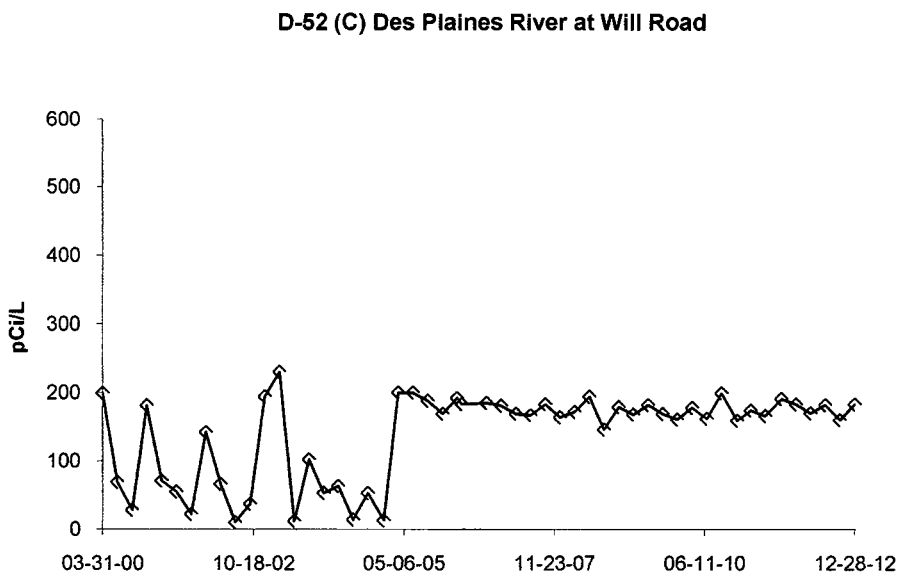
D-51 Dresden Lock & Dam



D-21 PLACED INTO SERVICE ON MARCH 30, 2007, REPLACED D-51

D-51 LOCATION REMOVED FROM PROGRAM JUNE 29, 2007 AND REPLACED WITH D-21

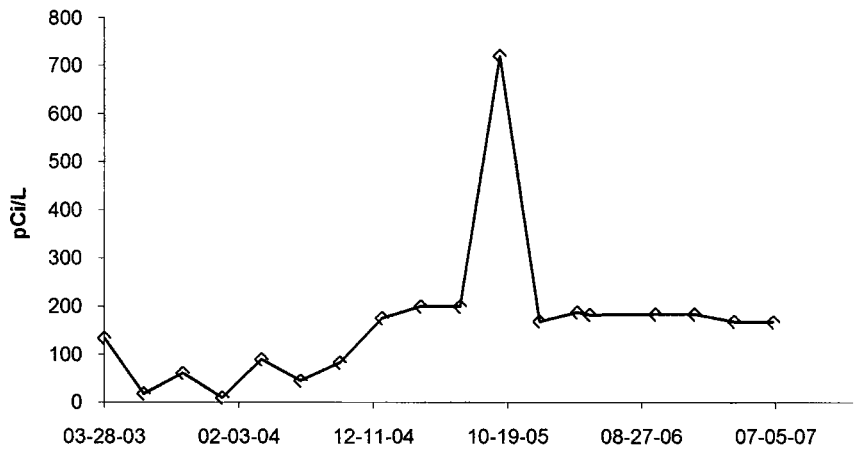
FIGURE C-4
SURFACE WATER - TRITIUM - STATION
D-52 (C) COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012



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

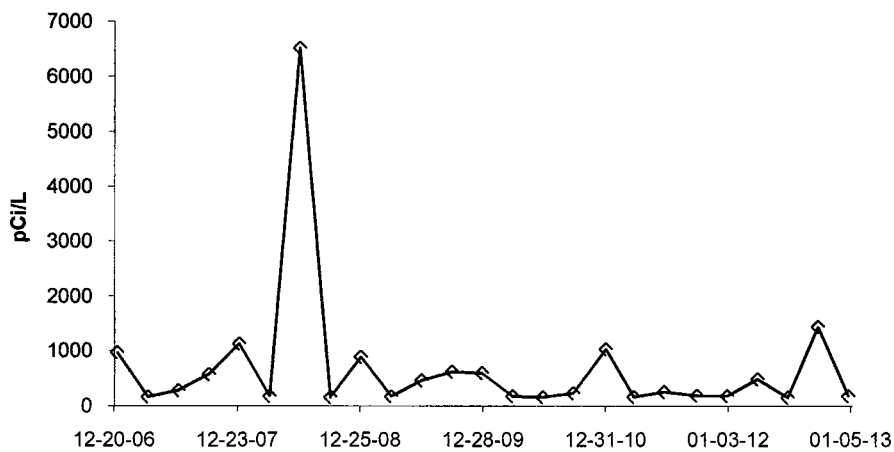
FIGURE C-5
SURFACE WATER - TRITIUM - STATION D-54 (C) AND D-57 (C) COLLECTED IN THE VICINITY OF DNPS, 2003 - 2012

D-54 (C) Kankakee River



Location shared with Braidwood Station (BD-10).

D-57 (C) Kankakee River at Will Road

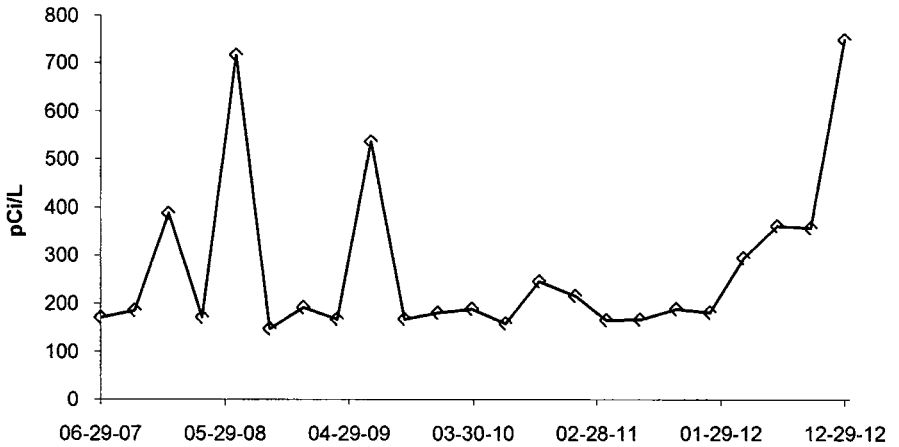


DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

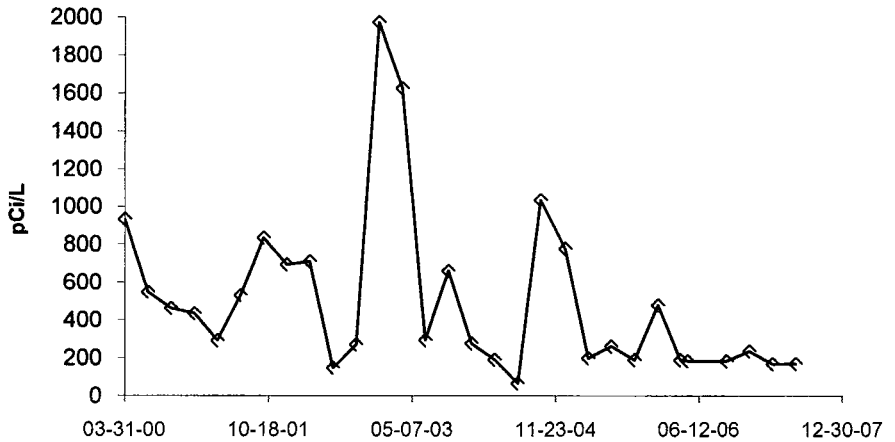
D-57 NEW STATION JULY 24, 2006. REPLACED D-54 ON JUNE 28, 2007

FIGURE C-6
SURFACE WATER - TRITIUM - STATIONS D-21 and D-51
COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-21 Illinois River at EJ&E Bridge



D-51 Dresden Lock & Dam

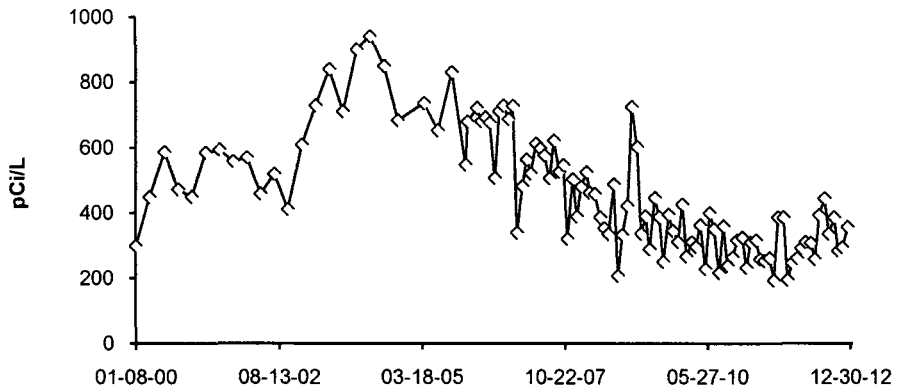


D-21 REPLACED D-51 JUNE 29, 2007

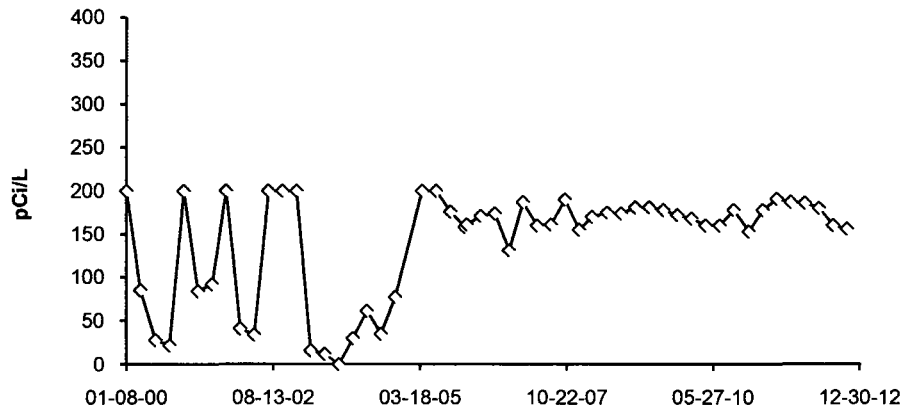
D-51 LOCATION REMOVED FROM PROGRAM JUNE 29, 2007 AND REPLACED WITH D-21

FIGURE C-7
GROUND WATER - TRITIUM - STATIONS D-23 and D-35 COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-23 Thorsen Well



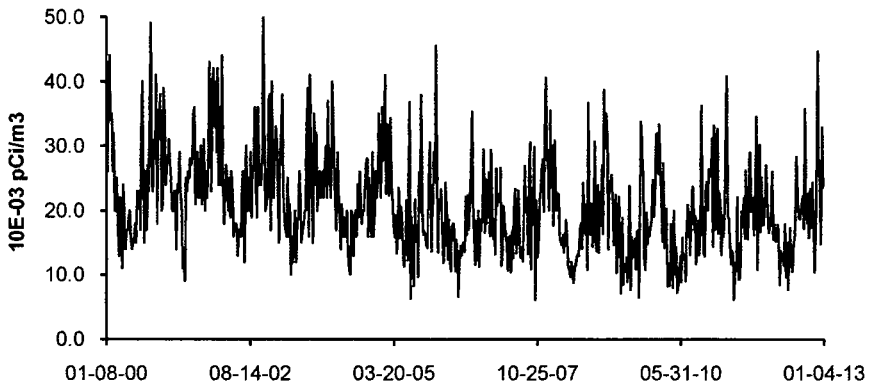
D-35 Dresden Lock and Dam



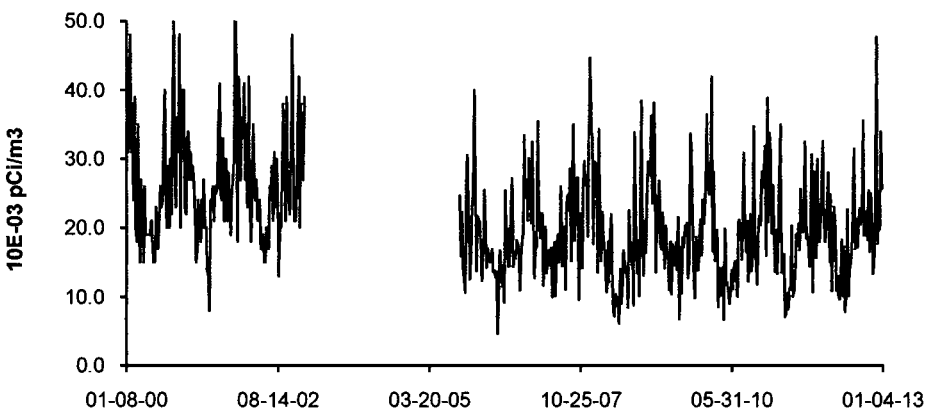
DUE TO VENDOR CHANGE IN 2005, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-8
AIR PARTICULATES - GROSS BETA - STATIONS D-01 and D-02 COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-01 Onsite Station 1



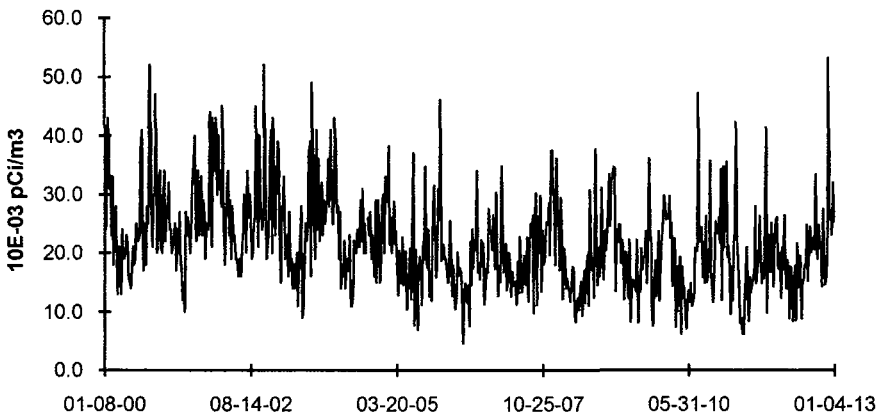
D-02 Onsite Station 2



D-02 No samples; power was restored on 09-16-05.

FIGURE C-9
AIR PARTICULATES - GROSS BETA - STATIONS D-03 and D-04 COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-03 Onsite Station 3



D-04 Collins Road on Station Property

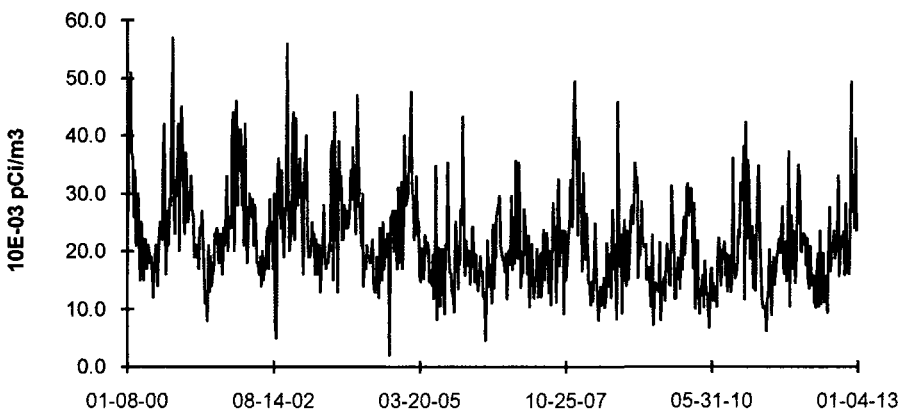
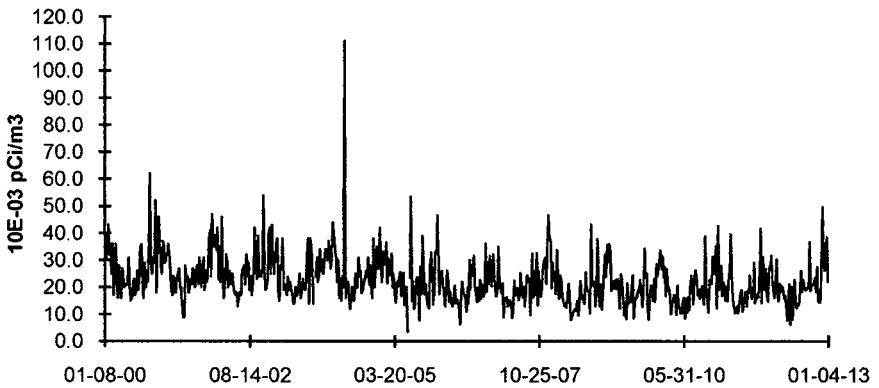


FIGURE C-10
AIR PARTICULATES - GROSS BETA - STATIONS D-07 and D-12 (C) COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-07 Clay Products, Dresden Road



D-12 (C), Quarry Road, Lisbon

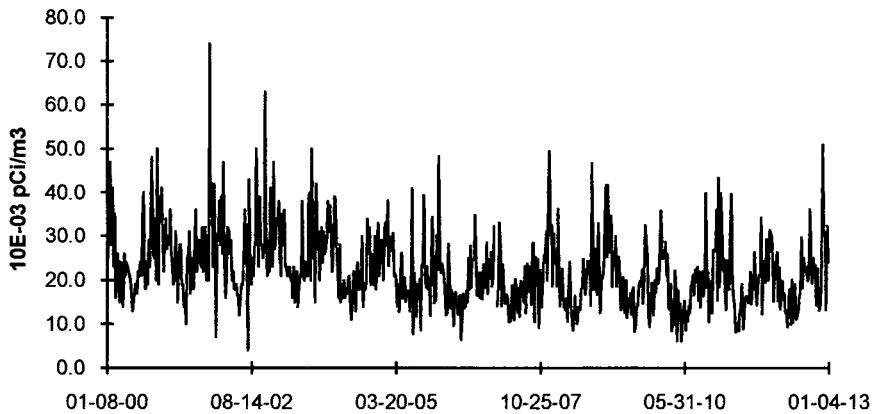
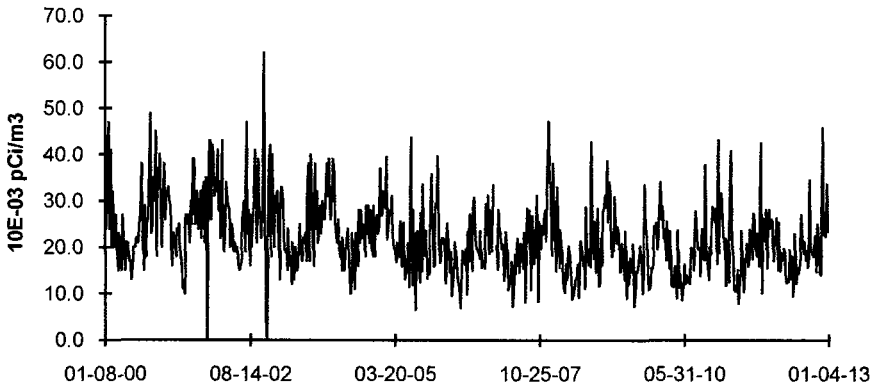


FIGURE C-11
AIR PARTICULATES - GROSS BETA - STATIONS D-45 and D-53 COLLECTED IN THE VICINITY OF DNPS, 2000 - 2012

D-45 McKinley Woods Road, Channahon



D-53 Will Road at Hollyhock

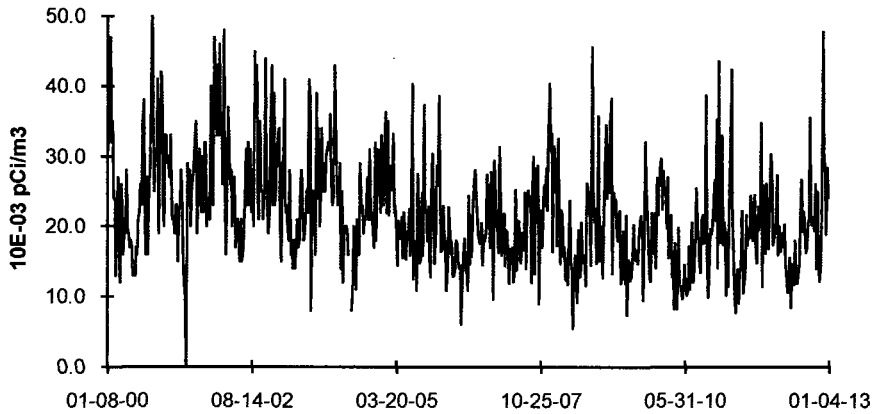
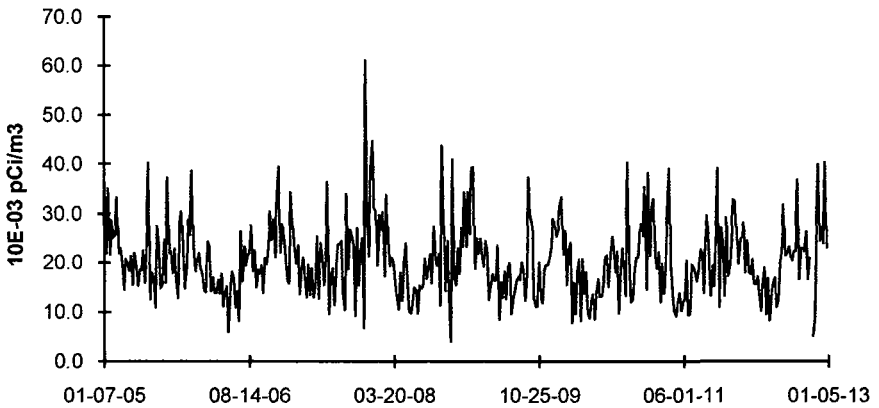


FIGURE C-12
AIR PARTICULATES - GROSS BETA - STATIONS D-08 and D-10 COLLECTED IN THE VICINITY OF DNPS, 2005 - 2012

D-08 Jugtown Road, Prairie Parks



D-10 Goose Lake Road, Goose Lake Village

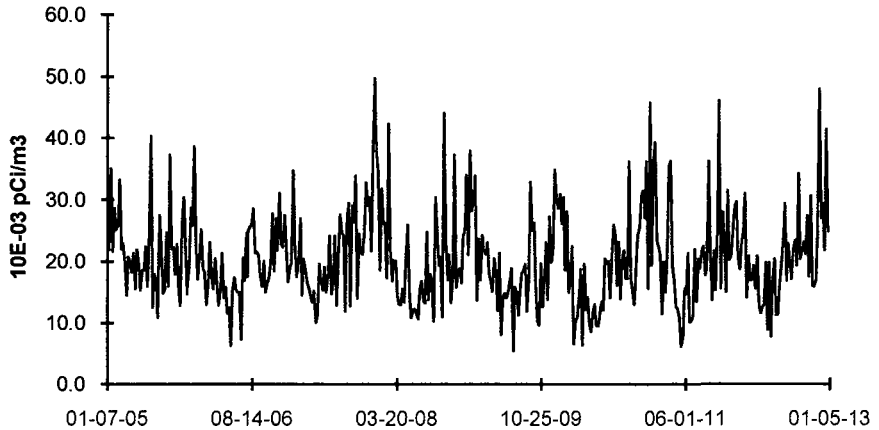
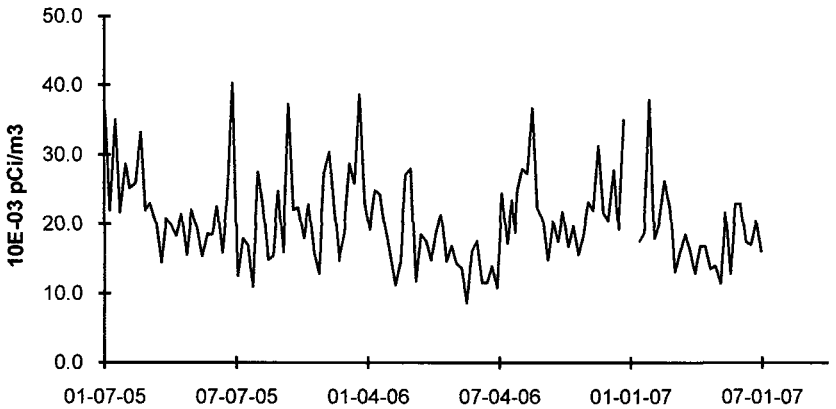
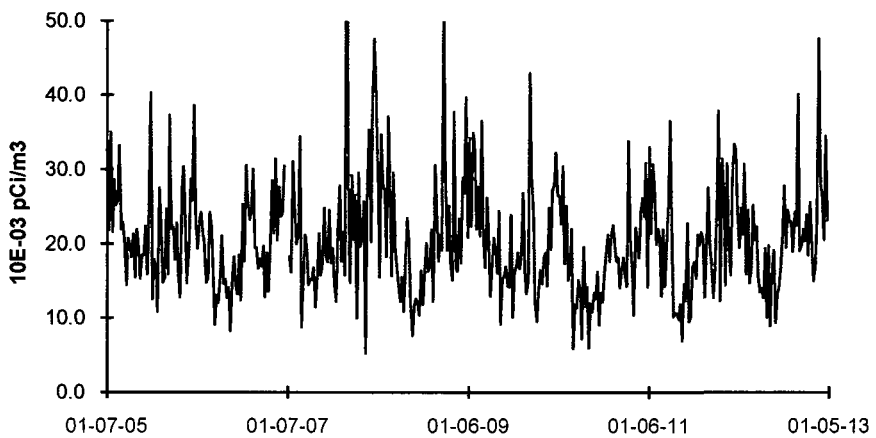


FIGURE C-13
AIR PARTICULATES - GROSS BETA - STATIONS D-13 and D-14 COLLECTED IN THE VICINITY OF DNPS, 2005 - 2012

D-13 Minooka



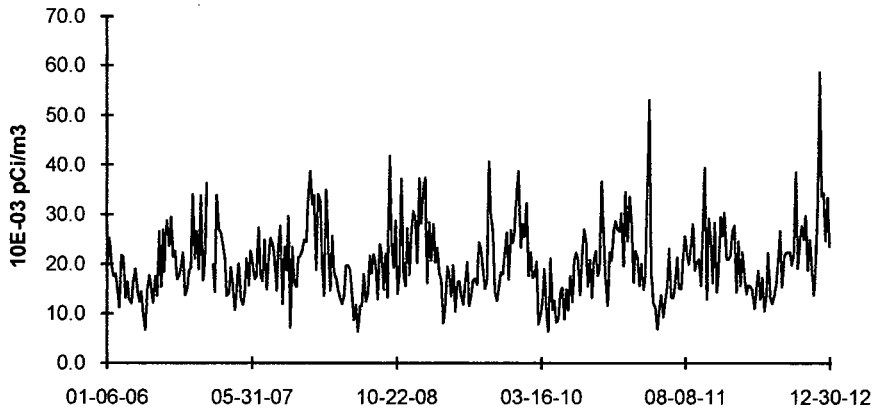
D-14 Center Street, Channahon



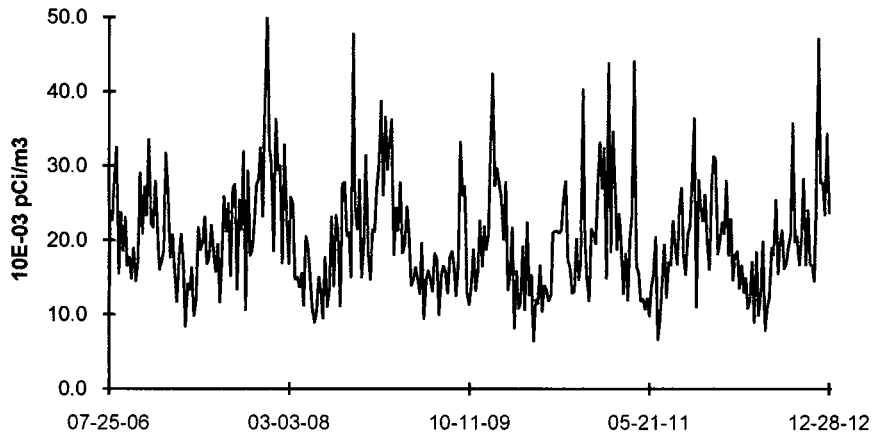
D-13 TAKEN OUT OF SERVICE JUNE 29, 2007 AND REPLACED WITH D-55

FIGURE C-14
AIR PARTICULATES - GROSS BETA - STATIONS D-55 and D-56 COLLECTED IN THE VICINITY OF DNPS, 2006-2012

D-55 Ridge Road, Minooka



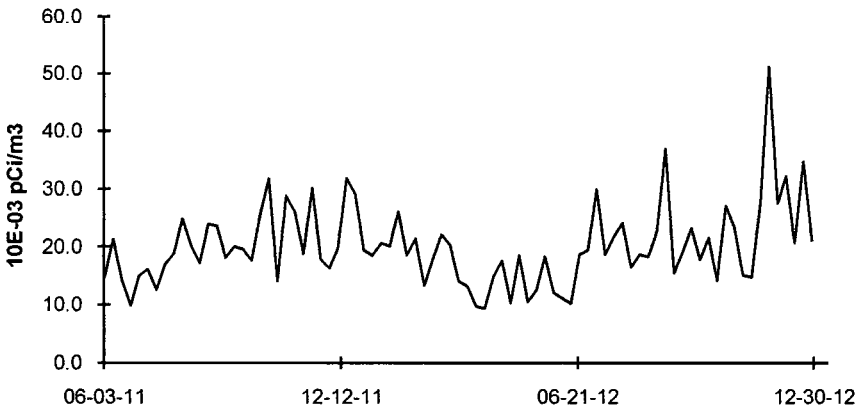
D-56 Will Road, Wildfeather



D-55 NEW STATION DECEMBER 30, 2005 REPLACED D-13 JUNE 29, 2007
D-56 NEW STATION JULY 25, 2006

FIGURE C-15
AIR PARTICULATES - GROSS BETA - STATION D-58
COLLECTED IN THE VICINITY OF DNPS, 2011-2012

D-58 Will Road Marina



D-58 NEW STATION IN MAY OF 2011

APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

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TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2012
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2012	E10066	Milk	Sr-89	pCi/L	101	94.8	1.07	A
			Sr-90	pCi/L	11.7	13.5	0.87	A
	E10067	Milk	I-131	pCi/L	87.5	92.5	0.95	A
			Ce-141	pCi/L	247	260	0.95	A
			Cr-51	pCi/L	435	436	1.00	A
			Cs-134	pCi/L	133	149	0.89	A
			Cs-137	pCi/L	156	159	0.98	A
			Co-58	pCi/L	127	132	0.96	A
			Mn-54	pCi/L	190	195	0.97	A
			Fe-59	pCi/L	179	168	1.07	A
			Zn-65	pCi/L	327	333	0.98	A
			Co-60	pCi/L	274	279	0.98	A
	E10069	AP	Ce-141	pCi	167	164	1.02	A
			Cr-51	pCi	310	276	1.12	A
			Cs-134	pCi	107	94.5	1.13	A
			Cs-137	pCi	109	101	1.08	A
			Co-58	pCi	87.6	83.5	1.05	A
			Mn-54	pCi	133	123	1.08	A
			Fe-59	pCi	113	106	1.07	A
			Zn-65	pCi	226	210	1.08	A
			Co-60	pCi	185	176	1.05	A
	E10068	Charcoal	I-131	pCi	92.8	94.2	0.99	A
	E10070	Water	Fe-55	pCi/L	1800	1570	1.15	A
June 2012	E10198	Milk	Sr-89	pCi/L	86.1	99.8	0.86	A
			Sr-90	pCi/L	9.2	12.7	0.72	W
	E10199	Milk	I-131	pCi/L	88.9	99.7	0.89	A
			Ce-141	pCi/L	72.8	82.2	0.89	A
			Cr-51	pCi/L	394	402	0.98	A
			Cs-134	pCi/L	159	174	0.91	A
			Cs-137	pCi/L	206	212	0.97	A
			Co-58	pCi/L	89.5	92.3	0.97	A
			Mn-54	pCi/L	129	132	0.98	A
			Fe-59	pCi/L	129	128	1.01	A
			Zn-65	pCi/L	193	199	0.97	A
			Co-60	pCi/L	342	355	0.96	A
	E10201	AP	Ce-141	pCi	73.2	75.1	0.97	A
			Cr-51	pCi	367	366	1.00	A
			Cs-134	pCi	165	159	1.04	A
			Cs-137	pCi	205	193	1.06	A
			Co-58	pCi	84.7	84.2	1.01	A
			Mn-54	pCi	118	121	0.98	A
			Fe-59	pCi	125	117	1.07	A
			Zn-65	pCi	181	182	0.99	A
			Co-60	pCi	338	324	1.04	A
	E10200	Charcoal	I-131	pCi	101	96.6	1.05	A

TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2012
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
June 2012	E10202	Water	Fe-55	pCi/L	1890	1580	1.20	A
September 2012	E10296	Milk	Sr-89	pCi/L	106	99.6	1.06	A
			Sr-90	pCi/L	13.6	16.0	0.85	A
	E10297	Milk	I-131	pCi/L	89.8	99.6	0.90	A
			Ce-141	pCi/L	160	164	0.98	A
			Cr-51	pCi/L	230	248	0.93	A
			Cs-134	pCi/L	101	108	0.94	A
			Cs-137	pCi/L	174	174	1.00	A
			Co-58	pCi/L	97.2	100	0.97	A
			Mn-54	pCi/L	188	196	0.96	A
			Fe-59	pCi/L	159	152	1.05	A
			Zn-65	pCi/L	195	192	1.02	A
			Co-60	pCi/L	155	152	1.02	A
	E10299	AP	Ce-141	pCi	145	135	1.07	A
			Cr-51	pCi	219	205	1.07	A
			Cs-134	pCi	94.1	89.4	1.05	A
			Cs-137	pCi	140	144	0.97	A
			Co-58	pCi	88.3	83.0	1.06	A
			Mn-54	pCi	173	162	1.07	A
			Fe-59	pCi	136	125	1.09	A
			Zn-65	pCi	165	159	1.04	A
			Co-60	pCi	133	125	1.06	A
	E10298	Charcoal	I-131	pCi	95.5	97.2	0.98	A
	E10300	Water	Fe-55	pCi/L	1630	1900	0.86	A
December 2012	E10334	Milk	Sr-89	pCi/L	101	96.6	1.05	A
			Sr-90	pCi/L	11.3	13.8	0.82	A
	E10335	Milk	I-131	pCi/L	93.1	90.0	1.03	A
			Ce-141	pCi/L	52.5	51.0	1.03	A
			Cr-51	pCi/L	373	348	1.07	A
			Cs-134	pCi/L	157	165	0.95	A
			Cs-137	pCi/L	113	117	0.97	A
			Co-58	pCi/L	94.1	98.5	0.96	A
			Mn-54	pCi/L	116	116	1.00	A
			Fe-59	pCi/L	124	116	1.07	A
			Zn-65	pCi/L	190	186	1.02	A
			Co-60	pCi/L	172	170	1.01	A
	E10337A	AP	Ce-141	pCi	51.8	49.6	1.04	A
			Cr-51	pCi	372	338	1.10	A
			Cs-134	pCi	165	161	1.02	A
			Cs-137	pCi	113	114	0.99	A
			Co-58	pCi	96.5	95.8	1.01	A
			Mn-54	pCi	118	112	1.05	A
			Fe-59	pCi	105	112	0.94	A
			Zn-65	pCi	166	181	0.92	A
			Co-60	pCi	179	165	1.08	A

TABLE D-1 **ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2012
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2012	E10336	Charcoal	I-131	pCi	73.1	72.7	1.01	A
	E10333	Water	Fe-55	pCi/L	1550	1750	0.89	A

(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.

TABLE D-2 **ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM**
TELEDYNE BROWN ENGINEERING, 2012
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
May 2012	RAD-89	Water	Sr-89	pCi/L	63.4	58.5	46.9 - 66.3	A
			Sr-90	pCi/L	33.5	37.4	27.4 - 43.1	A
			Ba-133	pCi/L	89.2	82.3	69.1 - 90.5	A
			Cs-134	pCi/L	66.5	74.2	60.6 - 81.6	A
			Cs-137	pCi/L	152	155	140 - 172	A
			Co-60	pCi/L	73.3	72.9	65.6 - 82.6	A
			Zn-65	pCi/L	109	105	94.5 - 125	A
			Gr-A	pCi/L	82.4	62.9	33.0 - 78.0	N (1)
			Gr-B	pCi/L	43.6	44.2	29.6 - 51.5	A
			I-131	pCi/L	25.9	27.1	22.5 - 31.9	A
			H-3	pCi/L	15433	15800	13800 - 17400	A
	MRAD-16	Filter	Gr-A	pCi/filter	39.5	77.8	26.1 - 121	A
November, 2012	RAD-91	Water	Sr-89	pCi/L	46.5	39.1	29.7 - 46.1	N (2)
			Sr-90	pCi/L	16.6	20.1	14.4 - 23.8	A
			Ba-133	pCi/L	85.2	84.8	71.3 - 93.3	A
			Cs-134	pCi/L	76.9	76.6	62.6 - 84.3	A
			Cs-137	pCi/L	177	183	165 - 203	A
			Co-60	pCi/L	77.4	78.3	70.5 - 88.5	A
			Zn-65	pCi/L	209	204	184 - 240	A
			Gr-A	pCi/L	50.6	58.6	30.6 - 72.9	A
			Gr-B	pCi/L	59.3	39.2	26.0 - 46.7	N (2)
			I-131	pCi/L	22.9	24.8	20.6 - 29.4	A
			H-3	pCi/L	5020	4890	4190 - 5380	A
	MRAD-17	Filter	Gr-A	pCi/filter	59.6	87.5	29.3 - 136	A

(1) Detector G1 is slightly biased high for Th-230 based measurements used only for ERA Gross Alpha samples. NCR 12-05

(2) The Sr-89 found to known ratio was 1.19, which TBE considers acceptable. It appears the aliquot was entered incorrectly for the Gross Beta NCR 12-13

(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. NA=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.

TABLE D-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2012
(PAGE 1 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2012	12-MaW26	Water	Cs-134	Bq/L	-0.0045		(1)	A
			Cs-137	Bq/L	37.5	39.9	27.9 - 51.9	A
			Co-57	Bq/L	30.8	32.9	23.0 - 42.8	A
			Co-60	Bq/L	22.4	23.72	16.60 - 30.84	A
			H-3	Bq/L	456	437	306 - 568	A
			Mn-54	Bq/L	31.0	31.8	22.3 - 41.3	A
			K-40	Bq/L	144	142	99 - 185	A
			Sr-90	Bq/L	-0.0084		(1)	A
			Zn-65	Bq/L	-0.369		(1)	A
	12-GrW26	Water	Gr-A	Bq/L	2.06	2.14	0.64 - 3.64	A
			Gr-B	Bq/L	7.48	6.36	3.18 - 9.54	A
	12-MaS26	Soil	Cs-134	Bq/kg	831	828	580 - 1076	A
			Cs-137	Bq/kg	0.145		(1)	A
			Co-57	Bq/kg	1270	1179	825 - 1533	A
			Co-60	Bq/kg	7.61	1.56	(2)	N (3)
			Mn-54	Bq/kg	634	558	391 - 725	A
			K-40	Bq/kg	1690	1491	1044 - 1938	A
			Sr-90	Bq/kg	328	392	274 - 540	A
			Zn-65	Bq/kg	753	642	449 - 835	A
	12-RdF26	AP	Cs-134	Bq/sample	2.31	2.38	1.67 - 3.09	A
			Cs-137	Bq/sample	2.15	1.79	1.25 - 2.33	W
			Co-57	Bq/sample	-0.0701		(1)	A
			Co-60	Bq/sample	2.62	2.182	1.527 - 2.837	W
			Mn-54	Bq/sample	4.13	3.24	2.27 - 4.21	W
			Sr-90	Bq/sample	0.0185		(1)	A
			Zn-65	Bq/sample	4.19	2.99	2.09 - 3.89	N (3)
	12-GrF26	AP	Gr-A	Bq/sample	0.365	1.2	0.4 - 2.0	A
			Gr-B	Bq/sample	2.31	2.4	1.2 - 3.6	A
	12-RdV26	Vegetation	Cs-134	Bq/sample	8.72	8.43	5.90 - 10.96	A
			Cs-137	Bq/sample	0.0424		(1)	A
			Co-57	Bq/sample	15.5	12.0	8.4 - 15.6	W
			Co-60	Bq/sample	6.80	6.05	4.24 - 7.87	A
			Mn-54	Bq/sample	0.0057		(1)	A
			Sr-90	Bq/sample	2.24	2.11	1.48 - 2.74	A
			Zn-65	Bq/sample	10.5	8.90	6.23 - 11.57	A
September 2012	12-MaW27	Water	Cs-134	Bq/L	21.4	23.2	16.2 - 30.2	A
			Cs-137	Bq/L	17.0	16.7	11.7 - 21.7	A
			Co-57	Bq/L	28.7	29.3	20.5 - 38.1	A
			Co-60	Bq/L	0.179		(1)	A
			H-3	Bq/L	387	334	234 - 434	A
			Mn-54	Bq/L	18.1	17.8	12.5 - 23.1	A
			K-40	Bq/L	139	134	94 - 174	A
			Sr-90	Bq/L	19.6	12.2	8.5 - 15.9	N (4)
			Zn-65	Bq/L	27.2	25.9	18.1 - 33.7	A
	12-GrW27	Water	Gr-A	Bq/L	0.966	1.79	0.54 - 3.04	A
			Gr-B	Bq/L	10.0	9.1	4.6 - 13.7	A

TABLE D-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2012
(PAGE 2 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
September 2012	12-MaS27	Soil	Cs-134	Bq/kg	880	939	657 - 1221	A
			Cs-137	Bq/kg	1220	1150	805 - 1495	A
			Co-57	Bq/kg	1330	1316	921 - 1711	A
			Co-60	Bq/kg	552	531	372 - 690	A
			Mn-54	Bq/kg	1000	920	644 - 1196	A
			K-40	Bq/kg	674	632	442 - 822	A
			Sr-90	Bq/kg	528	508	356 - 660	A
			Zn-65	Bq/kg	665	606	424 - 788	A
	12-RdF27	AP	Cs-134	Bq/sample	2.760	2.74	1.92 - 3.56	A
			Cs-137	Bq/sample	0.0415		(1)	A
			Co-57	Bq/sample	2.00	191.00	1.34 - 2.48	A
			Co-60	Bq/sample	1.78	1.728	1.210 - 2.246	A
			Mn-54	Bq/sample	2.40	2.36	1.65 - 3.07	A
			Sr-90	Bq/sample	0.931	1.03	0.72 - 1.34	A
			Zn-65	Bq/sample	-0.688		(1)	A
	12-GrF27	AP	Gr-A	Bq/sample	0.434	0.97	0.29 - 1.65	A
			Gr-B	Bq/sample	1.927	1.92	0.96 - 2.88	A
	12-RdV27	Vegetation	Cs-134	Bq/sample	6.28	6.51	4.56 - 8.46	A
			Cs-137	Bq/sample	4.62	4.38	3.07 - 5.69	A
			Co-57	Bq/sample	6.51	5.66	3.96 - 7.36	A
			Co-60	Bq/sample	5.32	5.12	3.58 - 6.66	A
			Mn-54	Bq/sample	3.59	3.27	2.29 - 4.25	A
			Sr-90	Bq/sample	0.0012		(1)	A
			Zn-65	Bq/sample	-0.046		(1)	A

(1) False positive test.
(2) Sensitivity evaluation
(3) No cause was found for the failed high soil Co-60 sensitivity test or the high Zn-65 in AP, which TBE considers an anomaly. NCR 12-08
(4) Sr-90 in water high due to incorrect aliquot entered in LIMS. 12-11
(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.

APPENDIX E

ERRATA DATA

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There is no errata data for 2012.

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APPENDIX F

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

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Docket No: 50-010
50-237
50-249

DRESDEN NUCLEAR POWER STATION
UNITS 1, 2 and 3

Annual Radiological
Groundwater Protection Program Report

1 January Through 31 December 2012

Prepared By

Teledyne Brown Engineering
Environmental Services

ExelonGeneration.

Dresden Nuclear Power Station
Morris, IL 60450

May 2013

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Table A-1 — Radiological Groundwater Protection Program - Sampling Locations, Distance and Direction, Dresden Nuclear Power Station, 2012

Figures

Security-Related Information: Maps of the Dresden Nuclear Power Station have been withheld from public disclosure under 10CFR2.390 and N.J.S.A. 47:1A-1.1

ARGPPR 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 Vicinity of Dresden Nuclear Power Station, 2012.

Table B-I.2 — Concentrations of Gamma Emitters in Groundwater Samples Collected in the Vicinity of Dresden Nuclear Power Station, 2012.

Table B-I.3 — Concentrations of Hard-To-Detects in Groundwater Samples Collected in the Vicinity of Dresden Nuclear Power Station, 2012.

Table B-II.1 — Concentrations of Tritium in Surface Water Samples Collected in the Vicinity of Dresden Nuclear Power Station, 2012.

Table B-II.2 — Concentrations of Gamma Emitters in Surface Water Samples Collected in the Vicinity of Dresden Nuclear Power Station, 2012.

Table B-III.1 — Concentrations of Tritium in Precipitation Water Samples Collected in the Vicinity of Dresden Nuclear Power Station, 2012.

I. Summary and Conclusions

Dresden Station is situated on approximately 600 acres of land that borders the Illinois River to the north and the Kankakee River to the east. This land is referred to as the owner-controlled area. The Dresden power plant itself takes up a small parcel of the owner-controlled area and is surrounded by a security fence. The security fence defines what is known as the Protected Area (PA).

The Dresden power plant has experienced leaks from underground lines and spills from systems containing radioactive water over its 50 year history. These incidents have created a number of areas of localized contamination within the PA. Isotopic analyses of groundwater in many of these areas show measurable concentrations of tritium (H-3).

Dresden participated in a fleetwide hydrogeologic investigation in during the summer of 2006 in an effort to characterize groundwater movement at each site. This investigation also compiled a list of the historic spills and leaks as well as a detailed analysis on groundwater hydrology for Dresden Nuclear Generation Station. Combining the tritium concentration in a locally contaminated area with the speed and direction of groundwater in the vicinity can produce a contaminated groundwater plume projection. If the plume of contaminated groundwater passes through the path of a groundwater monitoring well, it can be anticipated that the tritium concentration in this well will increase to some maximum concentration, then decrease over time.

The fleetwide Hydrogeologic Investigation Report (HIR) shows that groundwater movement on the Dresden site is very slow. In addition, there is a confining rock layer, the Maquoketa Shale layer, about 55 feet below the surface that impedes groundwater movement below this depth.

Dresden has a domestic water system that is supplied by two deep wells (1500 feet deep) that were installed about 50 years ago south of the PA. Samples taken from domestic water supply have never shown any detectable tritium concentration.

Tritium has a half-life of 12.3 years. This means that 40 years from now 90% of the tritium on site today will have decayed away to more stable elements. Given the limited volume of contaminated groundwater on site, radioactive decay, slow groundwater movement, and dilution effects, the conclusion of the HIR is that the operation of Dresden Nuclear Power Station has no adverse radiological impact on the environment. As a result there is little potential for contaminated groundwater on site to affect off-site drinking water.

II. Introduction

Radiological Groundwater Monitoring Program (RGPP):

Dresden has a Radiological Groundwater Monitoring Program (RGPP) that provides long-term monitoring intended to verify the fleet-wide hydrogeologic study conclusions. Dresden uses developed groundwater wells and surface water sample points in the RGPP.

The Dresden RGPP was established in 2006 and there have been no significant changes to this program. This program does not impact the operation of the plant and is independent of the REMP.

Developed groundwater wells are wells that were installed specifically for monitoring groundwater. These wells are equipped with screens and are properly sealed near the surface to avoid surface water intrusion. The wells were designed in accordance with appropriate codes and developed in accordance with appropriate standards and procedures. Dresden has groundwater monitoring wells identified as "shallow" (depths from 15 to 35 feet), "Intermediate" (depths from 35 to 55 feet) and "deep" (depths beyond 100 feet). All wells installed to a depth greater than 100 feet ("deep" wells) were found to be dry and removed from the RGPP. Surface water sample points are identified sample locations in the station's canals and cooling pond.

There are 89 sampling points in the RGPP:

Dresden has 45 developed groundwater monitoring wells within the PA. Some of these wells form a ring just inside the security fence and the remaining wells were installed near underground plant system piping that contains radioactive water.

Dresden has 26 developed groundwater monitoring wells outside the PA the majority of which form a ring just within the perimeter of the property.

Dresden has 8 surface water monitoring locations on the owner-controlled area sampled as part of the Dresden RGPP.

Dresden has 4 precipitation water monitoring locations sampled as part of the Dresden RGPP. An additional 8 locations were studied in 2011 through 2012, but only 4 locations are currently permanently a part of the RGPP program.

Dresden has 6 sentinel wells. These wells are not constructed to code or developed to a standard. The majority of these wells are idle and only used for qualitative troubleshooting.

The Dresden site-specific RGPP procedure identifies the historic 'events' that would affect the individual RGPP sample results. This procedure identifies threshold values for each sample point, which if exceeded, could be an indication of a new spill from an above ground system or a new leak in an underground pipe containing tritiated water. The RGPP sample points are currently sampled on a frequency determined by the well detection category in accordance with site document EN-DR-408-4160, Dresden RGPP Reference Material. During 2012, there were 484 analyses that were performed on 229 samples from 89 sampling points.

Sentinel Wells, sometimes referred to as "baby wells" are wells that were installed to monitor local shallow groundwater; typically in associated with a historic underground pipe leak. These wells are not constructed to code or developed to a standard. Most sentinel wells are from 6 to 12 feet deep and consist of 2" PVC pipe without screens. These wells are categorized as idle wells and are used only for troubleshooting purposes.

Dresden has two basic storm water runoff sewer systems within the PA: one sewer system routes to the east, then north and discharges into the Unit 1 intake canal, the second sewer-system routes to the west, then north, through a large Oil/Water Separator and discharges to the hot canal. Both the Unit 1 intake canal and the hot canal eventually route to the cooling pond. The Dresden Station RGPP has eight RGPP surface water sampling points to monitor these systems.

A. Objectives of the RGPP

The Objective of the RGPP is to provide long-term monitoring intended to verify the fleet-wide hydrogeologic study conclusions. The objective of the site-specific RGPP is to provide indication of short-term changes to groundwater tritium concentrations within the PA.

If isotopic results of groundwater samples exceed the thresholds specified in this procedure it could be an indication of a new spill from an above ground system or a new leak in an underground pipe containing tritiated water.

Specific Objectives include:

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

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

3. Regularly assess analytical results to identify adverse trends.

3. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

1. Dresden Nuclear Power Station will continue to perform routine sampling and radiological analysis of water from selected locations.

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

3. Dresden Nuclear Power Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

4. If an adverse trend in groundwater monitoring analytical results is identified, further investigation will be undertaken. If the investigation identifies a leak or unidentified spill, corrective actions will be implemented.

C. Program Description

Dresden has a Radiological Groundwater Monitoring Program (RGPP) that provides long-term monitoring intended to verify the fleet-wide hydrogeologic study conclusions. Dresden uses 89 developed groundwater wells and surface water sample points in the RGPP.

1. Sample Collection

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

<u>Groundwater and Surface Water</u>

Water samples are collected in accordance with the schedule delineated in the Dresden site-specific RGPP procedures. Analytical laboratories are subject to internal quality assurance programs, industry crosscheck programs, as well as nuclear industry audits. Station personnel review and evaluate the analytical results.

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most

common form of tritium is tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen.

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

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

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to helium-3 (3He). This radioactive decay releases a beta particle (low-energy electron). The radioactive decay of tritium is the source of the health risk from exposure to tritium. Tritium emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by Teledyne Brown Engineers (TBE) to analyze the environmental samples for radioactivity for the Dresden Nuclear Power Station RGPP in 2012.

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.

3. Concentrations of tritium in groundwater, surface water and precipitation water.

4. Concentrations of gross alpha and gross beta in groundwater.

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-233/234, 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 Dresden Nuclear Power Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Dresden Nuclear Power Station was considered operational at initial criticality. Several factors were important in the interpretation of the data:

1. <u>Lower Limit of Detection and Minimum Detectable Concentration</u>

   The Lower Limit of Detection (LLD) is the minimum sensitivity value that must be achieved routinely by the analytical parameter.

2. <u>Laboratory Measurements Uncertainty</u>

   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 food stuffs. The results of the monitoring were detailed in the report entitled, Environmental Radiological Monitoring for Dresden Nuclear Power 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. Additional detail may be found by consulting references (CRA 2006).

a. Tritium Production

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from

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

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

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected worldwide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons.

Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation

have typically been below 100 pCi/L since around 1980. Tritium concentrations in wells may still be above the 200-pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

c. Surface Water Data

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

The 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. These sample results cannot be distinguished as different from background at this concentration.

IV. Results and Discussion

Dresden Station initiated a Radiological Groundwater Protection Program (RGPP) in 2006.

A. Groundwater Results

Groundwater

Samples were collected from on-site wells throughout the year in accordance with Dresden's RGPP. Analytical results and anomalies are discussed below.

Tritium

Tritium concentrations in the shallow and intermediate aquifer are stable or decreasing over time. Tritium concentrations in MW-DN-124S and MW-DN-124I continue to be closely monitored for the existing plume in this area. The few wells that exceed the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L are located

onsite and are not available as a drinking water source. Although tritium is detected in a large number of these wells, it is important to note that the

majority were installed in areas of historic spills or close to piping containing tritiated water (Table B-I.1, Appendix B).

Strontium

Samples were collected and analyzed for strontium-89 and strontium-90 activity (Table B-I.1. Appendix B). Strontium-89 was not detected in any of the samples. Strontium was detected at a concentration greater than 1 pCi/L at one sampling location (MW-DN-105-S) in three of 30 samples. The concentrations ranged from 1.3 to 2.6 pCi/L.

Gross Alpha and Gross Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples throughout the sampling year in 2012. Gross Alpha (dissolved) was detected in 13 groundwater locations. The concentrations ranged from 1.8 to 13.9 pCi/L. Gross Alpha (suspended) was detected in two groundwater locations. The concentrations ranged from 1.6 to 7.0 pCi/L. Gross Beta (dissolved) was detected in 26 of the groundwater locations. The concentrations ranged from 1.6 to 80.0 pCi/L. Gross Beta (suspended) was detected in one groundwater location at a concentration of 41.5 pCi/L. The concentrations of Gross Alpha and Gross Beta, which are slightly above detectable levels, are considered to be background and are not the result of plant effluents.

Gamma Emitters

Naturally-occurring K-40 was detected in four samples. The concentrations ranged from 53 to 111 pCi/L. No other gamma emitting nuclides were detected (Table B-I.2, Appendix B).

Hard-To-Detects

Hard-To-Detect analyses were performed on 2 groundwater locations to establish background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-233/234, U-235 and U-238. The isotope U-233/234 and U-238 was detected at one of the two groundwater monitoring locations. The concentration of U-234 was 0.9 pCi/L and the concentration U-238 was 0.66 pCi/L (Table B-I.3,

Appendix B). The concentrations detected are considered background.

All other hard-to-detect nuclides were not detected at concentrations greater than their respective MDCs.

B. Surface Water Results

Surface Water

Samples were collected from eight 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 (Table B-II.1, Appendix B). Tritium values ranged from the detection limit to 5,490 pCi/l. The measurable concentrations of tritium are from an upstream source.

Strontium

Samples were not analyzed for strontium activity (Table B-II.1. Appendix B).

Gross Alpha and Gross Beta (dissolved and suspended)

Samples were not analyzed for Gross Alpha and Gross Beta in 2012.

Gamma Emitters

Naturally occurring K-40 was detected in one sample at a concentration of 84 pCi/L. No other gamma emitting nuclides were detected (Table B-II.2, Appendix B).

Hard-To-Detects

Samples were not analyzed for Hard-To-Detect analyses in 2012.

C. Precipitation Water Results

Precipitation Water

Samples were collected from 4 precipitation water locations throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

Samples from 4 locations were analyzed for tritium activity (Table B-III.1, Appendix B). Tritium was not detected in any samples.

D. Drinking Water Well Survey

No drinking water well surveys were conducted in 2012.

E. Summary of Results – Inter-Laboratory Comparison Program

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

F. Leaks, Spills, and Releases

There were no leaks, spills or releases of radioactive material in 2012. However, two new shallow wells, MW-DN-140S and MW-DN-141S were installed down gradient from the radioactive waste tank farm in response to an identified floor defect on "A" Waste sample Tank and extent of condition concerns. The samples collected from the newly installed wells tend to support that there was no impact on groundwater associated with the identified floor defect.

G. Trends

The elevated tritium concentrations are expected for the wells in the vicinity (MW-DN-124S and MW-DN-124I) as the plume continues to reside in this area.

Overall, tritium concentrations in the shallow and intermediate aquifers are decreasing over time.

H. Investigations

Six new monitoring wells were installed in late 2012 and will be added to the RGPP program in 2013. Four monitoring wells were installed at the mausoleum, MW-DN-134S, MW-DN-135S, MW-DN-136S and MW-DN-137S. Initial tritium and gamma isotopic analyses indicate that the mausoleum has had no impact on groundwater quality in this area. Two new monitoring wells were installed due to a floor defect that was identified on the "A" Waste Sample Tank that is part of the radiological waste processing system above ground tank farm. These two new wells, MW-DN-140S and MW-DN-141S were analyzed for tritium and gamma isotopic. The results, compared to existing trends, indicate that the floor defect had no impact on groundwater quality in this area.

I. Actions Taken

1. Compensatory Actions

The six newly installed wells in the fourth quarter of 2012 verified no groundwater impacts in the vicinity of the mausoleum and radioactive waste processing system. The action has been taken to add these new wells to the RGPP program.

2. Actions to Recover/Reverse Plumes

No actions were taken in 2012 by Dresden Station in an effort to reverse plume movement.

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APPENDIX A

LOCATION DISTANCE

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Dresden Nuclear Power Station, 2012

Site	Site Type	Location
DSP-105	Monitoring Well	30 feet east of the east wall of the EM Shop
DSP-106	Monitoring Well	65 feet east of east wall of EM Shop
DSP-107	Monitoring Well	9 feet east of the east Unit 1 Fuel Pool wall
DSP-108	Monitoring Well	40 ft east of the Unit 1 Sphere
DSP-117	Monitoring Well	Northeast of Unit 1 Sphere; 825 feet west of Ross Bridge
DSP-121	Monitoring Well	72 feet north of 2/3 Intake Canal fence
DSP-122	Monitoring Well	50 feet north of the Radwaste Tank Farm
DSP-123	Monitoring Well	Northeast corner of the Unit 1 Off-gas Building
DSP-124	Monitoring Well	9 feet south of Floor Drain Collector Tank
DSP-125	Monitoring Well	Northeast corner of the Unit 2/3A CST
DSP-126	Monitoring Well	21 feet northwest of the northwest bend in road behind Training Building
DSP-147	Monitoring Well	325 feet west of Telemetry Bridge
DSP-148	Monitoring Well	130 feet southeast of the Flow Regulating Station building
DSP-149R	Monitoring Well	35 feet south by southwest of the 138 KV yard fence
DSP-150	Monitoring Well	85 feet east of the northeast corner of the Unit 1 Spent Fuel Pool pad
DSP-151	Monitoring Well	65 feet north of the northeast corner of the Storeroom
DSP-152	Monitoring Well	210 feet south by southeast of the southeast corner of Maintenance Garage
DSP-153	Monitoring Well	150 feet east of the southeast corner of liquid hydrogen tank farm fence
DSP-154	Monitoring Well	33 feet west of the track; 165 feet east of the Security Checkpoint
DSP-156	Monitoring Well	70 feet east by northeast of the northwest corner of 138 KV yard fence
DSP-157-I	Monitoring Well	25 feet south of the south edge of the Employee Parking lot
DSP-157-M	Monitoring Well	25 feet south of the south edge of the Employee Parking lot
DSP-157-S	Monitoring Well	25 feet south of the south edge of the Employee Parking lot
DSP-158-I	Monitoring Well	53 feet west of the Kankakee River; 33 feet west of the cinder track
DSP-158-M	Monitoring Well	53 feet west of the Kankakee River; 33 feet west of the cinder track
DSP-158-S	Monitoring Well	50 feet west of the Kankakee River; 33 feet west of the cinder track
DSP-159-I	Monitoring Well	250 feet west of the Thorsen house; 450 ft south of the plant access gate
DSP-159-M	Monitoring Well	250 feet west of the Thorsen house; 450 ft south of the plant access gate
DSP-159-S	Monitoring Well	251 feet west of the Thorsen house; 450 ft south of the plant access gate
MW-DN-101-I	Monitoring Well	60 feet north of the Unit 1 Diesel Fuel Storage
MW-DN-101-S	Monitoring Well	60 feet north of the Unit 1 Diesel Fuel Storage
MW-DN-102-I	Monitoring Well	12 feet south of the southeast corner of the MUDS Building
MW-DN-102-S	Monitoring Well	13 feet south of the southeast corner of the MUDS Building
MW-DN-103-I	Monitoring Well	280 feet west of the northwest corner of N-GET Building
MW-DN-103-S	Monitoring Well	281 feet west of the northwest corner of N-GET Building
MW-DN-104-S	Monitoring Well	50 feet north of Radwaste Tank Farm
MW-DN-105-S	Monitoring Well	65 feet north of the northeast corner of the Storeroom
MW-DN-106-S	Monitoring Well	75 feet north of the 2/3 Intake Canal fence; east of the Unit 1 Intake Canal
MW-DN-107-S	Monitoring Well	15 feet west by southwest of the Unit 1 CST
MW-DN-108-I	Monitoring Well	7 feet southwest of the southwest corner of the Unit 1 Cribhouse
MW-DN-109-I	Monitoring Well	8 feet north of Chemistry Building
MW-DN-109-S	Monitoring Well	8 feet north of Chemistry Building
MW-DN-110-I	Monitoring Well	25 feet west of the Waste Water Treatment (WWT) Building
MW-DN-110-S	Monitoring Well	25 feet west of the Waste Water Treatment (WWT) Building
MW-DN-111-S	Monitoring Well	9 feet east of the Floor Drain Collector Tank
MW-DN-112-I	Monitoring Well	100 feet south of the Chemistry Building
MW-DN-112-S	Monitoring Well	100 feet south of the Chemistry Building
MW-DN-113-I	Monitoring Well	90 feet west of the southwest corner of the Administration Building
MW-DN-113-S	Monitoring Well	91 feet west of the southwest corner of the Administration Building
MW-DN-114-I	Monitoring Well	50 feet east of the Unit 1 Clean Demineralized Water Tank
MW-DN-114-S	Monitoring Well	8 feet southwest of the Radiation protection Dept west access doors
MW-DN-115-I	Monitoring Well	11 feet south of Instrument Maintenance Shop
MW-DN-115-S	Monitoring Well	12 feet south of Instrument Maintenance Shop
MW-DN-116-I	Monitoring Well	75 feet south of the Calgon Building roll-up door
MW-DN-116-S	Monitoring Well	75 feet south of the Calgon Building roll-up door
MW-DN-117-I	Monitoring Well	35 feet east by northeast of the Unit 1 Stack
MW-DN-118-S	Monitoring Well	Southeast corner of the Unit 1 Fuel Pool
MW-DN-119-I	Monitoring Well	20 feet east by northeast of the Unit 1 Sewage Ejector Building
MW-DN-119-S	Monitoring Well	21 feet east by northeast of the Unit 1 Sewage Ejector Building
MW-DN-120-I	Monitoring Well	45 feet north by northeast of the Ross Bridge railing
MW-DN-120-S	Monitoring Well	46 feet north by northeast of the Ross Bridge railing
MW-DN-121-S	Monitoring Well	7 feet west of the dirt road; 42 feet east of the 345KV yard fence

TABLE A-1: Radiological Groundwater Protection Program - Sampling Locations, Dresden Nuclear Power Station, 2012

Site	Site Type	Location
MW-DN-122-I	Monitoring Well	150 feet north of Collins Road; northeast of the G.E. Fuel Storage Facility
MW-DN-122-S	Monitoring Well	150 feet north of Collins Road; northeast of the G.E. Fuel Storage Facility
MW-DN-123-I	Monitoring Well	400 feet west of the Thorsen house; west of the Cold Canal
MW-DN-123-S	Monitoring Well	400 feet west of the Thorsen house; west of the Cold Canal
MW-DN-124-I	Monitoring Well	10 feet south of the liquid nitrogen inerting tanks
MW-DN-124-S	Monitoring Well	10 feet south of the liquid nitrogen inerting tanks
MW-DN-125-S	Monitoring Well	40 feet east of 2/3 B CST
MW-DN-126-S	Monitoring Well	15 feet south of fence around Unit 2/3 A CST and B CST (outside of fence)
MW-DN-127-S	Monitoring Well	20 feet south of Unit 3 HRSS
MW-DN-134-S	Monitoring Well	20-ft North of Mausoleum Building
MW-DN-135-S	Monitoring Well	20-ft East of Mausoleum Building
MW-DN-136-S	Monitoring Well	14.5-ft South of Mausoleum Building
MW-DN-137-S	Monitoring Well	20-ft West of Mausoleum Building
MW-DN-140-S	Monitoring Well	East of MW-DN-104S at SW corner outside of 2/3 crib house
MW-DN-141-S	Monitoring Well	North of 'A' Waste Tank next to 2/3 main chimney
MW-DN-MD-11	Monitoring Well	Piping located between Condensate Storage Tanks.
DSP-131	Surface Water	Storm water – 35 ft NE of the Unit 2/3 heating boiler 150,000 gallon diesel fuel storage tank. 15 ft W of the hot canal fence – underneath Security Block
DSP-132	Surface Water	Storm water – 150 ft NE of the Unit 1 Sphere. The sewer is in the middle of the road with a solid cover (no slots). There are two other sewers in the vicinity with solid covers on them, but both have the word "SANITARY" on the cover. The sewer is 66 ft SE of the Unit 1 diesel fuel transfer shed.
SW-DN-101	Surface Water	Unit 2/3 Intake (DSP50) at the Ross Bridge
SW-DN-102	Surface Water	Unit 2/3 Discharge (DSP20) at the Telemetry Bridge
SW-DN-103	Surface Water	Unit 2/3 Return Canal at the Discharge to the Intake Canal
SW-DN-104	Surface Water	Cold Canal (DSP34A) at the Cooling Tower walkway bridge
SW-DN-105	Surface Water	Hot Canal (DSP34B) at the Cooling Tower walkway bridge
SW-DN-106	Surface Water	Cooling Pond - Pool II at the east side of the Covered Bridge
FW-1	Precipitation	40 feet southwest of Unit 2/3 Off-gas Filter Building access door; north end of guardrail
FW-2	Precipitation	50 feet East of Chem Feed Trailer
FW-3	Precipitation	South of Stock Truck Bay rollup door
FW-4	Precipitation	Southeast corner of Unit 3 RB Interlock
FW-5	Precipitation	East of Unit 2/3 Intake Ross barrier
FW-6	Precipitation	North of Unit 1 Chimney
FW-7	Precipitation	Southeast of Unit 2 TB Trackway
FW-8	Precipitation	Southwest corner of 2/3 CST on fence
FW-9	Precipitation	South of MUDS Building on Security fence
FW-10	Precipitation	At the fence at the northwest corner of the SBO Building
FW-11	Precipitation	30 feet east of the east wall of the EM shop; at the stanchion for RGPP well DSP-105
FW-12	Precipitation	60 feet southeast of the southwest corner of the Admin Building; on the security fence

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ARGPPR 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 VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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)
DSP-105	03/26/12	< 181						
DSP-105	05/30/12	< 167	< 5.7	< 0.7	< 0.6	< 0.8	1.6 ± 0.7	< 1.4
DSP-105	08/27/12	313 ± 129						
DSP-105	10/24/12	< 172						
DSP-106	03/26/12	2560 ± 313						
DSP-106	05/30/12	2900 ± 337	< 5.1	< 0.7	< 1.0	< 0.8	4.2 ± 1.1	< 1.4
DSP-106	08/27/12	3120 ± 359						
DSP-106	10/24/12	2950 ± 340						
DSP-107	03/21/12	3240 ± 371						
DSP-107	05/29/12	3570 ± 404	< 4.8	< 0.9	< 0.8	< 0.3	5.3 ± 1.2	< 1.6
DSP-107	08/27/12	3190 ± 366						
DSP-107	10/24/12	2880 ± 336						
DSP-108	03/21/12	859 ± 147						
DSP-108	05/29/12	835 ± 146	< 4.8	< 0.4	< 1.1	< 0.3	12.1 ± 1.5	< 1.6
DSP-108	08/27/12	933 ± 164						
DSP-108	10/24/12	957 ± 163						
DSP-122	03/20/12	1420 ± 201						
DSP-122	05/25/12	1100 ± 179						
DSP-122	08/21/12	1230 ± 179						
DSP-122	10/23/12	1190 ± 179						
DSP-123	03/21/12	2670 ± 321						
DSP-123	05/29/12	2360 ± 284	< 4.9	< 0.9	2.0 ± 1.1	< 0.3	8.2 ± 1.4	< 1.6
DSP-123	08/21/12	2340 ± 281						
DSP-123	10/24/12	2530 ± 300						
DSP-124	03/27/12	6410 ± 684						
DSP-124	06/05/12	6470 ± 693						
DSP-124	08/28/12	4760 ± 518						
DSP-124	10/30/12	4140 ± 461						
DSP-125	03/19/12	178 ± 116						
DSP-125	05/22/12	< 196	< 3.6	< 0.7	9.1 ± 3.4	< 0.7	26.4 ± 3.6	< 2.1
DSP-125	08/21/12	258 ± 128						
DSP-125	10/30/12	226 ± 116						
DSP-126	06/06/12	< 189						
DSP-131	03/27/12	234 ± 116						
DSP-131	06/05/12	< 188						
DSP-131	08/29/12	256 ± 131						
DSP-131	10/30/12	< 170						
DSP-132	03/27/12	235 ± 116						
DSP-132	06/05/12	< 187						
DSP-132	08/29/12	208 ± 124						
DSP-132	10/30/12	737 ± 140						
DSP-148	03/28/12	213 ± 115						
DSP-148	08/29/12	435 ± 139						
DSP-148	10/31/12	333 ± 122						
DSP-149R	03/28/12	283 ± 120						
DSP-149R	05/21/12	< 200						
DSP-149R	08/29/12	398 ± 136						
DSP-149R	10/31/12	177 ± 112						
DSP-150	03/26/12	< 168						
DSP-150	05/30/12	< 171						
DSP-150	08/27/12	< 184						
DSP-150	10/24/12	< 184						
DSP-151	03/26/12	< 166						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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)
DSP-151	05/30/12	< 189						
DSP-151	08/27/12	< 178						
DSP-151	10/29/12	< 170						
DSP-154	06/06/12	< 187						
DSP-156	03/28/12	385 ± 124						
DSP-156	05/21/12	< 200						
DSP-156	08/29/12	502 ± 141						
DSP-156	10/31/12	227 ± 116						
DSP-157I (M)	06/06/12	< 186						
DSP-157S	06/06/12	< 187						
DSP-159I (M)	06/06/12	297 ± 133						
DSP-159S	06/06/12	< 184						
MW-DN-101I	03/21/12	1060 ± 167						
MW-DN-101I	05/29/12	997 ± 156	< 4.5	< 0.7	2.4 ± 1.4	< 0.8	12.1 ± 1.5	< 1.9
MW-DN-101I	08/22/12	1150 ± 175						
MW-DN-101I	10/24/12	1050 ± 172						
MW-DN-101S	03/21/12	< 172						
MW-DN-101S	05/29/12	< 165	< 4.4	< 0.6	6.2 ± 2.9	< 1.1	19.4 ± 2.3	< 2.7
MW-DN-101S	08/22/12	< 182						
MW-DN-101S	10/24/12	< 182						
MW-DN-102I	03/27/12	< 186						
MW-DN-102I	06/04/12	< 192	< 4.1	< 0.7	< 1.5	< 0.5	7.5 ± 1.4	< 1.6
MW-DN-102I	08/28/12	< 178						
MW-DN-102I	10/30/12	< 165						
MW-DN-102S	03/27/12	< 186						
MW-DN-102S	06/04/12	< 189	< 4.0	< 0.7	13.9 ± 9.0	< 1.8	42.8 ± 8.8	< 5.1
MW-DN-102S	08/28/12	< 175						
MW-DN-102S	10/30/12	< 169						
MW-DN-103I	06/06/12	< 187						
MW-DN-103S	06/06/12	< 169						
MW-DN-104S	03/20/12	< 169						
MW-DN-104S	05/23/12	< 200						
MW-DN-104S	08/21/12	297 ± 131						
MW-DN-104S	10/23/12	< 180						
MW-DN-105S	03/26/12	< 184	< 2.2	2.6 ± 0.5				
MW-DN-105S	05/30/12	< 173	< 4.5	0.9 ± 0.4				
MW-DN-105S	08/27/12	< 178	< 7.2	1.3 ± 0.6				
MW-DN-105S	10/29/12	< 169	< 2.2	1.3 ± 0.6				
MW-DN-106S	05/21/12	< 195						
MW-DN-107S	03/27/12	403 ± 140	< 1.9	< 0.6	9.9 ± 3.9	7.0 ± 1.3	80.0 ± 4.1	41.5 ± 2.2
MW-DN-107S	10/29/12	354 ± 126						
MW-DN-108I	03/20/12	< 169						
MW-DN-108I	05/29/12	< 171	< 5.0	< 0.9	< 1.1	< 0.8	13.8 ± 1.4	< 1.9
MW-DN-108I	08/22/12	< 166						
MW-DN-108I	10/23/12	< 181						
MW-DN-109I	03/20/12	< 169						
MW-DN-109I	05/23/12	< 198	< 3.8	< 0.7	< 1.0	< 0.5	11.8 ± 1.5	< 1.7
MW-DN-109I	08/21/12	402 ± 137						
MW-DN-109I	10/23/12	789 ± 146						
MW-DN-109S	03/20/12	< 167						
MW-DN-109S	05/23/12	< 197	< 3.7	< 0.7	3.7 ± 2.1	< 0.4	18.3 ± 2.1	< 1.0
MW-DN-109S	08/21/12	237 ± 127						
MW-DN-109S	10/23/12	< 174						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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-DN-110I	03/20/12	< 168						
MW-DN-110I	05/23/12	< 192						
MW-DN-110I	08/22/12	283 ± 129						
MW-DN-110I	10/23/12	210 ± 118						
MW-DN-110S	03/20/12	< 166						
MW-DN-110S	05/23/12	< 197						
MW-DN-110S	08/22/12	< 182						
MW-DN-110S	10/23/12	< 182						
MW-DN-111S	03/27/12	246 ± 126						
MW-DN-111S	06/05/12	324 ± 122						
MW-DN-111S	08/28/12	417 ± 132						
MW-DN-111S	10/30/12	291 ± 119						
MW-DN-112I	03/20/12	195 ± 112						
MW-DN-112I	05/23/12	409 ± 142						
MW-DN-112I	08/21/12	306 ± 130						
MW-DN-112I	10/23/12	396 ± 138						
MW-DN-112S	03/20/12	< 167						
MW-DN-112S	05/23/12	< 195						
MW-DN-112S	08/21/12	< 184						
MW-DN-112S	10/23/12	< 181						
MW-DN-113I	03/27/12	< 186						
MW-DN-113I	06/04/12	< 169	< 4.1	< 0.6	< 0.5	< 0.5	1.6 ± 0.7	< 1.6
MW-DN-113I	08/28/12	< 177						
MW-DN-113I	10/29/12	< 173						
MW-DN-113S	03/27/12	< 186						
MW-DN-113S	06/04/12	< 170	< 4.8	< 0.8	1.8 ± 0.8	1.6 ± 0.8	6.9 ± 1.2	< 1.7
MW-DN-113S	08/28/12	< 178						
MW-DN-113S	10/29/12	< 168						
MW-DN-114I	03/26/12	6430 ± 689						
MW-DN-114I	05/30/12	7320 ± 774						
MW-DN-114I	08/21/12	7300 ± 773						
MW-DN-114I	10/29/12	6700 ± 714						
MW-DN-114S	03/26/12	347 ± 132						
MW-DN-114S	05/30/12	202 ± 113						
MW-DN-114S	08/21/12	< 181						
MW-DN-114S	10/29/12	469 ± 129						
MW-DN-115I	03/26/12	202 ± 120						
MW-DN-115I	05/30/12	461 ± 127						
MW-DN-115I	08/28/12	273 ± 117						
MW-DN-115I	10/29/12	426 ± 125						
MW-DN-115S	03/26/12	< 182						
MW-DN-115S	05/30/12	238 ± 112						
MW-DN-115S	08/28/12	< 179						
MW-DN-115S	10/29/12	< 166						
MW-DN-116I	03/20/12	535 ± 145						
MW-DN-116I	05/23/12	240 ± 132	< 3.9	< 0.6	3.3 ± 1.8	< 1.0	22.4 ± 2.0	< 1.7
MW-DN-116I	08/22/12	2060 ± 256						
MW-DN-116I	10/23/12	739 ± 142						
MW-DN-116S	03/20/12	364 ± 124						
MW-DN-116S	05/23/12	373 ± 141	< 3.7	< 0.7	2.5 ± 1.6	< 0.7	19.3 ± 1.9	< 1.6
MW-DN-116S	08/22/12	537 ± 142						
MW-DN-116S	10/23/12	551 ± 146						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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-DN-118S	03/21/12		2950 ± 344						
MW-DN-118S	05/29/12		2570 ± 305	< 5.2	< 0.8	< 0.7	< 0.6	6.0 ± 1.1	< 1.5
MW-DN-118S	08/27/12		3070 ± 358						
MW-DN-118S	10/24/12		1430 ± 196						
MW-DN-119I	03/21/12		< 167						
MW-DN-119I	05/29/12		< 162	< 4.5	< 0.8	1.9 ± 1.0	< 0.6	19.6 ± 1.7	< 1.5
MW-DN-119I	08/28/12		227 ± 121						
MW-DN-119I	10/24/12		< 171						
MW-DN-119S	03/21/12		< 166						
MW-DN-119S	05/29/12		< 167	< 4.1	< 0.8	2.4 ± 1.5	< 0.6	12.9 ± 1.6	< 1.5
MW-DN-119S	08/28/12		< 178						
MW-DN-119S	10/24/12		< 173						
MW-DN-122I	06/06/12		< 165						
MW-DN-122S	06/06/12		< 170						
MW-DN-124I	03/28/12		48400 ± 4310						
MW-DN-124I	06/05/12		9120 ± 955	< 4.3	< 0.7	< 2.0	< 0.5	13.8 ± 1.7	< 1.6
MW-DN-124I	06/05/12	Reanalysis	9210 ± 966						
MW-DN-124I	08/29/12		53700 ± 5350						
MW-DN-124I	10/30/12		51800 ± 5210						
MW-DN-124S	03/28/12		38500 ± 3890						
MW-DN-124S	06/05/12		56900 ± 5720	< 3.9	< 0.6	< 2.6	< 0.4	20.4 ± 2.1	< 1.4
MW-DN-124S	08/29/12		16900 ± 1730						
MW-DN-124S	10/30/12		14100 ± 1440						
MW-DN-125S	03/26/12		307 ± 126						
MW-DN-125S	06/04/12		< 170	< 3.8	< 0.7	< 2.6	< 0.4	7.3 ± 1.7	< 1.4
MW-DN-125S	08/28/12		< 177						
MW-DN-125S	10/30/12		< 167						
MW-DN-126S	03/27/12		1920 ± 243						
MW-DN-126S	06/04/12		1470 ± 202	< 4.6	< 0.8	11.5 ± 5.1	< 1.3	34.9 ± 6.4	< 4.0
MW-DN-126S	08/29/12		1580 ± 214						
MW-DN-126S	10/29/12		897 ± 177						
MW-DN-127S	03/28/12		< 167						
MW-DN-127S	05/30/12		518 ± 132	< 4.6	< 0.6	< 2.1	< 0.8	9.8 ± 1.5	< 1.4
MW-DN-127S	08/29/12		< 177						
MW-DN-127S	10/29/12		< 168						
MW-DN-134S	11/21/12		316 ± 145						
MW-DN-135S	11/21/12		274 ± 141						
MW-DN-136S	11/21/12		285 ± 142						
MW-DN-137S	11/21/12		< 198						
MW-DN-140S	12/21/12		4030 ± 447						
MW-DN-141S	12/21/12		1090 ± 164						
MW-DN-MD-11	01/30/12		50500 ± 5090						
MW-DN-MD-11	03/19/12		38800 ± 3800						

TABLE B-I.2

CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

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
DSP-105	03/26/12	< 57	99 ± 63	< 6	< 5	< 11	< 6	< 13	< 7	< 10	< 12	< 6	< 7	< 39	< 14
DSP-105	05/30/12	< 20	< 44	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 10	< 2	< 2	< 19	< 6
DSP-105	08/27/12	< 42	< 83	< 4	< 5	< 12	< 6	< 9	< 6	< 8	< 14	< 4	< 4	< 30	< 12
DSP-105	10/24/12	< 37	< 39	< 4	< 4	< 10	< 4	< 10	< 5	< 8	< 14	< 4	< 4	< 25	< 8
DSP-106	03/26/12	< 39	< 80	< 5	< 4	< 7	< 5	< 9	< 3	< 9	< 10	< 3	< 4	< 25	< 5
DSP-106	05/30/12	< 15	< 13	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 1	< 2	< 14	< 4
DSP-106	08/27/12	< 36	< 79	< 4	< 4	< 10	< 3	< 8	< 5	< 7	< 14	< 4	< 4	< 31	< 8
DSP-106	10/24/12	< 34	< 35	< 3	< 3	< 9	< 4	< 6	< 4	< 6	< 11	< 3	< 4	< 23	< 9
DSP-107	03/21/12	< 41	< 41	< 4	< 4	< 8	< 4	< 8	< 4	< 9	< 13	< 4	< 5	< 26	< 7
DSP-107	05/29/12	< 16	< 31	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 8	< 1	< 2	< 15	< 5
DSP-107	08/27/12	< 37	< 32	< 4	< 5	< 9	< 4	< 8	< 5	< 9	< 14	< 4	< 5	< 31	< 9
DSP-107	10/24/12	< 43	< 94	< 5	< 5	< 10	< 5	< 10	< 6	< 8	< 14	< 4	< 5	< 31	< 10
DSP-108	03/21/12	< 23	< 19	< 2	< 2	< 5	< 2	< 4	< 3	< 4	< 7	< 2	< 2	< 15	< 5
DSP-108	05/29/12	< 17	< 14	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< 9	< 1	< 2	< 16	< 4
DSP-108	08/27/12	< 43	< 90	< 5	< 5	< 10	< 4	< 10	< 5	< 8	< 14	< 4	< 5	< 31	< 10
DSP-108	10/24/12	< 51	< 52	< 5	< 7	< 14	< 5	< 13	< 5	< 9	< 13	< 5	< 5	< 38	< 13
DSP-123	03/21/12	< 45	< 26	< 4	< 5	< 9	< 5	< 9	< 5	< 9	< 12	< 4	< 5	< 30	< 9
DSP-123	05/29/12	< 18	< 17	< 2	< 2	< 5	< 2	< 3	< 2	< 4	< 10	< 2	< 2	< 17	< 6
DSP-123	08/21/12	< 40	< 37	< 4	< 4	< 6	< 4	< 7	< 5	< 8	< 13	< 4	< 4	< 29	< 8
DSP-123	10/24/12	< 38	< 30	< 3	< 3	< 7	< 3	< 7	< 4	< 7	< 12	< 4	< 4	< 27	< 8
DSP-125	05/22/12	< 39	< 42	< 3	< 4	< 8	< 3	< 7	< 5	< 7	< 13	< 4	< 4	< 25	< 7
DSP-126	06/06/12	< 35	< 28	< 3	< 4	< 6	< 4	< 9	< 4	< 6	< 11	< 3	< 3	< 22	< 6
DSP-131	06/05/12	< 38	< 13	< 3	< 4	< 7	< 3	< 6	< 3	< 7	< 13	< 4	< 4	< 30	< 8
DSP-132	06/05/12	< 51	< 35	< 4	< 6	< 11	< 4	< 12	< 6	< 11	< 15	< 4	< 6	< 36	< 10
DSP-154	06/06/12	< 33	< 50	< 4	< 5	< 10	< 5	< 10	< 5	< 7	< 13	< 4	< 5	< 23	< 8
DSP-157I (M)	06/06/12	< 42	< 52	< 5	< 5	< 10	< 5	< 9	< 6	< 10	< 15	< 4	< 5	< 29	< 11
DSP-157S	06/06/12	< 33	< 36	< 3	< 3	< 4	< 4	< 5	< 4	< 9	< 11	< 4	< 3	< 19	< 5
DSP-159I (M)	06/06/12	< 29	< 100	< 3	< 3	< 7	< 3	< 4	< 4	< 6	< 11	< 3	< 5	< 22	< 6
DSP-159S	06/06/12	< 37	< 60	< 3	< 4	< 9	< 3	< 6	< 4	< 7	< 11	< 3	< 4	< 27	< 6
MW-DN-101I	03/21/12	< 17	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 5	< 2	< 2	< 12	< 4
MW-DN-101I	05/29/12	< 26	< 45	< 2	< 3	< 6	< 3	< 5	< 3	< 5	< 14	< 2	< 2	< 25	< 9
MW-DN-101I	08/22/12	< 30	< 27	< 3	< 3	< 7	< 4	< 7	< 4	< 6	< 10	< 3	< 3	< 21	< 7
MW-DN-101I	10/24/12	< 40	53 ± 35	< 4	< 6	< 10	< 5	< 10	< 5	< 9	< 15	< 5	< 5	< 33	< 11
MW-DN-101S	03/21/12	< 19	< 39	< 2	< 2	< 5	< 2	< 4	< 3	< 4	< 6	< 2	< 2	< 15	< 4
MW-DN-101S	05/29/12	< 25	< 20	< 3	< 3	< 7	< 3	< 6	< 3	< 5	< 13	< 2	< 3	< 27	< 8
MW-DN-101S	08/22/12	< 38	< 38	< 4	< 4	< 8	< 4	< 8	< 4	< 7	< 11	< 3	< 4	< 22	< 8
MW-DN-101S	10/24/12	< 34	< 37	< 4	< 4	< 9	< 4	< 8	< 5	< 7	< 12	< 4	< 4	< 27	< 8
MW-DN-102I	06/04/12	< 40	< 75	< 4	< 4	< 11	< 3	< 8	< 4	< 8	< 15	< 3	< 3	< 30	< 10

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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-DN-102S	06/04/12	< 34	< 87	< 4	< 4	< 7	< 3	< 8	< 4	< 6	< 15	< 3	< 4	< 28	< 6
MW-DN-103I	06/06/12	< 44	< 44	< 5	< 5	< 10	< 5	< 9	< 5	< 8	< 14	< 4	< 4	< 34	< 8
MW-DN-103S	06/06/12	< 27	< 21	< 2	< 3	< 6	< 3	< 6	< 4	< 6	< 8	< 2	< 3	< 16	< 7
MW-DN-106S	05/21/12	< 39	< 39	< 4	< 5	< 10	< 5	< 8	< 4	< 7	< 14	< 3	< 4	< 32	< 11
MW-DN-107S	03/27/12	< 49	111 ± 67	< 6	< 6	< 9	< 5	< 11	< 6	< 9	< 11	< 5	< 6	< 31	< 8
MW-DN-108I	03/20/12	< 20	< 18	< 2	< 2	< 5	< 2	< 4	< 3	< 4	< 7	< 2	< 2	< 14	< 5
MW-DN-108I	05/29/12	< 30	< 25	< 3	< 3	< 7	< 3	< 6	< 3	< 5	< 15	< 3	< 3	< 26	< 8
MW-DN-108I	08/22/12	< 35	< 70	< 3	< 4	< 8	< 4	< 7	< 4	< 6	< 12	< 3	< 4	< 23	< 6
MW-DN-108I	10/23/12	< 52	< 105	< 5	< 7	< 11	< 7	< 15	< 7	< 13	< 15	< 6	< 7	< 42	< 14
MW-DN-109I	05/23/12	< 49	< 109	< 4	< 4	< 8	< 5	< 9	< 5	< 8	< 14	< 4	< 5	< 33	< 9
MW-DN-109S	05/23/12	< 39	< 83	< 3	< 4	< 8	< 4	< 8	< 4	< 7	< 11	< 3	< 4	< 26	< 9
MW-DN-116I	03/20/12	< 18	< 37	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 6	< 2	< 2	< 13	< 4
MW-DN-116I	05/23/12	< 43	< 46	< 4	< 5	< 10	< 4	< 9	< 6	< 10	< 14	< 4	< 5	< 34	< 9
MW-DN-116S	03/20/12	< 18	< 19	< 2	< 2	< 5	< 2	< 4	< 2	< 3	< 6	< 2	< 2	< 13	< 5
MW-DN-116S	05/23/12	< 38	< 41	< 4	< 4	< 9	< 4	< 7	< 4	< 6	< 11	< 4	< 4	< 26	< 8
MW-DN-118S	03/21/12	< 20	< 19	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 6	< 2	< 2	< 15	< 4
MW-DN-118S	05/29/12	< 13	< 12	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< 7	< 1	< 1	< 12	< 4
MW-DN-119I	05/29/12	< 19	< 32	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 19	< 6
MW-DN-119S	05/29/12	< 20	< 40	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 20	< 6
MW-DN-122S	06/06/12	< 45	< 26	< 5	< 5	< 10	< 5	< 8	< 5	< 8	< 14	< 4	< 5	< 29	< 8
MW-DN-124I	06/05/12	< 29	< 31	< 3	< 3	< 6	< 3	< 6	< 3	< 5	< 10	< 2	< 3	< 15	< 4
MW-DN-124I	10/30/12	< 34	< 66	< 3	< 4	< 9	< 3	< 7	< 4	< 7	< 13	< 3	< 3	< 27	< 8
MW-DN-124S	06/05/12	< 30	< 32	< 4	< 3	< 9	< 4	< 9	< 4	< 5	< 14	< 3	< 4	< 31	< 7
MW-DN-124S	10/30/12	< 31	< 32	< 4	< 4	< 9	< 3	< 6	< 4	< 8	< 12	< 3	< 4	< 29	< 6
MW-DN-125S	06/04/12	< 50	< 78	< 3	< 5	< 7	< 3	< 8	< 5	< 7	< 14	< 4	< 4	< 27	< 6
MW-DN-126S	06/04/12	< 36	< 92	< 3	< 3	< 8	< 4	< 8	< 4	< 6	< 14	< 3	< 3	< 27	< 7
MW-DN-127S	05/30/12	< 20	< 18	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 18	< 6
SW-DN-113I	6/4/2012	< 29	< 63	< 2	< 3	< 6	< 3	< 5	< 4	< 5	< 11	< 3	< 3	< 23	< 7
SW-DN-113S	6/4/2012	< 39	< 34	< 4	< 5	< 9	< 4	< 7	< 4	< 8	< 14	< 3	< 4	< 30	< 9
SW-DN-116I	08/22/12	< 37	< 73	< 3	< 4	< 10	< 4	< 8	< 4	< 8	< 12	< 3	< 4	< 25	< 8
SW-DN-116I	10/23/12	< 35	< 69	< 3	< 4	< 7	< 4	< 6	< 4	< 6	< 12	< 3	< 4	< 24	< 7
SW-DN-116S	08/22/12	< 37	< 31	< 4	< 4	< 8	< 4	< 8	< 5	< 7	< 12	< 4	< 4	< 26	< 9
SW-DN-116S	10/23/12	< 39	< 57	< 4	< 4	< 9	< 5	< 9	< 5	< 8	< 13	< 4	< 4	< 27	< 9
SW-DN-118S	08/27/12	< 31	< 54	< 3	< 3	< 8	< 3	< 6	< 4	< 7	< 12	< 3	< 3	< 24	< 7
SW-DN-118S	10/24/12	< 39	< 69	< 4	< 4	< 9	< 4	< 7	< 4	< 7	< 14	< 4	< 4	< 27	< 7
SW-DN-122I	6/6/2012	< 45	< 87	< 5	< 5	< 10	< 4	< 8	< 5	< 7	< 15	< 5	< 5	< 30	< 9
MW-DN-134S	11/21/12	< 49	< 24	< 3	< 4	< 11	< 3	< 6	< 5	< 9	< 170	< 3	< 3	< 143	< 37
MW-DN-135S	11/21/12	< 40	< 27	< 3	< 4	< 9	< 3	< 6	< 4	< 7	< 157	< 3	< 3	< 122	< 41

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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-DN-136S	11/21/12	< 39	< 69	< 3	< 4	< 10	< 3	< 6	< 5	< 8	< 164	< 3	< 3	< 130	< 43
MW-DN-137S	11/21/12	< 40	< 21	< 3	< 4	< 8	< 2	< 5	< 4	< 7	< 162	< 3	< 3	< 112	< 37
MW-DN-140S	12/21/12	< 16	67 ± 37	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 13	< 1	< 2	< 20	< 6
MW-DN-141S	12/21/12	< 16	< 48	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 14	< 2	< 2	< 22	< 7

TABLE B-I.3 **CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238	Fe-55	Ni-63
MW-DN-107S	03/27/12	< 0.2	< 0.08	< 0.10	< 0.18	< 0.13	0.9 ± 0.3	< 0.12	0.66 ± 0.25	< 113	< 4.9
MW-DN-124I	06/05/12	< 0.1	< 0.07	< 0.02	< 0.07	< 0.05	< 0.1	< 0.02	< 0.07	< 41	< 2.9

TABLE B-II.1 CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3
SW-DN-101	03/28/12		< 167
SW-DN-101	05/21/12		247 ± 131
SW-DN-101	08/29/12		< 180
SW-DN-101	10/31/12		5490 ± 594
SW-DN-102	03/28/12		489 ± 134
SW-DN-102	05/21/12	Reanalysis	869 ± 164
SW-DN-102	05/21/12	Reanalysis	803 ± 145
SW-DN-102	05/21/12	Reanalysis	821 ± 145
SW-DN-102	08/29/12		< 182
SW-DN-102	10/31/12		3240 ± 372
SW-DN-103	03/28/12		569 ± 138
SW-DN-103	05/21/12		750 ± 145
SW-DN-103	08/29/12		< 182
SW-DN-103	10/31/12		2940 ± 343
SW-DN-104	03/28/12		564 ± 137
SW-DN-104	05/21/12		790 ± 164
SW-DN-104	08/29/12		< 182
SW-DN-104	10/31/12		3030 ± 352
SW-DN-105	03/28/12		468 ± 132
SW-DN-105	05/21/12	Reanalysis	811 ± 162
SW-DN-105	05/21/12	Reanalysis	837 ± 148
SW-DN-105	08/29/12		< 181
SW-DN-105	10/31/12		3270 ± 375
SW-DN-106	03/28/12		783 ± 147
SW-DN-106	05/21/12		773 ± 158
SW-DN-106	08/29/12		< 158
SW-DN-106	10/31/12		2640 ± 313

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012**

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
SW-DN-101	05/21/12	< 37	< 38	< 4	< 4	< 9	< 3	< 8	< 5	< 8	< 14	< 4	< 4	< 34	< 9
SW-DN-102	05/21/12	< 36	< 80	< 4	< 4	< 9	< 4	< 6	< 4	< 6	< 14	< 4	< 4	< 30	< 9
SW-DN-103	05/21/12	< 45	< 35	< 5	< 5	< 11	< 4	< 9	< 5	< 9	< 15	< 4	< 5	< 32	< 10
SW-DN-104	05/21/12	< 42	84 ± 44	< 4	< 5	< 9	< 4	< 8	< 4	< 8	< 15	< 4	< 5	< 26	< 10
SW-DN-105	05/21/12	< 42	< 40	< 4	< 4	< 10	< 5	< 7	< 4	< 9	< 14	< 4	< 5	< 31	< 11
SW-DN-106	05/21/12	< 40	< 72	< 4	< 4	< 8	< 4	< 9	< 5	< 7	< 14	< 4	< 4	< 30	< 9

TABLE B-III.1 CONCENTRATIONS OF TRITIUM IN PRECIPITATION WATER SAMPLES COLLECTED IN THE VICINITY OF DRESDEN NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3
FW-1	05/23/12	< 191
FW-10	05/23/12	< 199
FW-11	05/30/12	< 168
FW-12	05/30/12	< 167