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QUAD CITIES NUCLEAR POWER STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2012

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I. Summary and Conclusions

In 2012, the Quad Cities Generating Station released to the environment through the radioactive effluent liquid and gaseous pathways approximately 123 curies of noble gases, 2.5E-03 curies of fission and activation products, approximately 29 curies of Carbon-14 and approximately 83 curies of tritium. The dose from both liquid and gaseous effluents was conservatively calculated for the Hypothetical Maximum Exposed Member of the Public. The results of those calculations and their comparison to the allowable limits were as follows:

Gaseous and liquid radiation doses to members of the public at locations								
Effluents	Applicable Organ	Estimated Dose	Age Group	Location		% of Applicable Limit	Site Limit	Unit
				Distance (meters)	Direction (toward)			
Noble Gas	Gamma - Air Dose	6.02E-04	All	1029	NNE	3.01E-03	20	mRad
Noble Gas	Beta – Air Dose	3.08E-04	All	1029	NNE	7.70E-04	40	mRad
Iodine, Particulate C-14 & Tritium	Total Body	4.26E-02	Child	1029	NNE	4.26E-01	10	mrem
Iodine, Particulate C-14 & Tritium	Thyroid	2.07E-01	Infant	1029	NNE	6.90E-01	30	mrem
Liquid	Total Body	2.78E-05	Adult	Mississippi River		4.63E-04	6	mrem
Liquid	Liver	4.55E-05	Teen	Mississippi River		2.28E-05	20	mrem
Skyshine	Total Body	7.74E+00	All	800	N	3.10E+01	25	mrem
40CFR190	Total Body (Gas + Liq+ Skyshine)	7.78E+00	All	800	N	3.11E+01	25	mrem

The doses as a result of the radiological effluents released from the Quad Cities Generating Station were a very small percentage of the allowable limits, with the exception of 40CFR190 whole body radiation which was calculated to be 31.1% of the 25 mrem/yr limit. The largest component of 40CFR190 dose is attributable to BWR skyshine from N-16. This value is conservatively calculated for the hypothetical maximum exposed member of the public.

This report on the Radiological Environmental Monitoring Program (REMP) conducted for the Quad Cities Nuclear Power Station (QCNPS) by Exelon covers the period 01 January 2012 through 31 December 2012. During that time period, 1536 analyses were performed on 1421 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of QCNPS had no adverse radiological impact on the environment.

Surface water samples were analyzed for concentrations of gross beta, tritium, iron, nickel and gamma emitting nuclides. Ground water samples were analyzed for concentrations of tritium and gamma emitting nuclides. No fission or activation products were detected. Gross beta activities detected were

consistent with those detected in previous years and consistent with the control stations.

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 samples. Cesium-137 was detected in two of four sediment samples (one upstream and one downstream). Occasionally Cs-137 is detected at very low levels (just above LLD) in sediment and is not distinguishable from background levels.

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

High sensitivity I-131 analyses were performed on air samples. No I-131 was detected.

Cow milk samples were analyzed for concentrations of I-131 and gamma emitting nuclides. No I-131 was detected. Concentrations of naturally occurring isotopes (K-40 approximately 1200 pCi/L) were consistent with those detected in previous years. No fission or activation products were detected.

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

Environmental gamma radiation measurements were performed quarterly using Optically Stimulated Luminescence Dosimeters (OSLD). Beginning in 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimeters were deployed and Thermoluminescent Dosimeters (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 Quad Cities Nuclear Power Station (QCNPS), consisting of two 2,957 MWth boiling water reactors owned and operated by Exelon Corporation, is located in Cordova, Illinois along the Mississippi River. Unit No. 1 went critical on 16 March 1972. Unit No. 2 went critical on 02 December 1973. The site is located in northwestern Illinois, approximately 182 miles west of Chicago, Illinois.

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.

A. Objective of the REMP

The objectives of the REMP are to:

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

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

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways.

2. Establishing baseline radiological data of media within those pathways.

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

C. Radiation and Radioactivity

All matter is made of atoms. An atom is the smallest part into which matter can be broken down and still maintain all its chemical properties. Nuclear radiation is energy, in the form of waves or particles that is given off by unstable, radioactive atoms. Radioactive material exists naturally and has always been a part of our environment. The earth's crust, for example, contains radioactive uranium, radium, thorium and potassium. Some radioactivity is a result of nuclear weapons testing. Examples of radioactive fallout that is normally present in environmental samples are cesium-137 and strontium-90. Some examples of radioactive materials released from a nuclear power plant are cesium-137, iodine-131, strontium-90 and cobalt-60. Radiation is measured in units of millirem; much like temperature is measured in degrees. A millirem is a measure of the biological effect of the energy deposited in tissue. The natural and man-made radiation dose received in one year by the average American is 300 to 400 mrem (References 2, 3, 4 in Table II.D-1 below). Radioactivity is measured in curies. A curie is that amount of radioactive material needed to produce 37,000,000,000 nuclear disintegrations per second. This is an extremely large amount of radioactivity in comparison to environmental radioactivity. That is why radioactivity in the environment

is measured in picocuries. One picocurie is equal to one trillionth of a curie.

D. Sources of Radiation

As mentioned previously, naturally occurring radioactivity has always been a part of our environment. Table II D-1 shows the sources and doses of radiation from natural and man-made sources.

Table II.D-1

Radiation Sources and Corresponding Doses [1]

NATURAL		MAN-MADE	
Source	Radiation Dose (millirem/year)	Source	Radiation Dose (millirem/year)
Internal, inhalation [2]	228	Medical [3]	300
External, space	33	Consumer [4]	13
Internal, ingestion	29	Industrial[5]	0.3
External, terrestrial	21	Occupational	0.5
		Weapons Fallout	<1
		Nuclear Power Plants	<1
Approximate Total	311	Approximate Total	314

(1) Information from NCRP Reports 160 and 94

(2) Primarily from airborne radon and its radioactive progeny

(3) Includes CT (147 mrem), nuclear medicine (77 mrem), interventional fluoroscopy (43 mrem) and conventional radiography and fluoroscopy (33 mrem)

(4) Primarily from cigarette smoking (4.6 mrem), commercial air travel (3.4 mrem), building materials (3.5 mrem), and mining and agriculture (0.8 mrem)

(5) Industrial, security, medical, educational, and research

Cosmic radiation from the sun and outer space penetrates the earth's atmosphere and continuously bombards us with rays and charged particles. Some of this cosmic radiation interacts with gases and particles in the atmosphere, making them radioactive in turn. These radioactive byproducts from cosmic ray bombardment are referred to as cosmogenic radionuclides. Isotopes such as beryllium-7 and carbon-14 are formed in this way. Exposure to cosmic and cosmogenic sources of radioactivity results in about 33 mrem of radiation dose per year.

Additionally, natural radioactivity is in our body and in the food we eat (about 29 millirem/yr), the ground we walk on (about 21 millirem/yr) and

the air we breathe (about 228 millirem/yr). The majority of a person's annual dose results from exposure to radon and thoron in the air we breathe. These gases and their radioactive decay products arise from the decay of naturally occurring uranium, thorium and radium in the soil and building products such as brick, stone and concrete. Radon and thoron levels vary greatly with location, primarily due to changes in the concentration of uranium and thorium in the soil. Residents at some locations in Colorado, New York, Pennsylvania and New Jersey have a higher annual dose as a result of higher levels of radon/thoron gases in these areas. In total, these various sources of naturally-occurring radiation and radioactivity contribute to a total dose of about 311 mrem per year.

In addition to natural radiation, we are normally exposed to radiation from a number of man-made sources. The single largest doses from man-made sources result from therapeutic and diagnostic applications of x-rays and radiopharmaceuticals. The annual dose to an individual in the U.S. from medical and dental exposure is about 300 mrem. Consumer products, such as televisions and smoke detectors, contribute about 13 mrem/yr. Much smaller doses result from weapons fallout (less than 1 mrem/yr) and nuclear power plants. Typically, the average person in the United States receives about 314 mrem per year from man-made sources.

III. Program Description

A. Sample Collection

Samples for the QCNPS REMP were collected for Exelon Nuclear by Environmental Inc. (Midwest Labs). This section describes the general sampling methods used by Environmental Inc. to obtain environmental samples for the QCNPS REMP in 2012. Sample locations and descriptions can be found in Table B–1 and Figures B–1 and B–2, Appendix B.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, ground water, fish and sediment. Surface water samples were collected weekly from two locations, Q-33 and Q-34 (Control). Ground water samples were collected quarterly from two locations, Q-35 and Q-36. All water samples were collected in new containers, which were rinsed with source water prior to collection.

Fish samples comprising the edible portions of commercially and

recreationally important species were collected semiannually at two locations, Q-24 and Q-29 (Control). Sediment samples composed of recently deposited substrate were collected at two locations semiannually, Q-39 and Q-40 (Control).

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of air particulate, and airborne iodine. Airborne iodine and particulate samples were collected and analyzed at ten locations (Q-01, Q-02, Q-03, Q-04, Q-13, Q-16, Q-37, Q-38, Q-41 and Q-42 (control)). 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 particulate filters and air iodine samples were replaced weekly and sent to the laboratory for analysis.

Terrestrial Environment

The terrestrial environment was evaluated by performing radiological analyses on samples of milk and food product. Milk samples were collected biweekly at one location (Q-26) from May through October, and monthly from November through April. All samples were collected in new plastic containers from the bulk tank, preserved with sodium bisulfite, and shipped promptly to the laboratory.

Food products were collected annually in July at five locations (Q-Control, Q-Quad 1, Q-Quad 2, Q-Quad 3, and Q-Quad 4). Various types of broadleaf and root vegetables were collected and placed in new plastic bags, and sent to the laboratory for analysis.

Ambient Gamma Radiation

Beginning in 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimeters (OSLD) were deployed and Thermoluminescent Dosimeters (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 2 OSLD sets. The OSLD locations were placed on and around the QCNPS site as follows: An inner ring consisting of 15 locations (Q-101, Q-102, Q-103, Q-104, Q-105, Q-106,

Q-107, Q-108, Q-109, Q-111, Q-112, Q-113, Q-114, Q-115 and Q-116). These OSLDs are located in 15 of the 16 meteorological sectors in the general area of the site boundary (approximately 0.1 – 3 miles from the site). There are no OSLDs located in the SSW sector because this sector is located over water.

An outer ring consisting of 16 locations (Q-201, Q-202, Q-203, Q-204, Q-205, Q-206, Q-207, Q-208, Q-209, Q-210, Q-211, Q-212, Q-213, Q-214, Q-215 and Q-216). These OSLDs are located in each of the 16 meteorological sectors (approximately 6.0 – 8.0 km from the site)

An other set consisting of nine locations (Q-01, Q-02, Q-03, Q-04, Q-13, Q-16, Q-37, Q-38 and Q-41). The locations are at each of the air sample stations around the site.

The balance of one location (Q-42) is the control site.

The specific OSLD locations were determined by the following criteria:

1. The presence of relatively dense population;

2. Site meteorological data taking into account distance and elevation for each of the sixteen 22 1/2 degree sectors around the site, where estimated annual dose from QCNPS, if any, would be most significant;

3. On hills free from local obstructions and within sight of the stack (where practical);

4. Near the closest dwelling to the stack in the prevailing downwind direction.

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

B. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the QCNPS REMP in 2012 and the type of analyses. The analytical procedures used by the TBE laboratory are listed in Table B-2.

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

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

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

3. Concentrations of tritium in ground and surface water.

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

5. Ambient gamma radiation levels at various site environs.

6. Concentrations of Fe-55 and Ni-63 in surface water.

C. Data Interpretation

The radiological and direct radiation data collected prior to Quad Cities Nuclear Power Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, Quad Cities 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) is 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 is intended as an *a priori* (a before the fact) estimate of a system (including instrumentation, procedure and sample type) and not as an *a posteriori* (after the fact) criteria for the presence of activity. All analyses were designed to achieve the required QCNPS detection capabilities for environmental sample analysis.

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

2. Net Activity Calculation and Reporting of Results

Net activity for a sample is 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 is reported in all cases where positive activity was not detected. Gamma spectroscopy results for each type of sample were grouped as follows:

For surface water, groundwater and vegetation 12 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Zr-95, Nb-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 and Ba-140 and La-140 were reported.

For air iodine, one nuclide, I-131 was 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 QCNPS 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 CodeDate	Collection	Reason
A/I	Q-37	01/20/12	Low reading of 61.2 hours pump not running; collector reset pump.
A/I	Q-38	01/20/12	Low reading of 164.2 hours due to power outage from storm.
A/I	Q-41	01/27/12	Low reading of 184.1 hours (8-day run) due to power outage from storm.
A/I	Q-37	02/24/12	Low reading of 161.5 hours; pump not running; collector reset ground fault.
OSLD	Q-310-1	03/01/12	OSLD found on ground. Collector placed back on fence.
A/I	Q-37	03/23/12	Low reading of 69.7 hours; pump not running; collector reset ground fault.

Table D-1 LISTING OF SAMPLE ANOMALIES (continued)

Sample Type	Location Code	Collection Date	Reason
A/I	Q-42	03/23/12	Low reading of 62.0 hours; pump circuit blown; electrical work in area; collector reset breaker.
A/I	Q-37	03/30/12	Low reading of 152.8 hours; pump not running; collector reset ground fault.
A/I	Q-01	05/18/12	Low reading of 95.6 hours due to pump malfunction. Collector replaced pump on 05-16-12.
A/I	Q-04	05/25/12	Field check log missing; taken by high winds; collector replaced log.
A/I	Q-42	06/01/12	Pump out of service; collector replaced pump.
A/I	Q-42	06/07/12	Low reading of 116.4 hours due to pump malfunction; pump replaced 06-02-12.
A/I	Q-42	06/15/12	Low reading of 148.1 hours due to faulty GFCI. GFCI replaced.
A/I	Q-37	07/06/12	Low reading of 98.0 hours due to tripped breaker from power outage. Collector reset breaker.
AP	Q-13	07/13/12	Collector found filter damaged in holder from debris.
A/I	Q-16	11/02/12	Low reading of 166.7 hours due to work on new power connection.
A/I	Q-03	12/21/12	AP filter frozen to sampling train, filter torn.

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
SW	Q-33	01/13/12 – 02/09/12	No sample; water frozen
SW	Q-34	01/13/12 – 02/09/12	No sample; water frozen
A/I	Q-13	04/19/12	Low reading of 32.0 hours due to power outage from storm. Collector reset pump.
A/I	Q-37	04/20/12	Low reading of 38.1 hours due to power outage from storm. Collector reset pump.
OSLD	Q-112-2	05/03/12	OSLD missing in field; collector placed spare #3017787R.
OSLD	Q-210-1	05/03/12	OSLD missing in field; collector placed spare #3017788R.
A/I	Q-13	05/03/12	Low reading of 31.3 hours due to power outage from storm. Collector reset pump.
A/I	Q-13	05/10/12	Low reading of 4.6 hours due to pump malfunction. Collector replaced pump.
OSLD	Q-210-1	06/01/12	Spare OSLD (3017788R) found missing; collector placed spare #3017789R.
OSLD	Q-210-1	06/15/12	Spare OSLD (3017789R) found missing; collector placed spare #3017790R on 06-18-12; collector moved OSLD to less conspicuous location nearby.

Table D-2 LISTING OF MISSED SAMPLES (continued)

Sample Type	Location Code	Collection Date	Reason
OSLD	Q-108-1, Q-209-4, Q-216-2	06/29/12	OSLDs found missing at quarterly exchange.
A/I	Q-16	07/27/12	Charcoal cartridge lost by sample collector.
OSLD	Q-115-1	09/28/12	3rd Qtr. OSLD found missing during quarterly exchange; new 4th Qtr. OSLD replaced.
WW	Q-35	10/12/12	Well water unavailable; water shut off. Sample taken at 18306 River Road N, 100 yds. south of Q-35.
A/I	Q-13, Q-16, Q-41, Q-42	12/07/12	Samples lost in transit to EIML; Shipper could not trace; most likely discarded due to leak of one water sample.
SW	Q-33	12/21/12 – 12/28/12	No sample; water frozen.
SW	Q-34	12/28/12	No sample; water frozen.
OSLD	Q-209-4	12/28/12	OSLD found missing at quarterly exchange.

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

E. Program Changes

There were no program changes in 2012.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly and composited monthly at two locations (Q-33 and Q-34). Of these locations only Q-33, located downstream, could be affected by Quad Cities' effluent releases. The following analyses were performed:

Gross Beta

Samples from all locations were analyzed for concentrations of gross beta (Table C–I.1, Appendix C). Gross beta activity was detected in 22 of 24 samples. The values ranged from 2.2 to 5.2 pCi/L. Concentrations detected were consistent with those detected in previous years (Figure C–1, Appendix C). The required LLD was met.

Tritium

Quarterly composites of weekly collections were analyzed for tritium activity (Table C–I.2, Appendix C). No tritium activity was detected (Figure C–2, Appendix C). The 2000 pCi/L OCDM and contractually required 200 pCi/L LLDs were met.

Iron and Nickel

Quarterly composites of monthly collections were analyzed for Fe-55 and Ni-63 (Table C–I.2, Appendix C). No Fe-55 or Ni-63 was detected. The required LLDs were met.

Gamma Spectrometry

Samples from both locations were analyzed monthly for gamma emitting nuclides (Table C–I.3, Appendix C). Naturally occurring K-40, Ra-226, Ac-228, Th-228, and Th-232 were detected. No nuclides associated with QCNPS were detected and all required LLDs were met.

2. Ground Water

Quarterly grab samples were collected at two locations (Q-35 and Q-36). Both locations could be affected by Quad Cities' effluent releases. The following analyses were performed:

Tritium

Quarterly grab samples from the locations were analyzed for tritium activity (Table C–II.1, Appendix C). No tritium activity was detected (Figure C–3, Appendix C). The 2000 pCi/L OCDM and contractually required 200 pCi/L LLDs were met.

Gamma Spectrometry

Samples from all locations were analyzed for gamma emitting nuclides (Table C–II.2, Appendix C). Naturally occurring K-40 and Th-228 were detected. No nuclides associated with QCNPS were detected and all required LLDs were met.

3. Fish

Fish samples comprised of various commercially and recreationally important species were collected at two locations (Q-24 and Q-29) semiannually. Location Q-24 could be affected by Quad Cities' effluent releases. The following analysis was performed:

Gamma Spectrometry

The edible portion of fish samples from both locations were analyzed for gamma emitting nuclides (Table C–III.1, Appendix C). Naturally occurring K-40 was detected in all samples. No nuclides associated with QCNPS were detected and all required LLDs were met.

4. Sediment

Aquatic sediment samples were collected at two locations (Q-39 and Q-40) semiannually. The location Q-39, located downstream, could be affected by Quad Cities' effluent releases. The following analysis was performed:

Gamma Spectrometry

Sediment samples from Q-39 and Q-40 were analyzed for gamma emitting nuclides (Table C–IV.1, Appendix C). Cesium-137 was detected in two samples, one upstream and one downstream sample. The concentrations were 70 and 80 pCi/L. Occasionally Cs-137 is detected at very low levels (just above LLD) in sediment and is not distinguishable from background levels. No other nuclides potentially associated with QCNPS were detected and all required

LLDs were met. Naturally occurring K-40, Ra-226, Ac-228, Th-228, and Th-232 were detected.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from ten locations on a weekly basis. The ten locations were separated into three groups: Near-field samplers within 4 km (2.5 miles) of the site (Q-01, Q-02, Q-03 and Q-04), far-field samplers between 4 and 10 km (2.5 – 6.2 miles) from the site (Q-13, Q-16, Q-37, Q-38 and Q-41) and the Control sampler between 10 and 30 km (6.2 – 18.6 miles) from the site (Q-42). 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 QCNPS. The results from the near-field locations (Group I) ranged from 7 to 47 E–03 pCi/m^3 with a mean of 19 E–03 pCi/m^3. The results from the far-field locations (Group II) ranged from 5 to 53 E–03 pCi/m^3 with a mean of 19 E–03 pCi/m^3. The results from the Control location (Group III) ranged from 9 to 45 E–03 pCi/m^3 with a mean of 20 E–03 pCi/m^3. Comparison of the 2012 air particulate data with previous year's data indicate no effects from the operation of QCNPS. In addition comparisons of the weekly mean values for 2012 indicate no notable differences among the three groups (Figures C–4 through C–6, Appendix C).

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C–V.3, Appendix C). Naturally occurring Be-7, K-40, and Th-228 were detected. No nuclides associated with QCNPS were detected and all

required LLDs were met.

b. Airborne Iodine

Continuous air samples were collected from ten locations (Q-01, Q-02, Q-03, Q-04, Q-13, Q-16, Q-37, Q-38 Q-41 and Q-42) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). All results were less than the LLD for I-131.

2. Terrestrial

a. Milk

Samples were collected from one location (Q-26) 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 I-131 was detected and the LLD was met.

Gamma Spectrometry

Each milk sample was analyzed for concentrations of gamma emitting nuclides (Table C–VII.2, Appendix C). Naturally occurring K-40 was detected in all samples. No nuclides associated with QCNPS were detected and all required LLDs were met.

b. Food Products

Food product samples were collected at four locations plus a control location (Q-Control, Q-Quad 1, Q-Quad 2, Q-Quad 3 and Q-Quad 4) annually during growing season. Four locations, (Q-Quad 1, Q-Quad 2, Q-Quad 3 and Q-Quad 4) could be affected by Quad Cities' 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). Naturally occurring Be-7, K-40, Ra-226, Ac-228, Th-228, and Th-232 were detected. No nuclides associated with QCNPS were detected and all required LLDs were met.

C. Ambient Gamma Radiation

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

All of the OSLD measurements were below 30 mRem/quarter, with a range of 14.0 to 29.3 mRem/quarter. A comparison of the Inner Ring, Outer Ring and Other data to the Control Location data, indicate that the ambient gamma radiation levels from all the locations were comparable.

D. Independent Spent Fuel Storage Installation

QCNPS commenced use of an Independent Spent Fuel Storage Installation (ISFSI) in Dec 2005. There are no measurable changes in ambient gamma radiation levels as a result of ISFSI operations.

E. Land Use Survey

A Land Use Survey conducted during August 2012 around QCNPS was performed by Environmental Inc. (Midwest Labs) for Exelon Nuclear to comply with the Quad Cities' Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident and milk producing animals in each of the sixteen 22 ½ degree sectors around the site. The results from the land use census have not identified any locations, which yield a calculated dose or dose commitment, via the same pathway, that is at least 20% greater than at a location from which samples are currently being obtained. The results of this survey are summarized below:

Distance in Miles from QCNPS			
Sector	Residence Miles	Livestock Miles	Milk Farm Miles
N	0.6	2.7	-
NNE	3.8	3.1	-
NE	1.3	3.2	-
ENE	2.9	2.9	-
E	2.0	2.7	-
ESE	2.8	3.1	3.1
SE	2.5	3.2	-
SSE	1.1	3.6	6.6, 11.5
S	0.8	1.6	-
SSW	3.2	3.5	-
SW	2.9	3.3	-
WSW	2.2	2.7	-
W	2.6	4.3	4.6
WNW	2.7	3.8	-
NW	2.6	4.7	-
NNW	2.1	2.2	-

Of the above listed Milk Farms, only the farm located at 3.1 miles ESE of QCNPS, listed in the sample results section as Bill Stanley Dairy, has elected to participate in the QCNPS REMP program. Participation by local farmers is voluntary.

F. Errata Data

There is no Errata data for 2012.

G. Summary of Results – Inter-Laboratory Comparison Program

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

1. Analytics Evaluation Criteria

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

2. ERA Evaluation Criteria

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

3. DOE Evaluation Criteria

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

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

For the TBE laboratory, 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.

For the EIML laboratory, 12 out of 14 analytes met the specified acceptance criteria. Two analytes (Gross Beta and Co-57) did not meet the specified acceptance criteria for the following reason:

1. Environmental Inc., Midwest Laboratory's ERA April 2012 Gross Beta in water result of 76.2 pCi/L was higher than the known value of 44.2 pCi/L, exceeding the upper control limit of 51.5 pCi/L. The rerun result of 38.3 fell within the control limits. A sample dilution problem is suspected.

2. Environmental Inc., Midwest Laboratory's MAPEP August 2012 Co-57 in vegetation result of 7.44 pCi/L was higher than the known value of 5.66 pCi/L, exceeding the upper control limit of 7.36 pCi/L. The recount result of 6.74 fell within the control limits. The sample was recounted using a geometry more closely matched to the MAPEP sample size.

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

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APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

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

NAME OF FACILITY: QUAD CITIES | **DOCKET NUMBER: 50-254 &50-265 2012**
LOCATION OF FACILITY: CORDOVA, IL | **REPORTING PERIOD: ANNUAL**

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	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	GR-B	24	4	3.7 (11/12) (2.2/4.9)	4.2 (11/12) (3.0/5.2)	4.2 (11/12) (3.0/5.2)	Q-34 CONTROL CAMANCHE - UPSTREAM 4.4 MILES NNE OF SITE	0
	H-3	8	2000	<LLD	<LLD	-		0
	FE-55	8	200	<LLD	<LLD	-		0
	NI-63	8	5	<LLD	<LLD	-		0
	GAMMA	24						
	MN-54		15	<LLD	<LLD	-		0
	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0

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

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NAME OF FACILITY: QUAD CITIES | **DOCKET NUMBER: 50-254 &50-265 2012**
LOCATION OF FACILITY: CORDOVA, IL | **REPORTING PERIOD: ANNUAL**

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	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (PCI/LITER)	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	I-131		15	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0
	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0

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NAME OF FACILITY: QUAD CITIES				DOCKET NUMBER:		50-254 &50-265 2012		
LOCATION OF FACILITY: CORDOVA, IL				REPORTING PERIOD:		ANNUAL		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
GROUND WATER (PCI/LITER)	H-3	8	2000	<LLD	NA	-		0
	GAMMA	8						
	MN-54		15	<LLD	NA	-		0
	CO-58		15	<LLD	NA	-		0
	FE-59		30	<LLD	NA	-		0
	CO-60		15	<LLD	NA	-		0
	ZN-65		30	<LLD	NA	-		0
	NB-95		15	<LLD	NA	-		0
	ZR-95		30	<LLD	NA	-		0

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LOCATION OF FACILITY: CORDOVA, IL **REPORTING PERIOD: ANNUAL**

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
GROUND WATER (PCI/LITER)	I-131		15	<LLD	NA	-		0
	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		0
FISH (PCI/KG WET)	GAMMA MN-54	8	130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0

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

NAME OF FACILITY: QUAD CITIES LOCATION OF FACILITY: CORDOVA, IL				DOCKET NUMBER: REPORTING PERIOD:		50-254 &50-265 2012 ANNUAL LOCATION WITH HIGHEST ANNUAL MEAN (M)		
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	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FISH (PCI/KG WET)	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		130	<LLD	<LLD	-		0
	CS-137		150	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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LOCATION OF FACILITY: CORDOVA, IL | **REPORTING PERIOD: ANNUAL**

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
SEDIMENT (PCI/KG DRY)	GAMMA	4						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0

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LOCATION OF FACILITY: CORDOVA, IL				REPORTING PERIOD:		ANNUAL		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SEDIMENT (PCI/KG DRY)	CS-137		180	80 (1/2)	70 (1/2)	80 (1/2)	Q-39 INDICATOR CORDOVA - DOWNSTREAM MISSISSIPPI RIVER 0.8 MILES SSW OF SITE	0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	512	10	19 (461/461) (5/53)	20 (50/51) (9/45)	21 (48/48) (9/53)	Q-13 INDICATOR PRINCETON 4.7 MILES SW OF SITE	0
	GAMMA	40						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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NAME OF FACILITY: QUAD CITIES **DOCKET NUMBER: 50-254 &50-265 2012**
LOCATION OF FACILITY: CORDOVA, IL **REPORTING PERIOD: ANNUAL**

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	INDICATOR LOCATIONS MEAN (M) (F) RANGE	CONTROL LOCATION MEAN (M) (F) RANGE	LOCATION WITH HIGHEST ANNUAL MEAN (M) MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
AIR PARTICULATE (E-3 PCI/CU.METER)	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	511	70	<LLD	<LLD	-		0

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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NAME OF FACILITY: QUAD CITIES | **DOCKET NUMBER: 50-254 &50-265 2012**
LOCATION OF FACILITY: CORDOVA, IL | **REPORTING PERIOD: ANNUAL**

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
MILK (PCI/LITER)	I-131	19	1	<LLD	NA	-		0
	GAMMA	19						
	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
	ZR-95		NA	<LLD	NA	-		0

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

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

NAME OF FACILITY: QUAD CITIES				DOCKET NUMBER:		50-254 &50-265 2012		
LOCATION OF FACILITY: CORDOVA, IL				REPORTING PERIOD:		ANNUAL		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
MILK (PCI/LITER)	CS-134		15	<LLD	NA	-		0
	CS-137		18	<LLD	NA	-		0
	BA-140		60	<LLD	NA	-		0
	LA-140		15	<LLD	NA	-		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

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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

NAME OF FACILITY: QUAD CITIES				DOCKET NUMBER:		50-254 &50-265 2012		
LOCATION OF FACILITY: CORDOVA, IL				REPORTING PERIOD:		ANNUAL		
				INDICATOR LOCATIONS	CONTROL LOCATION	LOCATION WITH HIGHEST ANNUAL MEAN (M)		
MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	TYPES OF ANALYSIS PERFORMED	NUMBER OF ANALYSIS PERFORMED	REQUIRED LOWER LIMIT OF DETECTION (LLD)	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	MEAN (M) (F) RANGE	STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
VEGETATION (PCI/KG WET)	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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

NAME OF FACILITY: QUAD CITIES **DOCKET NUMBER: 50-254 &50-265 2012**

LOCATION OF FACILITY: CORDOVA, IL **REPORTING PERIOD: ANNUAL**

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	LOCATION WITH HIGHEST ANNUAL MEAN (M) STATION # NAME DISTANCE AND DIRECTION	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
DIRECT RADIATION (MILLI-ROENTGEN/QTR.)	OSLD-QUARTERLY	325	NA	19.9 (317/317) (14.0/29.3)	22.2 (8/8) (17.0/26.7)	24 (4/4) (19.0/29.3)	Q-211-2 INDICATOR 4.5 MILES SW	0

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FRACTION OF DETECTABLE MEASUREMENTS AT SPECIFIED LOCATIONS IS INDICATED IN PARENTHESIS (F)

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, Quad Cities Nuclear Power Station, 2012

Location	Location Description	Distance & Direction From Site
A. Surface Water		
Q-33	Cordova (indicator)	3.1 miles SSW
Q-34	Camanche, Upstream (control)	4.4 miles NNE
B. Ground/Well Water		
Q-35	McMillan Well (indicator)	1.5 miles S
Q-36	Cordova Well (indicator)	3.3 miles SSW
C. Milk - bi-weekly / monthly		
Q-26	Bill Stanley Dairy (indicator)	3.1 miles ESE
D. Air Particulates / Air Iodine		
Q-01	Onsite 1 (indicator)	0.5 miles N
Q-02	Onsite 2 (indicator)	0.4 miles ENE
Q-03	Onsite 3 (indicator)	0.6 miles S
Q-04	Nitrin (indicator)	1.7 miles NE
Q-13	Princeton (indicator)	4.7 miles SW
Q-16	Low Moor (indicator)	5.7 miles NNW
Q-37	Meredosia Road (indicator)	4.4 miles ENE
Q-38	Fuller Road (indicator)	4.7 miles E
Q-41	Camanche (indicator)	4.3 miles NNE
Q-42	LeClaire (control)	8.7 miles SSW
E. Fish		
Q-24	Pool #14 of Mississippi River, Downstream (indicator)	0.5 miles SW
Q-29	Mississippi River, Upstream (control)	1.0 miles N
F. Sediment		
Q-39	Cordova, Downstream on Mississippi River (indicator)	0.8 miles SSW
Q-40	North of Albany, Upstream on Mississippi River(control)	8.9 miles NE
G. Food Products		
Quadrant 1	Ken DeBaille	2.3 miles ENE
Quadrant 2	Dale Nimmic	3.0 miles ESE
Quadrant 3	Amy Johnston	1.8 miles S
Quadrant 4	Mike Fawcett	4.5 miles NW
Control	Charles Leavens	9.5 miles NE
H. Environmental Dosimetry - OSLD		
Inner Ring		
Q-101-1		0.6 miles N
Q-101-2		0.9 miles N
Q-102-1		1.3 miles NNE
Q-102-3		1.4 miles NNE
Q-103-1 and -2		1.2 miles NE
Q-104-1		1.1 miles ENE
Q-104-2		0.9 miles ENE
Q-105-1 and -2		0.8 miles E
Q-106-2 and -3		0.7 miles ESE
Q-107-2		0.7 miles SE
Q-107-3		0.8 miles SE
Q-108-1		1.0 miles SSE
Q-108-2		0.9 miles SSE

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

Location	Location Description	Distance & Direction From Site
H. Environmental Dosimetry – OSLD (continued)		
Inner Ring		
Q-109-1		0.9 miles S
Q-109-2		1.2 miles S
Q-111-1		2.6 miles SW
Q-111-2		2.5 miles SW
Q-112-1		2.5 miles WSW
Q-112-2		2.2 miles WSW
Q-113-1 and -2		2.5 miles W
Q-114-1		2.1 miles WNW
Q-114-2		2.5 miles WNW
Q-115-1		2.6 miles NW
Q-115-2		2.3 miles NW
Q-116-1		2.3 miles NNW
Q-116-3		2.4 miles NNW
Outer Ring		
Q-202-1		4.4 miles NNE
Q-202-2		4.8 miles NNE
Q-203-1		4.7 miles NE
Q-203-2		5.0 miles NE
Q-204-1		4.7 miles ENE
Q-204-2		4.5 miles ENE
Q-205-1		4.7 miles E
Q-205-4		4.8 miles E
Q-206-1 and -2		4.8 miles ESE
Q-207-1 and -4		4.7 miles SE
Q-208-1		4.3 miles SSE
Q-208-2		4.9 miles SSE
Q-209-1 and -4		4.7 miles S
Q-210-1 and -4 *		4.1 miles SSW
Q-210-5		3.3 miles SSW
Q-211-1 and -2		4.5 miles SW
Q-212-1		5.4 miles WSW
Q-212-2		4.4 miles WSW
Q-213-1		4.3 miles W
Q-213-2		4.8 miles W
Q-214-1		4.7 miles WNW
Q-214-2		4.4 miles WNW
Q-215-1		5.0 miles NW
Q-215-2		4.2 miles NW
Q-216-1		4.6 miles NNW
Q-216-2		4.3 miles NNW
Other		
Q-01	Onsite 1 (indicator)	0.5 miles N
Q-02	Onsite 2 (indicator)	0.4 miles ENE
Q-03	Onsite 3 (indicator)	0.6 miles S
Q-04	Nitrin (indicator)	1.7 miles NE
Q-13	Princeton (indicator)	4.7 miles SW
Q-16	Low Moor (indicator)	5.7 miles NNW
Q-37	Meredosia Road (indicator)	4.4 miles ENE
Q-38	Fuller Road (indicator)	4.7 miles E
Q-41	Camanche (indicator)	4.3 miles NNE

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

Location	Location Description	Distance & Direction From Site
H. Environmental Dosimetry – OSLD (continued)		
Control		
Q-42	LeCLaire	8.7 miles SSW

* Removed from ODCM in December 2006 and replaced by Q-210-5. Q-210-4 is for trending only

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

Sample Medium	Analysis	Sampling Method	Analytical Procedure Number
Surface Water	Gamma Spectroscopy	Monthly composite from weekly grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis
Surface Water	Gross Beta	Monthly composite from weekly grab samples	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices
Surface Water	Tritium	Quarterly composite from weekly grab samples	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Surface Water	Iron and Nickel	Quarterly composite from weekly grab samples	TBE, TBE-2006 Iron-55 in various matrices
Ground Water	Gamma Spectroscopy	Quarterly grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis
Ground Water	Tritium	Quarterly grab samples	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	TBE-2007 Gamma emitting radioisotope analysis
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis
Air Particulates	Gross Beta	One-week composite of continuous air sampling through glass fiber filter paper	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2007 Gamma emitting radioisotope analysis
Air Iodine	Gamma Spectroscopy	Weekly composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma emitting radioisotope analysis
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2012 Radioiodine in various matrices
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2007 Gamma emitting radioisotope analysis
Food Products	Gamma Spectroscopy	Annual grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements	Landauer Incorporated

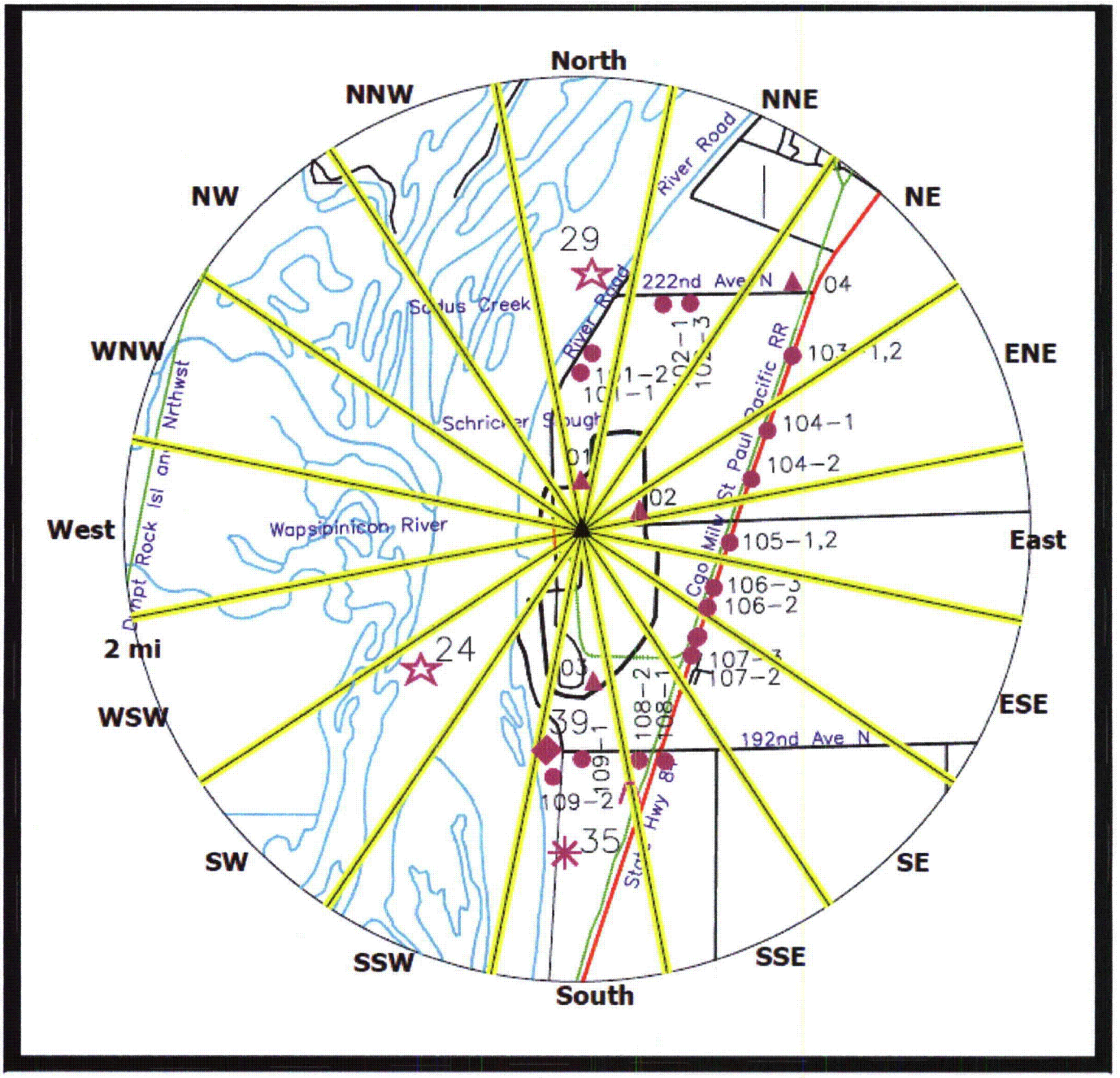

Figure B-1 Map
Quad Cities REMP Sampling Locations – 2 Mile Radius, 2012

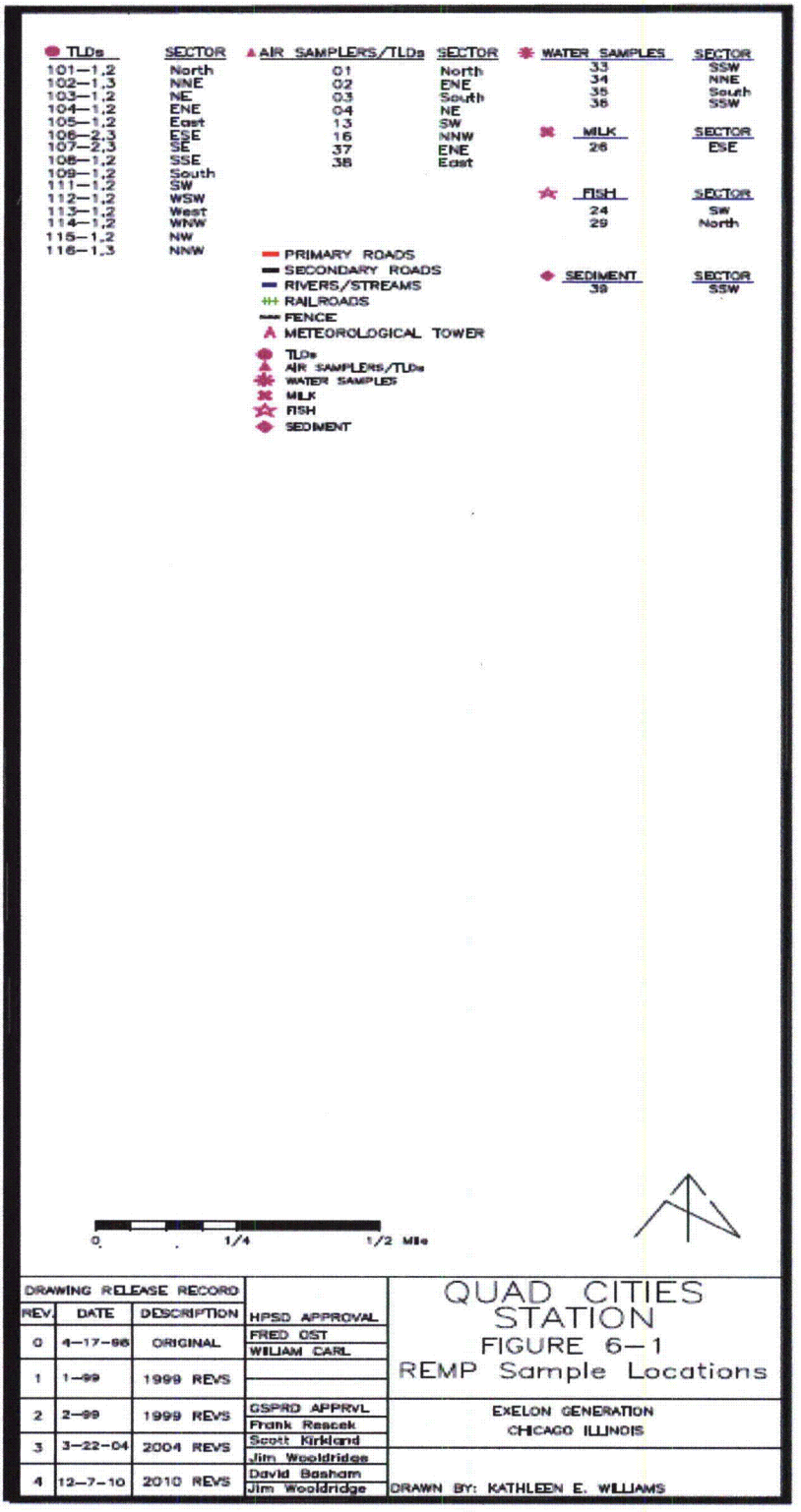

Figure B-1 Legend
Quad Cities REMP Sampling Locations – 2 Mile Radius, 2012

Figure B-2 Map
Quad Cities REMP Sampling Locations – 9.3 Mile Radius, 2012

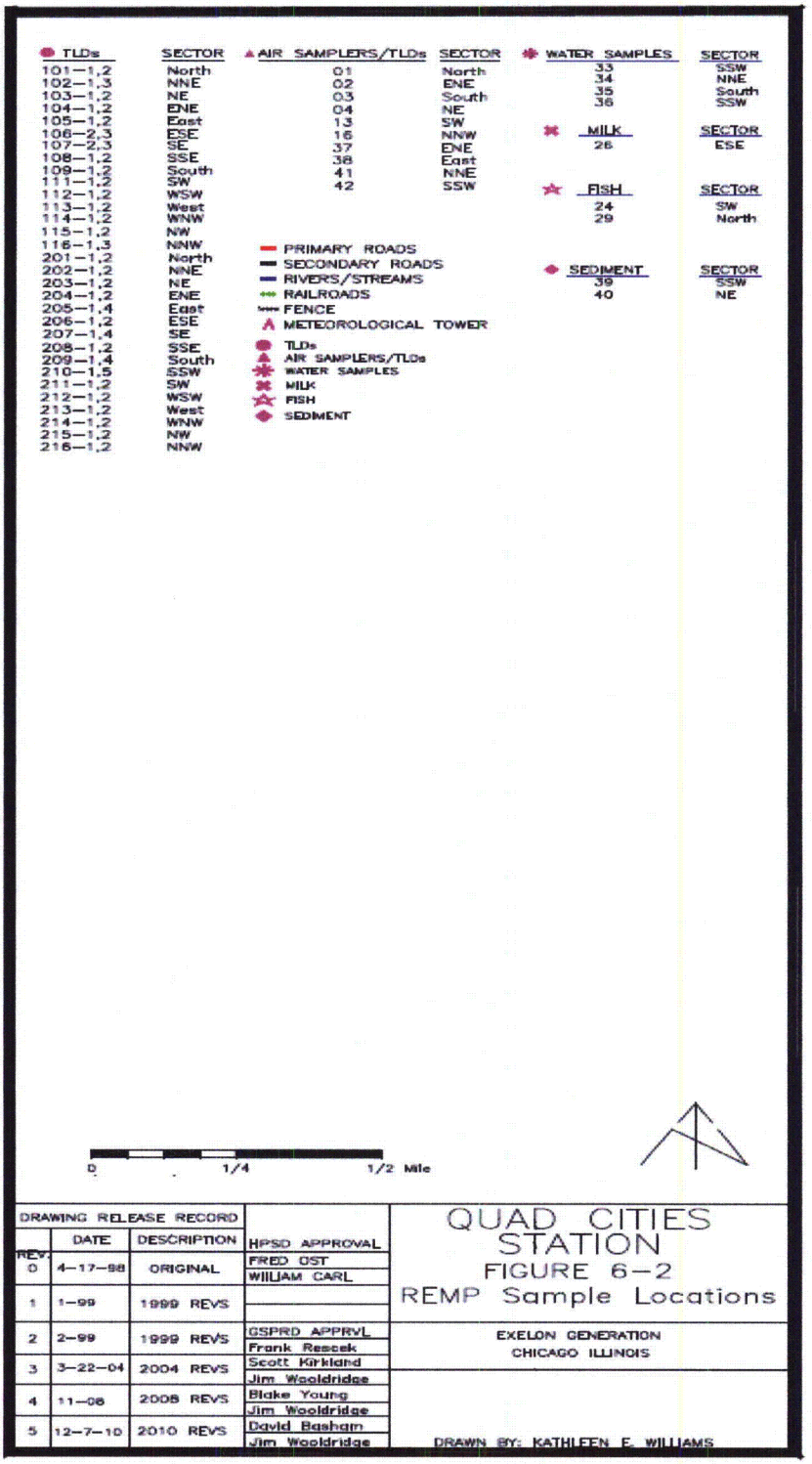

Figure B-2 Legend
Quad Cities REMP Sampling Locations – 9.3 Mile Radius, 2012

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 QUAD CITIES NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q-33	Q-34
01/06/12 - 01/06/12	3.2 ± 1.7 (1)	5.2 ± 1.9 (1)
02/03/12 - 02/23/12	< 2.5 (1)	< 2.6 (1)
03/01/12 - 03/30/12	4.7 ± 1.4	4.4 ± 1.4
04/06/12 - 04/27/12	4.7 ± 1.3	4.5 ± 1.3
05/03/12 - 05/24/12	3.8 ± 1.1	4.8 ± 1.2
06/01/12 - 06/29/12	4.9 ± 1.8	4.3 ± 1.8
07/05/12 - 07/27/12	3.0 ± 1.2	3.1 ± 1.2
08/03/12 - 08/30/12	3.2 ± 1.2	4.1 ± 1.2
09/07/12 - 09/28/12	2.2 ± 1.3	3.0 ± 1.4
10/04/12 - 10/26/12	3.4 ± 1.3	4.1 ± 1.3
11/02/12 - 11/30/12	4.3 ± 1.3	4.6 ± 1.3
12/07/12 - 12/21/12	2.8 ± 1.2 (1)	4.1 ± 1.3 (1)
MEAN*	3.7 ± 1.8	4.2 ± 1.3

TABLE C-I.2 **CONCENTRATIONS OF TRITIUM, IRON-55 AND NICKEL-63 IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION PERIOD	H-3	FE-55	NI-63
Q-33	01/06/12 - 03/30/12	< 108	< 110	< 4
	04/06/12 - 06/29/12	< 146	< 136	< 3
	07/05/12 - 09/28/12	< 164	< 135	< 3
	10/04/12 - 12/14/12	< 179	< 115	< 4
	MEAN	-	-	-
Q-34	01/06/12 - 03/30/12	< 167	< 169	< 4
	04/06/12 - 06/29/12	< 146	< 125	< 3
	07/05/12 - 09/28/12	< 163	< 107	< 4
	10/04/12 - 12/21/12	< 175	< 90	< 3
	MEAN	-	-	-

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

TABLE C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-33	01/06/12 - 01/06/12	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 9	< 1	< 1	< 31	< 9
	02/03/12 - 02/23/12	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 12	< 1	< 1	< 19	< 6
	03/01/12 - 03/30/12	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 9	< 2	< 2	< 18	< 6
	04/06/12 - 04/27/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 4	< 2	< 2	< 9	< 3
	05/03/12 - 05/24/12	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 15	< 2	< 2	< 21	< 7
	06/01/12 - 06/29/12	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 11	< 2	< 2	< 19	< 6
	07/05/12 - 07/27/12	< 5	< 5	< 9	< 4	< 9	< 4	< 8	< 12	< 4	< 5	< 26	< 9
	08/03/12 - 08/30/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 13	< 1	< 2	< 20	< 7
	09/07/12 - 09/28/12	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 8	< 1	< 1	< 14	< 4
	10/04/12 - 10/26/12	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 11	< 1	< 1	< 15	< 5
	11/02/12 - 11/30/12	< 4	< 4	< 7	< 4	< 9	< 3	< 7	< 10	< 3	< 3	< 21	< 7
	12/07/12 - 12/14/12	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 12	< 1	< 1	< 14	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-34	01/06/12 - 01/06/12	< 1	< 1	< 3	< 1	< 2	< 2	< 3	< 10	< 1	< 1	< 31	< 9
	02/03/12 - 02/23/12	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 12	< 1	< 1	< 17	< 5
	03/01/12 - 03/30/12	< 1	< 1	< 3	< 1	< 3	< 2	< 3	< 6	< 1	< 1	< 12	< 4
	04/06/12 - 04/27/12	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 4	< 2	< 2	< 11	< 4
	05/03/12 - 05/24/12	< 2	< 2	< 5	< 2	< 3	< 2	< 4	< 14	< 1	< 2	< 23	< 7
	06/01/12 - 06/29/12	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 9	< 2	< 2	< 16	< 5
	07/05/12 - 07/27/12	< 5	< 4	< 12	< 5	< 12	< 5	< 10	< 11	< 5	< 5	< 30	< 10
	08/03/12 - 08/30/12	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 2	< 20	< 6
	09/07/12 - 09/28/12	< 1	< 1	< 2	< 1	< 2	< 1	< 1	< 4	< 1	< 1	< 8	< 3
	10/04/12 - 10/26/12	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 11	< 1	< 1	< 15	< 4
	11/02/12 - 11/30/12	< 3	< 3	< 6	< 3	< 6	< 3	< 5	< 7	< 3	< 4	< 19	< 5
	12/07/12 - 12/21/12	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 9	< 1	< 1	< 13	< 4
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

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

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	Q-35	Q-36
01/13/12 - 01/13/12	< 171	< 177
04/13/12 - 04/13/12	< 199	< 194
07/13/12 - 07/13/12	< 167	< 168
10/12/12 - 10/12/12	< 159 (1)	< 158
MEAN	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND WATER SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-35	01/13/12 - 01/13/12	< 6	< 6	< 16	< 5	< 15	< 7	< 13	< 14	< 6	< 6	< 31	< 11
	04/13/12 - 04/13/12	< 4	< 4	< 9	< 5	< 7	< 4	< 8	< 10	< 4	< 4	< 26	< 7
	07/13/12 - 07/13/12	< 4	< 4	< 9	< 4	< 8	< 4	< 7	< 9	< 3	< 4	< 22	< 7
	10/12/12 - 10/12/12	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 5	< 2	< 2	< 12	< 4
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-36	01/13/12 - 01/13/12	< 7	< 5	< 12	< 6	< 14	< 7	< 10	< 14	< 6	< 7	< 34	< 12
	04/13/12 - 04/13/12	< 3	< 4	< 8	< 4	< 7	< 4	< 6	< 10	< 4	< 4	< 24	< 6
	07/13/12 - 07/13/12	< 3	< 4	< 9	< 4	< 7	< 4	< 7	< 10	< 4	< 4	< 26	< 8
	10/12/12 - 10/12/12	< 2	< 2	< 4	< 2	< 4	< 2	< 3	< 5	< 2	< 2	< 11	< 3
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

TABLE C-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2012**

RESULTS IN UNITS OF PC/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
Q-24												
Freshwater Drum	05/15/12	< 38	< 47	< 104	< 39	< 85	< 40	< 73	< 42	< 46	< 302	< 93
Shorthead Redhorse	05/15/12	< 48	< 49	< 137	< 57	< 140	< 80	< 113	< 62	< 77	< 410	< 122
Channel Catfish	10/24/12	< 60	< 57	< 149	< 65	< 133	< 72	< 114	< 60	< 71	< 498	< 135
Common Carp	10/24/12	< 54	< 46	< 123	< 49	< 93	< 51	< 99	< 52	< 52	< 410	< 107
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-29												
Channel Catfish	05/15/12	< 54	< 46	< 93	< 37	< 86	< 51	< 87	< 44	< 51	< 345	< 112
Shorthead Redhorse	05/15/12	< 39	< 48	< 97	< 55	< 87	< 50	< 82	< 37	< 39	< 311	< 88
Bigmouth Buffalo	10/24/12	< 50	< 51	< 124	< 56	< 116	< 65	< 101	< 50	< 51	< 368	< 99
Common Carp	10/24/12	< 49	< 53	< 113	< 51	< 108	< 49	< 93	< 43	< 55	< 354	< 87
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IV.1 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-39	05/26/12	< 58	< 57	< 140	< 67	< 120	< 63	< 93	< 43	80 ± 59	< 466	< 118
	10/15/12	< 53	< 51	< 113	< 58	< 104	< 53	< 103	< 48	< 59	< 298	< 71
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-40	05/26/12	< 54	< 58	< 155	< 70	< 122	< 70	< 133	< 50	< 66	< 527	< 212
	10/15/12	< 46	< 44	< 103	< 52	< 104	< 54	< 85	< 42	70 ± 58	< 241	< 78
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-V.1 CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2012

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

COLLECTION	GROUP I				GROUP II					GROUP III
PERIOD	Q-01	Q-02	Q-03	Q-04	Q-13	Q-16	Q-37	Q-38	Q-41	Q-42
12/30/11 - 01/06/12	15 ± 4	14 ± 4	17 ± 5	15 ± 4	18 ± 5	17 ± 4	20 ± 5	15 ± 4	13 ± 4	16 ± 4
01/06/12 - 01/13/12	22 ± 5	25 ± 5	19 ± 4	22 ± 5	23 ± 5	22 ± 5	18 ± 4	21 ± 5	18 ± 4	18 ± 4
01/13/12 - 01/19/12	27 ± 5	26 ± 5	25 ± 5	22 ± 5	28 ± 6	21 ± 5	(1) 24 ± 10	(1) 23 ± 5	27 ± 6	25 ± 5
01/19/12 - 01/27/12	28 ± 5	27 ± 5	28 ± 5	15 ± 4	25 ± 5	31 ± 5	26 ± 5	22 ± 5	(1) 26 ± 5	32 ± 5
01/27/12 - 02/03/12	16 ± 4	16 ± 4	16 ± 4	15 ± 4	14 ± 4	17 ± 4	18 ± 5	15 ± 4	12 ± 4	17 ± 4
02/03/12 - 02/09/12	18 ± 4	22 ± 4	21 ± 4	19 ± 4	22 ± 5	19 ± 5	25 ± 5	23 ± 4	21 ± 5	21 ± 5
02/09/12 - 02/16/12	15 ± 4	13 ± 4	15 ± 4	15 ± 4	19 ± 5	15 ± 4	15 ± 4	13 ± 4	15 ± 4	21 ± 5
02/16/12 - 02/23/12	18 ± 4	18 ± 4	19 ± 4	16 ± 4	23 ± 4	21 ± 4	(1) 22 ± 4	16 ± 4	20 ± 4	19 ± 4
02/23/12 - 03/01/12	20 ± 4	22 ± 4	20 ± 4	19 ± 4	24 ± 4	24 ± 4	19 ± 4	19 ± 4	24 ± 5	24 ± 4
03/01/12 - 03/08/12	18 ± 4	21 ± 4	18 ± 4	20 ± 4	16 ± 4	18 ± 4	20 ± 4	18 ± 4	20 ± 4	18 ± 4
03/08/12 - 03/16/12	14 ± 5	17 ± 5	15 ± 5	20 ± 5	20 ± 4	15 ± 4	16 ± 5	18 ± 5	17 ± 4	17 ± 4
03/16/12 - 03/23/12	13 ± 4	10 ± 4	14 ± 4	16 ± 4	19 ± 4	11 ± 4	(1) 21 ± 8	11 ± 4	15 ± 4	(1) 16 ± 7
03/23/12 - 03/30/12	12 ± 4	10 ± 4	13 ± 4	15 ± 4	11 ± 4	10 ± 4	(1) 12 ± 4	13 ± 4	7 ± 3	13 ± 4
03/30/12 - 04/06/12	10 ± 4	13 ± 4	12 ± 4	11 ± 4	13 ± 4	13 ± 4	10 ± 4	10 ± 4	12 ± 4	16 ± 4
04/06/12 - 04/13/12	17 ± 4	15 ± 4	16 ± 4	15 ± 4	11 ± 4	16 ± 4	14 ± 4	16 ± 4	16 ± 4	15 ± 4
04/13/12 - 04/19/12	13 ± 4	11 ± 4	13 ± 4	18 ± 4	(1)	13 ± 5	(1)	18 ± 4	15 ± 5	12 ± 5
04/19/12 - 04/26/12	15 ± 4	17 ± 4	11 ± 4	15 ± 4	17 ± 4	17 ± 4	5 ± 2	8 ± 4	13 ± 4	18 ± 4
04/26/12 - 05/03/12	11 ± 4	7 ± 4	11 ± 4	11 ± 4	(1)	10 ± 4	11 ± 4	12 ± 5	13 ± 5	15 ± 5
05/03/12 - 05/10/12	9 ± 4	10 ± 4	9 ± 4	9 ± 4	(1)	10 ± 4	12 ± 4	9 ± 4	10 ± 4	9 ± 3
05/10/12 - 05/18/12	(1) 11 ± 5	13 ± 4	14 ± 4	13 ± 4	15 ± 3	12 ± 3	16 ± 4	13 ± 4	15 ± 3	13 ± 3
05/18/12 - 05/24/12	21 ± 5	14 ± 4	14 ± 4	(1) 21 ± 4	19 ± 5	21 ± 5	20 ± 5	18 ± 4	9 ± 4	19 ± 5
05/24/12 - 06/01/12	13 ± 4	10 ± 4	10 ± 4	12 ± 4	9 ± 4	10 ± 4	9 ± 4	7 ± 4	9 ± 4	< 5 (1)
06/01/12 - 06/07/12	11 ± 4	10 ± 4	10 ± 4	9 ± 4	16 ± 5	11 ± 4	12 ± 4	10 ± 4	6 ± 4	(1) 12 ± 5
06/07/12 - 06/15/12	14 ± 4	17 ± 4	14 ± 4	15 ± 4	14 ± 4	11 ± 3	16 ± 4	16 ± 4	14 ± 4	(1) 13 ± 4
06/15/12 - 06/22/12	15 ± 4	11 ± 4	15 ± 4	15 ± 4	15 ± 4	19 ± 4	17 ± 4	15 ± 4	15 ± 4	12 ± 4
06/22/12 - 06/29/12	24 ± 5	19 ± 5	18 ± 5	19 ± 5	11 ± 4	16 ± 5	17 ± 5	12 ± 4	18 ± 5	18 ± 5
06/29/12 - 07/05/12	24 ± 5	21 ± 4	27 ± 5	26 ± 5	25 ± 5	26 ± 5	22 ± 7	19 ± 4	20 ± 5	20 ± 5
07/05/12 - 07/13/12	19 ± 4	13 ± 4	20 ± 4	21 ± 4	15 ± 4	20 ± 4	(1) 18 ± 4	13 ± 4	20 ± 4	17 ± 4
07/13/12 - 07/20/12	23 ± 5	21 ± 4	24 ± 5	19 ± 4	(1) 24 ± 5	21 ± 5	23 ± 5	18 ± 4	19 ± 4	19 ± 4
07/20/12 - 07/27/12	21 ± 5	18 ± 4	24 ± 5	23 ± 5	(1) 22 ± 5	24 ± 5	23 ± 5	18 ± 4	19 ± 4	17 ± 4
07/27/12 - 08/03/12	24 ± 5	21 ± 4	18 ± 4	17 ± 4	22 ± 4	23 ± 5	23 ± 5	18 ± 4	15 ± 4	19 ± 4
08/03/12 - 08/10/12	17 ± 4	20 ± 4	22 ± 4	18 ± 4	17 ± 4	17 ± 4	16 ± 4	17 ± 4	17 ± 4	20 ± 4
08/10/12 - 08/17/12	18 ± 4	19 ± 4	18 ± 4	19 ± 4	21 ± 4	20 ± 4	8 ± 3	18 ± 4	16 ± 4	16 ± 4
08/17/12 - 08/23/12	19 ± 4	23 ± 5	23 ± 5	21 ± 4	20 ± 5	15 ± 4	20 ± 4	24 ± 5	17 ± 5	17 ± 5
08/23/12 - 08/30/12	30 ± 5	26 ± 5	31 ± 5	26 ± 5	25 ± 5	30 ± 5	32 ± 5	26 ± 5	24 ± 5	30 ± 5
08/30/12 - 09/07/12	24 ± 5	23 ± 4	25 ± 5	20 ± 4	25 ± 4	22 ± 4	23 ± 4	24 ± 5	10 ± 3	21 ± 4
09/07/12 - 09/14/12	13 ± 4	14 ± 4	14 ± 4	17 ± 4	15 ± 4	15 ± 4	15 ± 4	15 ± 4	12 ± 4	20 ± 5
09/14/12 - 09/21/12	19 ± 5	16 ± 4	19 ± 5	17 ± 4	19 ± 5	13 ± 4	17 ± 5	16 ± 4	13 ± 4	18 ± 5
09/21/12 - 09/28/12	20 ± 4	17 ± 4	18 ± 4	22 ± 4	19 ± 4	17 ± 4	18 ± 4	16 ± 4	16 ± 4	21 ± 4
09/28/12 - 10/04/12	26 ± 5	27 ± 5	22 ± 4	22 ± 4	33 ± 6	24 ± 5	27 ± 5	23 ± 5	25 ± 5	23 ± 5
10/04/12 - 10/12/12	21 ± 4	18 ± 4	18 ± 4	17 ± 4	17 ± 4	14 ± 3	18 ± 4	18 ± 4	16 ± 4	18 ± 4
10/12/12 - 10/18/12	24 ± 5	19 ± 5	19 ± 5	20 ± 5	23 ± 5	21 ± 5	24 ± 5	20 ± 5	27 ± 5	26 ± 5
10/18/12 - 10/26/12	24 ± 5	17 ± 4	23 ± 5	16 ± 4	19 ± 4	21 ± 4	21 ± 5	19 ± 5	17 ± 4	21 ± 4
10/26/12 - 11/02/12	18 ± 5	17 ± 5	18 ± 5	17 ± 5	21 ± 5	(1) 15 ± 5	11 ± 4	17 ± 5	14 ± 4	20 ± 5
11/02/12 - 11/09/12	15 ± 4	15 ± 4	16 ± 4	15 ± 4	14 ± 4	18 ± 4	15 ± 4	15 ± 4	16 ± 4	16 ± 4
11/09/12 - 11/16/12	25 ± 5	24 ± 5	32 ± 5	26 ± 5	32 ± 5	30 ± 5	30 ± 5	27 ± 5	31 ± 5	24 ± 5
11/16/12 - 11/22/12	43 ± 6	42 ± 6	47 ± 6	42 ± 6	53 ± 7	39 ± 6	47 ± 6	40 ± 5	49 ± 7	45 ± 7
11/22/12 - 11/30/12	32 ± 6	16 ± 5	30 ± 5	25 ± 5	27 ± 4	24 ± 4	26 ± 5	17 ± 4	30 ± 5	32 ± 5
11/30/12 - 12/07/12	18 ± 5	21 ± 5	14 ± 5	20 ± 5	(1)	(1)	31 ± 6	16 ± 5	(1)	(1)
12/07/12 - 12/14/12	25 ± 5	28 ± 5	19 ± 4	23 ± 5	28 ± 5	30 ± 5	20 ± 5	27 ± 5	28 ± 5	34 ± 5
12/14/12 - 12/21/12	38 ± 6	30 ± 6	(1) 28 ± 5	34 ± 6	33 ± 6	34 ± 6	30 ± 5	33 ± 6	38 ± 6	43 ± 6
12/21/12 - 12/28/12	25 ± 5	18 ± 5	29 ± 5	19 ± 4	21 ± 5	24 ± 5	17 ± 4	24 ± 5	23 ± 5	26 ± 5
MEAN	20 ± 14	18 ± 13	19 ± 14	19 ± 11	21 ± 15	19 ± 13	19 ± 15	18 ± 12	18 ± 16	20 ± 14

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

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-V.2 MONTHLY AND YEARLY MEAN VALUES OF GROSS BETA CONCENTRATIONS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2012

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

GROUP I - NEAR-SITE LOCATIONS				GROUP II - FAR-FIELD LOCATIONS				GROUP III - CONTROL LOCATIONS			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
12/30/11 - 02/03/12	14	28	20 ± 10	12/30/11 - 02/03/12	12	31	21 ± 10	12/30/11 - 02/03/12	16	32	21 ± 14
02/03/12 - 03/02/12	13	22	18 ± 5	02/03/12 - 03/02/12	13	25	20 ± 7	02/03/12 - 03/01/12	19	24	21 ± 4
03/02/12 - 03/30/12	10	21	15 ± 7	03/01/12 - 03/30/12	7	21	15 ± 8	03/01/12 - 03/30/12	13	18	16 ± 5
03/30/12 - 05/04/12	7	18	13 ± 6	03/30/12 - 05/04/12	5	18	13 ± 6	03/30/12 - 05/03/12	12	18	15 ± 4
05/04/12 - 06/01/12	9	21	13 ± 8	05/03/12 - 06/01/12	7	21	13 ± 9	05/03/12 - 05/24/12	9	19	14 ± 10
06/01/12 - 06/29/12	9	24	15 ± 8	06/01/12 - 06/29/12	6	19	14 ± 6	06/01/12 - 06/29/12	12	18	14 ± 5
06/29/12 - 08/03/12	13	27	21 ± 6	06/29/12 - 08/03/12	13	26	20 ± 7	06/29/12 - 08/03/12	17	20	18 ± 2
08/03/12 - 08/31/12	17	31	22 ± 9	08/03/12 - 08/31/12	8	32	20 ± 11	08/03/12 - 08/30/12	16	30	20 ± 12
08/31/12 - 09/28/12	13	25	19 ± 7	08/30/12 - 09/28/12	10	25	17 ± 8	08/30/12 - 09/28/12	18	21	20 ± 3
09/28/12 - 11/02/12	16	27	20 ± 7	09/28/12 - 11/02/12	11	33	20 ± 10	09/28/12 - 11/02/12	18	26	21 ± 6
11/02/12 - 11/30/12	15	47	28 ± 22	11/02/12 - 11/30/12	14	53	29 ± 23	11/02/12 - 11/30/12	16	45	29 ± 25
11/30/12 - 12/29/12	14	38	24 ± 13	11/30/12 - 12/29/12	16	38	27 ± 12	12/07/12 - 12/28/12	26	43	34 ± 17
12/30/11 - 12/29/12	7	47	19 ± 13	12/30/11 - 12/29/12	5	53	19 ± 14	12/30/11 - 12/28/12	9	45	20 ± 14

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-01	12/30/11 - 03/30/12	< 3	< 4	< 8	< 4	< 5	< 4	< 7	< 3	< 3	< 69	< 24
	03/30/12 - 06/29/12	< 2	< 2	< 5	< 2	< 5	< 3	< 5	< 2	< 2	< 44	< 23
	06/29/12 - 09/28/12	< 4	< 5	< 12	< 3	< 6	< 5	< 11	< 4	< 3	< 161	< 41
	09/28/12 - 12/29/12	< 3	< 3	< 6	< 2	< 8	< 4	< 6	< 3	< 2	< 49	< 23
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-02	12/30/11 - 03/30/12	< 3	< 4	< 10	< 3	< 8	< 3	< 7	< 3	< 2	< 75	< 21
	03/30/12 - 06/29/12	< 1	< 3	< 6	< 2	< 4	< 2	< 4	< 1	< 2	< 50	< 16
	06/29/12 - 09/28/12	< 2	< 3	< 9	< 3	< 6	< 4	< 4	< 3	< 2	< 105	< 71
	09/28/12 - 12/29/12	< 2	< 3	< 8	< 3	< 7	< 3	< 5	< 2	< 3	< 39	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-03	12/30/11 - 03/30/12	< 2	< 3	< 9	< 3	< 7	< 4	< 7	< 3	< 2	< 80	< 23
	03/30/12 - 06/29/12	< 2	< 3	< 8	< 3	< 5	< 3	< 6	< 3	< 2	< 67	< 27
	06/29/12 - 09/28/12	< 3	< 3	< 9	< 2	< 7	< 3	< 6	< 3	< 2	< 106	< 45
	09/28/12 - 12/29/12	< 3	< 4	< 9	< 3	< 8	< 4	< 6	< 4	< 3	< 58	< 21
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-04	12/30/11 - 03/30/12	< 2	< 2	< 7	< 2	< 6	< 3	< 4	< 2	< 2	< 58	< 20
	03/30/12 - 06/29/12	< 3	< 4	< 9	< 2	< 6	< 4	< 6	< 3	< 2	< 59	< 22
	06/29/12 - 09/28/12	< 2	< 4	< 9	< 2	< 7	< 4	< 6	< 2	< 2	< 180	< 69
	09/28/12 - 12/29/12	< 3	< 2	< 9	< 3	< 6	< 4	< 6	< 3	< 2	< 54	< 17
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-13	12/30/11 - 03/30/12	< 2	< 3	< 9	< 2	< 5	< 4	< 4	< 2	< 2	< 72	< 26
	03/30/12 - 06/29/12	< 3	< 3	< 8	< 3	< 7	< 4	< 7	< 3	< 3	< 74	< 29
	06/29/12 - 09/28/12	< 3	< 3	< 9	< 4	< 7	< 4	< 7	< 2	< 2	< 134	< 40
	09/28/12 - 12/28/12	< 3	< 2	< 6	< 3	< 8	< 3	< 6	< 3	< 2	< 39	< 21
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-16	12/30/11 - 03/30/12	< 3	< 3	< 8	< 2	< 5	< 3	< 5	< 3	< 2	< 72	< 30
	03/30/12 - 06/29/12	< 2	< 3	< 8	< 2	< 6	< 3	< 6	< 2	< 2	< 57	< 25
	06/29/12 - 09/28/12	< 3	< 4	< 9	< 2	< 6	< 4	< 8	< 4	< 2	< 130	< 67
	09/28/12 - 12/28/12	< 3	< 4	< 9	< 2	< 6	< 4	< 7	< 3	< 2	< 48	< 19
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-37	12/30/11 - 03/30/12	< 3	< 4	< 12	< 3	< 8	< 4	< 7	< 4	< 3	< 86	< 26
	03/30/12 - 06/29/12	< 2	< 3	< 9	< 2	< 7	< 3	< 6	< 3	< 2	< 71	< 19
	06/29/12 - 09/28/12	< 3	< 5	< 10	< 4	< 7	< 4	< 5	< 4	< 3	< 157	< 48
	09/28/12 - 12/29/12	< 2	< 2	< 4	< 1	< 5	< 2	< 4	< 2	< 2	< 28	< 10
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-38	12/30/11 - 03/30/12	< 3	< 4	< 10	< 3	< 10	< 4	< 6	< 4	< 3	< 92	< 32
	03/30/12 - 06/29/12	< 3	< 4	< 9	< 3	< 7	< 4	< 6	< 3	< 2	< 83	< 31
	06/29/12 - 09/28/12	< 3	< 5	< 12	< 3	< 9	< 6	< 10	< 5	< 3	< 194	< 58
	09/28/12 - 12/29/12	< 2	< 2	< 5	< 3	< 5	< 3	< 5	< 2	< 1	< 32	< 16
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-41	12/30/11 - 03/30/12	< 2	< 4	< 10	< 4	< 7	< 4	< 6	< 3	< 2	< 63	< 39
	03/30/12 - 06/29/12	< 1	< 2	< 6	< 1	< 4	< 2	< 4	< 2	< 1	< 46	< 18
	06/29/12 - 09/28/12	< 2	< 3	< 8	< 3	< 6	< 3	< 7	< 3	< 2	< 107	< 55
	09/28/12 - 12/28/12	< 2	< 3	< 7	< 2	< 4	< 3	< 4	< 2	< 2	< 41	< 14
	MEAN	-	-	-	-	-	-	-	-	-	-	-
Q-42	12/30/11 - 03/30/12	< 2	< 3	< 7	< 2	< 6	< 4	< 6	< 2	< 2	< 60	< 19
	03/30/12 - 06/29/12	< 2	< 3	< 6	< 2	< 4	< 3	< 5	< 2	< 2	< 64	< 20
	06/29/12 - 09/28/12	< 3	< 3	< 9	< 2	< 5	< 4	< 7	< 3	< 2	< 124	< 42
	09/28/12 - 12/28/12	< 2	< 3	< 9	< 2	< 7	< 3	< 5	< 3	< 2	< 37	< 20
	MEAN	-	-	-	-	-	-	-	-	-	-	-

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

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

COLLECTION	GROUP I				GROUP II					GROUP III
PERIOD	Q-01	Q-02	Q-03	Q-04	Q-13	Q-16	Q-37	Q-38	Q-41	Q-42
12/30/11 - 01/06/12	< 20	< 33	< 34	< 33	< 32	< 33	< 15	< 36	< 34	< 33
01/06/12 - 01/13/12	< 8	< 14	< 14	< 14	< 14	< 8	< 21	< 21	< 20	< 19
01/13/12 - 01/19/12	< 25	< 45	< 46	< 44	< 57	< 47	< 49 (1)	< 40 (1)	< 21	< 47
01/19/12 - 01/27/12	< 16	< 42	< 44	< 42	< 39	< 12	< 33	< 33	< 30	< 29
01/27/12 - 02/03/12	< 18	< 45	< 47	< 45	< 45	< 39	< 42	< 42	< 40	< 17
02/03/12 - 02/09/12	< 30	< 55	< 57	< 55	< 68	< 18	< 45	< 45	< 54	< 52
02/09/12 - 02/16/12	< 20	< 47	< 48	< 47	< 51	< 25	< 59	< 59	< 61	< 60
02/16/12 - 02/23/12	< 17	< 41	< 42	< 41	< 46	< 16	< 47 (1)	< 45	< 49	< 48
02/23/12 - 03/01/12	< 47	< 17	< 48	< 47	< 50	< 20	< 36	< 36	< 38	< 36
03/01/12 - 03/08/12	< 7	< 17	< 18	< 17	< 25	< 11	< 15	< 15	< 20	< 20
03/08/12 - 03/16/12	< 19	< 45	< 33	< 45	< 33	< 32	< 40	< 40	< 29	< 28
03/16/12 - 03/23/12	< 9	< 24	< 25	< 24	< 25	< 10	< 59 (1)	< 24	< 24	< 63 (1)
03/23/12 - 03/30/12	< 38	< 38	< 39	< 16	< 37	< 17	< 47 (1)	< 43	< 42	< 40
03/30/12 - 04/06/12	< 20	< 34	< 35	< 33	< 36	< 24	< 47	< 47	< 48	< 47
04/06/12 - 04/13/12	< 29	< 28	< 29	< 29	< 13	< 9	< 19	< 19	< 18	< 17
04/13/12 - 04/19/12	< 21	< 49	< 51	< 49	(1)	< 29	(1)	< 46	< 56	< 55
04/19/12 - 04/26/12	< 24	< 41	< 42	< 41	< 44	< 28	< 54	< 54	< 57	< 55
04/26/12 - 05/03/12	< 14	< 36	< 37	< 36	(1)	< 23	< 51	< 51	< 56	< 53
05/03/12 - 05/10/12	< 56	< 56	< 58	< 56	(1)	< 54	< 32	< 54	< 56	< 50
05/10/12 - 05/18/12	< 50 (1)	< 59	< 60	< 58	< 64	< 26	< 59	< 59	< 61	< 61
05/18/12 - 05/24/12	< 21	< 52	< 54	< 52 (1)	< 67	< 49	< 40	< 17	< 50	< 50
05/24/12 - 06/01/12	< 36	< 59	< 61	< 59	< 53	< 29	< 68	< 68	< 59	< 58 (1)
06/01/12 - 06/07/12	< 18	< 42	< 43	< 42	< 53	< 51	< 41	< 41	< 20	< 62 (1)
06/07/12 - 06/15/12	< 11	< 27	< 28	< 27	< 23	< 8	< 23	< 23	< 19	< 25 (1)
06/15/12 - 06/22/12	< 16	< 41	< 42	< 41	< 41	< 41	< 42	< 42	< 42	< 17
06/22/12 - 06/29/12	< 37	< 60	< 62	< 60	< 63	< 34	< 65	< 65	< 68	< 68
06/29/12 - 07/05/12	< 11	< 27	< 28	< 27	< 33	< 20	< 53	< 31	< 39	< 39
07/05/12 - 07/13/12	< 21	< 55	< 55	< 55	< 50	< 28	< 58 (1)	< 58	< 52	< 52
07/13/12 - 07/20/12	< 60	< 26	< 58	< 58	< 62	< 23 (1)	< 63	< 63	< 65	< 65
07/20/12 - 07/27/12	< 17	< 40	< 40	< 40	< 40	(1)	< 28	< 28	< 28	< 28
07/27/12 - 08/03/12	< 51	< 49	< 21	< 49	< 48	< 21	< 42	< 42	< 40	< 41
08/03/12 - 08/10/12	< 15	< 27	< 27	< 27	< 27	< 16	< 39	< 38	< 38	< 39
08/10/12 - 08/17/12	< 36	< 35	< 34	< 14	< 34	< 15	< 30	< 30	< 30	< 29
08/17/12 - 08/23/12	< 9	< 24	< 24	< 24	< 29	< 20	< 33	< 33	< 40	< 39
08/23/12 - 08/30/12	< 58	< 56	< 56	< 56	< 25	< 65	< 63	< 63	< 68	< 24
08/30/12 - 09/07/12	< 16	< 40	< 40	< 40	< 35	< 13	< 37	< 37	< 33	< 33
09/07/12 - 09/14/12	< 22	< 54	< 54	< 54	< 52	< 20	< 54	< 54	< 52	< 52
09/14/12 - 09/21/12	< 12	< 32	< 32	< 31	< 32	< 14	< 32	< 32	< 33	< 33
09/21/12 - 09/28/12	< 51	< 50	< 50	< 60	< 60	< 62	< 24	< 44	< 44	< 43
09/28/12 - 10/04/12	< 27	< 50	< 49	< 49	< 62	< 26	< 40	< 40	< 51	< 50
10/04/12 - 10/12/12	< 20	< 52	< 50	< 50	< 52	< 49	< 49	< 20	< 51	< 51
10/12/12 - 10/18/12	< 8	< 22	< 21	< 21	< 24	< 11	< 23	< 23	< 26	< 26
10/18/12 - 10/26/12	< 17	< 32	< 30	< 30	< 27	< 33	< 37	< 37	< 19	< 33
10/26/12 - 11/02/12	< 28	< 50	< 49	< 49	< 47	< 20 (1)	< 57	< 57	< 56	< 56
11/02/12 - 11/09/12	< 14	< 37	< 36	< 36	< 36	< 32	< 33	< 32	< 33	< 14
11/09/12 - 11/16/12	< 11	< 26	< 25	< 25	< 24	< 10	< 20	< 19	< 19	< 19
11/16/12 - 11/22/12	< 15	< 39	< 38	< 38	< 51	< 22	< 41	< 40	< 55	< 55
11/22/12 - 11/30/12	< 15	< 27	< 26	< 26	< 21	< 18	< 43	< 41	< 35	< 34
11/30/12 - 12/07/12	< 64	< 35	< 62	< 41	(1)	(1)	< 41	< 41	(1)	(1)
12/07/12 - 12/14/12	< 15	< 38	< 36	< 36	< 36	< 15	< 36	< 36	< 37	< 37
12/14/12 - 12/21/12	< 12	< 33	< 32 (1)	< 32	< 33	< 15	< 36	< 36	< 37	< 37
12/21/12 - 12/28/12	< 17	< 32	< 31	< 31	< 37	< 23	< 35	< 35	< 44	< 43
MEAN	-	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-VII.1 CONCENTRATIONS OF I-131 IN MILK SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	INDICATOR FARM Q-26
01/06/12	< 0.6
02/03/12	< 0.6
03/02/12	< 0.6
04/06/12	< 0.4
05/04/12	< 0.4
05/18/12	< 0.6
06/01/12	< 0.4
06/15/12	< 0.6
06/29/12	< 0.5
07/13/12	< 0.5
07/27/12	< 0.5
08/10/12	< 0.6
08/24/12	< 0.5
09/07/12	< 0.6
09/21/12	< 0.7
10/05/12	< 0.6
10/19/12	< 0.6
11/02/12	< 0.7
12/07/12	< 0.5
MEAN	-

TABLE C-VII.2 CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-26	01/06/12	< 6	< 6	< 15	< 7	< 19	< 5	< 12	< 5	< 6	< 25	< 9
	02/03/12	< 6	< 7	< 14	< 7	< 17	< 6	< 10	< 6	< 7	< 31	< 9
	03/02/12	< 5	< 6	< 12	< 7	< 13	< 6	< 10	< 5	< 5	< 31	< 8
	04/06/12	< 4	< 4	< 12	< 6	< 10	< 5	< 9	< 4	< 5	< 29	< 11
	05/04/12	< 4	< 5	< 11	< 6	< 11	< 5	< 8	< 4	< 4	< 29	< 10
	05/18/12	< 6	< 5	< 15	< 6	< 13	< 6	< 9	< 5	< 5	< 29	< 10
	06/01/12	< 4	< 4	< 13	< 7	< 11	< 6	< 10	< 4	< 6	< 26	< 9
	06/15/12	< 5	< 5	< 13	< 5	< 10	< 5	< 8	< 4	< 4	< 38	< 12
	06/29/12	< 5	< 5	< 14	< 7	< 13	< 6	< 9	< 5	< 6	< 45	< 14
	07/13/12	< 6	< 5	< 13	< 6	< 11	< 7	< 10	< 5	< 7	< 35	< 10
	07/27/12	< 4	< 5	< 9	< 5	< 8	< 4	< 8	< 4	< 5	< 27	< 7
	08/10/12	< 8	< 6	< 18	< 9	< 18	< 8	< 15	< 7	< 7	< 40	< 11
	08/24/12	< 5	< 5	< 13	< 6	< 12	< 5	< 9	< 4	< 5	< 33	< 13
	09/07/12	< 4	< 4	< 12	< 5	< 10	< 5	< 8	< 5	< 5	< 26	< 7
	09/21/12	< 9	< 6	< 20	< 10	< 17	< 8	< 16	< 6	< 7	< 41	< 13
	10/05/12	< 7	< 9	< 19	< 10	< 19	< 10	< 13	< 8	< 7	< 53	< 9
	10/19/12	< 5	< 5	< 11	< 5	< 10	< 5	< 8	< 4	< 5	< 24	< 7
	11/02/12	< 7	< 8	< 23	< 11	< 17	< 9	< 14	< 8	< 7	< 48	< 14
	12/07/12	< 5	< 5	< 14	< 6	< 13	< 5	< 9	< 5	< 6	< 33	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-

TABLE C-VIII.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF QUAD CITIES 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
Q-CONTROL													
Broccoli	07/10/12	< 16	< 16	< 48	< 21	< 38	< 18	< 31	< 55	< 15	< 29	< 125	< 27
Horseradish	07/10/12	< 13	< 14	< 33	< 18	< 30	< 14	< 26	< 50	< 11	< 15	< 111	< 25
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 1													
Lettuce	07/10/12	< 17	< 17	< 42	< 20	< 37	< 18	< 30	< 57	< 15	< 17	< 119	< 31
Potatoes	07/10/12	< 8	< 8	< 21	< 10	< 16	< 9	< 13	< 28	< 7	< 17	< 59	< 17
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 2													
Onions	07/10/12	< 10	< 10	< 23	< 11	< 21	< 10	< 19	< 38	< 9	< 38	< 78	< 21
Rhubarb leaves	07/10/12	< 12	< 13	< 29	< 13	< 26	< 13	< 23	< 44	< 11	< 12	< 87	< 26
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 3													
Kohlrabi	07/10/12	< 17	< 17	< 40	< 20	< 37	< 20	< 32	< 59	< 14	< 32	< 118	< 30
Onions	07/10/12	< 8	< 8	< 19	< 9	< 18	< 9	< 15	< 29	< 8	< 46	< 61	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
Q-QUAD 4													
Cabbage	07/10/12	< 10	< 10	< 26	< 12	< 22	< 11	< 19	< 40	< 9	< 12	< 81	< 19
Potatoes	07/10/12	< 12	< 12	< 33	< 16	< 30	< 14	< 24	< 44	< 11	< 11	< 86	< 25
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

TABLE C-IX.1 QUARTERLY OSLD RESULTS FOR QUAD CITIES NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF MILLI-REM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
Q-01-1	18.5 ± 5.7	15.0	21.9	19.0	18.0
Q-01-2	18.5 ± 5.2	15.0	21.2	19.2	18.4
Q-02-1	18.6 ± 5.3	15.0	21.3	19.5	18.7
Q-02-2	19.0 ± 4.1	17.0	21.6	19.6	17.8
Q-03-1	17.4 ± 5.5	14.0	20.7	17.7	17.2
Q-03-2	17.4 ± 4.9	14.0	19.8	17.6	18.3
Q-04-1	19.6 ± 5.6	16.0	21.7	21.9	18.7
Q-04-2	19.1 ± 4.4	16.0	21.2	19.9	19.4
Q-13-1	19.7 ± 6.2	16.0	23.0	21.4	18.5
Q-13-2	20.9 ± 8.3	16.0	25.3	23.2	19.0
Q-16-1	17.6 ± 5.6	14.0	20.5	18.9	16.9
Q-16-2	18.9 ± 4.0	17.0	20.9	20.2	17.3
Q-37-1	22.5 ± 4.8	20.0	24.6	24.4	20.8
Q-37-2	21.6 ± 5.7	19.0	23.8	24.3	19.2
Q-38-1	22.0 ± 6.1	18.0	24.8	24.0	21.3
Q-38-2	22.5 ± 5.8	20.0	25.1	24.8	19.9
Q-41-1	18.6 ± 6.7	14.0	21.8	20.0	18.5
Q-41-2	19.6 ± 7.7	15.0	24.2	20.5	18.7
Q-42-1	22.8 ± 6.0	20.0	26.7	23.6	21.0
Q-42-2	21.6 ± 6.8	17.0	24.3	24.1	21.1
Q-101-1	19.5 ± 4.9	16.0	21.5	20.7	19.8
Q-101-2	18.8 ± 6.7	14.0	21.7	20.4	19.0
Q-102-1	21.3 ± 5.8	18.0	23.9	23.5	19.6
Q-102-3	20.1 ± 7.3	16.0	24.2	21.9	18.3
Q-103-1	18.9 ± 5.3	16.0	21.4	20.8	17.2
Q-103-2	18.2 ± 6.6	14.0	22.1	18.6	18.0
Q-104-1	18.6 ± 6.6	14.0	21.7	20.0	18.5
Q-104-2	19.0 ± 5.0	16.0	21.9	19.7	18.3
Q-105-1	19.5 ± 6.9	16.0	23.9	20.3	17.7
Q-105-2	18.5 ± 6.5	14.0	21.5	20.0	18.3
Q-106-2	19.4 ± 4.2	17.0	21.2	21.1	18.3
Q-106-3	19.5 ± 5.7	16.0	22.5	21.0	18.5
Q-107-2	18.0 ± 5.5	14.0	19.9	19.8	18.2
Q-107-3	19.4 ± 6.3	16.0	23.3	20.2	18.0
Q-108-1	17.0 ± 5.7	14.0	(1)	19.7	17.4
Q-108-2	17.8 ± 5.9	14.0	21.0	18.8	17.3
Q-109-1	19.7 ± 5.2	17.0	22.1	21.8	18.0
Q-109-2	20.3 ± 4.5	18.0	23.0	21.1	18.9
Q-111-1	19.5 ± 6.1	15.0	20.9	21.7	20.3
Q-111-2	18.8 ± 5.7	15.0	21.4	20.5	18.2
Q-112-1	20.0 ± 4.3	18.0	22.6	20.8	18.5
Q-112-2	17.6 ± 4.5	15.0	(1)	19.3	18.4
Q-113-1	19.2 ± 5.9	16.0	22.9	19.9	17.8
Q-113-2	18.7 ± 3.4	17.0	21.1	18.4	18.4
Q-114-1	18.8 ± 6.2	15.0	22.0	20.5	17.8
Q-114-2	19.8 ± 4.5	17.0	22.5	20.2	19.4
Q-115-1	18.9 ± 6.1	16.0	22.1	(1)	18.5
Q-115-2	18.4 ± 6.4	14.0	21.1	20.3	18.2
Q-116-1	19.9 ± 4.2	17.0	21.6	21.3	19.6
Q-116-3	20.4 ± 5.6	17.0	23.7	21.0	19.7

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.1 QUARTERLY OSLD RESULTS FOR QUAD CITIES NUCLEAR POWER STATION, 2012

RESULTS IN UNITS OF MILLI-REM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
Q-201-1	19.1 ± 5.9	15.0	21.8	20.4	19.2
Q-201-2	20.9 ± 5.0	18.0	23.3	22.6	19.5
Q-202-1	19.1 ± 4.7	16.0	21.3	20.5	18.5
Q-202-2	20.6 ± 5.3	17.0	23.3	21.3	20.7
Q-203-1	20.7 ± 4.0	18.0	22.5	21.9	20.4
Q-203-2	21.8 ± 4.6	19.0	22.7	24.4	20.9
Q-204-1	22.5 ± 8.9	17.0	27.7	23.8	21.5
Q-204-2	22.1 ± 7.4	17.0	25.4	24.2	21.8
Q-205-1	21.2 ± 6.6	17.0	25.1	21.5	21.0
Q-205-4	20.1 ± 7.2	21.0	15.5	24.2	19.6
Q-206-1	20.5 ± 7.0	16.0	23.7	22.8	19.4
Q-206-2	18.6 ± 5.1	15.0	20.5	20.3	18.7
Q-207-1	20.4 ± 8.6	15.0	25.3	21.6	19.6
Q-207-4	21.4 ± 7.5	16.0	24.5	23.1	21.9
Q-208-1	20.1 ± 3.2	19.0	20.7	22.1	18.7
Q-208-2	22.5 ± 7.4	18.0	26.6	24.0	21.2
Q-209-1	21.1 ± 6.2	17.0	23.7	23.3	20.2
Q-209-4	19.4 ± 9.5	16.0	(1)	22.7	(1)
Q-210-1	22.3 ± 4.3	20.0	(1)	24.2	22.7
Q-210-4	20.5 ± 5.7	17.0	22.0	23.5	19.6
Q-210-5	18.4 ± 6.1	14.0	20.8	20.1	18.7
Q-211-1	23.5 ± 9.3	17.0	27.6	25.9	23.4
Q-211-2	24.0 ± 8.7	19.0	29.3	25.1	22.6
Q-212-1	19.7 ± 5.8	16.0	23.0	20.5	19.4
Q-212-2	19.5 ± 4.5	17.0	21.9	20.7	18.2
Q-213-1	19.9 ± 7.6	15.0	24.1	21.1	19.5
Q-213-2	18.6 ± 3.7	16.0	20.1	19.6	18.7
Q-214-1	19.8 ± 7.5	15.0	24.0	20.7	19.3
Q-214-2	21.9 ± 4.2	20.0	24.0	23.5	20.2
Q-215-1	19.7 ± 7.1	15.0	23.3	21.4	19.1
Q-215-2	21.9 ± 5.4	19.0	25.5	21.4	21.8
Q-216-1	21.2 ± 7.6	16.0	24.2	23.8	20.8
Q-216-2	20.5 ± 4.7	18.0	(1)	22.6	21.0

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

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

RESULTS IN UNITS OF MILLIREM/QUARTER
STANDARD DEVIATIONS OF THE STATION DATA

COLLECTION PERIOD	INNER RING ± 2 S.D.	OUTER RING	OTHER	CONTROL
JAN-MAR	15.7 ± 2.7	17.0 ± 3.4	16.2 ± 4.0	18.5 ± 4.2
APR-JUN	22.1 ± 2.1	23.4 ± 5.4	22.4 ± 3.5	25.5 ± 3.4
JUL-SEP	20.5 ± 2.1	22.4 ± 3.3	20.9 ± 4.7	23.9 ± 0.7
OCT-DEC	18.5 ± 1.5	20.2 ± 2.7	18.7 ± 2.3	21.1 ± 0.1

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

RESULTS IN UNITS OF MILLIREM/QUARTER

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
INNER RING	117	14.0	24.2	19.1 ± 5.2
OUTER RING	128	14.0	29.3	20.7 ± 6.2
OTHER	72	14.0	25.3	19.5 ± 6.0
CONTROL	8	17.0	26.7	22.2 ± 6.1

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

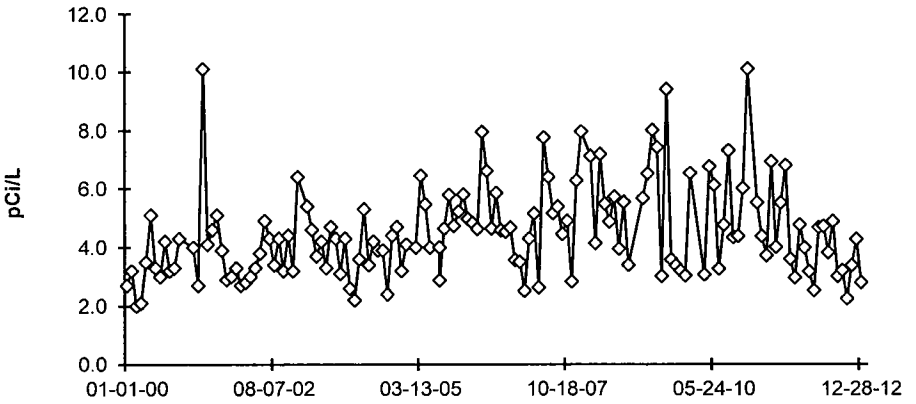
OUTER RING STATIONS - Q-201-1, Q-201-2, Q-202-1, Q-202-2, Q-203-1, Q-203-2, Q-204-1, Q-204-2, Q-205-1, Q-205-4, Q-206-1, Q-206-2, Q-207-1, Q-207-4, Q-208-1, Q-208-2, Q-209-1, Q-209-4, Q-210-1, Q-210-4, Q-210-5, Q-211-1, Q-211-2, Q-212-1, Q-212-2, Q-213-1, Q-213-2, Q-214-1, Q-214-2, Q-215-1, Q-215-2, Q-216-1, Q-216-2

OTHER STATIONS - Q-01-1, Q-01-2, Q-02-1, Q-02-2, Q-03-1, Q-03-2, Q-04-1, Q-04-2, Q-13-1, Q-13-2, Q-16-1, Q-16-2, Q-37-1, Q-37-2, Q-38-1, Q-38-2, Q-41-1, Q-41-2

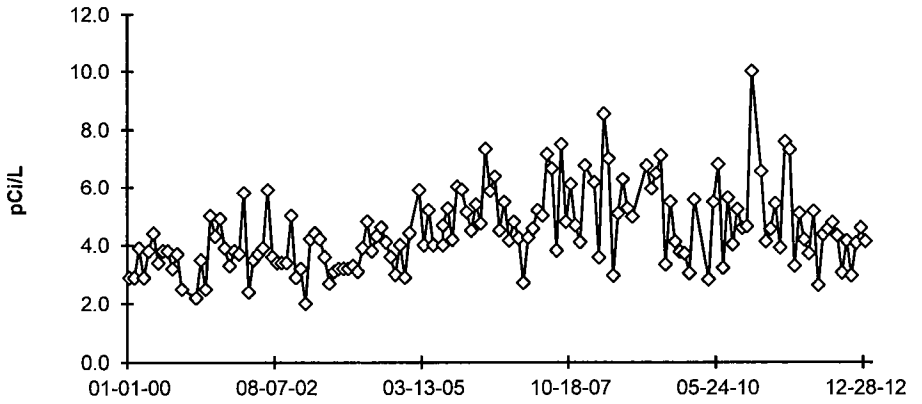
CONTROL STATIONS - Q-42-1, Q-42-2

FIGURE C-1
Surface Water - Gross Beta - Stations Q-33 and Q-34 (C) Collected in the Vicinity of QCNPS, 2000 - 2012

Q-33 Cordova



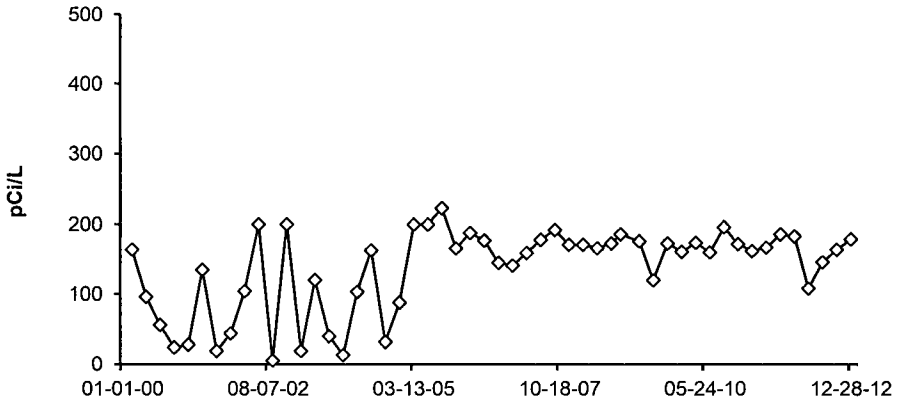
Q-34 (C) Camanche



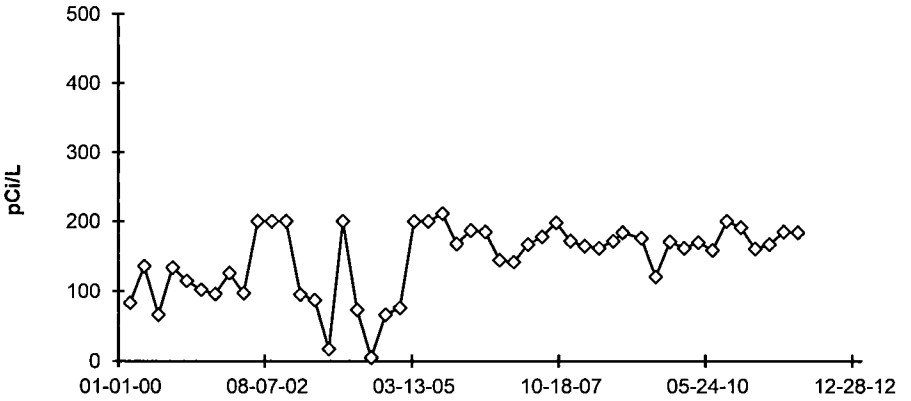
DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-2
Surface Water - Tritium - Stations Q-33 and Q-34 (C) Collected in the Vicinity of QCNPS, 2000 - 2012

Q-33 Cordova

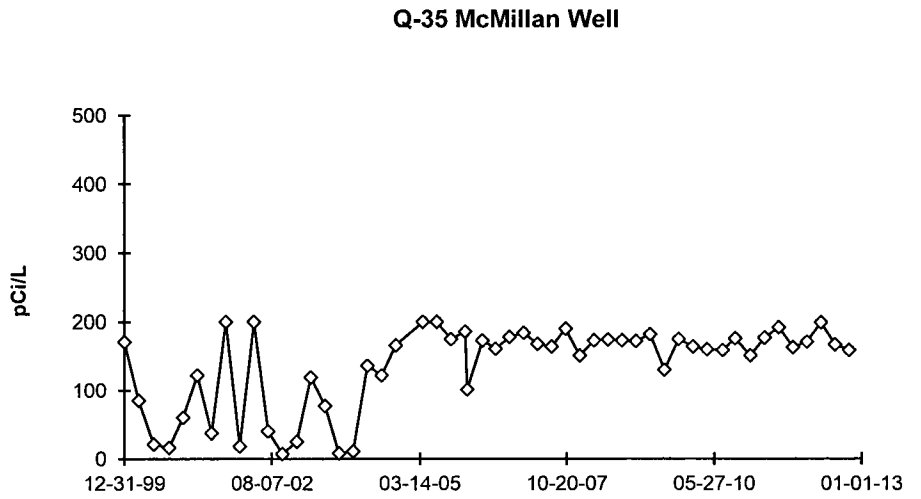


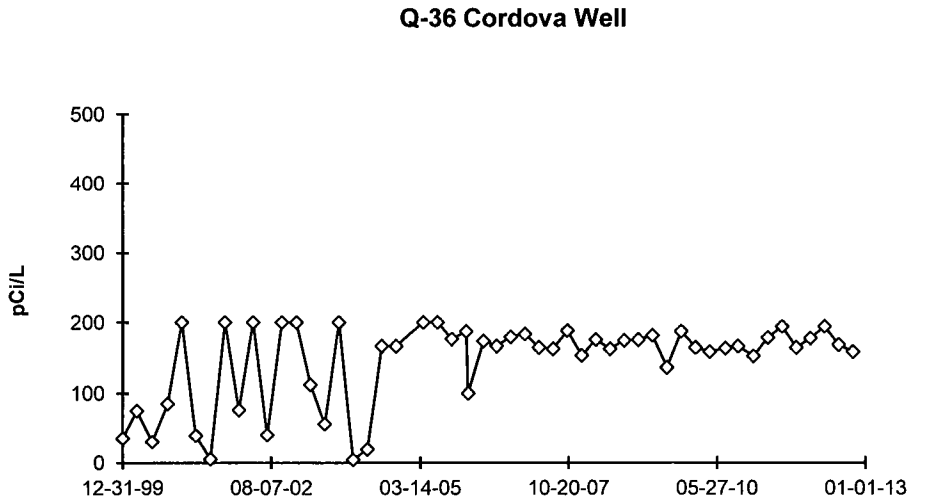
Q-34 (C) Camanche



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

FIGURE C-3
Ground Water - Tritium - Stations Q-35 and Q-36 Collected in the Vicinity of QCNPS, 2000 - 2012

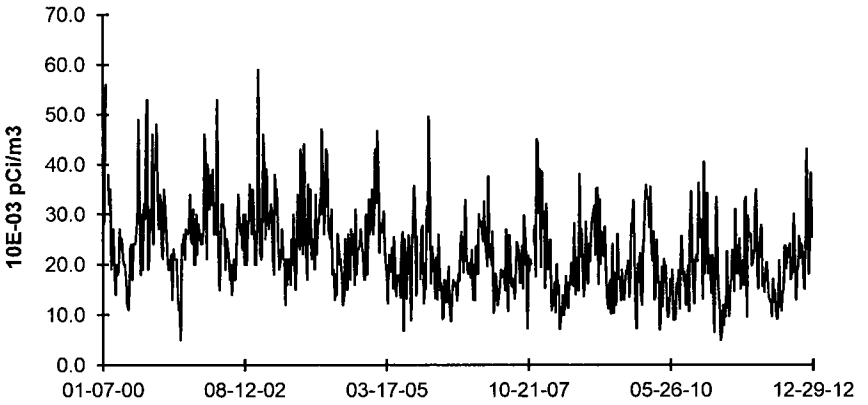




DUE TO VENDOR CHANGE, < VALUES ARE LLD VALUES JANUARY THROUGH JUNE 2005 AND MDC VALUES AFTER JULY 2005

FIGURE C-4
Air Particulates - Gross Beta- Stations Q-01 and Q-02 Collected in the Vicinity of QCNPS, 2000 - 2012

Q-01 Onsite No. 1



Q-02 Onsite No. 2

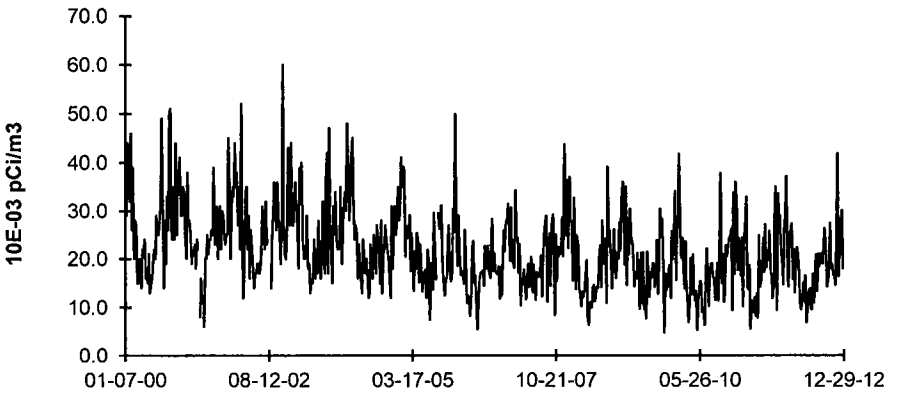
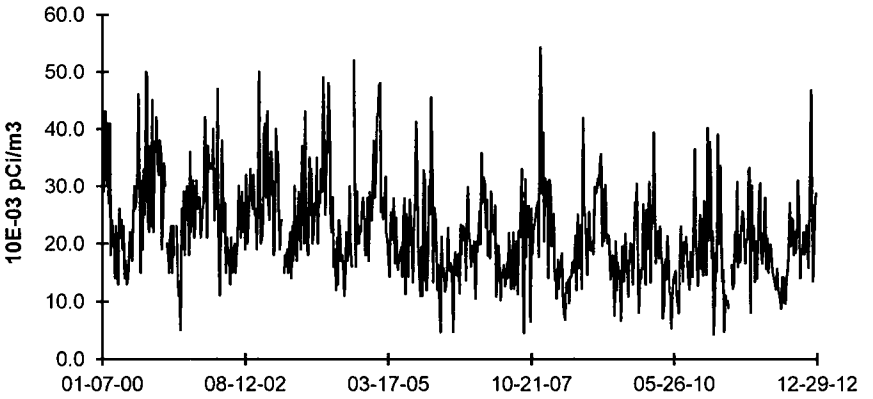


FIGURE C-5
Air Particulates - Gross Beta- Stations Q-03 and Q-04 Collected in the Vicinity of QCNPS, 2000 - 2012

Q-03 Onsite No. 3



Q-04 Nitrin

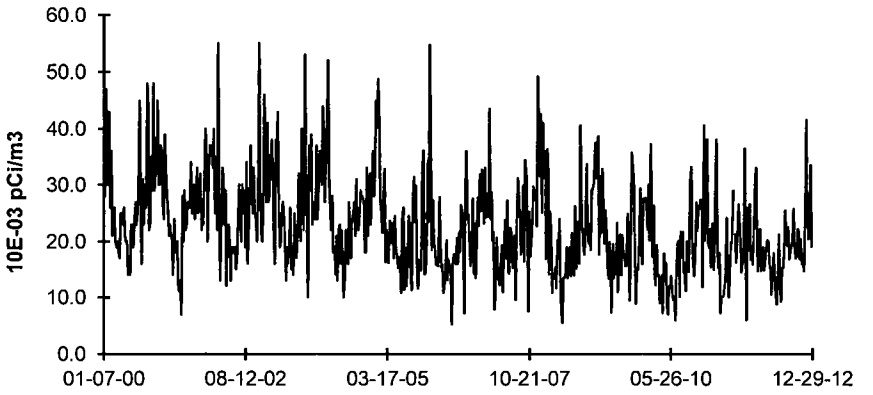
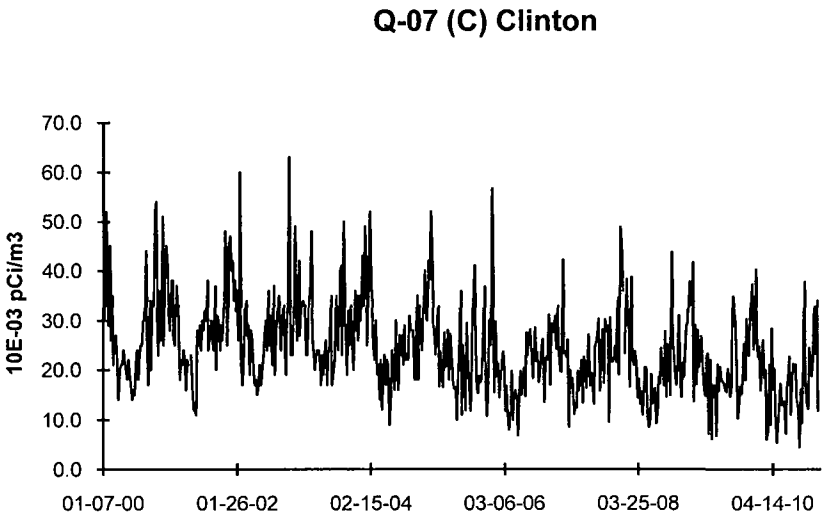
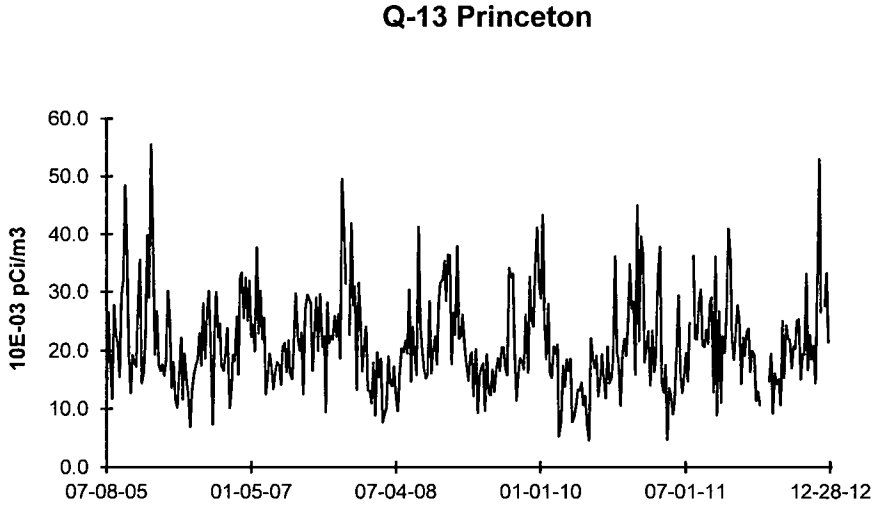


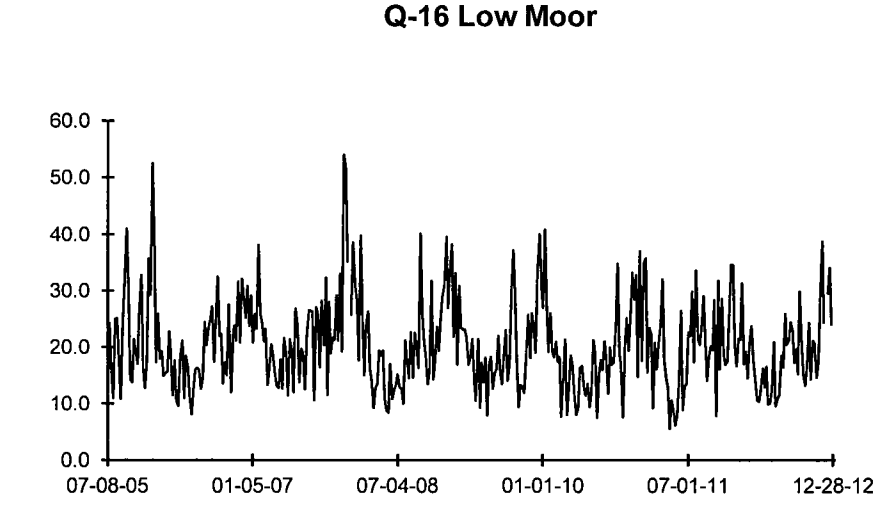
FIGURE C-6
Air Particulates - Gross Beta- Station Q-07 (C)
Collected in the Vicinity of QCNPS, 2000 - 2010



This location was removed from the program in January 2011 due to updated annual average meteorology. This data is retained in the report for historical comparision.

FIGURE C-7
Air Particulates - Gross Beta- Stations Q-13 and Q-16 Collected in the Vicinity of QCNPS, 2005 - 2012

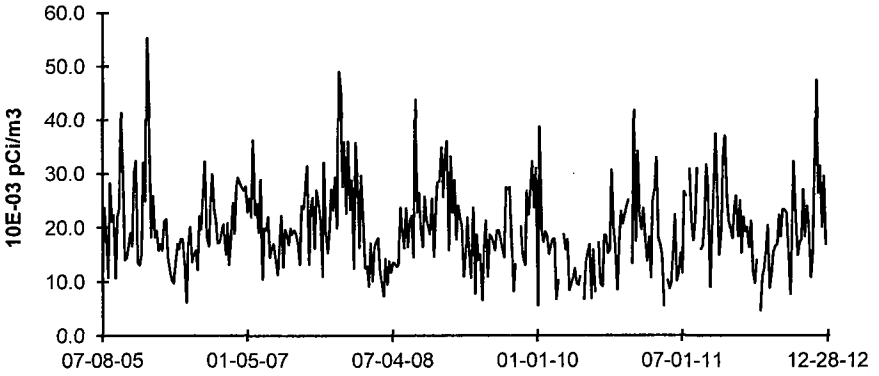




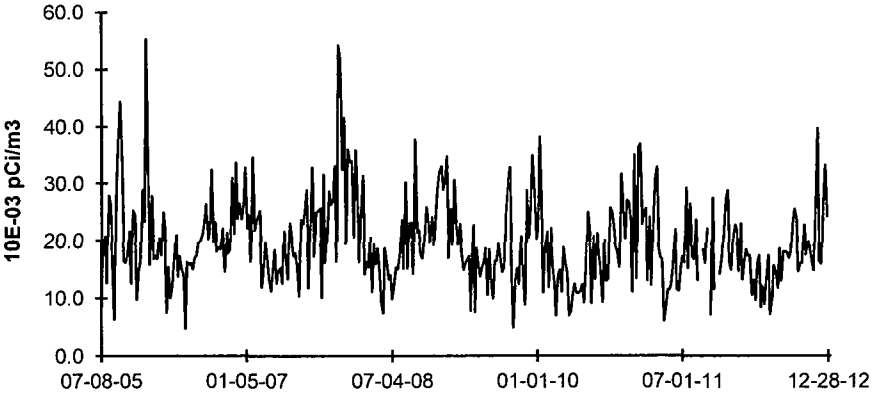
AIR PARTICULATE GROSS BETA ANALYSES OF FAR FIELD LOCATIONS STARTED IN JULY 2005

FIGURE C-8
Air Particulates - Gross Beta- Stations Q-37 and Q-38 Collected in the Vicinity of QCNPS, 2005 - 2012

Q-37 Meredosia Road



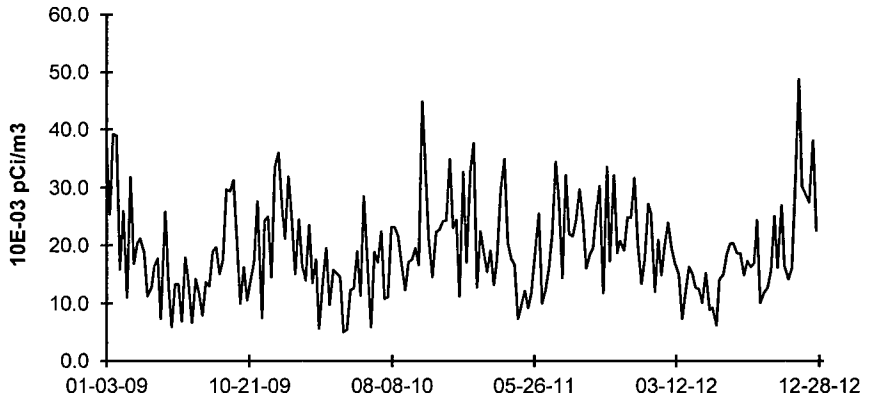
Q-38 Fuller Road



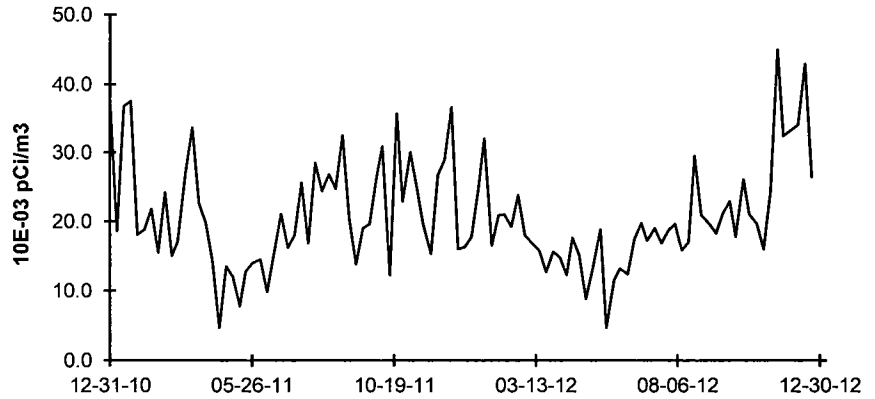
AIR PARTICULATE GROSS BETA ANALYSES OF FAR FIELD LOCATIONS STARTED IN JULY 2005

FIGURE C-9
Air Particulates - Gross Beta- Stations Q-41 and Q-42 (C) Collected in the Vicinity of QCNPS, 2009 - 2012

Q-41 Camanche



Q-42 LeClaire (Control)



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.

TABLE D-4 **ERA STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM[a]**
ENVIRONMENTAL, INC., 2012

Lab Code	Date	Analysis	Concentration (pCi/L) Laboratory Result [b]	ERA Result [c]	Control Limits	Acceptance
ERW-1783	04/09/12	Sr-89	62.2 ± 6.0	58.5	46.9 - 66.3	Pass
ERW-1783	04/09/12	Sr-90	33.7 ± 2.1	37.4	27.4 - 43.1	Pass
ERW-1786	04/09/12	Ba-133	75.7 ± 4.1	82.3	69.1 - 90.5	Pass
ERW-1786	04/09/12	Co-60	71.9 ± 4.0	72.9	65.6 - 82.6	Pass
ERW-1786	04/09/12	Cs-134	70.0 ± 4.3	74.2	60.6 - 81.6	Pass
ERW-1786	04/09/12	Cs-137	151.5 ± 6.1	155.0	140.0 - 172.0	Pass
ERW-1786	04/09/12	Zn-65	108.3 ± 89.0	105.0	94.5 - 125.0	Pass
ERW-1789	04/09/12	Gr. Alpha	55.0 ± 2.4	62.9	33.0 - 78.0	Pass
ERW-1789 [d]	04/09/12	Gr. Beta	76.2 ± 1.8	44.2	29.6 - 51.5	Fail
ERW-1798	04/09/12	H-3	16023 ± 355	15800	13800 - 17400	Pass
ERW-6283	10/05/12	Sr-89	41.5 ± 4.1	39.1	29.7 - 46.1	Pass
ERW-6283	10/05/12	Sr-90	19.7 ± 1.6	20.1	14.4 - 23.8	Pass
ERW-6286	10/05/12	Ba-133	82.7 ± 4.4	84.8	71.3 - 93.3	Pass
ERW-6286	10/05/12	Co-60	77.2 ± 3.7	78.3	70.5 - 88.5	Pass
ERW-6286	10/05/12	Cs-134	74.4 ± 1.5	76.6	62.6 - 84.3	Pass
ERW-6286	10/05/12	Cs-137	183.0 ± 6.2	183.0	165.0 - 203.0	Pass
ERW-6286	10/05/12	Zn-65	211.0 ± 9.9	204.0	184.0 - 240.0	Pass
ERW-6288	10/05/12	Gr. Alpha	47.0 ± 2.3	58.6	30.6 - 72.9	Pass
ERW-6288	10/05/12	Gr. Beta	33.4 ± 1.2	39.2	26.0 - 46.7	Pass
ERW-6290	10/05/12	I-131	23.3 ± 1.0	24.8	20.6 - 29.4	Pass

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

[b] Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

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

[d] Result of reanalysis: 38.3 ± 1.3 pCi/L. Sample dilution problem suspected. A new dilution was prepared.

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
ENVIRONMENTAL, INC., 2012
(Page 1 of 2)

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
STSO-1766	02/01/12	Co-57	1352.10 ± 4.00	1179.00	825.00 - 1533.00	Pass
STSO-1766	02/01/12	Co-60	1.70 ± 0.70	1.56	1.00 - 2.00	Pass
STSO-1766	02/01/12	Cs-134	842.20 ± 4.30	828.00	580.00 - 1076.00	Pass
STSO-1766	02/01/12	Cs-137	0.40 ± 0.90	0.00	0.00 - 1.00	Pass
STSO-1766	02/01/12	K-40	1729.60 ± 22.20	1491.00	1044.00 - 1938.00	Pass
STSO-1766	02/01/12	Mn-54	647.60 ± 4.20	558.00	391.00 - 725.00	Pass
STSO-1766	02/01/12	Sr-90	383.20 ± 15.30	392.00	274.00 - 510.00	Pass
STSO-1766	02/01/12	Zn-65	766.70 ± 6.70	642.00	449.00 - 835.00	Pass
STAP-1772	02/01/12	Co-57	0.010 ± 0.01	0.00	0.000 - 1.00	Pass
STAP-1772	02/01/12	Co-60	2.40 ± 0.08	2.18	1.53 - 2.84	Pass
STAP-1772	02/01/12	Cs-134	2.33 ± 0.13	2.38	1.67 - 3.09	Pass
STAP-1772	02/01/12	Cs-137	2.07 ± 0.10	1.79	1.25 - 2.33	Pass
STAP-1772	02/01/12	Mn-54	3.77 ± 0.14	3.24	2.27 - 4.21	Pass
STAP-1772	02/01/12	Sr-90	-0.010 ± 0.060	0.000	-0.10 - 0.13	Pass
STAP-1772	02/01/12	Zn-65	3.67 ± 0.20	2.99	2.09 - 3.89	Pass
STAP-1773	02/01/12	Gr. Alpha	0.51 ± 0.05	1.20	0.40 - 2.00	Pass
STAP-1773	02/01/12	Gr. Beta	2.75 ± 0.10	2.40	1.20 - 3.60	Pass
STVE-1776	02/01/12	Co-57	14.57 ± 0.28	12.00	8.40 - 15.60	Pass
STVE-1776	02/01/12	Co-60	6.45 ± 0.23	6.05	4.24 - 7.87	Pass
STVE-1776	02/01/12	Cs-134	8.39 ± 0.29	8.43	5.90 - 10.96	Pass
STVE-1776	02/01/12	Cs-137	0.01 ± 0.09	0.00	0.00 - 0.10	Pass
STVE-1776	02/01/12	Mn-54	0.03 ± 0.08	0.00	0.00 - 0.10	Pass
STVE-1776	02/01/12	Zn-65	10.31 ± 0.67	8.90	6.23 - 11.57	Pass
STW-1960	02/01/12	Gr. Alpha	1.68 ± 0.09	2.14	0.64 - 3.64	Pass
STW-1960	02/01/12	Gr. Beta	6.33 ± 0.10	6.36	3.18 - 9.54	Pass
STW-1964	02/01/12	Co-57	33.30 ± 0.40	32.90	23.00 - 42.80	Pass
STW-1964	02/01/12	Co-60	23.20 ± 0.40	23.72	16.60 - 30.84	Pass
STW-1964	02/01/12	Cs-134	0.30 ± 3.00	0.00	0.00 - 1.00	Pass
STW-1964	02/01/12	Cs-137	40.10 ± 0.60	39.90	27.90 - 51.90	Pass
STW-1964	02/01/12	H-3	460.00 ± 12.10	437.00	306.00 - 568.00	Pass
STW-1964	02/01/12	K-40	153.00 ± 4.20	142.00	99.00 - 185.00	Pass
STW-1964	02/01/12	Mn-54	32.70 ± 0.60	31.80	22.30 - 41.30	Pass
STW-1964	02/01/12	Sr-90	0.10 ± 0.20	0.00	0.00 - 1.00	Pass
STW-1964	02/01/12	Zn-65	0.01 ± 0.20	0.00	0.00 - 1.00	Pass

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) ENVIRONMENTAL, INC., 2012

			Concentration [a]			
Lab Code [b]	Date	Analysis	Laboratory result	Known Activity	Control Limits [c]	Acceptance
STSO-5392	08/01/12	Sr-90	483.52 ± 16.47	508.00	356.00 - 660.00	Pass
STSO-5394	08/01/12	Co-57	1528.00 ± 4.10	1316.00	921.00 - 1711.00	Pass
STSO-5394	08/01/12	Co-60	592.00 ± 3.20	531.00	372.00 - 690.00	Pass
STSO-5394	08/01/12	Cs-134	933.60 ± 5.82	939.00	657.00 - 1221.00	Pass
STSO-5394	08/01/12	Cs-137	1319.80 ± 5.50	1150.00	805.00 - 1495.00	Pass
STSO-5394	08/01/12	K-40	737.30 ± 17.70	632.00	442.00 - 822.00	Pass
STSO-5394	08/01/12	Mn-54	1083.20 ± 5.20	920.00	644.00 - 1196.00	Pass
STSO-5394	08/01/12	Zn-65	696.10 ± 7.00	606.00	424.00 - 788.00	Pass
STVE-5395 [d]	08/01/12	Co-57	7.44 ± 0.17	5.66	3.96 - 7.36	Fail
STVE-5395	08/01/12	Co-60	5.90 ± 0.15	5.12	3.58 - 6.66	Pass
STVE-5395	08/01/12	Cs-134	7.40 ± 0.31	6.51	4.56 - 8.46	Pass
STVE-5395	08/01/12	Cs-137	5.45 ± 0.18	4.38	3.07 - 5.69	Pass
STVE-5395	08/01/12	Mn-54	4.06 ± 0.21	3.27	2.29 - 4.25	Pass
STAP-5398	08/01/12	Gr. Alpha	0.41 ± 0.05	0.97	0.29 - 1.65	Pass
STAP-5398	08/01/12	Gr. Beta	2.11 ± 0.09	1.92	0.96 - 2.88	Pass
STAP-5403	08/01/12	Co-57	1.96 ± 0.05	1.91	1.34 - 2.48	Pass
STAP-5403	08/01/12	Co-60	1.76 ± 0.07	1.73	1.21 - 2.25	Pass
STAP-5403	08/01/12	Cs-134	2.74 ± 0.18	2.74	1.92 - 3.56	Pass
STAP-5403	08/01/12	Cs-137	0.00 ± 0.03	0.00	-0.01 - 0.01	Pass
STAP-5403	08/01/12	Mn-54	2.52 ± 0.10	2.36	1.65 - 3.07	Pass
STAP-5403	08/01/12	Zn-65	0.01 ± 0.06	0.00	-0.010 - 0.010	Pass

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

[b] Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).

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

[d] Result of reanalysis; 6.74 ± 0.15 Bq/sample. Gamma emitters for the vegetation matrix exhibited a high bias, only Co-57 exceeded acceptance limits. Recounted using a geometry more closely matched to the MAPEP sample size.

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