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10 CFR 50 Appendix I

RA14-016

May 15, 2014

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555

LaSalle County Station, Units 1 and 2
Facility Operating License Nos. NPF-11 and NPF-18
NRC Docket Nos. 50-373 and 50-374

Subject: 2013 Annual Radiological Environmental Operating Report

Enclosed is the Exelon Generation Company, LLC, LaSalle County Station 2013 Annual Radiological Environmental Operating Report, submitted in accordance with Technical Specification 5.6.2, "Annual Radiological Environmental Operating Report." This report contains the results of the Radiological Environmental and Meteorological Monitoring Programs. This report is enclosed as an attachment.

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

Should you have any questions concerning this letter, please contact Mr. Guy V. Ford, Regulatory Assurance Manager, at (815) 415-2800.

Respectfully,

Peter J. Karaba
Site Vice President
LaSalle County Station

Attachment

cc: Regional Administrator - NRC Region III
NRC Senior Resident Inspector - LaSalle County Station

Docket No: 50-373
50-374

LASALLE COUNTY STATION
UNITS 1 and 2

Annual Radiological
Environmental Operating Report

1 January Through 31 December 2013

Prepared By

Teledyne Brown Engineering
Environmental Services

LaSalle County Station
Marseilles, IL 61341

May 2014

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Appendices

I. Summary and Conclusions

This report on the Radiological Environmental Monitoring Program conducted for the LaSalle County Station (LSCS) by Exelon covers the period 1 January 2013 through 31 December 2013. During that time period, 1,453 analyses were performed on 1,353 samples. In assessing all the data gathered for this report and comparing these results with preoperational data, it was concluded that the operation of LSCS had no adverse radiological impact on the environment.

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

Fish (commercially and recreationally important species) and sediment samples were analyzed for concentrations of gamma emitting nuclides. No fission or activation products were detected in fish or sediment.

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 weekly air samples. All results were less than the minimum detectable activity for I-131.

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

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

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

II. Introduction

The LaSalle County Station (LSCS), consists of two boiling water reactors, each rated for 3,546 MWt. Both units are owned and operated by Exelon Corporation and are located in LaSalle County, Illinois. Unit 1 went critical on 16 March 1982. Unit 2 went critical on 02 December 1983. The site is located in northern Illinois, approximately 75 miles southwest of Chicago, Illinois.

A Radiological Environmental Monitoring Program (REMP) for LSCS was initiated in 1982 (the preoperational period for most media covers the periods 1 January 1979 through 26 December 1981 and was summarized in a separate report.). This report covers those analyses performed by Teledyne Brown Engineering (TBE) and Landauer on samples collected during the period 1 January 2013 through 31 December 2013.

A. Objective of the REMP

The objectives of the REMP are to:

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

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

B. Implementation of the Objectives

The implementation of the objectives is accomplished by:

1. Identifying significant exposure pathways.

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

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

III. Program Description

A. Sample Collection

Samples for the LSCS REMP were collected for Exelon Nuclear by Environmental Inc. (Midwest Labs). This section describes the general

collection methods used by Environmental Inc. (Midwest Labs) to obtain environmental samples for the LSCS REMP in 2013. Sample locations and descriptions can be found in Tables B–1 and B–2, and Figures B–1 through B–4, Appendix B.

Aquatic Environment

The aquatic environment was evaluated by performing radiological analyses on samples of surface water, ground/well water, fish, and sediment. Two gallon water samples were collected weekly from two surface water locations (L-21 and L-40) and composited for monthly and quarterly required analyses. Control location was L-21. Two ground/well water locations (L-27 and L-28) were also grab sampled quarterly. All samples were collected via grab sample. The samples were then transferred to new unused plastic containers. Both the grab container and the sample containers were rinsed with source water prior to actual sample collection. Fish samples were collected semiannually at three locations, L-34, L-35 and L-36 (Control). Sediment samples composed of recently deposited substrate were collected at three locations semiannually, L-21 (Control), L-40 and L-41.

Atmospheric Environment

The atmospheric environment was evaluated by performing radiological analyses on samples of airborne particulate and iodine. Airborne particulate and iodine samples were collected and analyzed weekly at nine locations (L-01, L-03, L-04, L-05, L-06, L-07, L-08, L-10 and L-11). The control location was L-10. Airborne particulate and iodine samples were obtained at each location, using a vacuum pump to pull air through a glass fiber particulate filter and iodine cartridge. The pumps were run continuously and sampled air at the rate of approximately one cubic foot per minute. The particulate filters and iodine cartridges 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. Samples were collected biweekly at one milk location (L-42) from May through October, and monthly from November through April. The control location was L-42. All samples were collected in new unused two gallon plastic bottles from the bulk tank at each location, preserved with sodium bisulfite, and shipped promptly to the laboratory.

Food products were collected annually in September at five locations (L-Quad C, L-Quad 1, L-Quad 2, L-Quad 3 and L-Quad 4). The control

location was L-Quad C. Various types of samples were collected and placed in new unused plastic bags, and sent to the laboratory for analysis.

Ambient Gamma Radiation

Beginning in the first quarter of 2012, Exelon changed the type of dosimetry used for the Radiological Environmental Monitoring Program (REMP). Optically Stimulated Luminescent Dosimetry (OSLD) were deployed and Thermo-luminescent Dosimetry (TLD) were discontinued. This change may cause step changes in readings, up or down, depending on site characteristics. However, 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 OSLDs were exchanged quarterly and sent to Landauer for analysis. The OSLD locations were placed on and around the LSCS site as follows:

An inner ring consisting of 16 locations (L-101, L-102, L-103, L-104, L-105, L-106, L-107, L-108, L-109, L-110, L-111B, L-112, L-113A, L-114, L-115 and L-116) near and within the site perimeter representing fence post doses (i.e., at locations where the doses will be potentially greater than maximum annual off–site doses) from LSCS release.

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

An other set consisting of eight locations (L-01, L-03, L-04, L-05, L-06, L-07, L-08 and L-11).

The balance of one location (L-10) representing the control area.

The specific OSLD locations were determined by the following criteria:

1. The presence of relatively dense population;

2. Site meteorological data taking into account distance and elevation for each of the sixteen 22 ½ degree sectors around the site, where estimated annual dose from LSCS, if any, would be most significant;

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

4. And near the closest dwelling to the vents in the prevailing downwind direction.

(Two OSLDs were placed at each location approximately six feet above ground level.)

B. Sample Analysis

This section describes the general analytical methodologies used by TBE and Environmental Inc. (Midwest Labs) to analyze the environmental samples for radioactivity for the LSCS REMP in 2013. The analytical procedures used by the laboratories are listed in Table B-2.

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

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

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

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

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

5. Ambient gamma radiation levels at various site environs.

C. Data Interpretation

The radiological and direct radiation data collected prior to LaSalle County Station becoming operational were used as a baseline with which these operational data were compared. For the purpose of this report, LaSalle County 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. <u>Lower Limit of Detection and Minimum Detectable Concentration</u>

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 a before the fact (a priori) estimate of a system (including instrumentation,

procedure and sample type) and not as an after the fact (a posteriori) criteria for the presence of activity. All analyses were designed to achieve the required LSCS detection capabilities for environmental sample analysis.

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

2. Net Activity Calculation and Reporting of Results

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

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

For surface water and food product 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 ground/well water, fish, sediment, air particulate and milk 11 nuclides, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Zr-95, Nb-95, Cs-134, Cs-137, Ba-140 and La-140 were reported.

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

D. Program Exceptions

For 2013, the LSCS REMP had a sample recovery rate in excess of **99%**. Sample anomalies and missed samples are listed in the tables below:

Table D-1 LISTING OF SAMPLE ANOMALIES

Sample Type	Location Code	Collection Date	Reason
A/I	L-03	04/25/13	Low reading of 75.6 hours due to pump malfunction; collector replaced pump.

Table D-1 LISTING OF SAMPLE ANOMALIES (continued)

Sample Type	Location Code	Collection Date	Reason
A/I	L-01	05/30/13	Low reading of 128.8 hours due to blown fuse; possibly storm related. Collector replaced fuse.
A/I	L-05	07/11/13	Low reading of 96.5 hours due to power outages related to the repair of a broken pole on the local power distribution system.
A/I	L-06	07/11/13	Low reading of 160.5 hours due to power outages related to the repair of a broken pole on the local power distribution system.

Table D-2 LISTING OF MISSED SAMPLES

Sample Type	Location Code	Collection Date	Reason
OSLD	L115-2	03/27/13	OSLD found missing in field during quarterly exchange; collector placed new 2nd quarter OSLD.
OSLD	L214-4	06/27/13	OSLD found missing during quarterly exchange; collector placed new 3rd quarter OSLD.
OSLD	L208-1	12/26/13	OSLD found missing during quarterly exchange; collector placed new 1st quarter OSLD.

Each program exception was reviewed to understand the causes of the program exception. Occasional equipment breakdowns and power outages were unavoidable.

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

E. Program Changes

There were no changes to the program in 2013.

IV. Results and Discussion

A. Aquatic Environment

1. Surface Water

Samples were taken weekly and composited monthly at two locations (L-21 and L-40). Of these locations only L-40 located downstream, could be affected by LaSalle's 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 was detected in all 24 samples with a range of 4.7 to 10.5 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). Tritium was detected in four of eight samples. The concentrations ranged from 528 to 1,790 pCi/l. Concentrations detected were consistent with those detected in previous years through the first three quarters. Fourth quarter control and indicator sample results were both slightly higher than previous years. However, because both control and indicator results were statistically equivalent, the elevated results were not attributed to LaSalle effluent releases (Figure C–2, Appendix C). The 2000 pCi/L OCDM and contractually required 200 pCi/L LLDs were met.

Gamma Spectrometry

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

2. Ground/Well Water

Quarterly grab samples were collected at two locations (L-27 and L-28). Wells 4, 5 and 6 are associated with L-28. L-27 and L-28 well 6 could be affected by LaSalle's 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 was detected and 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). No nuclides were detected, and all required LLDs were met.

3. Fish

Fish samples were collected at three locations (L-34, L-35 and L-36) semiannually. Locations L-34 and L-35 could be affected by LaSalle's effluent releases. The following analysis was performed:

Gamma Spectrometry

The edible portion of fish samples from both locations was analyzed for gamma emitting nuclides (Table C–III.1, Appendix C). Naturally occurring K-40 was found at all stations and ranged from 2,720 to 5,090 pCi/kg wet. No fission or activation products were found.

4. Sediment

Aquatic sediment samples were collected at three locations (L-21, L-40 and L-41) semiannually. Locations L-40 and L-41, located downstream, could be affected by LaSalle's effluent releases. The following analysis was performed:

Gamma Spectrometry

Sediment samples from both locations were analyzed for gamma emitting nuclides (Table C–IV.1, Appendix C). Nuclides detected were naturally occurring K-40. Potassium-40 was found at all stations and ranged from 13,100 to 21,700 pCi/kg dry. Cesium-137 was detected in one sample at a concentration of 122 pCi/L. No LaSalle fission or activation products were found.

B. Atmospheric Environment

1. Airborne

a. Air Particulates

Continuous air particulate samples were collected from nine locations on a weekly basis. The nine locations were separated into four groups: Group I (onsite) represents locations within the LSCS site boundary (L-03 and L-05), Group II (near site) represents the locations near the LSCS site (L-01 and L-06), Group III (far field) represents the control location at an intermediate distance from LSCS (L-04, L-07, L-08 and L-11) and Group IV (Control) represents the control location at a remote distance (L-10). 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 LSCS. The results from the OnSite locations (Group I) ranged from 8 to 52 E–3 pCi/m^3 with a mean of 20 E–3 pCi/m^3. The results from the near site location (Group II) ranged from 8 to 54 E–3 pCi/m^3 with a mean of 21 E–3 pCi/m^3. The results from the far field locations (Group III) ranged from 5 to 57 E-3 pCi/m^3 with a mean of 20 E–3 pCi/m^3. The results from the Control location (Group IV) ranged from 7 to 52 E–3 pCi/m^3 with a mean of 20 E–3 pCi/m^3. Comparison of the 2013 air particulate data with previous years data indicate no effects from the operation of LSCS (Figures C–3 through C-7, Appendix C). In addition, comparisons of the weekly mean values for 2013 indicate no notable differences among the four groups.

Gamma Spectrometry

Weekly samples were composited quarterly and analyzed for gamma emitting nuclides (Table C–V.3, Appendix C). Naturally occurring Be-7 due to cosmic ray activity was detected in all samples. These values ranged from 75 to 178 E–3 pCi/m^3. Naturally occurring K-40 was not detected in any samples. All other nuclides were less than the MDC.

b. Airborne Iodine

Continuous air samples were collected from nine locations (L-01, L-03, L-04, L-05, L-06, L-07, L-08, L-10 and L-11) and analyzed weekly for I-131 (Table C–VI.1, Appendix C). No I-131 was detected. All required LLDs were met.

2. Terrestrial

a. Milk

Samples were collected from one location (L-42) biweekly May through October and monthly November through April. The following analyses were performed:

Iodine-131

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

Gamma Spectrometry

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

Naturally occurring K-40 activity was found in all samples and ranged from 1,140 to 1,470 pCi/l. No other nuclides were detected, and all required LLDs were met.

b. Food Products

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

Gamma Spectrometry

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

C. Ambient Gamma Radiation

Ambient gamma radiation levels were measured utilizing Optically Stimulated Luminescence Dosimeters (OSLD). 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 OSLD measurements were below 30 mrem/quarter, with a range of 16.1 to 27.4 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 the Control Location L-10 were comparable.

D. Land Use Survey

A Land Use Survey conducted during the August 2013 growing season around the LaSalle County Station (LSCS) was performed by Environmental Inc. (Midwest Labs) for Exelon Nuclear to comply with Radiological Effluent Control 12.5.2 of the LaSalle's Offsite Dose Calculation Manual. The purpose of the survey was to document the nearest resident, milk producing animal and garden of greater than 500 ft^2 in each of the sixteen 22 ½ degree sectors around the site. The distance and direction of all locations from the LSCS reactor buildings were positioned using Global Positioning System (GPS) technology. There were no changes required to the LSCS REMP as a result of this survey. The results of this survey are summarized below.

Distance in Miles from the LSCS Reactor Buildings			
Sector	Residence Miles	Livestock Miles	Milk Farm Miles
A N	3.9	4.0	-
B NNE	1.6	1.7	-
C NE	2.1	3.5	-
D ENE	3.3	3.8	-
E E	3.2	-	14.2
F ESE	1.4	-	-
G SE	1.7	4.7	-
H SSE	1.8	4.7	-
J S	1.5	4.7	-
K SSW	0.7	-	-
L SW	1.0	5.8	-
M WSW	1.5	-	-
N W	1.5	3.0	-
P WNW	0.9	3.0	-
Q NW	1.8	4.0	-
R NNW	1.7	4.6	-

E. Errata Data

Teledyne Brown Engineering (TBE) provides data results (activity, uncertainty, and minimum detectable concentration [MDC]). We are required to calculate the MDC using the following equation that includes the 4.66 multiplier:

$$MDA = \frac{4.66\sqrt{\frac{\beta}{\Delta t}}}{2.22\,(v)(y)\,(a)(\varepsilon)}$$

Where:

Δt = counting time for sample (minutes)

β = background rate of instrument blank (cpm)

2.22 = dpm/pCi or : 2.22×10^6 dpm/μCi

v = volume or mass of sample analyzed

y = chemical yield

ε = efficiency of the counter

λ = radioactive decay constant for the particular radionuclide

$a = \exp(-\lambda\Delta t)$

The formulas used to determine activity, uncertainty, and MDC are contained in the software of the TBE counting equipment. For the gamma system, when the new TBE detector 08 was added to the system in January of 2012, the default multiplier of 3.29 was mistakenly entered into the calculations for MDC values on detector 08. On April 15th, 2013, the multiplier was updated from 3.29 to the correct value of 4.66. When the MDCs were recalculated using the 4.66 multiplier, the MDC values increased by 41.6%. The greatest impact was on the short-lived nuclides that have LLD requirements, e.g. I-131, Ba-140, and La-140. The activity and uncertainty calculations were not affected. Several results were affected for LaSalle Station and are listed in Appendix G, Errata Data.

All samples from LaSalle Station that were analyzed on TBE detector 08, during the above mentioned timeframe, are identified in Appendix G, Errata Data. All sample results that were affected by the error are identified in Appendix G, noting the affected nuclide, the required MDC, the actual MDC, and the units. The sample results that were not affected by the incorrect multiplier are noted with "*" in the appropriate locations of Appendix G.

F. 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, 178 out of 185 analyses performed met the specified acceptance criteria. Seven analyses (Sr-89 and Sr-90 in milk, Co-57, Zn-65 and Sr-90 in soil, Cs-134 in air particulate and Sr-90 in vegetation [two low warning in a row]) did not meet the specified acceptance criteria or internal QA requirements for the following reason:

1. Teledyne Brown Engineering's Analytics September 2013 Sr-89 in milk result of 63.9 pCi/L was lower than the known value of 96.0 pCi/L. The failure was a result of analyst error and was specific to the Analytics sample. Client samples for the associated time period were evaluated and no client samples were affected by this failure. NCR 13-15

2. Teledyne Brown Engineering's Analytics September 2013 Sr-90 in milk result of 8.88 pCi/L was lower than the known value of 13.2 pCi/L. The failure was a result of analyst error and was specific to the Analytics sample. Client samples for the associated time period were evaluated and no client samples were affected by this failure. NCR 13-15

3. & 4. Teledyne Brown Engineering's MAPEP September 2013 Co-57 and Zn-65 in soil were evaluated as failing the false positive test. While MAPEP evaluated the results as failures, the gamma software listed the results as non identified nuclides. The two nuclides would never have been reported as detected nuclides to a client. MAPEP does not allow laboratories to put in qualifiers for the submitted data nor "less than" results. MAPEP evaluates results based on the relationship between the activity and the uncertainty. MAPEP spiked the soil sample with an extremely large concentration of Eu-152, which was identified by the gamma software as an interfering nuclide, resulting in <u>forced</u> activity results that were evaluated by MAPEP as detected Co-57 and Zn-65. No client samples were affected by these failures. NCR 13-14

5. Teledyne Brown Engineering's MAPEP September 2013 Sr-90 in soil result of 664 Bq/kg was higher than the known value of 460 Bq/kg, exceeding the upper control limit of 598 Bq/kg. An incorrect Sr-90 result was entered into the MAPEP database. The correct Sr-90 activity of 322 Bq/kg would have been evaluated as acceptable with warning. No client samples were affected by this failure. NCR 13-14

6. Teledyne Brown Engineering's MAPEP September 2013 Cs-134 in air particulate activity of -0.570 Bq/sample was evaluated as a failed false positive test, based on MAPEP's evaluation of the result as a significant negative value at 3 standard deviations. A negative number would never have been reported as a detected nuclide to a client, therefore no client samples were affected by this failure. NCR 13-14

7. Teledyne Brown Engineering's MAPEP September 2013 Sr-90 in vegetation result was investigated due to two low warnings in a row. It appears the September sample was double spiked with carrier, resulting in a low activity. With a recovery of around 50%

lower, the Sr-90 result would have fallen within the acceptance range. No client samples were affected by this issue. NCR 13-14

For the EIML laboratory, 89 of 92 analyses met the specified acceptance criteria. Three analyses (AP - Gross Alpha, Soil - Sr-90 and Co-57) did not meet the specified acceptance criteria for the following reasons:

1. Environmental Inc., Midwest Laboratory's MAPEP February 2013 air particulate gross alpha result of 0.14 Bq/total sample was lower than the known value of 1.20 Bq/total sample, exceeding the lower control limit of 0.36 Bq/total sample. The filter was recounted overnight. No significant activity could be detected. The failure was specific to the MAPEP sample, therefore there was no impact to client samples as a result of this issue.
2. Environmental Inc., Midwest Laboratory's MAPEP February 2013 soil Co-57 result of 408.40 Bq/kg was lower than the known value of 628.0 Bq/kg, exceeding the lower control limit of 440.0 Bq/kg. The sample was reanalyzed using additional fuming nitric separations. The reanalysis result of 574.4 fell within the control limits.
3. Environmental Inc., Midwest Laboratory's MAPEP August 2013 soil Co-57 result of 699.60 Bq/kg was higher than the known value of 0.00 Bq/kg, exceeding the upper control limit of 5.00 Bq/kg. Interference from Eu-152 resulted in misidentification of Co-57. The failure was specific to the MAPEP sample, therefore there was no impact to client samples as a result of this issue.

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

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING REPORT SUMMARY

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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
SURFACE WATER (PCI/LITER)	GR-B	24	4	8.2 (12/12) (6.9/8.9)	7.9 (12/12) (4.7/10.5)	8.2 (12/12) (6.9/8.9)	L-40 INDICATOR ILLINOIS RIVER - DOWNSTREAM 5.2 MILES NNW OF SITE	0
	H-3	8	200	1109 (2/4) (528/1690)	1175 (2/4) (559/1790)	1175 (2/4) (559/1790)	L-21 CONTROL ILLINOIS RIVER AT SENECA - UPSTREAM 4.0 MILES NE OF SITE	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
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0

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

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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
SURFACE WATER (PCI/LITER)	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
GROUND WATER (PCI/LITER)	H-3	12	200	<LLD	<LLD	-		0
	GAMMA	12						
	MN-54		15	<LLD	<LLD	-		0

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LOCATION OF FACILITY: MARSEILLES, 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)	CO-58		15	<LLD	<LLD	-		0
	FE-59		30	<LLD	<LLD	-		0
	CO-60		15	<LLD	<LLD	-		0
	ZN-65		30	<LLD	<LLD	-		0
	NB-95		15	<LLD	<LLD	-		0
	ZR-95		30	<LLD	<LLD	-		0
	CS-134		15	<LLD	<LLD	-		0
	CS-137		18	<LLD	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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)	BA-140		60	<LLD	<LLD	-		0
	LA-140		15	<LLD	<LLD	-		0
FISH (PCI/KG WET)	GAMMA	12						
	MN-54		130	<LLD	<LLD	-		0
	CO-58		130	<LLD	<LLD	-		0
	FE-59		260	<LLD	<LLD	-		0
	CO-60		130	<LLD	<LLD	-		0
	ZN-65		260	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0

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

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NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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
FISH (PCI/KG WET)	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
SEDIMENT (PCI/KG DRY)	GAMMA	6						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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)	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0
	CS-134		150	<LLD	<LLD	-		0
	CS-137		180	<LLD	122 (1/2)	122 (1/2)	L-21 CONTROL ILLINOIS RIVER AT SENECA - UPSTREAM 4.0 MILES NE OF SITE	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 PARENTHESES (F)

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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
AIR PARTICULATE (E-3 PCI/CU.METER)	GR-B	468	10	20 (414/416) (5/57)	20 (52/52) (7/52)	21 (52/52) (10/46)	L-11 INDICATOR RANSOM 6.0 MILES S OF SITE	0
	GAMMA	36						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

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				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
AIR PARTICULATE (E-3 PCI/CU.METER)	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	468	70	<LLD	<LLD	-		0
MILK (PCI/LITER)	I-131	20	1	NA	<LLD	-		0
	GAMMA MN-54	20	NA	NA	<LLD	-		0
	CO-58		NA	NA	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

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				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)	FE-59		NA	NA	<LLD	-		0
	CO-60		NA	NA	<LLD	-		0
	ZN-65		NA	NA	<LLD	-		0
	NB-95		NA	NA	<LLD	-		0
	ZR-95		NA	NA	<LLD	-		0
	CS-134		15	NA	<LLD	-		0
	CS-137		18	NA	<LLD	-		0
	BA-140		60	NA	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

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				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)	LA-140		15	NA	<LLD	-		0
VEGETATION (PCI/KG WET)	GAMMA	10						
	MN-54		NA	<LLD	<LLD	-		0
	CO-58		NA	<LLD	<LLD	-		0
	FE-59		NA	<LLD	<LLD	-		0
	CO-60		NA	<LLD	<LLD	-		0
	ZN-65		NA	<LLD	<LLD	-		0
	NB-95		NA	<LLD	<LLD	-		0
	ZR-95		NA	<LLD	<LLD	-		0

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TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ANNUAL SUMMARY FOR THE LASALLE COUNTY STATION, 2013

NAME OF FACILITY: LASALLE				DOCKET NUMBER: 50-373 & 50-374 2013				
LOCATION OF FACILITY: MARSEILLES, 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)	I-131		60	<LLD	<LLD	-		0
	CS-134		60	<LLD	<LLD	-		0
	CS-137		80	<LLD	<LLD	-		0
	BA-140		NA	<LLD	<LLD	-		0
	LA-140		NA	<LLD	<LLD	-		0
DIRECT RADIATION (MREM/QTR.)	OSLD-QUARTERLY	333	NA	22.9 (325/325) (16.1/27.4)	20.5 (8/8) (19.0/22.3)	25.8 (4/4) (25.1/26.3)	L-102-2 INDICATOR 0.6 MILES NNE	0

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APPENDIX B

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

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, LaSalle County Station, 2013

Location	Location Description	Distance & Direction From Site
A. Surface Water		
L-21	Illinois River at Seneca, Upstream (control)	4.0 miles NE
L-40	Illinois River, Downstream (indicator)	5.2 miles NNW
B. Ground/Well Water		
L-27	LSCS Onsite Well (indicator)	0 miles at station
L-28-W4	Marseilles Well (control)	7.0 miles NNW
L-28-W5	Marseilles Well (control)	6.7 miles NNW
L-28-W6	Marseilles Well (indicator)	4.1 miles N
C. Milk - bi-weekly / monthly		
L-42	Biros Farm (control)	14.2 miles E
D. Air Particulates / Air Iodine		
L-01	Nearsite 1 (indicator)	1.5 miles NNW
L-03	Onsite 3 (indicator)	1.0 miles ENE
L-04	Rte. 170 (indicator)	3.2 miles E
L-05	Onsite 5 (indicator)	0.3 miles ESE
L-06	Nearsite 6 (indicator)	0.4 miles W
L-07	Seneca (indicator)	5.2 miles NNE
L-08	Marseilles (indicator)	6.0 miles NNW
L-10	Streator (control)	13.5 miles SW
L-11	Ransom (indicator)	6.0 miles S
E. Fish		
L-34	LaSalle Cooling Lake (indicator)	2.0 miles E
L-35	Marseilles Pool of Illinois River, Downstream (indicator)	6.5 miles NNW
L-36	Illinois River, Upstream of Discharge (control)	4.3 miles NE
F. Sediment		
L-21	Illinois River at Seneca, Upstream (control)	4.0 miles NE
L-40	Illinois River, Downstream (indicator)	5.2 miles NNW
L-41	Illinois River, Downstream (indicator)	4.6 miles N
G. Food Products		
Quadrant 1	Diane Partridge	4.5 miles NE
Quadrant 2	Mike and Gina Welbourne	3.8 miles ESE
Quadrant 3	Michael Olson	1.5 miles WSW
Quadrant 4	Robert Eisers	4.5 miles NW
Control	Eugene Clements	10.0 miles NW

TABLE B-1: Radiological Environmental Monitoring Program - Sampling Locations, Distance and Direction, LaSalle County Station, 2013

Location	Location Description	Distance & Direction From Site
H. Environmental Dosimetry - OSLD		
Inner Ring		
L-101-1 and -2		0.5 miles N
L-102-1 and -2		0.6 miles NNE
L-103-1 and -2		0.7 miles NE
L-104-1 and -2		0.8 miles ENE
L-105-1 and -2		0.7 miles E
L-106-1 and -2		1.4 miles ESE
L-107-1 and -2		0.8 miles SE
L-108-1 and -2		0.5 miles SSE
L-109-1 and -2		0.6 miles S
L-110-1 and -2		0.6 miles SSW
L-111b-1 and -2		0.8 miles SW
L-112-1 and -2		0.9 miles WSW
L-113a-1 and -2		0.8 miles W
L-114-1 and -2		0.9 miles WNW
L-115-1 and -2		0.7 miles NW
L-116-1 and -2		0.6 miles NNW
Outer Ring		
L-201-3 and -4		4.0 miles N
L-202-3 and -4		3.6 miles NNE
L-203-1 and -2		4.0 miles NE
L-204-1 and -2		3.2 miles ENE
L-205-1 and -2		3.2 miles ESE
L-205-3 and -4		5.1 miles E
L-206-1 and -2		4.3 miles SE
L-207-1 and -2		4.5 miles SSE
L-208-1 and -2		4.5 miles S
L-209-1 and -2		4.0 miles SSW
L-210-1 and -2		3.3 miles SW
L-211-1 and -2		4.5 miles WSW
L-212-1 and -2		4.0 miles W
L-213-3 and -4		4.9 miles W
L-214-3 and -4		5.1 miles WNW
L-215-3 and -4		5.0 miles NW
L-216-3 and -4		5.0 miles NNW
Other		
L-01-1 and -2	Nearsite 1 (indicator)	1.5 miles NNW
L-03-1 and -2	Onsite 3 (indicator)	1.0 miles ENE
L-04-1 and -2	Rte. 170 (indicator)	3.2 miles E
L-05-1 and -2	Onsite 5 (indicator)	0.3 miles ESE
L-06-1 and -2	Nearsite 6 (indicator)	0.4 miles W
L-07-1 and -2	Seneca (indicator)	5.2 miles NNE
L-08-1 and -2	Marseilles (indicator)	6.0 miles NNW
L-11-1 and -2	Ransom (indicator)	6.0 miles S
Control and Special Interest		
L-10-1 and -2	Streator	13.5 miles SW

TABLE B-2: Radiological Environmental Monitoring Program – Summary of Sample Collection and Analytical Methods, LaSalle County Station, 2013

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 Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Surface Water	Gross Beta	Monthly composite from weekly grab samples.	TBE, TBE-2008 Gross Alpha and/or gross beta activity in various matrices Env. Inc., W(DS)-01 Determination of gross alpha and/or gross beta in water (dissolved solids or total residue)
Surface Water	Tritium	Quarterly composite from weekly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Ground/Well Water	Gamma Spectroscopy	Quarterly grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Ground/Well Water	Tritium	Quarterly grab samples.	TBE, TBE-2011 Tritium analysis in drinking water by liquid scintillation Env. Inc., T-02 Determination of tritium in water (direct method)
Fish	Gamma Spectroscopy	Semi-annual samples collected via electroshocking or other techniques	TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Sediment	Gamma Spectroscopy	Semi-annual grab samples	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
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 Env. Inc., AP-02 Determination of gross alpha and/or gross beta in air particulate filters
Air Particulates	Gamma Spectroscopy	Quarterly composite of each station	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Air Iodine	Gamma Spectroscopy	Bi-weekly composite of continuous air sampling through charcoal filter	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., I-131-02 Determination of I-131 in charcoal canisters by gamma spectroscopy (batch method)
Milk	I-131	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2012 Radioiodine in various matrices Env. Inc., I-131-01 Determination of I-131 in milk by an ion exchange
Milk	Gamma Spectroscopy	Bi-weekly grab sample when cows are on pasture. Monthly all other times	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
Food Products	Gamma Spectroscopy	Annual grab samples.	TBE, TBE-2007 Gamma emitting radioisotope analysis Env. Inc., GS-01 Determination of gamma emitters by gamma spectroscopy
OSLD	Optically Stimulated Luminescence Dosimetry	Quarterly OSLDs comprised of two Al_2O_3:C Landauer Incorporated elements.	Landauer Incorporated

Figure B-1
Inner Ring OSLD Locations
of the LaSalle County Station, 2013

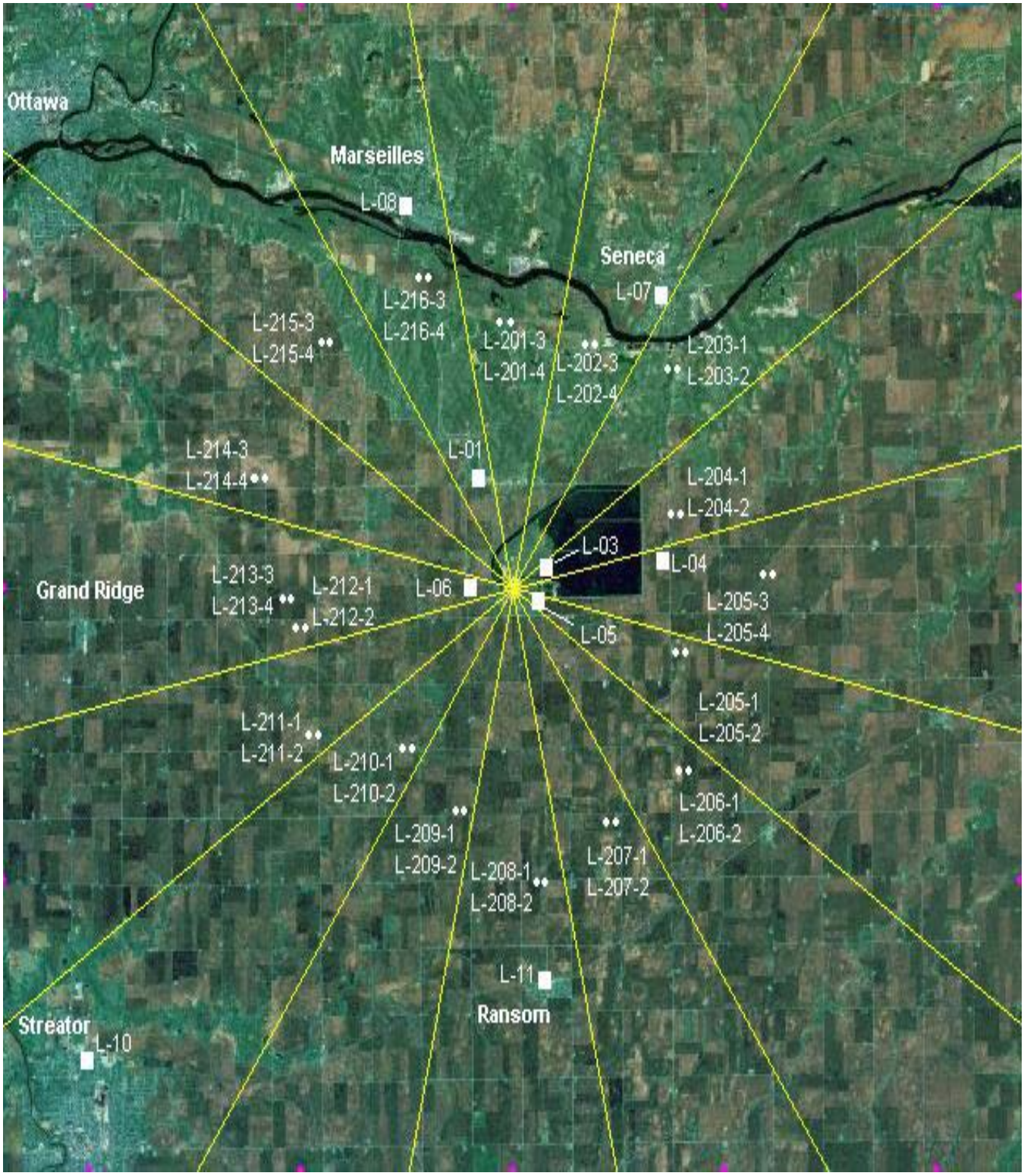


Figure B-2
Outer Ring OSLD Locations and Fixed Air Sampling Locations
of the LaSalle County Station, 2013

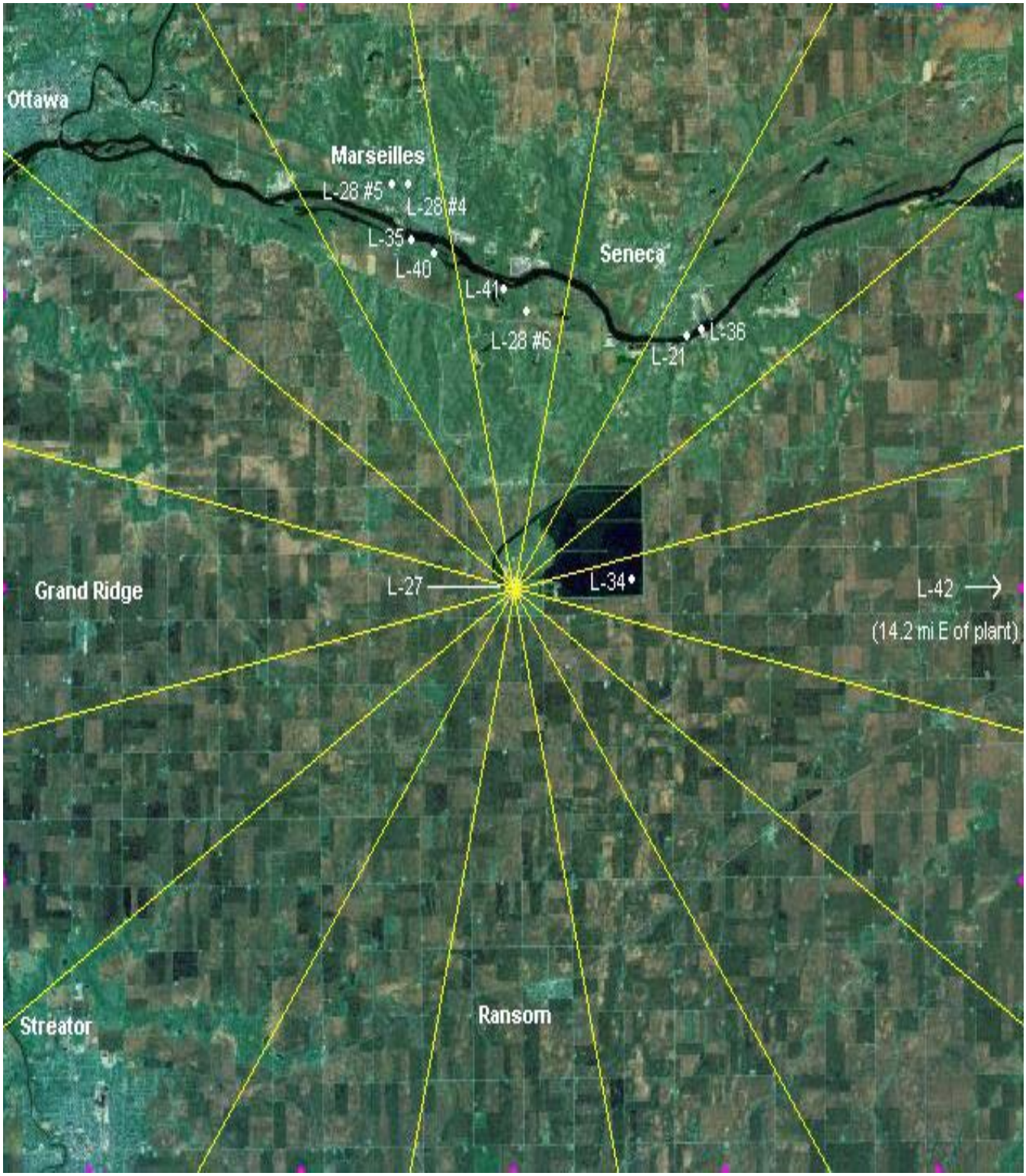


Figure B-3
Ingestion and Waterborne Exposure Pathway Sample Locations
of the LaSalle County Station, 2013

APPENDIX C

DATA TABLES AND FIGURES
PRIMARY LABORATORY

Table C-I.1 **CONCENTRATIONS OF GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	L-21	L-40
01/03/13 - 01/31/13	9.3 ± 2.1	8.9 ± 2.0
02/07/13 - 02/28/13	7.3 ± 2.1	8.1 ± 2.2
03/07/13 - 03/27/13	8.1 ± 2.1	8.2 ± 2.1
04/04/13 - 04/25/13	6.5 ± 1.7	6.9 ± 1.6
05/02/13 - 05/30/13	4.7 ± 1.9	6.9 ± 2.0
06/06/13 - 06/27/13	8.4 ± 1.6	8.0 ± 1.6
07/04/13 - 07/25/13	6.6 ± 1.6	8.1 ± 1.7
08/01/13 - 08/29/13	8.8 ± 1.7	8.5 ± 1.6
09/05/13 - 09/25/13	7.2 ± 2.0	8.6 ± 2.0
10/03/13 - 10/31/13	10.5 ± 1.8	8.5 ± 1.7
11/07/13 - 11/27/13	7.6 ± 1.6	8.3 ± 1.6
12/05/13 - 12/26/13	9.7 ± 1.9	8.9 ± 1.8
MEAN	7.9 ± 3.2	8.2 ± 1.3

Table C-I.2 **CONCENTRATIONS OF TRITIUM IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	L-21	L-40
01/03/13 - 03/27/13	< 197	< 192
04/04/13 - 06/27/13	< 193	< 184
07/04/13 - 09/25/13	1790 ± 227	1690 ± 219
10/03/13 - 12/26/13	559 ± 146	528 ± 145
MEAN	1175 ± 1741	1109 ± 1643

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

Table C-I.3 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-21	01/03/13 - 01/31/13	< 1	< 1	< 2	< 1	< 1	< 1	< 2	< 15	< 1	< 1	< 16	< 4
	02/07/13 - 02/28/13	< 2	< 2	< 6	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 24	< 8
	03/07/13 - 03/27/13	< 2	< 2	< 6	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 23	< 9
	04/04/13 - 04/25/13	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 11	< 2	< 2	< 18	< 6
	05/02/13 - 05/30/13	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 3	< 2	< 2	< 30	< 9
	06/06/13 - 06/27/13	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 13	< 1	< 1	< 17	< 6
	07/04/13 - 07/25/13	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 13	< 2	< 2	< 23	< 8
	08/01/13 - 08/29/13	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< 13	< 1	< 1	< 18	< 5
	09/05/13 - 09/25/13	< 2	< 2	< 5	< 1	< 3	< 2	< 4	< 6	< 2	< 2	< 43	< 12
	10/03/13 - 10/31/13	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< 11	< 1	< 1	< 17	< 6
	11/07/13 - 11/27/13	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 12	< 1	< 1	< 16	< 5
	12/05/13 - 12/26/13	< 2	< 2	< 5	< 2	< 3	< 2	< 3	< 13	< 2	< 2	< 19	< 7
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
L-40	01/03/13 - 01/31/13	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 15	< 1	< 1	< 17	< 5
	02/07/13 - 02/28/13	< 2	< 2	< 5	< 2	< 3	< 2	< 4	< 13	< 2	< 2	< 21	< 6
	03/07/13 - 03/27/13	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< 12	< 1	< 2	< 19	< 5
	04/04/13 - 04/25/13	< 2	< 3	< 6	< 2	< 5	< 3	< 5	< 14	< 2	< 2	< 25	< 9
	05/02/13 - 05/30/13	< 2	< 2	< 6	< 2	< 4	< 2	< 4	< 8	< 2	< 2	< 30	< 10
	06/06/13 - 06/27/13	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 14	< 1	< 1	< 17	< 6
	07/04/13 - 07/25/13	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 12	< 2	< 2	< 21	< 7
	08/01/13 - 08/29/13	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 14	< 1	< 1	< 19	< 6
	09/05/13 - 09/25/13	< 2	< 2	< 5	< 2	< 3	< 2	< 3	< 7	< 1	< 2	< 37	< 14
	10/03/13 - 10/31/13	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 11	< 1	< 1	< 14	< 4
	11/07/13 - 11/27/13	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 13	< 1	< 1	< 17	< 5
	12/05/13 - 12/26/13	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 13	< 1	< 2	< 20	< 5
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-II.1 **CONCENTRATIONS OF TRITIUM IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

COLLECTION PERIOD	L-27	L-28-W4	L-28-W5	L-28-W6
01/10/13 - 01/10/13	< 172		< 170	< 170
04/11/13 - 04/11/13	< 177	< 177		< 176
07/11/13 - 07/11/13	< 191		< 190	< 193
10/10/13 - 10/10/13	< 171	< 177		< 177
MEAN	-	-	-	-

Table C-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUND/WELL WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-27	01/10/13 - 01/10/13	< 4	< 4	< 9	< 5	< 9	< 5	< 7	< 5	< 5	< 31	< 8
	04/11/13 - 04/11/13	< 5	< 6	< 11	< 5	< 10	< 6	< 10	< 4	< 6	< 32	< 9
	07/11/13 - 07/11/13	< 6	< 6	< 14	< 6	< 12	< 6	< 12	< 6	< 7	< 32	< 12
	10/10/13 - 10/10/13	< 2	< 2	< 6	< 2	< 4	< 3	< 4	< 2	< 2	< 24	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-28-W4	04/11/13 - 04/11/13	< 5	< 5	< 9	< 5	< 11	< 5	< 9	< 4	< 5	< 33	< 12
	10/10/13 - 10/10/13	< 2	< 2	< 4	< 2	< 3	< 2	< 3	< 2	< 2	< 18	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-28-W5	01/10/13 - 01/10/13	< 4	< 4	< 10	< 4	< 7	< 5	< 8	< 4	< 4	< 27	< 10
	07/11/13 - 07/11/13	< 4	< 4	< 9	< 3	< 9	< 4	< 7	< 4	< 4	< 27	< 8
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-28-W6	01/10/13 - 01/10/13	< 4	< 4	< 10	< 4	< 10	< 5	< 9	< 4	< 5	< 28	< 10
	04/11/13 - 04/11/13	< 5	< 5	< 11	< 5	< 11	< 6	< 9	< 4	< 5	< 36	< 12
	07/11/13 - 07/11/13	< 4	< 4	< 10	< 5	< 9	< 5	< 7	< 4	< 4	< 26	< 9
	10/10/13 - 10/10/13	< 2	< 2	< 4	< 2	< 4	< 2	< 4	< 1	< 2	< 18	< 6
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-III.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FISH SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-34												
Common Carp	05/02/13	< 59	< 72	< 168	< 75	< 99	< 88	< 136	< 63	< 53	< 904	< 310
Largemouth Bass	05/02/13	< 44	< 36	< 127	< 42	< 81	< 58	< 91	< 47	< 37	< 800	< 236
Channel Catfish	10/02/13	< 55	< 71	< 121	< 69	< 140	< 66	< 122	< 47	< 57	< 571	< 198
Common Carp	10/02/13	< 71	< 59	< 160	< 61	< 137	< 67	< 109	< 49	< 58	< 549	< 147
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-35												
Channel Catfish	05/02/13	< 53	< 60	< 147	< 48	< 106	< 64	< 110	< 47	< 53	< 787	< 220
Smallmouth Buffalo	05/02/13	< 61	< 81	< 195	< 69	< 133	< 61	< 123	< 59	< 67	< 1020	< 276
Common Carp	10/03/13	< 56	< 64	< 123	< 51	< 103	< 59	< 87	< 51	< 62	< 450	< 119
Smallmouth Buffalo	10/03/13	< 56	< 52	< 125	< 61	< 138	< 72	< 118	< 66	< 58	< 589	< 115
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-36												
Channel Catfish	05/02/13	< 57	< 61	< 135	< 68	< 128	< 64	< 135	< 54	< 59	< 949	< 237
Smallmouth Buffalo	05/02/13	< 52	< 70	< 151	< 62	< 126	< 74	< 115	< 56	< 56	< 945	< 231
Smallmouth Bass	10/03/13	< 50	< 53	< 105	< 69	< 108	< 60	< 98	< 44	< 61	< 422	< 130
Smallmouth Buffalo	10/03/13	< 48	< 51	< 101	< 48	< 100	< 58	< 109	< 51	< 53	< 470	< 119
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-IV.1 **CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-21	05/09/13	< 76	< 94	< 214	< 114	< 178	< 123	< 184	< 82	< 118	< 882	< 285
	10/03/13	< 79	< 107	< 262	< 92	< 192	< 124	< 186	< 67	122 ± 75	< 1642	< 530
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-40	05/09/13	< 65	< 68	< 175	< 73	< 156	< 88	< 141	< 60	< 76	< 659	< 187
	10/03/13	< 77	< 81	< 270	< 91	< 156	< 100	< 167	< 69	< 75	< 1520	< 424
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-41	05/09/13	< 49	< 58	< 154	< 61	< 144	< 57	< 108	< 40	< 53	< 485	< 123
	10/03/13	< 45	< 58	< 156	< 52	< 112	< 68	< 112	< 42	< 49	< 1022	< 224
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-V.1 **CONCENTRATIONS OF GROSS BETA IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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

COLLECTION	GROUP I		GROUP II		GROUP III				GROUP IV
PERIOD	L-03	L-05	L-01	L-06	L-04	L-07	L-08	L-11	L-10
01/03/13 - 01/10/13	52 ± 6	48 ± 6	54 ± 6	48 ± 6	48 ± 6	49 ± 6	57 ± 6	46 ± 6	52 ± 6
01/10/13 - 01/17/13	24 ± 5	24 ± 5	31 ± 5	25 ± 5	22 ± 5	27 ± 5	28 ± 5	23 ± 5	28 ± 5
01/17/13 - 01/24/13	18 ± 4	20 ± 5	21 ± 5	21 ± 5	18 ± 4	17 ± 4	21 ± 5	16 ± 4	14 ± 4
01/24/13 - 01/31/13	24 ± 5	29 ± 5	23 ± 5	25 ± 5	24 ± 5	24 ± 5	30 ± 5	27 ± 5	21 ± 5
01/31/13 - 02/07/13	36 ± 5	32 ± 5	29 ± 5	34 ± 5	29 ± 5	34 ± 5	32 ± 5	32 ± 5	31 ± 5
02/07/13 - 02/14/13	17 ± 4	14 ± 4	22 ± 5	29 ± 5	18 ± 4	22 ± 5	20 ± 4	20 ± 4	15 ± 4
02/14/13 - 02/21/13	15 ± 4	17 ± 4	15 ± 4	19 ± 5	14 ± 4	18 ± 4	20 ± 5	16 ± 4	14 ± 4
02/21/13 - 02/28/13	12 ± 4	11 ± 4	14 ± 4	25 ± 5	10 ± 4	16 ± 4	15 ± 4	14 ± 4	13 ± 4
02/28/13 - 03/07/13	12 ± 4	11 ± 4	16 ± 4	11 ± 4	12 ± 4	15 ± 4	11 ± 4	13 ± 4	13 ± 4
03/07/13 - 03/14/13	21 ± 5	18 ± 5	15 ± 4	15 ± 4	16 ± 5	16 ± 5	19 ± 5	15 ± 5	20 ± 5
03/14/13 - 03/21/13	20 ± 5	21 ± 4	21 ± 5	21 ± 5	17 ± 4	21 ± 5	18 ± 4	15 ± 4	19 ± 4
03/21/13 - 03/27/13	11 ± 4	13 ± 4	12 ± 4	11 ± 4	11 ± 4	8 ± 4	8 ± 4	22 ± 5	9 ± 4
03/27/13 - 04/04/13	13 ± 3	18 ± 4	19 ± 4	15 ± 4	16 ± 4	18 ± 4	17 ± 4	19 ± 4	15 ± 4
04/04/13 - 04/11/13	10 ± 4	22 ± 5	14 ± 4	15 ± 4	12 ± 4	12 ± 4	16 ± 4	17 ± 4	14 ± 4
04/11/13 - 04/18/13	8 ± 4	< 5	11 ± 4	10 ± 4	10 ± 4	5 ± 3	8 ± 4	10 ± 4	7 ± 4
04/18/13 - 04/25/13	< 9 (1)	14 ± 4	16 ± 4	17 ± 4	17 ± 4	13 ± 4	14 ± 4	14 ± 4	15 ± 4
04/25/13 - 05/02/13	25 ± 5	21 ± 4	23 ± 5	24 ± 5	21 ± 4	18 ± 4	22 ± 4	21 ± 4	26 ± 5
05/02/13 - 05/09/13	12 ± 4	13 ± 4	15 ± 4	9 ± 4	12 ± 4	11 ± 4	14 ± 4	13 ± 4	8 ± 4
05/09/13 - 05/16/13	20 ± 5	15 ± 5	15 ± 5	13 ± 4	18 ± 5	18 ± 5	14 ± 4	18 ± 5	15 ± 5
05/16/13 - 05/23/13	17 ± 4	18 ± 4	19 ± 4	19 ± 4	17 ± 4	17 ± 4	15 ± 4	20 ± 5	15 ± 4
05/23/13 - 05/30/13	15 ± 5	11 ± 4	8 ± 4 (1)	12 ± 4	20 ± 5	11 ± 4	9 ± 4	14 ± 4	13 ± 4
05/30/13 - 06/06/13	10 ± 4	8 ± 4	8 ± 4	9 ± 4	10 ± 4	7 ± 4	7 ± 4	10 ± 4	10 ± 4
06/06/13 - 06/13/13	19 ± 4	18 ± 4	18 ± 4	16 ± 4	20 ± 4	15 ± 4	17 ± 4	19 ± 4	19 ± 4
06/13/13 - 06/20/13	10 ± 4	11 ± 4	12 ± 4	14 ± 4	9 ± 4	13 ± 4	11 ± 4	12 ± 4	12 ± 4
06/20/13 - 06/27/13	20 ± 4	19 ± 4	20 ± 4	16 ± 4	17 ± 4	17 ± 4	18 ± 4	20 ± 4	17 ± 4
06/27/13 - 07/04/13	11 ± 4	11 ± 4	11 ± 4	11 ± 4	13 ± 4	9 ± 4	11 ± 4	13 ± 4	13 ± 4
07/04/13 - 07/11/13	20 ± 4	29 ± 7 (1)	17 ± 4	16 ± 4 (1)	17 ± 4	18 ± 4	16 ± 4	23 ± 4	17 ± 4
07/11/13 - 07/18/13	13 ± 4	10 ± 4	12 ± 4	12 ± 4	12 ± 4	14 ± 4	11 ± 4	12 ± 4	14 ± 4
07/18/13 - 07/25/13	17 ± 5	16 ± 4	10 ± 4	14 ± 4	12 ± 4	12 ± 4	16 ± 5	14 ± 4	14 ± 4
07/25/13 - 08/01/13	15 ± 4	14 ± 4	13 ± 4	16 ± 4	11 ± 4	15 ± 4	10 ± 4	14 ± 4	15 ± 4
08/01/13 - 08/08/13	18 ± 4	17 ± 4	17 ± 4	20 ± 5	14 ± 4	19 ± 4	19 ± 4	21 ± 5	18 ± 4
08/08/13 - 08/14/13	20 ± 5	22 ± 5	15 ± 4	19 ± 5	17 ± 4	16 ± 4	18 ± 4	22 ± 5	23 ± 5
08/14/13 - 08/22/13	28 ± 5	26 ± 5	24 ± 5	26 ± 5	27 ± 5	28 ± 5	27 ± 5	35 ± 5	32 ± 5
08/22/13 - 08/29/13	27 ± 5	24 ± 5	23 ± 5	27 ± 5	19 ± 5	30 ± 5	24 ± 5	24 ± 5	22 ± 5
08/29/13 - 09/05/13	20 ± 5	19 ± 5	22 ± 5	18 ± 4	16 ± 4	21 ± 5	20 ± 5	20 ± 5	27 ± 5
09/05/13 - 09/12/13	40 ± 6	35 ± 5	35 ± 5	40 ± 6	32 ± 5	38 ± 5	41 ± 6	34 ± 5	37 ± 5
09/12/13 - 09/19/13	22 ± 5	22 ± 5	20 ± 4	24 ± 5	19 ± 4	18 ± 4	15 ± 4	21 ± 5	23 ± 5
09/19/13 - 09/25/13	13 ± 4	14 ± 4	12 ± 4	18 ± 5	14 ± 4	16 ± 5	16 ± 5	15 ± 4	19 ± 5
09/25/13 - 10/03/13	23 ± 4	25 ± 5	24 ± 4	27 ± 5	25 ± 5	23 ± 4	20 ± 4	25 ± 5	26 ± 5
10/03/13 - 10/10/13	22 ± 5	18 ± 4	18 ± 4	20 ± 5	19 ± 5	20 ± 5	20 ± 5	17 ± 4	17 ± 4
10/10/13 - 10/17/13	21 ± 5	18 ± 5	21 ± 5	19 ± 5	20 ± 5	23 ± 5	21 ± 5	19 ± 5	22 ± 5
10/17/13 - 10/23/13	18 ± 5	15 ± 5	17 ± 5	18 ± 5	17 ± 5	22 ± 5	15 ± 5	15 ± 5	17 ± 5
10/23/13 - 10/31/13	21 ± 4	17 ± 4	21 ± 5	21 ± 5	19 ± 4	23 ± 5	20 ± 4	23 ± 5	22 ± 5
10/31/13 - 11/07/13	24 ± 5	25 ± 5	23 ± 5	25 ± 5	27 ± 5	25 ± 5	23 ± 5	23 ± 5	22 ± 5
11/07/13 - 11/14/13	20 ± 5	18 ± 5	21 ± 5	18 ± 5	16 ± 4	23 ± 5	20 ± 5	19 ± 5	17 ± 5
11/14/13 - 11/21/13	19 ± 4	16 ± 4	18 ± 4	22 ± 5	18 ± 4	21 ± 4	13 ± 4	24 ± 5	13 ± 4
11/21/13 - 11/27/13	18 ± 5	17 ± 5	24 ± 5	22 ± 5	21 ± 5	21 ± 5	18 ± 5	18 ± 5	18 ± 5
11/27/13 - 12/05/13	34 ± 5	33 ± 5	34 ± 5	39 ± 5	36 ± 5	42 ± 5	38 ± 5	42 ± 5	40 ± 5
12/05/13 - 12/12/13	36 ± 5	39 ± 6	39 ± 6	38 ± 6	36 ± 5	41 ± 6	33 ± 5	43 ± 6	40 ± 6
12/12/13 - 12/19/13	29 ± 5	28 ± 5	32 ± 5	33 ± 5	24 ± 5	31 ± 5	35 ± 5	32 ± 5	30 ± 5
12/19/13 - 12/26/13	29 ± 5	26 ± 5	30 ± 5	33 ± 5	26 ± 5	30 ± 5	28 ± 5	31 ± 5	28 ± 5
12/26/13 - 01/02/14	27 ± 5	31 ± 5	30 ± 5	21 ± 5	28 ± 5	28 ± 5	30 ± 5	26 ± 5	27 ± 5
MEAN	20 ± 17	20 ± 16	20 ± 17	21 ± 17	19 ± 15	21 ± 18	20 ± 19	21 ± 16	20 ± 18

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 LASALLE COUNTY STATION, 2013**

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

GROUP I - NEAR-SITE LOCATIONS				GROUP II - FAR-FIELD LOCATIONS				GROUP III - FAR-FIELD LOCATIONS				GROUP IV - CONTROL LOCATION			
COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD	COLLECTION PERIOD	MIN	MAX	MEAN ± 2SD
01/03/13 - 01/31/13	18	52	30 ± 26	01/03/13 - 01/31/13	21	54	31 ± 25	01/03/13 - 01/31/13	16	57	30 ± 26	01/03/13 - 01/31/13	14	52	29 ± 33
01/31/13 - 02/28/13	11	36	19 ± 19	01/31/13 - 02/28/13	14	34	23 ± 14	01/31/13 - 02/28/13	10	34	21 ± 15	01/31/13 - 02/28/13	13	31	18 ± 18
02/28/13 - 04/04/13	11	21	16 ± 8	02/28/13 - 04/04/13	11	21	16 ± 8	02/28/13 - 04/04/13	8	22	15 ± 8	02/28/13 - 04/04/13	9	20	15 ± 9
04/04/13 - 05/02/13	8	25	16 ± 14	04/04/13 - 05/02/13	10	24	16 ± 10	04/04/13 - 05/02/13	5	22	14 ± 10	04/04/13 - 05/02/13	7	26	15 ± 15
05/02/13 - 05/30/13	11	20	15 ± 7	05/02/13 - 05/30/13	8	19	14 ± 8	05/02/13 - 05/30/13	9	20	15 ± 7	05/02/13 - 05/30/13	8	15	13 ± 7
05/30/13 - 07/04/13	8	20	14 ± 9	05/30/13 - 07/04/13	8	20	13 ± 8	05/30/13 - 07/04/13	7	20	13 ± 8	05/30/13 - 07/04/13	10	19	14 ± 7
07/04/13 - 08/01/13	10	29	17 ± 11	07/04/13 - 08/01/13	10	17	14 ± 5	07/04/13 - 08/01/13	10	23	14 ± 6	07/04/13 - 08/01/13	14	17	15 ± 3
08/01/13 - 08/29/13	17	28	23 ± 8	08/01/13 - 08/29/13	15	27	21 ± 9	08/01/13 - 08/29/13	14	35	22 ± 12	08/01/13 - 08/29/13	18	32	24 ± 12
08/29/13 - 10/03/13	13	40	23 ± 17	08/29/13 - 10/03/13	12	40	24 ± 17	08/29/13 - 10/03/13	14	41	23 ± 16	08/29/13 - 10/03/13	19	37	26 ± 14
10/03/13 - 10/31/13	15	22	19 ± 4	10/03/13 - 10/31/13	17	21	19 ± 3	10/03/13 - 10/31/13	15	23	20 ± 5	10/03/13 - 10/31/13	17	22	20 ± 6
10/31/13 - 11/27/13	16	25	20 ± 7	10/31/13 - 11/27/13	18	25	22 ± 5	10/31/13 - 11/27/13	13	27	21 ± 7	10/31/13 - 11/27/13	13	22	17 ± 8
11/27/13 - 01/02/14	26	39	31 ± 8	11/27/13 - 01/02/14	21	39	33 ± 11	11/27/13 - 01/02/14	24	43	33 ± 12	11/27/13 - 01/02/14	27	40	33 ± 13
01/03/13 - 1/2/2014	8	52	20 ± 16	01/03/13 - 01/02/14	8	54	21 ± 17	01/03/13 - 01/02/14	5	57	20 ± 17	01/03/13 - 01/02/14	7	52	20 ± 18

Table C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-01	01/03/13 - 04/04/13	< 3	< 5	< 16	< 3	< 10	< 6	< 11	< 3	< 3	< 594	< 260
	04/04/13 - 07/04/13	< 4	< 5	< 17	< 3	< 8	< 5	< 12	< 3	< 3	< 448	< 137
	07/04/13 - 10/03/13	< 4	< 7	< 21	< 3	< 11	< 6	< 10	< 5	< 3	< 1069	< 256
	10/03/13 - 01/02/14	< 2	< 5	< 14	< 2	< 7	< 4	< 9	< 3	< 2	< 286	< 125
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-03	01/03/13 - 04/04/13	< 4	< 8	< 21	< 3	< 9	< 7	< 11	< 4	< 3	< 670	< 153
	04/04/13 - 07/04/13	< 5	< 7	< 35	< 5	< 10	< 10	< 13	< 5	< 4	< 669	< 294
	07/04/13 - 10/03/13	< 3	< 4	< 19	< 3	< 9	< 7	< 10	< 3	< 3	< 837	< 308
	10/03/13 - 01/02/14	< 3	< 5	< 14	< 3	< 7	< 5	< 10	< 3	< 2	< 298	< 97
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-04	01/03/13 - 04/04/13	< 3	< 5	< 18	< 3	< 8	< 7	< 11	< 4	< 3	< 756	< 248
	04/04/13 - 07/04/13	< 3	< 5	< 13	< 3	< 8	< 5	< 7	< 3	< 3	< 486	< 208
	07/04/13 - 10/03/13	< 3	< 4	< 17	< 3	< 7	< 5	< 8	< 3	< 2	< 776	< 281
	10/03/13 - 01/02/14	< 5	< 6	< 22	< 4	< 11	< 9	< 14	< 4	< 4	< 537	< 152
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-05	01/03/13 - 04/04/13	< 3	< 5	< 17	< 3	< 6	< 7	< 12	< 3	< 2	< 610	< 251
	04/04/13 - 07/04/13	< 4	< 5	< 17	< 2	< 8	< 6	< 9	< 3	< 3	< 463	< 165
	07/04/13 - 10/03/13	< 3	< 5	< 16	< 2	< 7	< 5	< 8	< 3	< 2	< 769	< 358
	10/03/13 - 01/02/14	< 2	< 4	< 12	< 2	< 8	< 4	< 7	< 3	< 2	< 328	< 108
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-06	01/03/13 - 04/04/13	< 3	< 6	< 16	< 3	< 9	< 6	< 12	< 3	< 2	< 611	< 237
	04/04/13 - 07/04/13	< 4	< 7	< 15	< 4	< 9	< 7	< 12	< 4	< 3	< 497	< 175
	07/04/13 - 10/03/13	< 4	< 9	< 19	< 5	< 15	< 10	< 16	< 4	< 3	< 902	< 541
	10/03/13 - 01/02/14	< 3	< 5	< 18	< 3	< 8	< 6	< 9	< 3	< 3	< 397	< 108
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-V.3 **CONCENTRATIONS OF GAMMA EMITTERS IN AIR PARTICULATE SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-07	01/03/13 - 04/04/13	< 4	< 6	< 19	< 3	< 9	< 7	< 10	< 4	< 3	< 660	< 281
	04/04/13 - 07/04/13	< 2	< 4	< 15	< 3	< 5	< 5	< 6	< 2	< 2	< 291	< 182
	07/04/13 - 10/03/13	< 4	< 7	< 22	< 3	< 10	< 7	< 12	< 4	< 3	< 978	< 158
	10/03/13 - 01/02/14	< 4	< 6	< 20	< 4	< 10	< 6	< 10	< 4	< 3	< 460	< 131
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-08	01/03/13 - 04/04/13	< 4	< 7	< 18	< 4	< 11	< 7	< 12	< 5	< 4	< 796	< 352
	04/04/13 - 07/04/13	< 2	< 3	< 13	< 2	< 6	< 4	< 7	< 2	< 2	< 363	< 185
	07/04/13 - 10/03/13	< 2	< 4	< 18	< 2	< 6	< 7	< 9	< 3	< 2	< 869	< 319
	10/03/13 - 01/02/14	< 2	< 3	< 10	< 3	< 5	< 5	< 7	< 2	< 2	< 304	< 76
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-10	01/03/13 - 04/04/13	< 4	< 5	< 17	< 4	< 9	< 5	< 10	< 4	< 3	< 652	< 299
	04/04/13 - 07/04/13	< 3	< 4	< 12	< 2	< 6	< 4	< 7	< 2	< 2	< 369	< 112
	07/04/13 - 10/03/13	< 3	< 5	< 22	< 3	< 8	< 9	< 11	< 4	< 3	< 835	< 401
	10/03/13 - 01/02/14	< 3	< 4	< 13	< 3	< 4	< 4	< 9	< 3	< 3	< 330	< 158
	MEAN	-	-	-	-	-	-	-	-	-	-	-
L-11	01/03/13 - 04/04/13	< 3	< 5	< 13	< 2	< 9	< 5	< 8	< 3	< 3	< 473	< 213
	04/04/13 - 07/04/13	< 3	< 3	< 14	< 2	< 7	< 6	< 11	< 2	< 2	< 430	< 230
	07/04/13 - 10/03/13	< 2	< 4	< 19	< 2	< 7	< 4	< 8	< 3	< 2	< 727	< 380
	10/03/13 - 01/02/14	< 3	< 4	< 11	< 3	< 7	< 4	< 7	< 2	< 2	< 328	< 149
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VI.1 **CONCENTRATIONS OF I-131 IN AIR IODINE SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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

COLLECTION PERIOD	GROUP I		GROUP II		GROUP III				GROUP IV
	L-03	L-05	L-01	L-06	L-04	L-07	L-08	L-11	L-10
01/03/13 - 01/10/13	< 55	< 55	< 23	< 55	< 55	< 43	< 43	< 43	< 43
01/10/13 - 01/17/13	< 53	< 54	< 53	< 55	< 52	< 53	< 51	< 55	< 33
01/17/13 - 01/24/13	< 45	< 45	< 15	< 45	< 44	< 33	< 33	< 33	< 33
01/24/13 - 01/31/13	< 39	< 39	< 39	< 49	< 39	< 49	< 49	< 19	< 49
01/31/13 - 02/07/13	< 50	< 50	< 21	< 49	< 51	< 47	< 46	< 45	< 46
02/07/13 - 02/14/13	< 56	< 56	< 33	< 55	< 55	< 57	< 57	< 70	< 70
02/14/13 - 02/21/13	< 27	< 27	< 14	< 27	< 27	< 39	< 39	< 39	< 39
02/21/13 - 02/28/13	< 20	< 45	< 44	< 44	< 44	< 49	< 48	< 48	< 48
02/28/13 - 03/07/13	< 38	< 38	< 16	< 38	< 38	< 25	< 25	< 25	< 25
03/07/13 - 03/14/13	< 55	< 55	< 54	< 55	< 54	< 70	< 70	< 70	< 70
03/14/13 - 03/21/13	< 52	< 51	< 31	< 52	< 52	< 61	< 61	< 61	< 61
03/21/13 - 03/27/13	< 46	< 27	< 46	< 46	< 46	< 62	< 62	< 62	< 62
03/27/13 - 04/04/13	< 42	< 42	< 25	< 42	< 42	< 66	< 66	< 66	< 66
04/04/13 - 04/11/13	< 41	< 42	< 41	< 16	< 41	< 29	< 29	< 29	< 29
04/11/13 - 04/18/13	< 65	< 64	< 65	< 27	< 65	< 51	< 51	< 50	< 51
04/18/13 - 04/25/13	< 41 (1)	< 44	< 44	< 39	< 44	< 17	< 39	< 39	< 39
04/25/13 - 05/02/13	< 60	< 58	< 24	< 58	< 58	< 41	< 40	< 41	< 41
05/02/13 - 05/09/13	< 65	< 65	< 65	< 65	< 65	< 67	< 28	< 65	< 65
05/09/13 - 05/16/13	< 67	< 67	< 28	< 67	< 67	< 44	< 45	< 45	< 45
05/16/13 - 05/23/13	< 45	< 45	< 45	< 69	< 45	< 69	< 69	< 69	< 29
05/23/13 - 05/30/13	< 52	< 52	< 20 (1)	< 52	< 52	< 45	< 46	< 46	< 46
05/30/13 - 06/06/13	< 46	< 46	< 46	< 49	< 46	< 49	< 49	< 21	< 49
06/06/13 - 06/13/13	< 52	< 52	< 20	< 52	< 51	< 40	< 41	< 41	< 41
06/13/13 - 06/20/13	< 63	< 63	< 24	< 63	< 62	< 64	< 65	< 65	< 65
06/20/13 - 06/27/13	< 58	< 58	< 22	< 58	< 58	< 60	< 59	< 59	< 59
06/27/13 - 07/04/13	< 11	< 28	< 28	< 28	< 28	< 34	< 34	< 34	< 34
07/04/13 - 07/11/13	< 65	< 44 (1)	< 27	< 68 (1)	< 64	< 64	< 64	< 64	< 64
07/11/13 - 07/18/13	< 62	< 62	< 62	< 62	< 24	< 62	< 62	< 62	< 62
07/18/13 - 07/25/13	< 56	< 57	< 22	< 56	< 56	< 52	< 52	< 52	< 52
07/25/13 - 08/01/13	< 70	< 26	< 70	< 70	< 70	< 64	< 70	< 70	< 70
08/01/13 - 08/08/13	< 19	< 20	< 8	< 19	< 19	< 22	< 22	< 22	< 22
08/08/13 - 08/14/13	< 64	< 61	< 63	< 24	< 63	< 56	< 56	< 56	< 56
08/14/13 - 08/22/13	< 46	< 47	< 46	< 57	< 46	< 58	< 58	< 22	< 58
08/22/13 - 08/29/13	< 56	< 56	< 56	< 55	< 56	< 29	< 55	< 55	< 55
08/29/13 - 09/05/13	< 34	< 34	< 13	< 33	< 33	< 29	< 29	< 29	< 29
09/05/13 - 09/12/13	< 35	< 33	< 34	< 39	< 34	< 39	< 17	< 39	< 39
09/12/13 - 09/19/13	< 22	< 22	< 22	< 20	< 22	< 21	< 21	< 9	< 21
09/19/13 - 09/25/13	< 34	< 35	< 34	< 53	< 34	< 56	< 56	< 55	< 22
09/25/13 - 10/03/13	< 44	< 44	< 44	< 24	< 44	< 63	< 61	< 61	< 64
10/03/13 - 10/10/13	< 67	< 67	< 66	< 67	< 66	< 68	< 68	< 28	< 68
10/10/13 - 10/17/13	< 64	< 65	< 25	< 64	< 64	< 65	< 64	< 63	< 63
10/17/13 - 10/23/13	< 62	< 62	< 24	< 62	< 62	< 54	< 54	< 55	< 55
10/23/13 - 10/31/13	< 30	< 30	< 12	< 30	< 30	< 35	< 34	< 34	< 34
10/31/13 - 11/07/13	< 14	< 33	< 33	< 33	< 33	< 37	< 37	< 37	< 37
11/07/13 - 11/14/13	< 64	< 64	< 27	< 64	< 64	< 57	< 57	< 56	< 56
11/14/13 - 11/21/13	< 52	< 52	< 52	< 52	< 22	< 51	< 53	< 52	< 52
11/21/13 - 11/27/13	< 57	< 57	< 31	< 57	< 57	< 69	< 69	< 68	< 69
11/27/13 - 12/05/13	< 28	< 11	< 28	< 28	< 28	< 26	< 26	< 26	< 26
12/05/13 - 12/12/13	< 66	< 66	< 25	< 66	< 66	< 69	< 69	< 69	< 69
12/12/13 - 12/19/13	< 65	< 65	< 65	< 25	< 65	< 65	< 65	< 64	< 65
12/19/13 - 12/26/13	< 41	< 41	< 41	< 42	< 41	< 43	< 43	< 42	< 42
12/26/13 - 01/02/14	< 54	< 54	< 54	< 60	< 54	< 21	< 60	< 60	< 60
MEAN	-	-	-	-	-	-	-	-	-

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-VII.1 **CONCENTRATIONS OF I-131 IN MILK SAMPLES IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

	CONTROL FARM
COLLECTION PERIOD	L-42
1/4/2013	< 0.5
02/07/13	< 0.7
03/07/13	< 0.7
04/04/13	< 0.8
05/02/13	< 0.7
05/16/13	< 0.7
05/30/13	< 0.6
06/13/13	< 0.6
06/27/13	< 0.8
07/11/13	< 0.6
07/25/13	< 0.7
08/08/13	< 0.7
08/22/13	< 0.6
09/05/13	< 0.8
09/19/13	< 0.9
10/03/13	< 0.8
10/17/13	< 0.9
10/31/13	< 0.6
11/14/13	< 0.7
12/05/13	< 0.8
MEAN	-

Table C-VII.2 **CONCENTRATIONS OF GAMMA EMITTERS IN MILK SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-42	01/04/13	< 7	< 8	< 20	< 10	< 16	< 8	< 13	< 5	< 7	< 46	< 16
	02/07/13	< 5	< 6	< 14	< 7	< 11	< 7	< 10	< 5	< 5	< 39	< 9
	03/07/13	< 5	< 6	< 13	< 6	< 13	< 6	< 10	< 5	< 6	< 36	< 7
	04/04/13	< 6	< 5	< 14	< 8	< 12	< 6	< 13	< 6	< 6	< 46	< 12
	05/02/13	< 5	< 6	< 15	< 7	< 15	< 6	< 11	< 5	< 6	< 40	< 12
	05/16/13	< 6	< 7	< 15	< 7	< 14	< 7	< 9	< 5	< 6	< 44	< 13
	05/30/13	< 6	< 5	< 13	< 7	< 13	< 5	< 9	< 6	< 6	< 27	< 8
	06/13/13	< 6	< 7	< 15	< 8	< 13	< 7	< 11	< 5	< 7	< 28	< 9
	06/27/13	< 5	< 6	< 14	< 7	< 13	< 7	< 10	< 6	< 6	< 39	< 10
	07/11/13	< 5	< 5	< 11	< 5	< 10	< 5	< 9	< 4	< 5	< 33	< 8
	07/25/13	< 6	< 6	< 14	< 7	< 13	< 7	< 11	< 6	< 6	< 44	< 14
	08/08/13	< 7	< 7	< 16	< 7	< 15	< 8	< 13	< 6	< 7	< 49	< 13
	08/22/13	< 5	< 5	< 10	< 6	< 10	< 5	< 9	< 5	< 5	< 36	< 8
	09/05/13	< 6	< 7	< 16	< 9	< 15	< 7	< 13	< 6	< 6	< 39	< 11
	09/19/13	< 6	< 7	< 13	< 8	< 14	< 7	< 11	< 6	< 6	< 42	< 11
	10/03/13	< 7	< 7	< 14	< 7	< 15	< 7	< 10	< 5	< 6	< 45	< 8
	10/17/13	< 2	< 2	< 6	< 3	< 5	< 3	< 4	< 2	< 2	< 20	< 6
	10/31/13	< 7	< 7	< 16	< 7	< 14	< 7	< 14	< 6	< 7	< 42	< 15
	11/14/13	< 5	< 6	< 15	< 6	< 12	< 6	< 12	< 4	< 6	< 51	< 14
	12/05/13	< 7	< 6	< 17	< 9	< 15	< 6	< 12	< 6	< 7	< 45	< 9
	MEAN	-	-	-	-	-	-	-	-	-	-	-

Table C-VIII.1 **CONCENTRATIONS OF GAMMA EMITTERS IN FOOD PRODUCT SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

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
L-CONTROL													
Potatoes	09/07/13	< 11	< 17	< 38	< 13	< 35	< 15	< 28	< 52	< 11	< 11	< 107	< 19
Swiss Chard	09/07/13	< 13	< 16	< 39	< 19	< 38	< 16	< 25	< 42	< 10	< 13	< 101	< 30
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
L-QUAD 1													
Celery root	09/07/13	< 13	< 15	< 39	< 18	< 29	< 12	< 23	< 39	< 12	< 11	< 75	< 34
Kale	09/07/13	< 12	< 15	< 32	< 16	< 30	< 14	< 22	< 42	< 11	< 11	< 76	< 27
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
L-QUAD 2													
Beets	09/07/13	< 10	< 14	< 34	< 17	< 31	< 13	< 25	< 41	< 12	< 12	< 101	< 27
Cabbage	09/07/13	< 11	< 11	< 29	< 13	< 27	< 13	< 23	< 42	< 10	< 11	< 87	< 26
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
L-QUAD 3													
Cabbage	09/07/13	< 11	< 11	< 26	< 14	< 25	< 12	< 21	< 34	< 10	< 11	< 81	< 24
Radishes	09/07/13	< 12	< 14	< 35	< 15	< 28	< 14	< 21	< 46	< 13	< 12	< 89	< 18
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-
L-QUAD 4													
Beet greens	09/07/13	< 9	< 11	< 27	< 15	< 26	< 11	< 19	< 38	< 9	< 10	< 83	< 13
Beets	09/07/13	< 10	< 12	< 30	< 16	< 28	< 13	< 20	< 40	< 9	< 11	< 82	< 23
	MEAN	-	-	-	-	-	-	-	-	-	-	-	-

Table C-IX.1 QUARTERLY OSLD RESULTS FOR LASALLE COUNTY STATION, 2013

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
L-01-1	24.8 ± 2.3	23.4	24.8	24.8	26.2
L-01-2	24.2 ± 3.6	26.1	23.3	22.1	25.1
L-03-1	21.9 ± 2.3	22.1	22.0	20.3	23.1
L-03-2	23.2 ± 1.7	22.7	22.7	24.5	22.9
L-04-1	22.7 ± 1.5	22.4	21.8	22.8	23.6
L-04-2	22.6 ± 3.4	22.7	24.8	22.3	20.7
L-05-1	22.4 ± 1.0	22.5	21.7	22.8	22.6
L-05-2	22.9 ± 1.1	22.3	23.4	22.6	23.3
L-06-1	23.5 ± 1.8	22.7	24.7	22.9	23.7
L-06-2	24.0 ± 2.7	25.3	24.8	22.3	23.5
L-07-1	24.1 ± 2.2	23.2	24.9	23.0	25.1
L-07-2	23.9 ± 3.4	23.1	26.2	22.2	23.9
L-08-1	23.1 ± 1.9	22.8	23.6	21.9	24.1
L-08-2	22.8 ± 2.0	22.9	23.4	21.4	23.6
L-10-1	20.4 ± 1.9	20.9	21.3	19.1	20.4
L-10-2	20.7 ± 2.7	20.5	20.8	19.0	22.3
L-11-1	20.4 ± 2.5	20.0	22.1	19.2	20.1
L-11-2	20.9 ± 3.6	20.7	22.7	18.5	21.8
L-101-1	24.3 ± 4.2	21.3	25.7	24.6	25.7
L-101-2	23.3 ± 2.3	23.3	24.6	21.8	23.5
L-102-1	25.3 ± 2.4	25.0	26.7	23.8	25.7
L-102-2	25.8 ± 1.1	26.3	25.1	26.1	25.6
L-103-1	22.6 ± 2.0	22.5	23.2	21.3	23.5
L-103-2	23.3 ± 2.3	23.6	23.9	21.6	24.0
L-104-1	22.2 ± 4.1	21.6	24.6	19.8	22.9
L-104-2	21.1 ± 1.2	20.3	21.3	21.2	21.7
L-105-1	23.6 ± 2.6	22.9	24.3	22.2	25.0
L-105-2	23.5 ± 0.5	23.3	23.2	23.8	23.5
L-106-1	22.0 ± 3.3	21.8	23.4	19.7	23.0
L-106-2	21.4 ± 2.1	22.4	22.0	20.1	21.0
L-107-1	23.0 ± 2.3	22.6	24.5	21.8	22.9
L-107-2	23.4 ± 3.3	22.6	24.3	21.6	25.2
L-108-1	24.1 ± 1.8	24.3	24.9	24.2	22.8
L-108-2	19.5 ± 3.4	19.6	20.3	17.1	21.0
L-109-1	23.0 ± 3.6	21.2	24.4	21.6	24.6
L-109-2	23.7 ± 4.6	24.5	22.9	21.0	26.4
L-110-1	22.8 ± 1.3	22.8	23.7	22.5	22.2
L-110-2	22.6 ± 2.8	21.4	23.5	21.3	24.0
L-112-1	22.4 ± 2.3	22.0	23.8	21.0	22.6
L-112-2	23.9 ± 1.4	23.6	24.8	23.2	23.8
L-114-1	23.0 ± 1.2	22.1	22.9	23.5	23.3
L-114-2	22.3 ± 2.9	22.8	23.0	20.1	23.2
L-115-1	22.1 ± 4.2	20.8	25.2	20.7	21.8
L-115-2	21.3 ± 2.6	(1)	22.7	20.9	20.2

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

Table C-IX.1 QUARTERLY OSLD RESULTS FOR LASALLE COUNTY STATION, 2013

RESULTS IN UNITS OF MREM/QUARTER ± 2 STANDARD DEVIATIONS

STATION CODE	MEAN ± 2 S.D.	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
L-116-1	20.8 ± 3.2	20.2	21.3	18.9	22.6
L-116-2	22.4 ± 4.1	20.4	25.2	22.4	21.7
L-201-3	18.4 ± 3.2	18.8	19.4	16.1	19.4
L-201-4	23.4 ± 1.2	23.4	22.8	23.1	24.2
L-202-3	20.7 ± 2.6	20.7	22.2	19.0	21.0
L-202-4	20.2 ± 3.7	21.0	20.2	17.7	22.0
L-203-1	23.9 ± 2.2	24.1	23.9	22.4	25.0
L-203-2	22.9 ± 4.8	23.0	24.2	19.4	24.8
L-204-1	23.2 ± 2.0	22.1	22.7	24.2	23.9
L-204-2	23.9 ± 4.4	22.9	26.8	21.6	24.1
L-205-1	23.3 ± 0.7	23.6	23.5	23.1	22.9
L-205-2	22.8 ± 1.4	23.4	23.0	21.8	23.1
L-205-3	22.6 ± 1.8	21.7	22.8	22.2	23.8
L-205-4	23.0 ± 3.5	22.2	22.4	21.7	25.5
L-206-1	23.6 ± 1.8	23.3	22.8	23.5	24.9
L-206-2	21.3 ± 4.7	20.9	22.7	18.2	23.5
L-207-1	22.1 ± 1.5	21.5	22.8	21.3	22.6
L-207-2	22.8 ± 2.4	21.1	22.8	23.4	23.8
L-208-1	22.4 ± 3.1	22.8	23.7	20.7	(1)
L-208-2	24.6 ± 2.6	24.4	26.3	24.7	23.1
L-209-1	23.1 ± 1.5	23.4	23.7	22.0	23.3
L-209-2	23.0 ± 1.0	22.9	23.7	22.6	22.6
L-210-1	24.1 ± 1.8	23.4	24.6	25.1	23.3
L-210-2	25.0 ± 3.7	24.5	27.4	22.9	25.2
L-211-1	23.1 ± 2.0	22.5	22.3	22.9	24.5
L-211-2	23.7 ± 1.4	22.7	24.3	23.7	23.9
L-212-1	23.9 ± 4.1	24.2	26.6	21.8	23.1
L-212-2	23.0 ± 1.7	22.5	24.1	22.1	23.1
L-213-3	23.9 ± 1.7	22.7	23.9	24.7	24.3
L-213-4	21.5 ± 2.2	20.3	22.0	20.8	22.7
L-214-3	22.1 ± 1.2	22.4	22.8	21.6	21.6
L-214-4	20.7 ± 0.9	20.9	(1)	21.1	20.2
L-215-3	24.5 ± 1.5	25.2	24.8	24.6	23.4
L-215-4	23.7 ± 2.7	21.9	24.2	23.7	25.1
L-216-3	23.4 ± 3.7	21.1	23.8	23.1	25.6
L-216-4	24.7 ± 2.8	25.1	24.2	23.0	26.3
L-111B-1	23.1 ± 2.4	21.4	24.0	23.9	23.2
L-111B-2	24.0 ± 5.1	24.4	26.4	20.4	24.8
L-113A-1	24.8 ± 2.3	23.9	26.0	23.7	25.5
L-113A-2	24.1 ± 2.0	24.1	25.5	23.2	23.6

(1) SEE PROGRAM EXCEPTIONS SECTION FOR EXPLANATION

TABLE C-IX.2 MEAN QUARTERLY OSLD RESULTS FOR THE INNER RING, OUTER RING, OTHER AND CONTROL LOCATIONS FOR LASALLE COUNTY STATION, 2013

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

COLLECTION PERIOD	INNER RING ± 2 S.D.	OUTER RING	OTHER	CONTROL
JAN-MAR	22.5 ± 3.1	22.5 ± 2.9	22.8 ± 2.9	20.7 ± 0.6
APR-JUN	24.0 ± 3.0	23.6 ± 3.3	23.6 ± 2.7	21.1 ± 0.7
JUL-SEP	21.8 ± 3.7	22.1 ± 4.1	22.1 ± 3.3	19.1 ± 0.1
OCT-DEC	23.5 ± 3.1	23.5 ± 3.0	23.3 ± 3.1	21.4 ± 2.7

TABLE C-IX.3 SUMMARY OF THE AMBIENT DOSIMETRY PROGRAM FOR LASALLE COUNTY STATION, 2013

RESULTS IN UNITS OF MREM/QUARTER

LOCATION	SAMPLES ANALYZED	PERIOD MINIMUM	PERIOD MAXIMUM	PERIOD MEAN ± 2 S.D.
INNER RING	127	17.1	26.7	23.0 ± 3.6
OUTER RING	134	16.1	27.4	22.9 ± 3.6
OTHER	64	18.5	26.2	22.9 ± 3.1
CONTROL	8	19.0	22.3	20.5 ± 2.2

INNER RING STATIONS - L-101-1, L-101-2, L-102-1, L-102-2, L-103-1, L-103-2, L-104-1, L-104-2, L-105-1, L-105-2, L-106-1, L-106-2, L-107-1, L-107-2, L-108-1, L-108-2, L-109-1, L-109-2, L-110-1, L-110-2, L-111B-1, L-111B-2, L-112-1, L-112-2, L-113A-1, L-113A-2, L-114-1, L-114-2, L-115-1, L-115-2, L-116-1, L-116-2

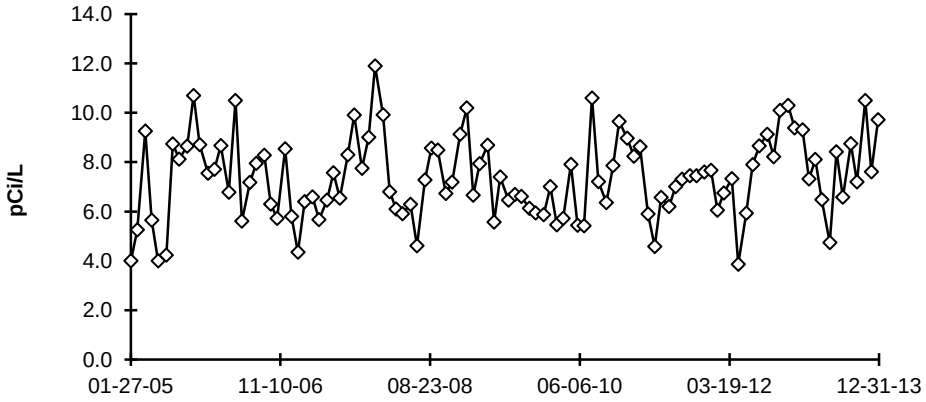
OUTER RING STATIONS - L-201-3, L-201-4, L-202-3, L-202-4, L-203-1, L-203-2, L-204-1, L-204-2, L-205-1, L-205-2, L-205-3, L-205-4, L-206-1, L-206-2, L-207-1, L-207-2, L-208-1, L-208-2, L-209-1, L-209-2, L-210-1, L-210-2, L-211-1, L-211-2, L-212-1, L-212-2, L-213-3, L-213-4, L-214-3, L-214-4, L-215-3,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

OTHER STATIONS - L-01-1, L-01-2, L-03-1, L-03-2, L-04-1, L-04-2, L-05-1, L-05-2, L-06-1, L-06-2, L-07-1, L-07-2, L-08-1, L-08-2, L-11-1, L-11-2

CONTROL STATIONS - L-10-1, L-10-2

FIGURE C-1
Surface Water - Gross Beta - Stations L-21 (C) and L-40 Collected in the Vicinity of LSCS, 2005 - 2013

L-21 (C) Illinois River at Seneca



L-40 Illinois River Downstream

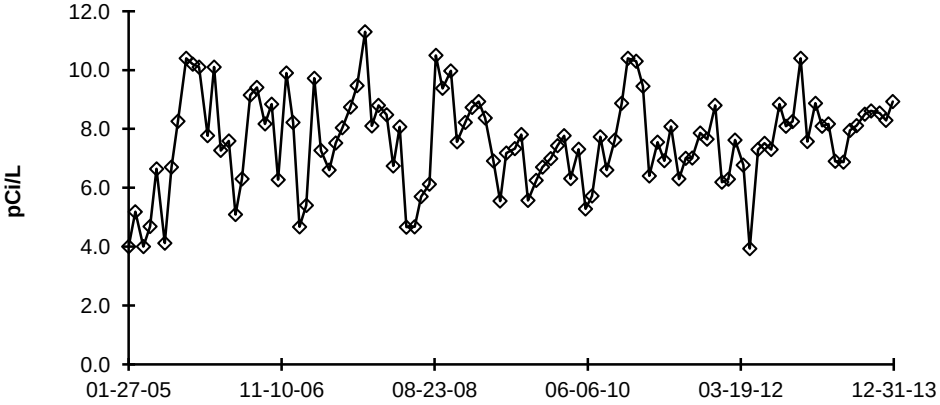
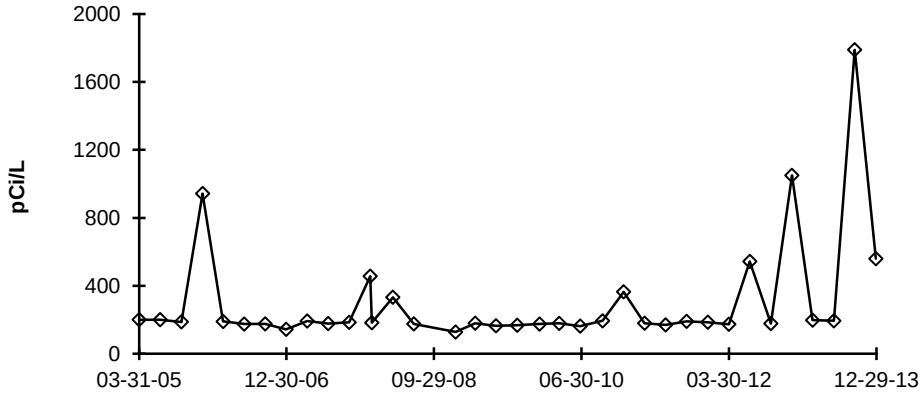


FIGURE C-2
Surface Water - Tritium - Stations L-21 (C) and L-40 Collected in the Vicinity of LSCS, 2005 - 2013

L-21 Illinois River at Seneca



L-40 Illinois River Downstream

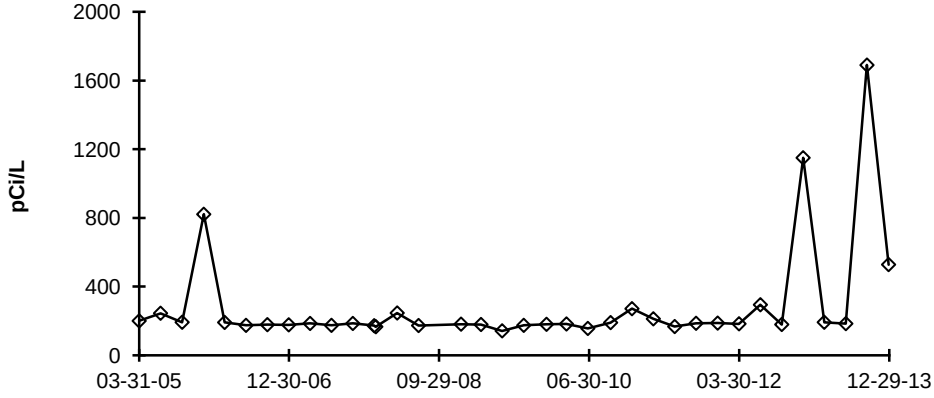
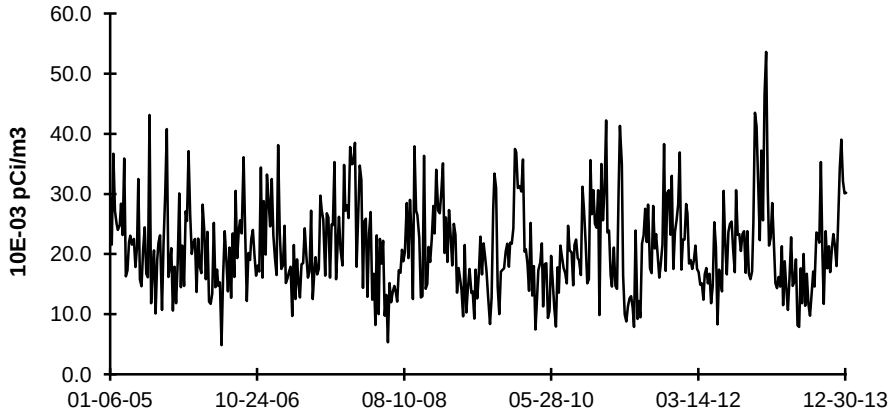


FIGURE C-3
Air Particulate - Gross Beta - Stations L-01 and L-03 Collected in the Vicinity of LSCS, 2005 - 2013

L-01 Nearsite No. 1



L-03 Onsite No. 3

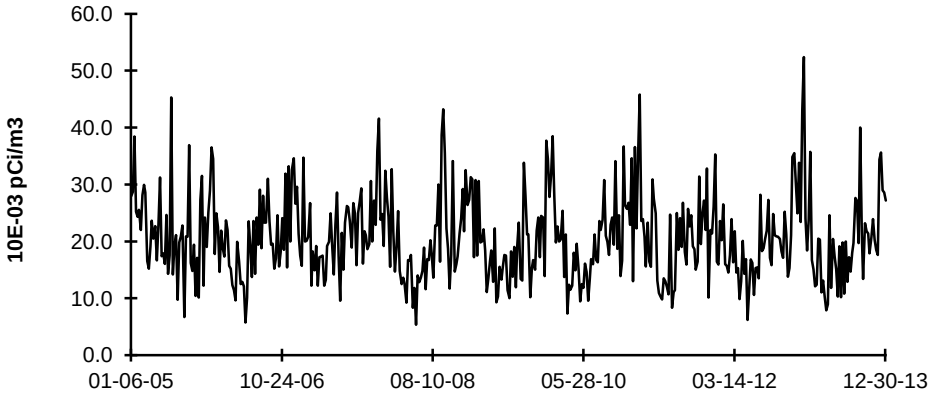
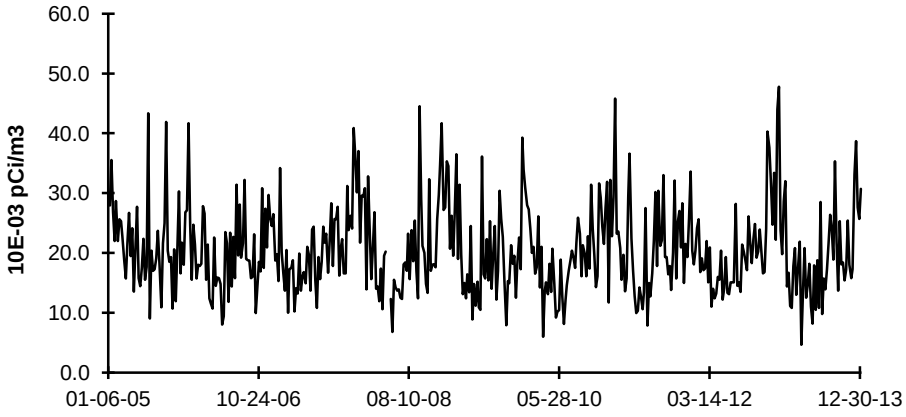


FIGURE C-4
Air Particulate - Gross Beta - Stations L-05 and L-06 Collected in the Vicinity of LSCS, 2005 - 2013

L-05 Onsite No. 5



L-06 Nearsite No. 6

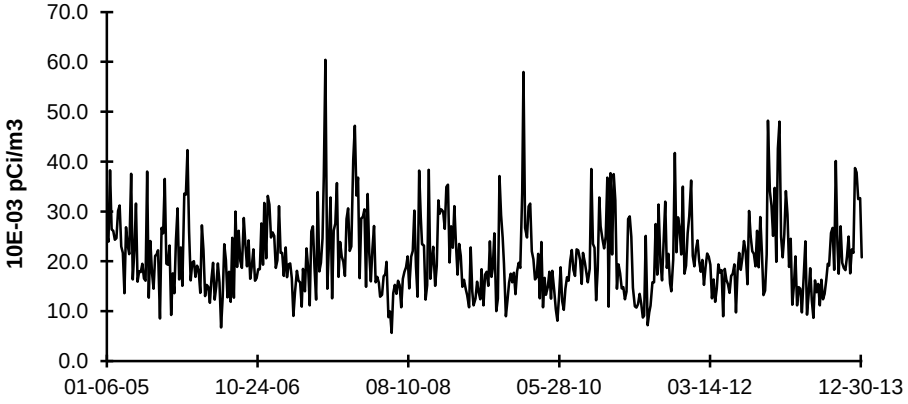


FIGURE C-5
Air Particulate - Gross Beta - Station L-10 (C)
Collected in the Vicinity of LSCS, 2005 - 2013

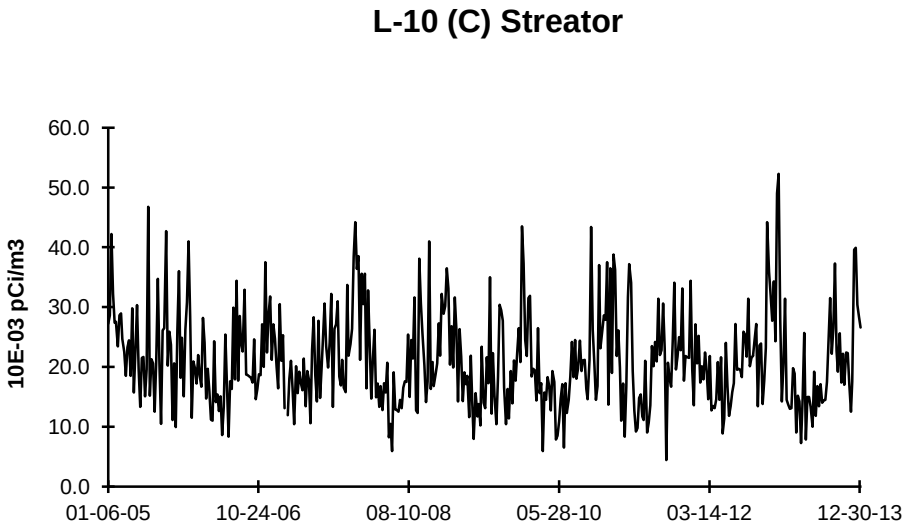
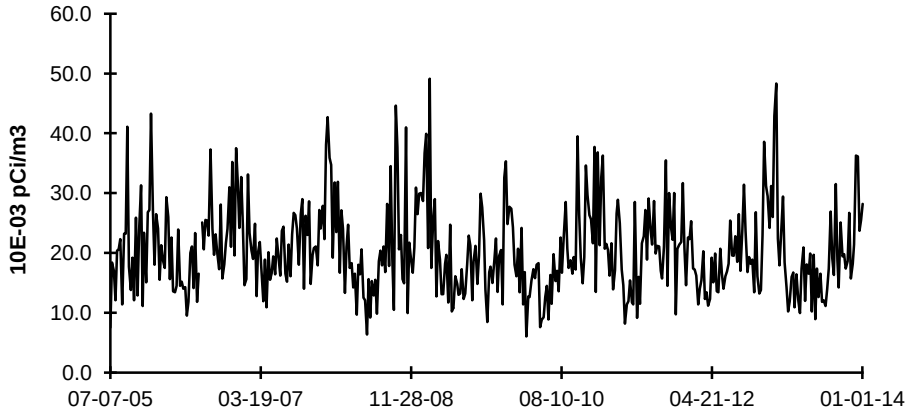


FIGURE C-6
Air Particulate - Gross Beta - Stations L-04 and L-07 Collected in the Vicinity of LSCS, 2005 - 2013

L-04 Rte. 170



L-07 Seneca

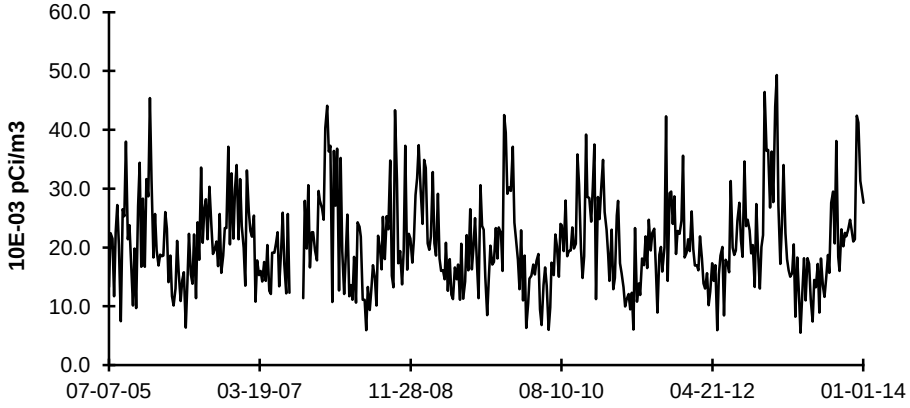
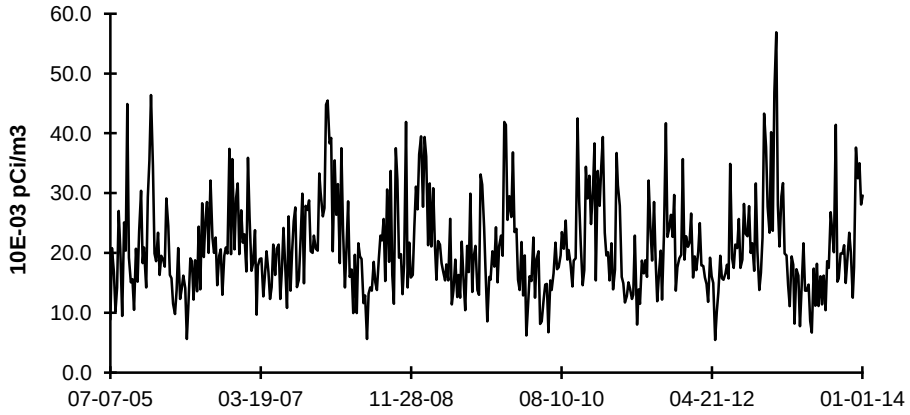
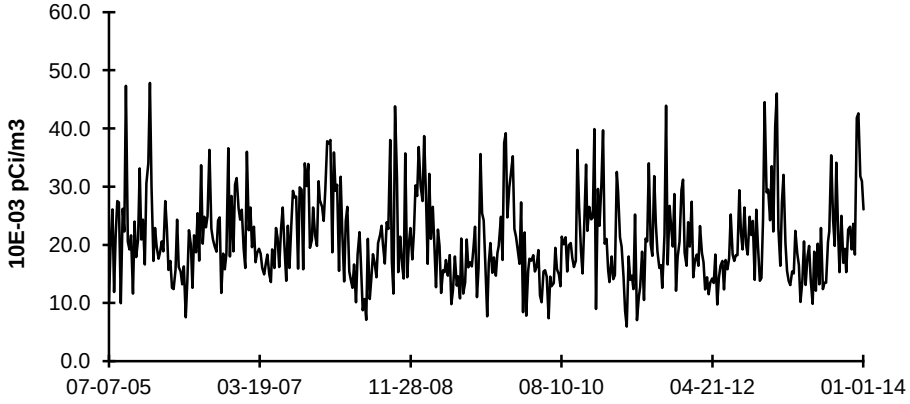


FIGURE C-7
Air Particulate - Gross Beta - Stations L-08 and L-11 Collected in the Vicinity of LSCS, 2005 - 2013

L-08 Marseilles



L-11 Ransom



APPENDIX D

INTER-LABORATORY COMPARISON PROGRAM

TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2013
(PAGE 1 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2013	E10477	Milk	Sr-89	pCi/L	120	99.7	1.20	A
			Sr-90	pCi/L	9.21	11.0	0.84	A
	E10478	Milk	I-131	pCi/L	87.1	100	0.87	A
			Ce-141	pCi/L	186	187	0.99	A
			Cr-51	pCi/L	463	472	0.98	A
			Cs-134	pCi/L	201	214	0.94	A
			Cs-137	pCi/L	262	266	0.98	A
			Co-58	pCi/L	200	208	0.96	A
			Mn-54	pCi/L	215	208	1.03	A
			Fe-59	pCi/L	266	252	1.06	A
			Zn-65	pCi/L	311	301	1.03	A
			Co-60	pCi/L	384	400	0.96	A
	E10480	AP	Ce-141	pCi	95.3	95.6	1.00	A
			Cr-51	pCi	264	241	1.10	A
			Cs-134	pCi	123	109	1.13	A
			Cs-137	pCi	142	136	1.04	A
			Co-58	pCi	112	106	1.06	A
			Mn-54	pCi	115	106	1.08	A
			Fe-59	pCi	139	129	1.08	A
			Zn-65	pCi	163	153	1.07	A
			Co-60	pCi	212	204	1.04	A
	E10479	Charcoal	I-131	pCi	90.1	92.6	0.97	A
	E10481	Water	Fe-55	pCi/L	1840	1890	0.97	A
June 2013	E10564	Milk	Sr-89	pCi/L	110	95.0	1.16	A
			Sr-90	pCi/L	15.8	17.0	0.93	A
	E10545	Milk	I-131	pCi/L	92.6	95.5	0.97	A
			Ce-141	pCi/L	83.1	90.4	0.92	A
			Cr-51	pCi/L	253	250	1.01	A
			Cs-134	pCi/L	118	125	0.94	A
			Cs-137	pCi/L	143	151	0.95	A
			Co-58	pCi/L	87.1	94.0	0.93	A
			Mn-54	pCi/L	171	172	0.99	A
			Fe-59	pCi/L	125	120	1.04	A
			Zn-65	pCi/L	220	217	1.01	A
			Co-60	pCi/L	169	175	0.97	A
	E10547	AP	Ce-141	pCi	56.8	56.7	1.00	A
			Cr-51	pCi	168	157	1.07	A
			Cs-134	pCi	85.2	78.4	1.09	A
			Cs-137	pCi	101	94.6	1.07	A
			Co-58	pCi	62.7	58.9	1.06	A
			Mn-54	pCi	125	108	1.16	A
			Fe-59	pCi	85.7	75.0	1.14	A
			Zn-65	pCi	169	136	1.24	W
			Co-60	pCi	116	110	1.05	A
	E10546	Charcoal	I-131	pCi	86.5	89.7	0.96	A

TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2013
(PAGE 2 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
June 2013	E10549	Water	Fe-55	pCi/L	1610	1610	1.00	A
September 2013	E10646	Milk	Sr-89	pCi/L	63.9	96.0	0.67	N (1)
			Sr-90	pCi/L	8.88	13.2	0.67	N (1)
	E10647	Milk	I-131	pCi/L	93.9	98.3	0.96	A
			Ce-141	pCi/L				NA (2)
			Cr-51	pCi/L	272	277	0.98	A
			Cs-134	pCi/L	150	172	0.87	A
			Cs-137	pCi/L	125	131	0.95	A
			Co-58	pCi/L	105	108	0.97	A
			Mn-54	pCi/L	138	139	0.99	A
			Fe-59	pCi/L	125	130	0.96	A
			Zn-65	pCi/L	264	266	0.99	A
			Co-60	pCi/L	187	196	0.95	A
	E10672	AP	Ce-141	pCi				NA (2)
			Cr-51	pCi	208	223	0.93	A
			Cs-134	pCi	143	139	1.03	A
			Cs-137	pCi	106	105	1.01	A
			Co-58	pCi	97.0	86.5	1.12	A
			Mn-54	pCi	116	112	1.04	A
			Fe-59	pCi	98.6	105	0.94	A
			Zn-65	pCi	219	214	1.02	A
			Co-60	pCi	166	158	1.05	A
	E10648	Charcoal	I-131	pCi	76.3	71.7	1.06	A
	E10673	Water	Fe-55	pCi/L	1790	1690	1.06	A
December 2013	E10774	Milk	Sr-89	pCi/L	97.3	93.8	1.04	A
			Sr-90	pCi/L	13.3	12.9	1.03	A
	E10775	Milk	I-131	pCi/L	89.7	96.1	0.93	A
			Ce-141	pCi/L	99.8	110	0.91	A
			Cr-51	pCi/L	297	297	1.00	A
			Cs-134	pCi/L	129	142	0.91	A
			Cs-137	pCi/L	126	126	1.00	A
			Co-58	pCi/L	116	112	1.04	A
			Mn-54	pCi/L	167	168	0.99	A
			Fe-59	pCi/L	117	110	1.06	A
			Zn-65	pCi/L	757	741	1.02	A
			Co-60	pCi/L	141	147	0.96	A
	E10777	AP	Ce-141	pCi	85.1	88.0	0.97	A
			Cr-51	pCi	278	238	1.17	A
			Cs-134	pCi	123	114	1.08	A
			Cs-137	pCi	102	101	1.01	A
			Co-58	pCi	84.4	89.9	0.94	A
			Mn-54	pCi	132	135	0.98	A
			Fe-59	pCi	101	88.3	1.14	A
			Zn-65	pCi	506	595	0.85	A
			Co-60	pCi	118	118	1.00	A

TABLE D-1 ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING, 2013
(PAGE 3 OF 3)

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2013	E10776	Charcoal	I-131	pCi	84.7	80.5	1.05	A
	E10778	Water	Fe-55	pCi/L	2010	1910	1.05	A

(1) Milk, Sr-89/90 - The failure was due to analyst error. No client samples were affected by this failure. NCR 13-15

(2) The sample was not spiked with Ce-141.

(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, 2013
(PAGE 1 OF 1)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
May 2013	RAD-93	Water	Sr-89	pCi/L	48.3	41.3	31.6 - 48.4	A
			Sr-90	pCi/L	19.3	23.9	17.2 - 28.0	A
			Ba-133	pCi/L	81.9	82.1	69.0 - 90.3	A
			Cs-134	pCi/L	40.9	42.8	34.2 - 47.1	A
			Cs-137	pCi/L	44.0	41.7	37.0 - 48.8	A
			Co-60	pCi/L	61.9	65.9	59.3 - 75.0	A
			Zn-65	pCi/L	202	189	170 - 222	A
			Gr-A	pCi/L	34.2	40.8	21.1 - 51.9	A
			Gr-B	pCi/L	18.0	21.6	13.0 - 29.7	A
			I-131	pCi/L	23.8	23.8	19.7 - 28.3	A
			U-Nat	pCi/L	60.4	61.2	49.8 - 67.9	A
			H-3	pCi/L	3970	4050	3450 - 4460	A
	MRAD-18	Filter	Gr-A	pCi/filter	Lost during processing			
November 2013	RAD-95	Water	Sr-89	pCi/L	25.5	21.9	14.4 - 28.2	A
			Sr-90	pCi/L	14.3	18.1	12.8 - 21.5	A
			Ba-133	pCi/L	57.2	54.2	44.7 - 59.9	A
			Cs-134	pCi/L	83.3	86.7	71.1 - 95.4	A
			Cs-137	pCi/L	201	206	185 - 228	A
			Co-60	pCi/L	104	102	91.8 - 114	A
			Zn-65	pCi/L	361	333	300 - 389	A
			Gr-A	pCi/L	29.5	42.8	22.2 - 54.3	A
			Gr-B	pCi/L	30.1	32.2	20.8 - 39.9	A
			I-131	pCi/L	23.1	23.6	19.6 - 28.0	A
			U-Nat	pCi/L	5.53	6.24	4.70 - 7.44	A
			H-3	pCi/L	17650	17700	15500 - 19500	A
	MRAD-19	Filter	Gr-A	pCi/filter	33.0	83.0	27.8 - 129	A

(a) Teledyne Brown Engineering reported result.

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

(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. 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, 2013
(PAGE 1 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2013	13-MaW28	Water	Cs-134	Bq/L	21.0	24.4	17.1 - 31.7	A
			Cs-137	Bq/L	0.0446		(1)	A
			Co-57	Bq/L	28.3	30.9	21.6 - 40.2	A
			Co-60	Bq/L	18.2	19.56	13.69 - 25.43	A
			H-3	Bq/L	506	507	355 - 659	A
			Mn-54	Bq/L	25.7	27.4	19.2 - 35.6	A
			K-40	Bq/L	2.09		(1)	A
			Sr-90	Bq/L	10.5	10.5	7.4 - 13.7	A
			Zn-65	Bq/L	29.2	30.4	21.3 - 39.5	A
	13-GrW28	Water	Gr-A	Bq/L	2.74	2.31	0.69 - 3.93	A
			Gr-B	Bq/L	15.6	13.0	6.5 - 19.5	A
	13-MaS28	Soil	Cs-134	Bq/kg	859	887	621 - 1153	A
			Cs-137	Bq/kg	633	587	411 - 763	A
			Co-57	Bq/kg	0.256		(1)	A
			Co-60	Bq/kg	738	691	484 - 898	A
			Mn-54	Bq/kg	0.671		(1)	A
			K-40	Bq/kg	714	625.3	437.7 - 812.9	A
			Sr-90	Bq/kg	442	628	440 - 816	W
			Zn-65	Bq/kg	1057	995	697 - 1294	A
	13-RdF28	AP	Cs-134	Bq/sample	1.73	1.78	1.25 - 2.31	A
			Cs-137	Bq/sample	2.73	2.60	1.82 - 3.38	A
			Co-57	Bq/sample	2.38	2.36	1.65 - 3.07	A
			Co-60	Bq/sample	0.0302		(1)	A
			Mn-54	Bq/sample	4.36	4.26	2.98 - 5.54	A
			Sr-90	Bq/sample	1.43	1.49	1.04 - 1.94	A
			Zn-65	Bq/sample	3.14	3.13	2.19 - 4.07	A
	13-GrF28	AP	Gr-A	Bq/sample	0.767	1.20	0.36 - 2.04	A
			Gr-B	Bq/sample	0.871	0.85	0.43 - 1.28	A
	13-RdV28	Vegetation	Cs-134	Bq/sample	-0.197		(1)	A
			Cs-137	Bq/sample	7.39	6.87	4.81 - 8.93	A
			Co-57	Bq/sample	9.87	8.68	6.08 - 11.28	A
			Co-60	Bq/sample	6.08	5.85	4.10 - 7.61	A
			Mn-54	Bq/sample	-0.0104		(1)	A
			Sr-90	Bq/sample	1.28	1.64	1.15 - 2.13	W
			Zn-65	Bq/sample	6.84	6.25	4.38 - 8.13	A
September 2013	13-MaW29	Water	Cs-134	Bq/L	29.1	30.0	21.0 - 39.0	A
			Cs-137	Bq/L	34.5	31.6	22.1 - 41.1	A
			Co-57	Bq/L	0.0358		(1)	A
			Co-60	Bq/L	24.6	23.58	16.51 - 30.65	A
			H-3	Bq/L	2.45		(1)	A
			Mn-54	Bq/L	0.0337		(1)	A
			K-40	Bq/L	0.193		(1)	A
			Sr-90	Bq/L	9.12	7.22	5.05 - 9.39	W
			Zn-65	Bq/L	38.1	34.6	24.2 - 45.0	A
	13-GrW29	Water	Gr-A	Bq/L	1.13	0.701	0.210 - 1.192	A
			Gr-B	Bq/L	7.61	5.94	2.97 - 8.91	A

TABLE D-3 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING, 2013
(PAGE 2 OF 2)

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
September 2013	13-MaS29	Soil	Cs-134	Bq/kg	1150	1172	820 - 1524	A
			Cs-137	Bq/kg	1100	977	684 - 1270	A
			Co-57	Bq/kg	670		(1)	N (2)
			Co-60	Bq/kg	502	451	316 - 586	A
			Mn-54	Bq/kg	758	674	472 - 876	A
			K-40	Bq/kg	796	633	443 - 823	W
			Sr-90	Bq/kg	664	460	322 - 598	N (2)
			Zn-65	Bq/kg	210		(1)	N (2)
	13-RdF29	AP	Cs-134	Bq/sample	-0.570		(1)	N (2)
			Cs-137	Bq/sample	2.85	2.7	1.9 - 3.5	A
			Co-57	Bq/sample	3.30	3.4	2.4 - 4.4	A
			Co-60	Bq/sample	2.41	2.3	1.6 - 3.0	A
			Mn-54	Bq/sample	3.65	3.5	2.5 - 4.6	A
			Sr-90	Bq/sample	1.40	1.81	1.27 - 2.35	W
			Zn-65	Bq/sample	2.90	2.7	1.9 - 3.5	A
	13-GrF29	AP	Gr-A	Bq/sample	0.872	0.9	0.3 - 1.5	A
			Gr-B	Bq/sample	1.57	1.63	0.82 - 2.45	A
	13-RdV29	Vegetation	Cs-134	Bq/sample	5.29	5.20	3.64 - 6.76	A
			Cs-137	Bq/sample	7.48	6.60	4.62 - 8.58	A
			Co-57	Bq/sample	0.0129		(1)	A
			Co-60	Bq/sample	0.0523		(1)	A
			Mn-54	Bq/sample	8.78	7.88	5.52 - 10.24	A
			Sr-90	Bq/sample	1.63	2.32	1.62 - 3.02	W (2)
			Zn-65	Bq/sample	3.18	2.63	1.84 - 3.42	W

(1) False positive test.

(2) Soil, Co-57 & Zn-65 identified by gamma software as not detected, MAPEP evaluated as failing the false positive test. A large concentration of Eu-152 was spiked into the sample, causing interference in the analysis. Gamma software recognized the interference and identified them as not detected. MAPEP does not allow clients to enter non-detect designation. NCR 13-04
Soil, Sr-90 - incorrect results were submitted to MAPEP. Actual result was 332 bq/kg, which is with the acceptance range. NCR 13-04
AP, Cs-134 - MAPEP evaluated the -0.570 as a failed false positive test. No client samples were affected by these failures. NCR 13-04
Vegetation, Sr-90 - it appears that the carrier was double spiked into the sample, resulting in the low activity for this sample. NCR 13-04

(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 (a) STATISTICAL SUMMARY PROFICIENCY TESTING PROGRAM**
ENVIRONMENTAL, INC., 2013

Lab Code	Date	Concentration (pCi/L) Analysis	Laboratory Result (b)	ERA Result (c)	Control Limits	Acceptance
ERW-1593	04/08/13	Sr-89	43.6 ± 4.3	41.30	31.6 - 48.4	Pass
ERW-1593	04/08/13	Sr-90	23.2 ± 1.7	23.90	17.2 - 28.0	Pass
ERW-1596	04/08/13	Ba-133	74.80 4.00	82.10	69.00 90.30	Pass
ERW-1596	04/08/13	Co-60	65.50 3.42	65.90	59.30 75.00	Pass
ERW-1596	04/08/13	Cs-134	41.10 3.47	42.80	34.20 47.10	Pass
ERW-1596	04/08/13	Cs-137	42.30 4.03	41.70	37.00 48.80	Pass
ERW-1596	04/08/13	Zn-65	200.3 ± 10.1	189.0	170.0 - 222.0	Pass
ERW-1598	04/08/13	Gr. Alpha	34.30 1.98	40.80	21.10 51.90	Pass
ERW-1598	04/08/13	Gr. Beta	18.70 0.98	21.60	13.00 29.70	Pass
ERW-1600	04/08/13	I-131	23.00 ± 1.10	23.80	19.70 - 28.30	Pass
ERW-1600	04/08/13	I-131(Gamma)	23.48 ± 9.44	23.80	19.70 ± 28.30	Pass
ERW-1606	04/08/13	H-3	4041 ± 194	4050	3450 - 4460	Pass
ERW-6009	10/07/13	Sr-89	22.00 2.80	21.90	14.40 28.20	Pass
ERW-6009	10/07/13	Sr-90	17.10 2.55	18.10	12.80 21.50	Pass
ERW-6012	10/07/13	Ba-133	48.20 4.29	54.20	44.70 59.90	Pass
ERW-6012	10/07/13	Co-60	100.8 ± 4.7	102.0	91.8 - 114.0	Pass
ERW-6012	10/07/13	Cs-134	87.30 4.35	86.70	71.10 95.40	Pass
ERW-6012	10/07/13	Cs-137	199.6 ± 7.4	206.0	185.0 - 228.0	Pass
ERW-6012	10/07/13	Zn-65	356.2 ± 13.2	333.0	300.0 - 389.0	Pass
ERW-6015	10/07/13	Gr. Alpha	30.70 11.90	42.80	22.20 54.30	Pass
ERW-6015	10/07/13	Gr. Beta	25.70 6.48	32.20	20.80 39.90	Pass
ERW-6019	10/07/13	I-131	22.50 1.01	23.60	19.60 28.00	Pass
ERW-6024	10/07/13	H-3	18397 695	17700	15500 19500	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.

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
ENVIRONMENTAL, INC., 2013

			Concentration (a)			
Lab Code (b)	Date	Analysis	Laboratory result	Known Activity	Control Limits (c)	Acceptance
MAAP-738	02/01/13	Co-57	2.58 ± 0.06	2.36	1.65 - 3.07	Pass
MAAP-738	02/01/13	Co-60	0.01 ± 0.03	0.00	0.00 - 0.10	Pass
MAAP-738	02/01/13	Cs-134	1.82 ± 0.13	1.78	1.25 - 2.31	Pass
MAAP-738	02/01/13	Cs-137	2.93 ± 0.10	2.60	1.82 - 3.38	Pass
MAAP-738	02/01/13	Mn-54	4.87 ± 0.13	4.26	2.98 - 5.54	Pass
MAAP-738	02/01/13	Sr-90	1.39 ± 0.14	1.49	1.04 - 1.94	Pass
MAAP-738	02/01/13	Zn-65	3.84 ± 0.20	3.13	2.19 - 4.07	Pass
MAAP-738 d	02/01/13	Gr. Alpha	0.14 ± 0.03	1.20	0.36 - 2.04	Fail (1)
MAAP-738	02/01/13	Gr. Beta	0.93 ± 0.06	0.85	0.43 - 1.28	Pass
MAW-806	02/01/13	Co-57	31.20 0.40	30.90	21.60 40.20	Pass
MAW-806	02/01/13	Co-60	19.70 ± 0.30	16.56	13.69 - 25.43	Pass
MAW-806	02/01/13	Cs-134	23.20 ± 0.50	24.40	17.10 - 31.70	Pass
MAW-806	02/01/13	Cs-137	0.03 ± 0.12	0.00	0.00 - 1.00	Pass
MAW-806	02/01/13	Fe-55	34.00 ± 3.30	44.00	30.80 - 57.20	Pass
MAW-806	02/01/13	H-3	511.60 ± 12.50	507.00	355.00 - 659.00	Pass
MAW-806	02/01/13	K-40	2.20 ± 0.90	0.00	0.00 - 5.00	Pass
MAW-806	02/01/13	Mn-54	27.60 ± 0.50	27.40	19.20 - 35.60	Pass
MAW-806	02/01/13	Sr-90	9.30 ± 0.80	10.50	7.40 - 13.70	Pass
MAW-806	02/01/13	Zn-65	31.60 ± 0.80	30.40	21.30 - 39.50	Pass
MAW-811	02/01/13	Gr. Alpha	1.87 ± 0.09	2.31	0.69 - 3.93	Pass
MAW-811	02/01/13	Gr. Beta	13.04 ± 0.13	13.00	6.50 - 19.50	Pass
MASO-739	02/01/13	Co-57	0.60 ± 0.50	0.00	0.00 - 5.00	Pass
MASO-739	02/01/13	Co-60	739.20 ± 28.50	691.00	484.00 - 898.00	Pass
MASO-739	02/01/13	Cs-134	863.30 ± 34.10	887.00	621.00 - 1153.00	Pass
MASO-739	02/01/13	Cs-137	661.80 ± 25.70	587.00	411.00 - 763.00	Pass
MASO-739	02/01/13	K-40	745.80 ± 33.30	625.30	437.70 - 812.90	Pass
MASO-739	02/01/13	Mn-54	1.10 ± 1.00	0.00	0.00 - 5.00	Pass
MASO-739	02/01/13	Zn-65	1109.60 ± 44.10	995.00	697.00 - 1294.00	Pass
MASO-744 e	02/01/13	Sr-90	408.40 ± 14.00	628.00	440.00 - 816.00	Fail (2)
MAVE-747	02/01/13	Co-57	10.37 ± 0.17	8.68	6.08 - 11.28	Pass
MAVE-747	02/01/13	Co-60	6.48 ± 0.17	5.85	4.10 - 7.61	Pass
MAVE-747	02/01/13	Cs-134	0.02 ± 0.04	0.00	0.00 - 0.10	Pass
MAVE-747	02/01/13	Cs-137	7.79 ± 0.21	6.87	4.81 - 8.93	Pass
MAVE-747	02/01/13	Mn-54	0.00 ± 0.05	0.00	0.00 - 0.10	Pass
MAVE-747	02/01/13	Zn-65	7.29 ± 0.33	6.25	4.38 - 8.13	Pass
MASO-5043 f	08/01/13	Co-57	699.60 ± 3.90	0.00	0.00 - 5.00	Fail (3)
MASO-5043	08/01/13	Cs-134	1191.70 ± 23.00	1172.00	820.00 - 1524.00	Pass
MASO-5043	08/01/13	Cs-137	1072.00 ± 5.10	977.00	684.00 - 1270.00	Pass
MASO-5043	08/01/13	K-40	760.00 ± 16.20	633.00	443.00 - 823.00	Pass
MASO-5043	08/01/13	Mn-54	753.80 ± 4.90	674.00	472.000 - 876.000	Pass

TABLE D-5 DOE'S MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
ENVIRONMENTAL, INC., 2013

			Concentration (a)			
Lab Code (b)	Date	Analysis	Laboratory result	Known Activity	Control Limits (c)	Acceptance
MASO-5043	08/01/13	Sr-90	383.90 ± 14.50	460.00	322.00 - 598.00	Pass
MASO-5043	08/01/13	Zn-65	-351.50 ± 5.50	0.00	0.00 - 0.00	Pass
MAW-5094	08/01/13	Co-57	0.01 ± 0.09	0.00	0.00 - 5.00	Pass
MAW-5094	08/01/13	Co-60	23.20 ± 0.32	23.58	16.51 - 30.65	Pass
MAW-5094	08/01/13	Cs-134	27.60 ± 0.58	30.40	21.00 - 39.00	Pass
MAW-5094	08/01/13	Cs-137	32.31 ± 0.52	31.60	22.10 - 41.10	Pass
MAW-5094	08/01/13	Fe-55	39.20 ± 3.50	53.30	37.30 - 69.30	Pass
MAW-5094	08/01/13	Gr. Alpha	0.54 ± 0.05	0.70	0.21 - 1.19	Pass
MAW-5094	08/01/13	Gr. Beta	5.85 ± 0.09	5.94	2.97 - 8.91	Pass
MAW-5094	08/01/13	H-3	1.20 ± 3.00	0.00	0.00 - 5.00	Pass
MAW-5094	08/01/13	K-40	2.22 ± 0.90	0.00	0.00 - 5.00	Pass
MAW-5094	08/01/13	Mn-54	0.010 ± 0.11	0.00	0.00 - 5.00	Pass
MAW-5094	08/01/13	Sr-90	6.40 ± 0.60	7.22	5.05 - 9.39	Pass
MAW-5094	08/01/13	Zn-65	35.30 ± 0.90	34.60	24.20 - 45.00	Pass
MAVE-5046	08/01/13	Co-57	0.01 ± 0.03	0.00	0.00 - 0.00	Pass
MAVE-5046	08/01/13	Co-60	0.00 ± 0.04	0.00	0.00 - 0.00	Pass
MAVE-5046	08/01/13	Cs-134	5.71 ± 0.23	5.20	3.64 - 6.76	Pass
MAVE-5046	08/01/13	Cs-137	7.64 ± 0.20	6.60	4.62 - 8.58	Pass
MAVE-5046	08/01/13	Mn-54	9.08 ± 0.24	7.88	5.52 - 10.24	Pass
MAVE-5046	08/01/13	Zn-65	2.92 ± 0.25	2.63	1.84 - 3.42	Pass
MAAP-5046	08/01/13	Co-57	3.48 ± 0.14	3.40	1.90 - 3.50	Pass
MAAP-5046	08/01/13	Co-60	2.44 ± 0.08	3.40	1.60 - 3.00	Pass
MAAP-5046	08/01/13	Cs-134	0.01 ± 0.03	0.00	0.02 - 0.04	Pass
MAAP-5046	08/01/13	Cs-137	3.09 ± 0.13	2.70	1.90 - 3.50	Pass
MAAP-5046	08/01/13	Gr. Alpha	0.28 ± 0.04	0.90	0.27 - 1.53	Pass
MAAP-5046	08/01/13	Gr. Beta	1.90 ± 0.08	1.63	0.82 - 2.45	Pass
MAAP-5046	08/01/13	Mn-54	3.95 ± 0.12	3.50	2.50 - 4.60	Pass
MAAP-5046	08/01/13	Sr-90	1.69 ± 4.10	1.81	1.27 - 2.35	Pass
MAAP-5046	08/01/13	Zn-65	3.27 ± 0.18	2.70	2.50 - 4.60	Pass

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

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

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

(1) The filter was recounted overnight, no significant alpha activity could be detected.

(2) The sample was reanalyzed using additional fuming nitric separations. Result of reanalysis: 574.4 ± 35.2 Bq/kg.

(3) Interference from Eu-152 resulted in misidentification of Co-57.

APPENDIX E

EFFLUENT DATA

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INTRODUCTION

LaSalle County Station, a two-unit BWR, is located near Marseilles, Illinois in LaSalle County, 3.5 miles south of the Illinois River. Both units are rated at 3546 MWt. Unit 1 loaded fuel in March 1982. Unit 2 loaded fuel in late December 1983. The Station is designed to keep releases to the environment at levels below those specified in the regulations.

Liquid effluents, although no longer released from LaSalle County Station, were designed to be released to the Illinois River in controlled batches after radioassay of each batch. Gaseous effluents are released to the atmosphere after delay allowing time for short-lived (noble) gases to decay. Releases to the atmosphere are sampled and analyzed on a routine basis. The gaseous effluent samples are analyzed for particulate, iodine, noble gas, and tritium activity. The particulate and iodine sample results are obtained from continuously collected composite samples. The noble gas and tritium sample results are obtained from routine grab samples. The results of effluent analyses are summarized on a monthly basis and reported to the Nuclear Regulatory Commission as required per Technical Specifications. Airborne concentrations of noble gases, tritium, I-131, and particulate radioactivity in offsite areas are calculated using effluent and meteorological data.

Environmental monitoring is conducted by sampling at indicator and control (background) locations in the vicinity of LaSalle County Station to measure changes in radiation or radioactivity levels that may be attributable to station operations. If significant changes attributable to LaSalle County Station are measured, these changes are correlated with effluent releases. External gamma radiation exposure from noble gases and internal dose from I-131 in milk are the critical pathways at this site; however, an environmental monitoring program is conducted which also includes these and many other pathways which are less significant in terms of radiation protection.

SUMMARY

Gaseous effluents for the period contributed to only a small fraction of the LaSalle County Station Radiological Effluent Controls Limits. Liquid effluents had no contribution to offsite dose, as no liquid radioactive discharges were conducted. Calculations of environmental concentrations based on effluent, Illinois River flow, and meteorological data for the period indicate that consumption by the public of radionuclides attributable to LaSalle County Station does not exceed regulatory limits. Radiation exposure from radionuclides released to the atmosphere represented the critical pathway for the period with a maximum individual total dose estimated to be 1.05E+00 mrem for the year, where a shielding and occupancy factor of 0.7 is assumed. The assessment of radiation doses is performed in accordance with the Offsite Dose Calculation Manual (ODCM), specifically, a comparison of preoperational studies with operational controls or with previous environmental surveillance reports and an assessment of the observed impacts of the plant operation on the environment. Control locations are basis for “preoperational data.” The results of analysis confirm that the station is operating in compliance with 10CFR50 Appendix I, 10CFR20 and 40CFR190.

1.0 EFFLUENTS

1.1 Gaseous Effluents to the Atmosphere

Measured concentrations of noble gases, radioiodine, and particulate radioactivity released to the atmosphere during the year, are listed in Table 1.1-1. A total of 1.55E+03 curies of fission and activation gases were released with an average release rate of 9.38E+01 µCi/sec.

A total of 6.29E-02 curies of I-131 were released during the year with an average release rate of 1.99E-03 µCi/sec.

A total of 1.59E-02 curies of beta-gamma emitters were released as airborne particulate matter with an average release rate of 5.05E-04 µCi/sec. Alpha-emitting radionuclides were below the lower limit of detection (LLD). Carbon-14 released in 2013 was calculated separately with a total of 3.37E+01 curies released with an average release rate of 1.07E+00 µCi/sec.

A total of 5.75E+00 curies of tritium were released with an average release rate of 4.01E-01 µCi/sec.

1.2 Liquids Released to Illinois River

There were no liquid batch releases in 2013. Continuous release path activity was below applicable Lower Limits of Detection.

2.0 SOLID RADIOACTIVE WASTE

Solid radioactive wastes were shipped by truck to a disposal facility or to a waste processor. For further detail, refer the LaSalle 2013 Annual Radioactive Effluent Release Report (ARERR). This report was submitted to the USNRC by the required date of May 1st, 2014.

3.0 DOSE TO MAN

3.1 Gaseous Effluent Pathways

Table 3.1-1 summarizes the doses resulting from releases of airborne radioactivity via the different exposure pathways.

3.1.1 Noble Gases

3.1.1.1 Gamma Dose Rates

Unit 1 and Unit 2 gaseous releases at LaSalle County Station are reported as Unit 1 releases due to a single station vent stack (SVS) release point. Offsite Gamma air and whole body dose rates are shown in Table 3.1-1 and were calculated based on measured release rates, isotopic composition of the noble gases and average meteorological data for the period. Doses based on concurrent meteorological data are shown in Table 3.4-1. Based on measured effluents and meteorological data, the maximum total body dose to an individual would be 1.29E-02 mrem (Table 3.1-1) for the year, with an occupancy or shielding factor of 0.7 included. The maximum total body dose based on measured effluents and concurrent meteorological data would be 1.70E-02 mrem (Table 3.4-1).

The maximum gamma air dose was 1.94E-02 mrad from Table 3.1-1, and the maximum gamma air dose from concurrent meterorological data was 2.47E-03 mrad (Table 3.4-1).

3.1.1.2 Beta Air and Skin Rates

The range of beta particles in air is relatively small (on the order of a few meters or less); consequently, plumes of gaseous effluents may be considered "infinite" for purpose of calculating the dose from beta radiation incident on the skin. However, the actual dose to sensitive skin tissues is difficult to calculate due to the effect of the beta particle energies, thickness of inert skin and clothing covering sensitive tissues. For purposes of this report the skin is taken to have a thickness of 7.0 mg/cm^2 and an occupancy factor of 1.0 is used. The skin dose (from beta and gamma radiation) for the year was 2.18E-02 mrem from Table 3.1-1, and the skin dose from concurrent meteorological data was 2.42E-03 mrem (Table 3.4-1). The maximum offsite beta dose for the

year was 9.26E-04 mrad from Table 3.1-1, and the maximum offsite beta dose from concurrent meteorological data was 6.96E-04 mrad (Table 3.4-1).

3.1.2 Radioactive Iodine

The human thyroid exhibits a significant capacity to concentrate ingested or inhaled iodine. The radioiodine, I-131, released during routing operation of the plant, may be made available to man resulting in a dose to the thyroid. The principal pathway of interest for this radionuclide is ingestion of radioiodine in milk.

3.1.2.1 Dose to Thyroid

The hypothetical thyroid dose to a maximum exposed individual living near the station via ingestion of milk was calculated. The radionuclide considered was I-131 and the source of milk was taken to be the nearest dairy farm with the cows pastured from May through October. The maximum thyroid does due to I-131 was 3.10E-01 mrem for the year.

3.2 Liquid Effluent Pathways

The three principal pathways through the aquatic environment for potential doses to man from liquid waste are ingestion of potable water, eating aquatic foods, and exposure while on the shoreline. Not all of these pathways are significant or applicable at a given time but a reasonable approximation of the dose can be made by adjusting the dose formula for season of the year or type and degree of use of the aquatic environment. NRC developed equations* were used to calculate the doses to the whole body, lower gastro-intestinal tracts, thyroid, bone and skin; specific parameters for use in the equations are given in the Offsite Dose Calculation Manual. The maximum whole body dose was 0.00E+00 mrem and organ dose was 0.00E+00 for the year mrem (Table 3.2-1).

3.3 Assessment of Dose to Member of Public

During the period January to December 2013, LaSalle County Station did not exceed these limits as shown in Table 3.1-1 and

Table 3.2-1 (based on annual average meteorological data), and as shown in Table 3.3-1:

- The Radiological Effluent Technical Standards (RETS) limits on dose or dose commitment to an individual due to radioactive materials in liquid effluents from each reactor unit (1.5 mrem to the whole body or 5 mrem to any organ during any calendar year; 3 mrem to the whole body or 10 mrem to any organ during the calendar year).

- The RETS limits on air dose in noble gases released in gaseous effluents to a member of the public from each reactor unit (5 mrad for gamma radiation or 10 mrad for beta radiation during any calendar quarter; 10 mrads for gamma radiation or 20 mrad for beta radiation during a calendar year).

- The RETS limits on dose to a member of the public due to iodine-131, iodine-133, tritium and radionuclides in particulate form with half-lives greater than eight days in gaseous effluents released from each reactor unit (7.5 mrem to any organ during any calendar quarter; 15 mrem to any organ during any calendar year).

- The 10CFR20 limit on Total Effective Dose Equivalent to individual members of the public (100 mrem).

4.0 SITE METEOROLOGY

A summary of the site meteorological measurements taken during each calendar quarter of the year is given in Appendix F. The data are presented as cumulative joint frequency distributions of the wind direction for the 375' level and wind speed class by atmospheric stability class determined from the temperature difference between the 375' and 33' levels. Data recovery for these measurements was 99.7% during 2013.

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*Nuclear Regulatory Commission, Regulatory Guide 1.109 (Rev. 1)

APPENDIX E-1

DATA TABLES AND FIGURES

Table 1.1-1

LASALLE COUNTY NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2013)
UNIT 1 AND UNIT 2
DOCKET NUMBERS 50-373 AND 50-374
GASEOUS EFFLUENTS SUMMATION OF ALL RELEASES

A. Fission & Activation Gases	**Unit**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter4**	Est. Total Error %
1. Total Release	Ci	3.17E+02	1.56E+02	4.67E+02	6.14E+02	2.50E+01
2. Average release rate for the period	µCi/sec	4.02E+01	1.98E+02	5.92E+01	7.79E+01	
3. Percent of ODCM limit	%	*	*	*	*	
B. Iodine						
1. Total Iodine – 131	Ci	2.53E-02	4.74E-03	7.63E-03	2.52E-02	1.50E+01
2. Average release rate for the period	µCi/sec	3.20E-03	6.02E-04	9.67E-04	3.20E-03	
3. Percent of ODCM limit	%	*	*	*	*	
C. Particulates						
1. Particulates with half-lives > 8 days	Ci	4.40E-03	1.83E-03	3.09E-03	6.61E-03	3.50E+01
2. Average release rate for the period	µCi/sec	5.66E-04	2.32E-04	3.89E-04	8.32E-04	
3. Percent of ODCM limit	%	*	*	*	*	
D. Tritium						
1. Total Release	Ci	2.41E-01	3.60E-01	1.56E+00	3.59E+00	1.50E+01
2. Average release rate for the period	µCi/sec	1.30E+00	2.27E-01	5.91E-02	1.65E-02	
3. Percent of ODCM limit	%	*	*	*	*	
E. Gross Alpha						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	3.50E+01
2. Average release rate for the period	µCi/sec	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	*	*	*	*	
F. Carbon-14						
1. Total Release	Ci	8.42E+00	8.43E+00	8.42E+00	8.42E+00	
2. Average release rate for the period	µCi/sec	1.08E+00	1.07E+00	1.06E+00	1.06E+00	
3. Percent of ODCM limit	%	*	*	*	*	

"*" This information is contained in the Radiological Impact on Man section of the report.
"<" Indicates activity of sample is less than LLD given in µCi/ml

Table 1.2-1

LASALLE COUNTY NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2013)
LIQUID RELEASES
UNIT 1 AND UNIT 2
SUMMATION OF ALL LIQUID RELEASES

A. Fission & Activation Products	**Unit**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter4**	Est. Total Error %
1. Total Release (not including tritium, gases & alpha)	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average diluted concentration during period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of applicable limit	%	*	*	*	*	

B. Tritium						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average diluted concentration during period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of applicable limit	%	*	*	*	*	

C. Dissolved & Entrained Gases						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average diluted concentration during period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of applicable limit	%	*	*	*	*	

D. Gross Alpha Activity						
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	N/A
2. Average release rate for the period	μCi/mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	*	*	*	*	

E. Volume of Waste Released (prior to dilution)	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00

F. Volume of Dilution Water Used During Period	Liters	0.00E+00	0.00E+00	0.00E+00	0.00E+00

"*" This information is contained in the Radiological Impact on Man section of the report.
"<" Indicates activity of sample is less than LLD given in μCi/ml

Table 2.1-1

SOLID RADWASTE ANNUAL REPORT

LaSalle County Station

Table 2.1-1 deliberately deleted. For solid waste disposal detail, refer to the LaSalle County Station 2013 Annual Radiological Effluent Release Report (ARERR).

Table 3.1-1

LASALLE COUNTY NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2013)
RADIOLOGICAL IMPACT ON MAN
MAXIMUM DOSES RESULTING FROM GASEOUS RELEASES AND COMPLIANCE STATUS

Infant Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
Gamma Air	5.00E+00	mRad	3.84E-03	0.08	2.22E-03	0.04	6.33E-03	0.13	6.98E-03	0.14	1.00E+01	0.19
Beta Air	1.00E+01	mRad	1.98E-04	0.00	9.52E-05	0.00	2.85E-04	0.00	3.48E-04	0.00	2.00E+01	0.01
NG Total Body	2.50E+00	mRem	2.56E-03	0.10	1.48E-03	0.06	4.22E-03	0.17	4.66E-03	0.19	5.00E+00	0.26
NG Skin	7.50E+00	mRem	4.33E-03	0.06	2.49E-03	0.03	7.12E-03	0.09	7.86E-03	0.11	1.50E+01	0.15
NNG Organ	7.50E+00	mRem	1.24E-01	1.65	2.43E-02	0.32	3.82E-02	0.51	1.24E-01	1.65	1.50E+01	2.07

Child Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
Gamma Air	5.00E+00	mRad	3.84E-03	0.08	2.22E-03	0.04	6.33E-03	0.13	6.98E-03	0.14	1.00E+01	0.19
Beta Air	1.00E+01	mRad	1.98E-04	0.00	9.52E-05	0.00	2.85E-04	0.00	3.48E-04	0.00	2.00E+01	0.01
NG Total Body	2.50E+00	mRem	2.56E-03	0.10	1.48E-03	0.06	4.22E-03	0.17	4.66E-03	0.19	5.00E+00	0.26
NG Skin	7.50E+00	mRem	4.33E-03	0.06	2.49E-03	0.03	7.12E-03	0.09	7.86E-03	0.11	1.50E+01	0.15
NNG Organ	7.50E+00	mRem	5.11E-02	0.68	1.01E-02	0.13	1.59E-02	0.21	5.11E-02	0.68	1.50E+01	0.85

Teenager Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
Gamma Air	5.00E+00	mRad	3.84E-03	0.08	2.22E-03	0.04	6.33E-03	0.13	6.98E-03	0.14	1.00E+01	0.19
Beta Air	1.00E+01	mRad	1.98E-04	0.00	9.52E-05	0.00	2.85E-04	0.00	3.48E-04	0.00	2.00E+01	0.01
NG Total Body	2.50E+00	mRem	2.56E-03	0.10	1.48E-03	0.06	4.22E-03	0.17	4.66E-03	0.19	5.00E+00	0.26
NG Skin	7.50E+00	mRem	4.33E-03	0.06	2.49E-03	0.03	7.12E-03	0.09	7.86E-03	0.11	1.50E+01	0.15
NNG Organ	7.50E+00	mRem	2.58E-02	0.34	5.07E-03	0.07	7.98E-03	0.11	2.58E-02	0.34	1.50E+01	0.43

Adult Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
Gamma Air	5.00E+00	mRad	3.84E-03	0.08	2.22E-03	0.04	6.33E-03	0.13	6.98E-03	0.14	1.00E+01	0.19
Beta Air	1.00E+01	mRad	1.98E-04	0.00	9.52E-05	0.00	2.85E-04	0.00	3.48E-04	0.00	2.00E+01	0.01
NG Total Body	2.50E+00	mRem	2.56E-03	0.10	1.48E-03	0.06	4.22E-03	0.17	4.66E-03	0.19	5.00E+00	0.26
NG Skin	7.50E+00	mRem	4.33E-03	0.06	2.49E-03	0.03	7.12E-03	0.09	7.86E-03	0.11	1.50E+01	0.15
NNG Organ	7.50E+00	mRem	1.63E-02	0.22	3.19E-03	0.04	5.03E-03	0.07	1.63E-02	0.22	1.50E+01	0.27

The LaSalle County Nuclear Power Station maximum expected annual dose from Carbon-14 has been calculated using the maximum gross thermal capacity at full power operation. The resultant bounding doses are based upon site specific assumptions of source term.

Table 3.2-1

LASALLE COUNTY NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2013)
RADIOLOGICAL IMPACT ON MAN
MAXIMUM DOSES RESULTING FROM LIQUID RELEASES AND COMPLIANCE STATUS

Infant Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
10CFR50 Appendix I compliance												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
40CFR141 compliance (nearest public drinking water)												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00

Child Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
10CFR50 Appendix I compliance												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
40CFR141 compliance (nearest public drinking water)												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00

Teenager Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
10CFR50 Appendix I compliance												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
40CFR141 compliance (nearest public drinking water)												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00

Adult Receptor	Quarterly Limit	Units	1st Quarter	% of Limit	2nd Quarter	% of Limit	3rd Quarter	% of Limit	4th Quarter	% of Limit	Annual Limit	% of Limit
10CFR50 Appendix I compliance												
Total Body	1.50E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	3.00E+00	0.00
Organ	5.00E+00	mRem	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	0.00E+00	0.00	1.00E+01	0.00
40CFR141 compliance (nearest public drinking water)												
Total Body		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00
Organ		mRem	0.00E+00		0.00E+00		0.00E+00		0.00E+00		4.00E+00	0.00

Table 3.3-1

LASALLE COUNTY NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2013)
RADIOLOGICAL IMPACT ON MAN
MAXIMUM DOSES RESULTING FROM RELEASES AND COMPLIANCE STATUS

10CFR20 / 40CFR190 Compliance

	1st Quarter Dose (mRem)	2nd Quarter Dose (mRem)	3rd Quarter Dose (mRem)	4th Quarter Dose (mRem)	Annual Dose (mRem)	Annual Limit (mRem/yr)	% Annual Limit
Unit 1							
						40CFR190 Compliance	
U1 D^{Ex}	9.93E-02	8.53E-02	1.00E-01	1.03E-01	3.88E-01	25	1.55
						10CFR20 Compliance	
U1 D^{Tot}	2.23E-01	1.10E-01	1.39E-01	2.27E-01	6.98E-01	100	0.70
						40CFR190 Compliance	
Bone	7.18E-03	6.89E-03	6.94E-03	7.19E-03	2.82E-02	25	0.11
Liver	1.86E-03	1.54E-03	1.59E-03	1.87E-03	6.87E-03	25	0.03
Thyroid	1.24E-01	2.43E-02	3.82E-02	1.24E-01	3.10E-01	75	0.41
Kidney	1.93E-03	1.56E-03	1.61E-03	1.93E-03	7.03E-03	25	0.03
Lung	1.49E-03	1.47E-03	1.48E-03	1.49E-03	5.93E-03	25	0.02
GI-LLI	1.50E-03	1.48E-03	1.48E-03	1.51E-03	5.97E-03	25	0.02
Unit 2							
						40CFR190 Compliance	
U2 D^{Ex}	7.07E-02	8.37E-02	9.57E-02	9.86E-02	3.49E-01	25	1.39
						10CFR20 Compliance	
U2 D^{Tot}	7.07E-02	8.37E-02	9.57E-02	9.86E-02	3.49E-01	100	0.35
						40CFR190 Compliance	
Bone	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
Liver	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
Thyroid	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	75	0.00
Kidney	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
Lung	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00
GI-LLI	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	25	0.00

Table 3.4-1

LASALLE COUNTY NUCLEAR POWER STATION
EFFLUENT AND WASTE DISPOSAL ANNUAL REPORT (2013)
RADIOLOGICAL IMPACT ON MAN
MAXIMUM GAMMA AIR DOSE

Doses Resulting from Airborne Releases

The following are the maximum annual calculated cumulative offsite doses resulting from LaSalle County Station airborne releases.

LaSalle County Generating Station:

Dose	*Maximum Value*	*Sector Affected*
gamma air [1]	2.470×10^{-3} mrad	East
beta air [2]	6.960×10^{-4} mrad	East
whole body [3]	1.696×10^{-2} mrem	East
skin [4]	2.420×10^{-3} mrem	East
organ [5] (infant-thyroid)	$1.462 \times 10^{+0}$ mrem	Southeast

Compliance Status

10 CFR 50 Appendix I	**Yearly Objective**		**% of Appendix I**
gamma air	10.0	mrad	0.02
beta air	20.0	mrad	0.00
whole body	5.0	mrem	0.34
skin	15.0	mrem	0.02
organ	15.0	mrem	9.75

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

APPENDIX F

METEOROLOGICAL DATA

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

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

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

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

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

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

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Neutral - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	8	44	41	0	0	94
NNE	0	10	12	2	0	0	24
NE	2	2	6	10	5	0	25
ENE	2	8	15	21	12	3	61
E	0	4	13	24	9	1	51
ESE	2	7	6	13	1	0	29
SE	1	7	12	10	1	0	31
SSE	1	3	9	9	0	1	23
S	0	5	4	5	1	0	15
SSW	1	10	21	8	11	2	53
SW	0	7	18	12	5	0	42
WSW	1	12	14	29	10	0	66
W	0	16	26	34	15	3	94
WNW	0	15	68	85	37	8	213
NW	0	13	57	33	3	0	106
NNW	0	15	78	93	9	0	195
Variable	1	0	0	0	0	0	1
Total	12	142	403	429	119	18	1123

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	20	6	0	0	0	27
NNE	7	13	0	0	0	0	20
NE	3	3	1	1	0	0	8
ENE	2	2	4	8	0	0	16
E	1	13	4	5	1	0	24
ESE	2	8	17	10	0	0	37
SE	1	5	27	16	2	0	51
SSE	1	4	12	21	3	0	41
S	1	2	4	12	6	3	28
SSW	5	6	13	28	19	0	71
SW	3	10	6	24	11	0	54
WSW	1	5	19	20	1	5	51
W	3	15	18	11	9	12	68
WNW	4	20	40	14	40	33	151
NW	4	13	14	2	2	1	36
NNW	1	5	8	3	0	0	17
Variable	0	0	0	0	0	0	0
Total	40	144	193	175	94	54	700

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	0	0	0	0	4
NNE	1	2	0	0	0	0	3
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	8	7	0	0	0	15
ESE	0	7	4	1	0	0	12
SE	1	4	7	3	0	0	15
SSE	1	1	2	1	0	0	5
S	0	2	2	2	0	0	6
SSW	0	4	17	5	0	0	26
SW	0	5	8	3	3	0	19
WSW	0	9	13	6	0	0	28
W	0	8	13	2	1	0	24
WNW	0	10	1	1	0	1	13
NW	0	2	0	0	0	0	2
NNW	0	5	1	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	3	72	75	24	4	1	179

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	7	8	0	0	0	15
ESE	1	10	0	0	0	0	11
SE	1	4	5	2	0	0	12
SSE	0	2	3	0	0	0	5
S	0	1	0	1	0	0	2
SSW	0	5	13	0	0	0	18
SW	0	6	8	0	0	0	14
WSW	0	7	2	0	0	0	9
W	0	4	2	0	0	0	6
WNW	0	6	2	0	0	0	8
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	2	53	43	3	0	0	101

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Neutral - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	7	51	24	2	88
NNE	2	4	7	6	3	1	23
NE	0	3	6	9	7	3	28
ENE	1	1	10	12	21	16	61
E	3	2	11	6	18	15	55
ESE	2	6	2	7	14	2	33
SE	0	4	2	16	4	1	27
SSE	1	5	8	13	6	0	33
S	1	6	7	5	4	1	24
SSW	0	6	12	14	8	24	64
SW	0	5	9	16	10	9	49
WSW	1	5	7	25	22	14	74
W	0	5	17	27	36	31	116
WNW	1	9	30	75	57	71	243
NW	2	12	39	53	60	15	181
NNW	0	12	24	39	29	15	119
Variable	1	0	0	0	0	0	1
Total	15	89	198	374	323	220	1219

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 72
Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January – March 2013
Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	7	2	1	0	15
NNE	0	11	4	3	0	0	18
NE	0	5	10	1	1	0	17
ENE	0	5	9	4	4	1	23
E	1	1	6	3	0	0	11
ESE	0	5	2	15	6	5	33
SE	2	4	2	13	14	10	45
SSE	0	5	3	6	25	22	61
S	0	2	5	1	5	25	38
SSW	2	5	4	5	12	47	75
SW	0	3	2	12	4	32	53
WSW	1	7	4	11	14	23	60
W	8	2	6	10	21	35	82
WNW	1	5	8	30	5	44	93
NW	0	5	6	20	5	1	37
NNW	2	1	6	5	7	0	21
Variable	0	0	0	0	0	0	0
Total	17	71	84	141	124	245	682

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 6
Hours of missing stability measurements in all stability classes: 3

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	1	0	0	3
NNE	0	0	1	0	0	0	1
NE	0	1	1	0	0	0	2
ENE	0	1	0	0	0	0	1
E	1	1	3	0	0	0	5
ESE	0	2	7	5	2	0	16
SE	0	0	2	5	2	2	11
SSE	0	1	1	2	3	5	12
S	0	1	0	1	2	7	11
SSW	0	0	0	2	3	1	6
SW	0	0	3	4	9	6	22
WSW	1	0	5	9	1	6	22
W	0	1	6	2	5	2	16
WNW	0	0	1	5	2	0	8
NW	0	0	3	3	0	0	6
NNW	0	0	5	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	2	8	40	39	29	29	147

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

LaSalle County Generating Station

Period of Record: January - March 2013
Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	4	1	0	0	7
NNE	0	0	3	0	0	0	3
NE	0	0	1	2	0	0	3
ENE	0	0	0	5	0	0	5
E	0	0	0	0	0	0	0
ESE	0	0	2	4	1	0	7
SE	0	1	1	2	1	0	5
SSE	0	0	1	0	0	0	1
S	0	0	1	1	0	0	2
SSW	0	1	1	4	4	0	10
SW	0	1	0	5	0	0	6
WSW	0	1	1	0	0	0	2
W	0	0	2	0	0	0	2
WNW	0	0	1	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	3	1	1	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	9	19	25	6	0	59

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	7	4	0	0	14
NNE	0	1	7	2	0	0	10
NE	0	2	5	6	1	0	14
ENE	0	1	2	3	1	0	7
E	0	0	3	2	0	0	5
ESE	0	0	4	2	1	0	7
SE	0	1	1	2	4	0	8
SSE	0	0	1	1	2	1	5
S	0	0	2	5	2	0	9
SSW	0	1	0	8	0	0	9
SW	0	0	2	10	4	0	16
WSW	0	0	2	3	1	4	10
W	0	0	3	4	1	1	9
WNW	0	0	2	7	0	0	9
NW	0	1	1	4	0	0	6
NNW	0	0	5	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	10	47	63	17	6	143

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	16	5	0	0	24
NNE	0	8	7	2	0	0	17
NE	0	2	10	19	2	0	33
ENE	0	0	2	8	1	1	12
E	0	0	1	3	1	0	5
ESE	0	1	7	4	1	0	13
SE	0	1	2	4	3	0	10
SSE	0	0	4	3	0	0	7
S	0	0	5	5	4	1	15
SSW	0	1	9	9	1	0	20
SW	1	0	6	7	3	0	17
WSW	0	0	5	6	3	0	14
W	0	4	12	4	2	0	22
WNW	0	2	13	13	0	0	28
NW	0	0	8	9	3	0	20
NNW	0	1	10	4	0	0	15
Variable	0	0	0	0	0	0	0
Total	1	23	117	105	24	2	272

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Neutral - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	19	20	1	0	0	40
NNE	0	29	32	1	0	0	62
NE	0	15	35	17	1	0	68
ENE	0	21	24	27	2	0	74
E	0	14	23	8	4	0	49
ESE	0	13	24	7	0	0	44
SE	3	16	9	8	1	0	37
SSE	0	3	16	5	4	0	28
S	4	17	21	23	15	3	83
SSW	2	18	30	24	3	1	78
SW	2	7	20	25	5	0	59
WSW	2	11	32	11	3	3	62
W	2	11	40	21	20	2	96
WNW	1	10	27	13	5	0	56
NW	1	11	10	6	1	0	29
NNW	0	8	17	17	3	0	45
Variable	1	1	0	0	0	0	2
Total	18	224	380	214	67	9	912

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	19	10	0	0	0	30
NNE	1	14	9	0	0	0	24
NE	0	5	14	2	0	0	21
ENE	1	2	9	5	0	0	17
E	4	20	41	15	0	0	80
ESE	0	13	8	4	0	0	25
SE	0	6	5	7	0	0	18
SSE	0	2	5	15	3	0	25
S	1	10	16	18	6	1	52
SSW	2	11	21	9	3	2	48
SW	2	7	12	5	0	0	26
WSW	1	5	9	10	3	0	28
W	1	8	12	3	1	1	26
WNW	0	7	11	4	8	0	30
NW	0	2	21	2	0	0	25
NNW	1	8	6	0	0	0	15
Variable	0	1	0	0	0	0	1
Total	15	140	209	99	24	4	491

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	0	0	0	0	5
NNE	0	0	0	0	0	0	0
NE	2	0	0	0	0	0	2
ENE	1	1	0	0	0	0	2
E	1	10	11	0	0	0	22
ESE	1	22	3	0	0	0	26
SE	1	12	8	0	0	0	21
SSE	2	2	3	1	0	0	8
S	2	14	10	2	0	0	28
SSW	1	6	14	1	1	0	23
SW	1	4	14	5	0	0	24
WSW	1	9	2	0	0	0	12
W	0	10	2	0	0	0	12
WNW	0	5	7	0	0	0	12
NW	0	2	1	0	0	0	3
NNW	0	4	1	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	13	106	76	9	1	0	205

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	0	0	0	0	5
NNE	0	1	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	1	4	0	0	0	0	5
ESE	0	8	0	0	0	0	8
SE	0	19	6	0	0	0	25
SSE	0	9	7	0	0	0	16
S	0	8	3	0	0	0	11
SSW	0	3	4	0	0	0	7
SW	0	1	0	0	0	0	1
WSW	0	1	0	0	0	0	1
W	0	7	1	0	0	0	8
WNW	0	8	0	0	0	0	8
NW	0	1	0	0	0	0	1
NNW	0	2	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	2	77	21	0	0	0	100

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: April – June 2013
Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Speed (in mph)

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

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	3	1	0	5
NNE	0	1	3	3	1	0	8
NE	0	0	0	5	2	0	7
ENE	0	0	0	1	0	0	1
E	0	0	0	1	0	0	1
ESE	0	0	1	2	1	0	4
SE	0	0	1	5	5	0	11
SSE	0	0	0	0	1	1	2
S	0	0	0	2	3	1	6
SSW	0	0	1	2	11	4	18
SW	0	0	2	3	1	2	8
WSW	0	0	0	1	0	2	3
W	0	0	0	0	1	1	2
WNW	0	0	0	4	3	0	7
NW	0	0	0	0	4	0	4
NNW	0	0	1	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	1	10	32	34	11	88

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Neutral - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	6	23	22	10	1	62
NNE	0	8	34	27	8	3	80
NE	0	11	34	46	43	3	137
ENE	0	13	17	21	31	8	90
E	0	7	18	14	16	9	64
ESE	1	6	19	15	8	1	50
SE	0	8	9	17	15	0	49
SSE	0	3	14	18	6	3	44
S	2	6	20	16	22	34	100
SSW	1	4	15	18	31	29	98
SW	0	6	8	23	31	11	79
WSW	1	5	14	27	23	12	82
W	1	8	22	36	29	27	123
WNW	0	10	24	27	11	3	75
NW	0	7	12	26	21	7	73
NNW	0	0	13	30	8	0	51
Variable	1	1	0	0	0	0	2
Total	7	109	296	383	313	151	1259

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	0	6	6	8	0	23
NNE	1	2	9	16	4	0	32
NE	0	1	3	15	2	1	22
ENE	0	1	6	12	6	2	27
E	1	5	7	18	24	3	58
ESE	0	1	9	11	9	2	32
SE	0	4	2	9	9	6	30
SSE	0	7	2	6	4	10	29
S	0	1	4	13	18	33	69
SSW	0	3	11	17	21	28	80
SW	0	1	8	20	10	8	47
WSW	0	4	4	12	8	7	35
W	0	1	6	8	7	12	34
WNW	0	3	8	9	6	13	39
NW	0	2	2	19	13	5	41
NNW	0	1	3	3	3	0	10
Variable	0	1	0	0	0	0	1
Total	5	38	90	194	152	130	609

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

LaSalle County Generating Station

Period of Record: April – June 2013
Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	2	0	4
NNE	0	0	0	2	1	0	3
NE	0	1	1	2	2	0	6
ENE	0	1	4	1	0	0	6
E	0	2	1	3	6	1	13
ESE	0	0	3	10	4	3	20
SE	0	0	5	10	7	4	26
SSE	0	0	3	8	10	1	22
S	0	0	3	13	7	3	26
SSW	0	1	6	11	4	2	24
SW	0	0	3	7	4	0	14
WSW	0	1	1	2	0	0	4
W	0	0	1	0	0	0	1
WNW	0	0	6	9	0	0	15
NW	0	1	5	1	3	0	10
NNW	0	0	0	1	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	8	43	80	50	14	195

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

LaSalle County Generating Station

Period of Record: April - June 2013
Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	1	1	0	0	2
SSW	0	0	6	3	0	0	9
SW	0	0	8	1	0	0	9
WSW	0	0	2	2	0	0	4
W	0	0	1	2	0	0	3
WNW	0	0	1	7	0	0	8
NW	0	0	1	2	0	0	3
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	1	20	18	0	0	39

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	2	0	0	0	3
NNE	0	0	2	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	1	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	2	0	0	0	0	2
S	0	0	2	0	0	0	2
SSW	0	4	7	1	0	0	12
SW	0	5	14	1	0	0	20
WSW	0	4	18	8	0	0	30
W	0	4	3	1	0	0	8
WNW	0	1	2	5	0	0	8
NW	0	4	2	1	0	0	7
NNW	0	2	3	2	0	0	7
Variable	0	0	0	0	0	0	0
Total	0	27	55	20	0	0	102

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	6	7	1	0	0	14
NNE	0	1	4	0	0	0	5
NE	0	1	8	0	0	0	9
ENE	0	0	8	0	0	0	8
E	0	4	11	0	0	0	15
ESE	0	2	9	0	0	0	11
SE	0	1	1	1	0	0	3
SSE	0	7	4	0	0	0	11
S	0	4	8	0	0	0	12
SSW	0	9	8	2	0	0	19
SW	0	16	8	3	0	0	27
WSW	0	8	11	4	0	0	23
W	0	13	15	0	0	0	28
WNW	0	8	11	3	0	0	22
NW	0	3	14	2	0	0	19
NNW	0	8	9	7	0	0	24
Variable	0	0	0	0	0	0	0
Total	0	91	136	23	0	0	250

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Neutral - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	20	20	2	0	0	45
NNE	0	41	20	4	0	0	65
NE	3	20	28	3	0	0	54
ENE	1	22	30	7	0	0	60
E	0	27	28	0	0	0	55
ESE	1	26	26	0	0	0	53
SE	0	18	11	2	0	0	31
SSE	6	16	7	3	0	0	32
S	3	14	11	0	0	0	28
SSW	1	25	12	2	0	0	40
SW	2	25	24	5	0	0	56
WSW	2	16	26	8	0	0	52
W	0	16	3	4	0	0	23
WNW	1	12	8	2	0	0	23
NW	0	7	11	1	0	0	19
NNW	1	14	26	7	0	0	48
Variable	1	0	0	0	0	0	1
Total	25	319	291	50	0	0	685

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	37	10	0	0	0	49
NNE	0	24	9	0	0	0	33
NE	2	6	11	1	0	0	20
ENE	1	11	26	4	0	0	42
E	1	31	27	0	0	0	59
ESE	3	10	3	0	0	0	16
SE	1	7	0	0	0	0	8
SSE	2	5	3	0	0	0	10
S	2	16	11	0	0	0	29
SSW	1	14	17	0	0	0	32
SW	4	21	33	1	0	0	59
WSW	0	14	36	4	0	0	54
W	2	18	7	1	0	0	28
WNW	2	15	15	0	0	0	32
NW	1	14	5	0	0	0	20
NNW	0	7	9	0	0	0	16
Variable	1	0	0	0	0	0	1
Total	25	250	222	11	0	0	508

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	9	0	0	0	0	11
NNE	1	0	0	0	0	0	1
NE	3	1	0	0	0	0	4
ENE	0	2	1	0	0	0	3
E	2	36	15	0	0	0	53
ESE	3	27	1	0	0	0	31
SE	4	16	1	0	0	0	21
SSE	3	16	0	0	0	0	19
S	1	20	1	0	0	0	22
SSW	5	25	9	0	0	0	39
SW	5	25	23	0	0	0	53
WSW	4	14	7	4	0	0	29
W	3	6	4	0	0	0	13
WNW	7	11	0	1	0	0	19
NW	3	3	0	0	0	0	6
NNW	2	10	0	0	0	0	12
Variable	0	0	0	0	0	0	0
Total	48	221	62	5	0	0	336

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	2	14	2	0	0	0	18
ESE	1	27	0	0	0	0	28
SE	0	29	0	0	0	0	29
SSE	1	22	0	0	0	0	23
S	1	23	0	0	0	0	24
SSW	0	70	15	0	0	0	85
SW	0	34	1	0	0	0	35
WSW	3	12	0	0	0	0	15
W	0	17	1	0	0	0	18
WNW	1	4	0	0	0	0	5
NW	1	2	0	0	0	0	3
NNW	1	2	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	12	256	19	0	0	0	287

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	2	1	0	0	3
NE	0	0	1	1	0	0	2
ENE	0	0	1	1	0	0	2
E	0	0	1	0	0	0	1
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	1	0	0	1
S	0	0	1	2	0	0	3
SSW	0	1	14	1	1	1	18
SW	0	1	13	6	1	0	21
WSW	0	3	5	5	2	0	15
W	0	2	4	2	0	0	8
WNW	0	0	2	2	4	0	8
NW	0	0	1	4	1	0	6
NNW	0	0	1	3	1	0	5
Variable	0	0	0	0	0	0	0
Total	0	7	48	29	10	1	95

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Neutral - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	10	30	15	2	1	59
NNE	0	17	28	19	7	3	74
NE	1	12	25	30	4	2	74
ENE	0	18	13	35	6	0	72
E	1	10	39	10	0	0	60
ESE	0	14	35	11	0	0	60
SE	0	16	12	9	0	0	37
SSE	2	7	21	10	0	0	40
S	1	11	18	10	1	0	41
SSW	1	13	28	12	5	2	61
SW	1	15	25	38	10	1	90
WSW	1	19	27	29	12	1	89
W	0	11	22	14	2	1	50
WNW	0	13	10	10	6	0	39
NW	0	8	20	16	4	0	48
NNW	2	12	12	26	11	0	63
Variable	0	1	0	0	0	0	1
Total	11	207	365	294	70	11	958

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	3	20	6	0	30
NNE	1	4	7	19	8	1	40
NE	1	4	15	22	10	2	54
ENE	1	6	19	24	3	0	53
E	0	4	12	29	15	0	60
ESE	0	2	11	17	3	0	33
SE	1	8	13	8	1	0	31
SSE	5	1	10	4	0	0	20
S	3	0	11	10	5	0	29
SSW	1	3	8	15	20	1	48
SW	1	3	13	38	35	5	95
WSW	0	2	13	22	22	4	63
W	3	2	7	14	8	5	39
WNW	1	6	10	14	4	0	35
NW	0	3	9	9	10	0	31
NNW	2	1	5	10	4	0	22
Variable	0	0	0	0	0	0	0
Total	20	50	166	275	154	18	683

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	1	0	0	4
NNE	0	0	4	2	0	0	6
NE	0	3	4	1	0	0	8
ENE	0	4	4	0	1	0	9
E	0	0	3	8	7	0	18
ESE	0	1	8	13	9	1	32
SE	2	1	11	12	8	3	37
SSE	1	2	8	12	1	0	24
S	0	5	7	14	8	0	34
SSW	1	5	12	27	16	3	64
SW	0	1	14	34	17	4	70
WSW	5	2	5	8	3	5	28
W	2	2	2	4	0	0	10
WNW	1	1	4	9	0	1	16
NW	1	1	1	2	0	0	5
NNW	1	1	7	2	0	0	11
Variable	0	0	0	0	0	0	0
Total	14	29	97	149	70	17	376

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

LaSalle County Generating Station

Period of Record: July - September 2013
Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	2	0	2
SE	0	0	1	9	3	0	13
SSE	0	0	5	4	4	0	13
S	0	0	0	0	10	0	10
SSW	0	0	3	4	3	0	10
SW	0	1	0	12	5	0	18
WSW	0	0	1	0	0	0	1
W	0	0	0	4	0	0	4
WNW	0	0	0	2	0	0	2
NW	0	0	1	1	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	11	36	27	0	75

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Extremely Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	0	0	0	0	1
NNE	0	0	2	1	0	0	3
NE	0	0	2	1	0	0	3
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	1	1
S	0	1	2	0	0	0	3
SSW	0	0	2	0	0	0	2
SW	0	0	0	1	0	0	1
WSW	0	0	0	0	0	0	0
W	0	0	0	8	1	0	9
WNW	0	1	0	4	1	0	6
NW	0	0	0	0	0	0	0
NNW	0	1	4	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	4	12	15	2	1	34

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Moderately Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	3	3	0	0	9
NNE	0	2	7	0	0	0	9
NE	0	0	1	1	0	0	2
ENE	0	0	1	2	0	0	3
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	2	0	0	0	2
SSE	0	0	2	2	0	0	4
S	0	0	4	1	3	2	10
SSW	0	1	5	2	0	0	8
SW	0	0	3	1	0	0	4
WSW	0	0	0	1	0	0	1
W	0	0	2	7	2	0	11
WNW	0	0	4	4	0	0	8
NW	0	0	2	2	0	0	4
NNW	0	2	11	6	1	0	20
Variable	0	0	0	0	0	0	0
Total	0	8	47	32	6	2	95

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Slightly Unstable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	5	3	0	0	9
NNE	0	2	4	0	0	0	6
NE	0	0	5	0	0	0	5
ENE	0	0	4	1	0	0	5
E	0	1	3	0	0	0	4
ESE	0	1	0	0	0	0	1
SE	0	0	1	1	0	0	2
SSE	0	0	1	9	0	0	10
S	0	1	9	0	1	0	11
SSW	0	7	2	9	2	0	20
SW	0	0	10	2	0	0	12
WSW	0	0	5	9	0	0	14
W	0	0	4	14	2	0	20
WNW	0	1	10	14	1	0	26
NW	0	1	7	0	0	0	8
NNW	0	2	1	2	1	0	6
Variable	0	0	0	0	0	0	0
Total	0	17	71	64	7	0	159

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Neutral - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	7	3	4	0	0	14
NNE	0	6	3	0	0	0	9
NE	0	5	15	2	0	0	22
ENE	0	3	19	5	1	0	28
E	1	8	27	10	0	0	46
ESE	2	11	27	2	0	0	42
SE	1	10	20	7	0	0	38
SSE	1	7	14	14	3	0	39
S	0	12	19	16	5	1	53
SSW	1	17	19	21	8	1	67
SW	1	10	21	33	7	0	72
WSW	0	19	37	30	7	1	94
W	2	23	57	52	11	1	146
WNW	1	14	39	37	8	0	99
NW	1	5	27	24	0	0	57
NNW	0	11	55	51	7	0	124
Variable	0	0	0	0	0	0	0
Total	11	168	402	308	57	4	950

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Slightly Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	8	0	0	0	0	8
NNE	0	5	0	0	0	0	5
NE	0	2	0	1	0	0	3
ENE	0	6	2	1	0	0	9
E	0	15	9	0	0	0	24
ESE	0	10	10	0	0	0	20
SE	0	11	7	6	0	0	24
SSE	0	7	7	6	2	0	22
S	2	12	20	8	1	0	43
SSW	0	8	33	18	4	0	63
SW	0	5	29	29	11	0	74
WSW	0	10	27	6	2	0	45
W	1	8	34	18	13	3	77
WNW	1	13	32	15	15	3	79
NW	3	8	9	0	0	0	20
NNW	0	8	10	2	0	0	20
Variable	0	0	0	0	0	0	0
Total	7	136	229	110	48	6	536

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 4
Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Moderately Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	0	0	0	0	4
NNE	1	1	0	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	1	0	0	0	0	0	1
E	0	8	3	0	0	0	11
ESE	3	4	10	0	0	0	17
SE	0	6	9	0	0	0	15
SSE	0	4	10	0	0	0	14
S	1	2	8	2	0	0	13
SSW	1	7	17	14	0	0	39
SW	1	14	11	21	3	0	50
WSW	0	5	29	3	0	0	37
W	1	12	22	0	0	0	35
WNW	0	5	7	0	1	0	13
NW	0	3	1	0	0	0	4
NNW	0	3	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	9	78	127	40	4	0	258

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 7
Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Extremely Stable - 200Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	0	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	4	0	0	0	0	5
ESE	0	13	4	0	0	0	17
SE	3	13	7	0	0	0	23
SSE	0	11	4	0	0	0	15
S	2	2	2	0	0	0	6
SSW	1	16	10	1	0	0	28
SW	0	9	8	0	0	0	17
WSW	0	14	14	0	0	0	28
W	0	12	3	0	0	0	15
WNW	0	4	2	0	0	0	6
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	7	101	54	1	0	0	163

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Extremely Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Moderately Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Slightly Unstable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

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

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

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Neutral - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	6	6	5	3	0	20
NNE	0	5	10	9	3	0	27
NE	0	1	6	21	10	0	38
ENE	0	0	13	16	9	0	38
E	0	1	9	16	9	0	35
ESE	0	1	17	12	7	0	37
SE	0	5	14	10	5	1	35
SSE	1	5	10	17	19	4	56
S	0	1	18	20	16	23	78
SSW	1	6	18	23	21	24	93
SW	0	2	16	32	29	5	84
WSW	1	9	12	47	24	9	102
W	1	11	21	60	47	28	168
WNW	0	7	17	59	32	23	138
NW	0	5	26	60	35	6	132
NNW	1	3	16	32	31	7	90
Variable	0	0	0	0	0	0	0
Total	5	68	229	439	300	130	1171

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 37
Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Slightly Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	7	4	0	0	12
NNE	0	0	11	0	0	0	11
NE	0	0	4	1	0	0	5
ENE	0	3	4	2	0	1	10
E	0	2	5	10	3	1	21
ESE	0	2	3	9	2	0	16
SE	0	2	3	12	3	8	28
SSE	0	0	7	19	7	10	43
S	0	1	5	13	15	17	51
SSW	0	0	4	25	36	24	89
SW	0	4	9	22	23	49	107
WSW	0	3	7	27	15	9	61
W	0	0	7	21	14	14	56
WNW	0	2	5	22	27	28	84
NW	0	0	12	21	16	3	52
NNW	0	0	1	12	1	0	14
Variable	0	0	0	0	0	0	0
Total	0	20	94	220	162	164	660

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 29
Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Moderately Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	1	1	0	5
NNE	0	0	1	3	0	0	4
NE	0	1	2	2	0	0	5
ENE	0	0	4	1	0	0	5
E	0	0	1	1	0	0	2
ESE	0	0	0	3	1	0	4
SE	0	0	2	4	14	3	23
SSE	0	0	1	0	7	4	12
S	0	1	1	2	8	7	19
SSW	0	0	2	3	7	10	22
SW	0	3	6	11	6	6	32
WSW	0	0	6	6	6	1	19
W	1	0	3	7	4	1	16
WNW	0	1	4	13	7	2	27
NW	0	1	4	5	0	0	10
NNW	0	0	1	4	1	0	6
Variable	0	0	0	0	0	0	0
Total	1	7	41	66	62	34	211

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 4
Hours of missing stability measurements in all stability classes: 2

LaSalle County Generating Station

Period of Record: October - December 2013
Stability Class - Extremely Stable - 375Ft-33Ft Delta-T (F)
Winds Measured at 375 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	3	1	2	7
SSE	0	0	2	2	1	0	5
S	0	0	5	1	9	2	17
SSW	0	0	2	0	0	0	2
SW	0	0	2	1	0	0	3
WSW	0	0	4	11	2	0	17
W	0	0	3	2	2	1	8
WNW	0	0	2	3	0	0	5
NW	0	0	1	1	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	23	24	15	5	67

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

APPENDIX G

ERRATA DATA

1. Summary

Due to an incorrect setting on Detector 08 at Teledyne Brown Engineering (TBE), a default multiplier of 3.29 was mistakenly used in the calculations for MDC for several analyses. The error was isolated to Detector 08. Non-conformance 13-07 was initiated and corrective actions have been implemented to address the issue at TBE. All samples analyzed on Detector 08 from January 2012 through April 15th, 2013, were reprocessed using the correct factor of 4.66. As a result, all MDCs for the affected samples have increased by 41.6%. The previously reported activities and uncertainties for samples analyzed in the above mentioned timeframe were not affected. The increased MDCs caused several LLDs to be missed.

All samples from LaSalle Station that were analyzed on TBE Detector 08, during the above mentioned timeframe, are identified in the following tables. All sample results that were affected by the error are identified with the affected nuclide, the required MDC, the actual MDC, and the units. The sample results that were not affected by the error are noted with "*" in the appropriate locations of the tables.

2011

CLIENT ID	START DATE	END DATE	MATRIX	NUCLIDE	REQUIRED MDC	REVISED MDC	UNITS
4Q11 L-10	09/28/11	12/29/11	Air Particulate	*	*	*	*

*Required LLDs were achieved.

2012

CLIENT ID	START DATE	END DATE	MATRIX	NUCLIDE	REQUIRED MDC	REVISED MDC	UNITS
1Q12 L-03	12/29/11	03/29/12	Air Particulate	*	*	*	*
1Q12 L-11	12/29/11	03/29/12	Air Particulate	*	*	*	*
L-40	01/05/12	01/26/12	Surface Water	*	*	*	*
L-28-W4	01/12/12	01/12/12	Ground Water	I-131	<15	<15.16	pCi/L
L-28-W4	01/12/12	01/12/12	Ground Water	La-140	<15	<15.44	pCi/L
L-42	03/01/12	03/01/12	Milk	*	*	*	*
L-40	03/01/12	03/29/12	Surface Water	*	*	*	*
L-42	05/17/12	05/17/12	Milk	*	*	*	*
L-42	06/26/12	06/26/12	Milk	*	*	*	*
3Q12 L-10	06/28/12	09/27/12	Air Particulate	*	*	*	*
L-42	07/12/12	07/12/12	Milk	La-140	<15	<17.34	pCi/L
L-40	08/02/12	08/30/12	Surface Water	I-131	<15	<16.48	pCi/L
L-42	08/09/12	08/09/12	Milk	*	*	*	*
L-42	09/06/12	09/06/12	Milk	*	*	*	*
L-QUAD 3	09/15/12	09/15/12	Vegetation	*	*	*	*
4Q12 L-01	09/27/12	01/03/13	Air Particulate	*	*	*	*
4Q12 L-04	09/27/12	01/03/13	Air Particulate	*	*	*	*
4Q12 L-06	09/27/12	01/03/13	Air Particulate	*	*	*	*
L-40	10/04/12	10/25/12	Surface Water	*	*	*	*
L-28-W4	10/11/12	10/11/12	Ground Water	I-131	<15	<18.26	pCi/L
L-28-W4	10/11/12	10/11/12	Ground Water	La-140	<15	<16.7	pCi/L
L-42	10/18/12	10/18/12	Milk	La-140	<15	<16.27	pCi/L
L-42	11/01/12	11/01/12	Milk	La-140	<15	<17.01	pCi/L
L-40	11/01/12	11/29/12	Surface Water	I-131	<15	<15.34	pCi/L
SW-LS-103	12/05/12		RGPP	*	*	*	*
L-40	12/06/12	12/27/12	Surface Water	*	*	*	*
L-42	12/07/12	12/07/12	Milk	*	*	*	*

*Required LLDs were achieved.

2013

CLIENT ID	START DATE	END DATE	MATRIX	NUCLIDE	REQUIRED MDC	REVISED MDC	UNITS
L-42	01/04/13	01/04/13	Milk	La-140	<15	<16.26	pCi/L
L-21	02/07/13	02/28/13	Surface Water	*	*	*	*
L-42	03/07/13	03/07/13	Milk	*	*	*	*

*Required LLDs were achieved.

APPENDIX H

ANNUAL RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM REPORT (ARGPPR)

Docket No: 50-373
50-374

LASALLE COUNTY STATION
UNITS 1 and 2

Annual Radiological
Groundwater Protection Program Report

1 January Through 31 December 2013

Prepared By

Teledyne Brown Engineering
Environmental Services

LaSalle County Station
Marseilles, IL 61341

May 2014

Table Of Contents

Appendices

I. Summary and Conclusions

In 2006, Exelon instituted a comprehensive program to evaluate the impact of station operations on groundwater and surface water in the vicinity of LaSalle County Station. This evaluation involved numerous station personnel and contractor support personnel. Following baseline sampling and subsequent recommendations, LaSalle's Radiological Groundwater Protection Program (RGPP) program now consists of the four surface water and eighteen groundwater well sampling locations. The results for LaSalle's RGPP sampling efforts in 2013 are included in this report.

This is the eighth in a series of annual reports on the status of the RGPP conducted at LaSalle County Station. This report covers groundwater and surface water samples, collected from the environment, both on and off station property in 2013. During that time period, 216 analyses were performed on 91 samples from 23 locations (4 surface water and 19 groundwater monitoring locations). The monitoring was conducted by Station personnel.

In assessing all the data gathered for this report, it was concluded that the operation of LaSalle County Station had no adverse radiological impact on the environment, and there are no known active releases into the groundwater at LaSalle County Station.

Strontium-89 and Strontium-90 were not detected in any groundwater or surface water samples during 2013.

All gamma-emitting radionuclides attributable to licensed plant operations were not detected in any of the groundwater or surface water samples.

In the case of tritium, Exelon specified that its laboratories achieve a lower limit of detection 10 times lower than that required by federal regulation.

Tritium was not detected in surface water samples at concentrations greater than the United States Environmental Protection Agency (USEPA) drinking water standard (and the Nuclear Regulatory Commission Reporting Limit) of 20,000 pCi/L. Levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L in 7 of 19 groundwater monitoring locations. The tritium concentrations ranged from <LLD to 209,000 ± 20,800 pCi/L. Elevated tritium levels (>200 pCi/L) observed are associated with the U1 CY tank leak, which occurred in June - July, 2010, and historic elevated tritium believed to be associated with the 2001 CY tank leak, as documented in the Station's 10CFR50.75(g) report.

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples during the third and fourth quarter

sampling in 2013. Gross Alpha (dissolved) was not detected at any groundwater locations. Gross Alpha (suspended) was detected in 6 of 12 samples affecting 5 of 8 groundwater locations analyzed. The concentrations ranged from 2.0 to 12.6 pCi/L. Gross Beta (dissolved) was detected in 9 of 12 samples affecting 7 of 8 groundwater locations analyzed. The concentrations ranged from 2.4 to 22.0 pCi/L. Gross Beta (suspended) was detected in 7 of 12 samples affecting 4 of 8 groundwater locations analyzed. The concentrations ranged from 3.1 to 52.6 pCi/L.

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on surface water samples during the third sampling in 2013. Gross Alpha (dissolved) was not detected at any surface water locations. Gross Alpha (suspended) was not detected at any surface water locations. Gross Beta (dissolved) was detected at both of the surface water locations analyzed. The concentrations ranged from 12.2 to 14.3 pCi/L. Gross Beta (suspended) was not detected at any of the four surface water locations analyzed.

Hard-To-Detect analyses were performed on six of the groundwater sampling locations in accordance with the LaSalle RGPP and to aid in establishing background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235, and U-238. The isotopes of U-234 and U-238 were detected in five samples affecting 5 of 6 groundwater locations. The U-234 concentrations ranged from 0.49 to 21.2 pCi/L. The U-238 concentrations ranged from 0.61 to 11.6 pCi/L. U-234 and U-238 are commonly found in groundwater at low concentrations due to the naturally occurring Radium (Uranium) Decay Series. The isotope U-235 was detected in one groundwater sample at a concentration of 0.86 pCi/L. U-235 can be found in groundwater at low concentrations due to the naturally occurring Actinium Decay Series.

Introduction

The LaSalle County Station (LSCS), consisting of two boiling water reactors, each rated for 3,546 MWt, owned and operated by Exelon Corporation, is located in LaSalle County, Illinois. Unit No. 1 went critical on 16 March 1982. Unit No. 2 went critical on 02 December 1983. The site is located in northern Illinois, approximately 75 miles southwest of Chicago, Illinois.

This report covers those analyses performed by Teledyne Brown Engineering (TBE) on samples collected in 2013.

A. Objectives of the RGPP

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

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

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

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

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

5. Regularly assess analytical results to identify adverse trends.

6. Take necessary corrective actions to protect groundwater resources.

B. Implementation of the Objectives

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

Exelon and its consultant identified locations as described in the 2006 Phase 1 study. Phase 1 studies were conducted by Conestoga Rovers and Associates (CRA) and the results and conclusions were made available to state and federal regulators.

1. The LaSalle County Station reports describe the local hydrogeologic regime. Periodically, the flow patterns on the

surface and shallow subsurface are updated based on ongoing measurements.

2. LaSalle County Station will continue to perform routine sampling and radiological analysis of water from selected locations.

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

4. LaSalle County Station staff and consulting hydrogeologist assess analytical results on an ongoing basis to identify adverse trends.

C. Program Description

1. Sample Collection

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

Groundwater and Surface Water

Samples of water are collected, managed, transported and analyzed in accordance with approved procedures following EPA methods. Both groundwater and surface samples water are collected. Sample locations, sample collection frequencies and analytical frequencies are controlled in accordance with approved station procedures. Contractor and/or station personnel are trained in the collection, preservation management, and shipment of samples, as well as in documentation of sampling events. Analytical laboratories are subject to internal quality assurance programs, industry cross-check programs, as well as nuclear industry audits. Station personnel review and evaluate all analytical data deliverables as data are received.

Analytical data results are reviewed by both station personnel and an independent hydrogeologist for adverse trends or changes to hydrogeologic conditions.

D. Characteristics of Tritium (H-3)

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common form of tritium is tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen.

Tritiated water behaves the same as ordinary water in both the

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

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

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

III. Program Description

A. Sample Analysis

This section describes the general analytical methodologies used by TBE to analyze the environmental samples for radioactivity for the LaSalle County Station RGPP in 2013. Sample and analysis and frequency is based upon well location, assessed risk and site hydrogeology as described in the RGPP.

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

1. Concentrations of gamma emitters in groundwater and surface water.

2. Concentrations of strontium in groundwater and surface water.

3. Concentrations of tritium in groundwater and surface water.

4. Concentrations of Gross Alpha, Dissolved and Suspended and Gross Beta, Dissolved and Suspended in groundwater and surface water.

5. Concentrations of Am-241 in groundwater.

6. Concentrations of Cm-242 and Cm-243/244 in groundwater.

7. Concentrations of Pu-238 and PU-239/240 in groundwater.

8. Concentrations of U-234, U-235 and U-238 in groundwater.

9. Concentrations of Fe-55 in groundwater.

10. Concentrations of Ni-63 in groundwater.

B. Data Interpretation

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

1. Lower Limit of Detection and Minimum Detectable Concentration

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

2. Laboratory Measurements Uncertainty

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

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

calculated. Exelon reports the TPU by following the result with plus or minus ± the estimated sample standard deviation, as TPU, that is obtained by propagating all sources of analytical uncertainty in measurements.

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

C. Background Analysis

A pre-operational radiological environmental monitoring program (pre-operational REMP) was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were atmospheric radiation, fall-out, domestic water, surface water, precipitation, marine life, and foodstuffs. The results of the monitoring were detailed in the report entitled, Environmental Radiological Monitoring for LaSalle County Nuclear Power Station, Commonwealth Edison Company, Annual Reports for the years 1979 and 1981. The pre-operational REMP contained analytical results from samples collected from the surface water and groundwater.

1. Background Concentrations of Tritium

The purpose of the following discussion is to summarize background measurements of tritium in various media performed by others. Additional detail may be found by consulting references (CRA 2006).

a. Tritium Production

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

A major anthropogenic source of tritium and strontium-90

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

b. Precipitation Data

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provide tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected world wide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at stations throughout the U.S. from 1960 up to and including 2006. Based on GNIP data for sample stations located in the U.S. Midwest, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of thermonuclear weapons. Tritium concentrations in surface water showed a sharp decline up until 1975 followed by a gradual decline since that time**.** Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980. LaSalle's 1979 or 1981 pre-operational REMP showed precipitation tritium concentrations >300 pCi/L. Tritium concentrations in wells may still be above the 200 pCi/L detection limit from the external causes described above. Water from previous years and decades is naturally captured in groundwater, so some well water sources today are affected by the surface water from the 1960s that was elevated in tritium.

Surface Water Data

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Illinois surface water data were typically less than 100 pCi/L. Illinois River H-3 results have shown >200 pCi/L, as evidenced in LaSalle's REMP program sample results. This could be attributable to releases from Braidwood and Dresden upstream.

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

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

IV. Results and Discussion

A. Groundwater Results

Groundwater

Samples were collected from onsite wells throughout the year in accordance with the station radiological groundwater protection program. Analytical results and anomalies are discussed below.

Tritium

Samples from 19 locations were analyzed for tritium activity. Tritium values ranged from <LLD to 209,000 pCi/L at well MW-LS-104S. Based on the hyrogeological study conducted at LaSalle, there is no feasible pathway into a drinking water supply. Based on established aquifer flow paths the location most representative of potential offsite release into groundwater was also less than the detection limit (Table B-I.1, Appendix B).

Strontium

Thirteen samples from 9 groundwater locations were analyzed for Strontium-89 and Strontium-90. The results were less than the required detection limit of 10 pCi/liter for Strontium-89 and less than the required detection limit of 1.0 pCi/liter for Strontium-90 (Table B-I.1, Appendix B).

Gross Alpha and Gross Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on groundwater samples during the third and fourth sampling in 2013. Gross Alpha (dissolved) was not detected at any groundwater locations. Gross Alpha (suspended) was detected in 6 of 12 samples affecting 5 of 8 groundwater locations analyzed. The concentrations ranged from 2.0 to 12.6 pCi/L. Gross Beta (dissolved) was detected in 9 of 12 samples affecting 7 of 8 groundwater locations analyzed. The concentrations ranged from 2.4 to 22.0 pCi/L. Gross Beta (suspended) was detected in 7 of 12 samples affecting 4 of 8 groundwater locations analyzed. The concentrations ranged from 3.1 to 52.6 pCi/L. These concentrations of Gross Alpha and Gross Beta, which are slightly above detectable levels, are considered to be background and are not the result of plant effluents (Table B-I.1, Appendix B).

Gamma Emitters

Naturally occurring K-40 was detected in four of 23 samples analyzed. The concentration ranged from 36 to 52 pCi/L. No other gamma emitting nuclides were detected in any of the samples analyzed (Table B-I.2, Appendix B).

Hard-To-Detect

Hard-To-Detect analyses were performed on six of the groundwater sampling locations in accordance with the LaSalle RGPP and were used to establish background levels. The analyses included Fe-55, Ni-63, Am-241, Cm-242, Cm-243/244, Pu-238, Pu-239/240, U-234, U-235, and U-238. The isotopes of U-234 and U-238 were detected in five samples affecting 5 of 6 groundwater locations. The U-234 concentrations ranged from 0.49 to 21.2 pCi/L. The U-238 concentrations ranged from 0.61 to 11.6 pCi/L. U-234 and U-238 are commonly found in groundwater at low concentrations due to the naturally occurring Radium (Uranium) Decay Series. The isotope U-235 was detected in one groundwater sample at a concentration of 0.86 pCi/L. U-235 can be found in groundwater at low concentrations due to the naturally occurring Actinium Decay Series. The concentrations of U-234, U-235, and U-238 discussed above are considered to be background and are not the result of plant effluents (Table B-1.3, Appendix B).

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

B. Surface Water Results

Surface Water

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

Tritium

Samples from four locations were analyzed for tritium activity. Fourteen of 18 samples from 4 surface water locations did show activity above 200 pCi/L. The concentrations ranged from 193 to 3,290 pCi/L. Based on the hyrogeological study conducted at LaSalle, there is no feasible pathway into a drinking water supply. Based on established aquifer flow paths the location most representative of potential offsite release into groundwater was also less than the detection limit. (Table B–II.1, Appendix B).

Strontium

Two samples from 2 surface water locations were analyzed for Strontium-89 and Strontium-90. The results were less than the required detection limit of 10 pCi/liter for Strontium-89 and less than the required detection limit of 1.0 pCi/liter for Strontium-90 (Table B-II.1, Appendix B).

Gross Alpha and Gross Beta (dissolved and suspended)

Gross Alpha and Gross Beta analyses in the dissolved and suspended fractions were performed on surface water samples during the third sampling in 2013. Gross Alpha (dissolved) was not detected at any surface water locations. Gross Alpha (suspended) was not detected at any surface water locations. Gross Beta (dissolved) was detected at both of the surface water locations analyzed. The concentrations ranged from 12.2 to 14.3 pCi/L. Gross Beta (suspended) was not detected at any of the four surface water locations analyzed. These concentrations of Gross Beta, which are slightly above detectable levels, are considered to be background and are not the result of plant effluents (Table B-II.1, Appendix B).

Gamma Emitters

Naturally occurring K-40 was detected in one of seven samples analyzed at a concentration of 49 pCi/L. No other gamma emitting nuclides were detected in any of the samples analyzed. (Table B-II.2, Appendix B).

C. Drinking Water Well Survey

A drinking water well survey was conducted during the summer 2006 by CRA (CRA 2006) around the LaSalle County Station. This survey concluded that no residents in the vicinity of the plant utilize the shallow water aquifer as a drinking water supply. Site hydrological studies of aquifer flow and permeation rates from the shallow aquifer to the deep aquifer concluded that there is no feasible dose receptor via a ground water pathway at LaSalle.

D. Summary of Results – Inter-Laboratory Comparison Program

Inter-Laboratory Comparison Program results for TBE and Environmental Inc. (Midwest Labs) are presented in the AREOR.

E. Leaks, Spills, and Releases

There were no new leaks identified at LaSalle Station during the reporting period.

F. Trends

Analysis results from samples continue to be trended in order to assess impact to groundwater at LaSalle Station. There were no new leaks identified in the reporting period. Sample data from the plume arising from the 2010 U1 CY tank leak is being trended per the LaSalle RGPP. The plume had been dispersing with groundwater flow, and an extraction well has been installed to provide additional control of the plume migration (see Section H.3). Currently, no tritium has migrated offsite, and tritium migration offsite is not expected.

G. Investigations

No new investigations were carried out during the reporting period.

H. Actions Taken

1. Compensatory Actions

   No compensatory actions were taken during the reporting period.

2. Installation of Monitoring Wells

   No new monitoring wells have been installed during the reporting period.

3. Actions to Recover/Reverse Plumes

   An extraction well (RW-LS-100S), to control the migration of the tritium plume near the U1 CY tank, was installed and became operational in October 2012.

APPENDIX A

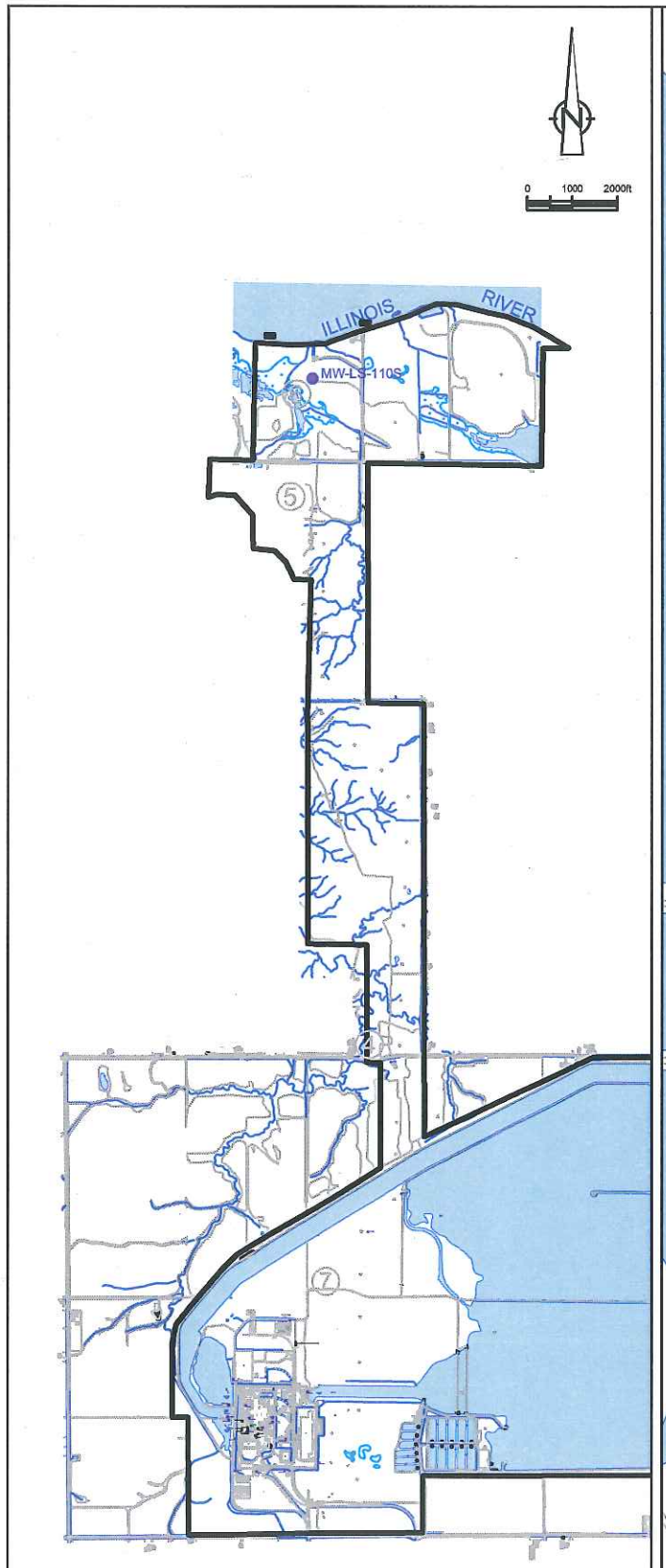
LOCATION DESIGNATION

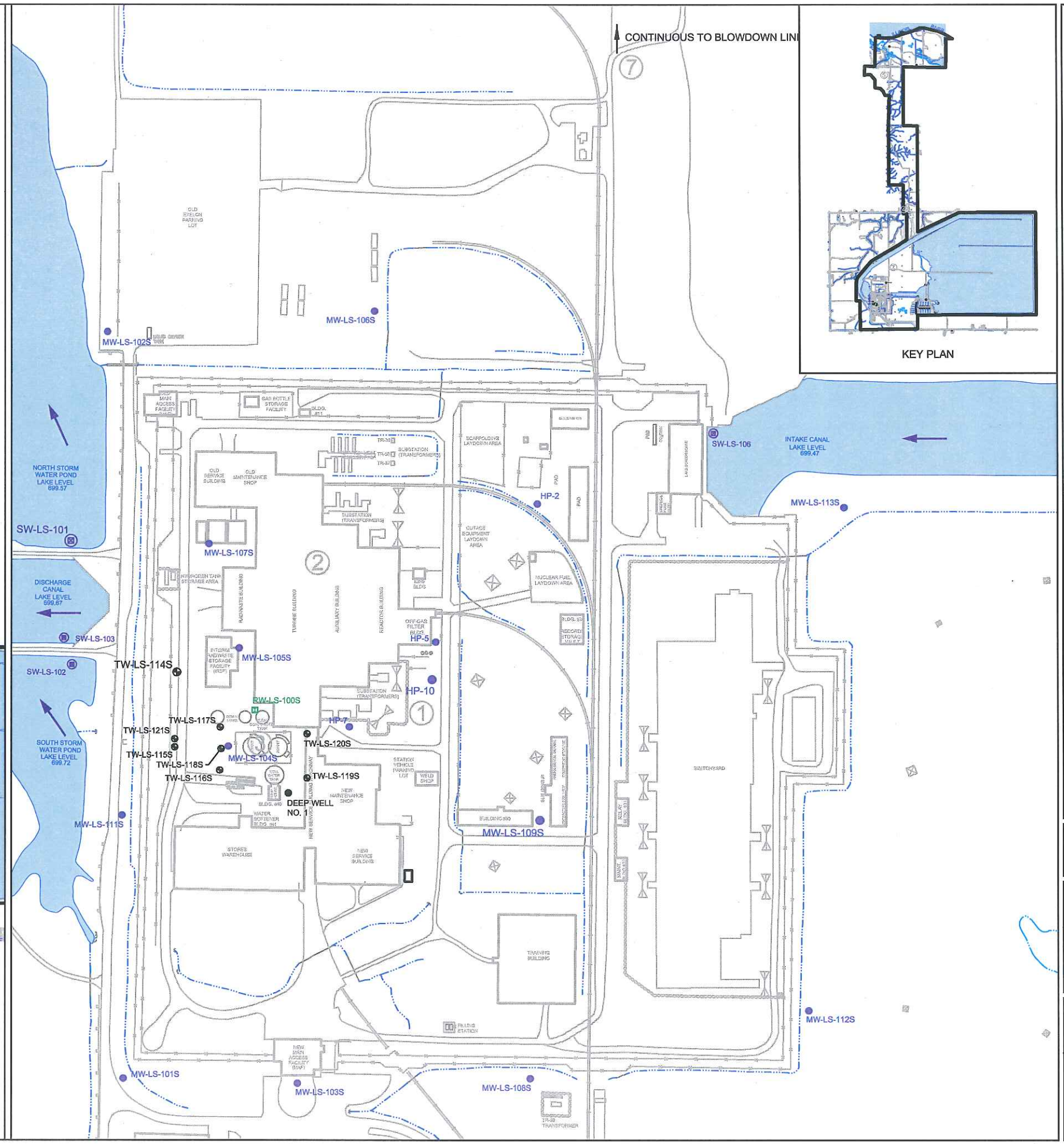
TABLE A-1 LaSalle County Station Groundwater Monitoring Sample Point List, 2013

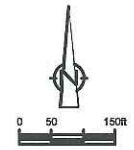
Site	Site Type
SW-LS-101	Surface Water
SW-LS-102	Surface Water
SW-LS-103	Surface Water
SW-LS-104	Surface Water
SW-LS-105	Surface Water
SW-LS-106	Surface Water
MW-LS-101S	Monitoring Well
MW-LS-102S	Monitoring Well
MW-LS-103S	Monitoring Well
MW-LS-104S	Monitoring Well
MW-LS-105S	Monitoring Well
MW-LS-106S	Monitoring Well
MW-LS-107S	Monitoring Well
MW-LS-108S	Monitoring Well
MW-LS-109S	Monitoring Well
MW-LS-110S	Monitoring Well
MW-LS-111S	Monitoring Well
MW-LS-112S	Monitoring Well
MW-LS-113S	Monitoring Well
HP-2	Monitoring Well
HP-5	Monitoring Well
HP-7	Monitoring Well
HP-10	Monitoring Well
RW-LS-100S	Extraction Well
TW-LS-114S	Monitoring Well
TW-LS-115S	Monitoring Well
TW-LS-116S	Monitoring Well
TW-LS-117S	Monitoring Well
TW-LS-118S	Monitoring Well
TW-LS-119S	Monitoring Well
TW-LS-120S	Monitoring Well
TW-LS-121S	Monitoring Well

APPENDIX A-1

LASALLE COUNTY STATION MAP OF GROUNDWATER MONITORING SAMPLE LOCATIONS







LEGEND

- EDGE OF WATER
- STORM WATER DITCH
- TRANSMISSION TOWER
- HP-1 MONITORING WELL LOCATION
- (1) AREA FOR FURTHER EVALUATION (AFE LASALLE)
- SURFACE WATER FLOW
- RW-LS-100S RECOVERY WELL LOCATION AND IDENTIFIER
- TW-114S APPROXIMATE TEMPORARY MONITORING WELL LOCATION AND IDENTIFIER

AFE	DESCRIPTION
1	HPCS/RI
2	REACTOR / TURBINE / AUXILIARY BUILDINGS
3	CY SYSTEM
4	VALVE PIT 3B
5	VALVE PIT 15B
6	VALVE PIT 16B
7	RAD WASTE LINE

SCALE VERIFICATION

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

EXELON GENERATION COMPANY, LLC

FLEETWIDE ASSESSMENT

MONITORING WELL LOCATIONS
LaSALLE GENERATING STATION
MARSEILLES, ILLINOIS

Exelon

CONESTOGA-ROVERS & ASSOCIATES

Source References:
SDI CONSULTANTS, ALTA/ACSM LAND TITLE SURVEY
LASALLE NUCLEAR STATION, 9-15-2000

Project Manager:	Reviewed By:	Date:	
S. QUIGLEY	M. KELLY	JULY 2006	
Scale: AS SHOWN	Project №: 71554-00	Report №: MART002	Drawing №: figure 1

71554-00(MART002)GN-CC002 APR 02/2013

APPENDIX B

DATA TABLES

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
HP-10	03/27/13	< 168						
HP-10	06/25/13	< 188						
HP-10	09/25/13	< 173	< 3.9	< 0.6	< 4.2	2.0 ± 1.3	< 7.0	< 4.1
HP-10	12/09/13	< 192			< 3.5	< 0.5	3.7 ± 1.5	< 1.5
HP-2	03/27/13	< 165						
HP-2	06/25/13	< 188						
HP-2	09/24/13	< 174	< 7.1	< 0.6	< 1.0	< 0.8	6.0 ± 1.0	< 1.6
HP-2	12/09/13	< 170						
HP-5	03/24/13	< 169						
HP-5	06/25/13	< 189						
HP-5	09/25/13	< 176	< 5.4	< 0.6	< 1.5	6.5 ± 1.5	3.6 ± 1.1	3.1 ± 1.3
HP-5	12/09/13	< 189						
HP-7	03/27/13	< 167						
HP-7	06/25/13	< 187						
HP-7	09/25/13	< 172	< 6.8	< 0.6	< 1.8	< 1.1	9.8 ± 1.4	< 3.2
HP-7	12/09/13	< 191						
MW-LS-104S	03/27/13	209000 ± 20800						
MW-LS-104S	06/25/13	131000 ± 13100	< 4.2	< 0.9				
MW-LS-104S	09/25/13	169000 ± 16800			< 0.9	< 1.1	< 1.4	< 1.6
MW-LS-104S	12/06/13	126000 ± 12600						
MW-LS-105S	03/27/13	< 179						
MW-LS-105S	06/25/13	269 ± 130						
MW-LS-105S	09/24/13	223 ± 118	< 3.4	< 0.6	< 0.7	2.8 ± 1.5	3.9 ± 0.9	8.3 ± 1.9
MW-LS-105S	12/06/13	329 ± 137	< 8.1	< 0.5	< 1.2	5.5 ± 2.5	2.4 ± 1.4	34.9 ± 3.7
MW-LS-106S	03/29/13	< 180						
MW-LS-106S	06/26/13	< 189						
MW-LS-106S	09/25/13	< 174						
MW-LS-107S	03/27/13	< 178						
MW-LS-107S	06/25/13	< 188						
MW-LS-107S	09/24/13	< 163	< 5.1	< 0.7	< 5.6	12.6 ± 3.0	16.5 ± 6.2	52.6 ± 4.8
MW-LS-107S	12/06/13	< 191	< 7.4	< 0.5	< 23.7	< 6.7	< 11.5	17.9 ± 3.7
MW-LS-111S	03/29/13	< 166						
MW-LS-111S	06/26/13	< 189						
MW-LS-111S	09/25/13	< 176	< 3.5	< 0.5	< 11.5	4.2 ± 1.4	20.6 ± 6.5	16.2 ± 3.0
MW-LS-111S	12/19/13	< 188	< 6.7	< 0.6	< 7.2	< 1.7	22.0 ± 6.4	8.2 ± 2.7
OIL SEPARATOR	03/27/13	5600 ± 603						
OIL SEPARATOR	06/25/13	2670 ± 320						
OIL SEPARATOR	09/26/13	16300 ± 1680						
OIL SEPARATOR	12/06/13	15500 ± 1590						
RW-LS-100	03/27/13	69800 ± 6100						
RW-LS-100S	06/25/13	25500 ± 2600	< 4.6	< 0.9				
RW-LS-100S	09/24/13	49800 ± 5000	< 2.9	< 0.8				
RW-LS-100S	12/05/13	49100 ± 4940						
TW-LS-114S	03/27/13	< 166						
TW-LS-114S	06/25/13	< 190						
TW-LS-114S	09/24/13	< 170						
TW-LS-114S	12/06/13	< 192						
TW-LS-115S	03/27/13	< 169						
TW-LS-115S	06/25/13	< 189						
TW-LS-115S	09/24/13	< 193						
TW-LS-115S	12/06/13	< 191						
TW-LS-116S	03/27/13	11100 ± 1150						
TW-LS-116S	06/25/13	16500 ± 1690						
TW-LS-116S	09/24/13	11100 ± 1160						

TABLE B-I.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA, AND GROSS BETA IN GROUNDWATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
TW-LS-116S	12/05/13	11800 ± 1220						
TW-LS-117S	03/27/13	< 168						
TW-LS-117S	06/25/13	< 189						
TW-LS-117S	09/24/13	< 195						
TW-LS-117S	12/06/13	< 185						
TW-LS-118S	03/27/13	114000 ± 11400						
TW-LS-118S	06/25/13	71000 ± 7110						
TW-LS-118S	09/24/13	67000 ± 6730						
TW-LS-118S	12/05/13	52700 ± 5290						
TW-LS-119S	03/27/13	< 164						
TW-LS-119S	06/25/13	6810 ± 727						
TW-LS-119S	09/24/13	11000 ± 1140						
TW-LS-119S	12/05/13	10100 ± 1050						
TW-LS-120S	03/27/13	< 165						
TW-LS-120S	06/25/13	< 195						
TW-LS-120S	09/24/13	< 196						
TW-LS-120S	12/09/13	< 190						
TW-LS-121S	03/27/13	< 167						
TW-LS-121S	06/25/13	< 186						
TW-LS-121S	09/24/13	< 193						
TW-LS-121S	12/06/13	< 189						

TABLE B-I.2 **CONCENTRATIONS OF GAMMA EMITTERS IN GROUNDWATER**
SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
HP-10	06/25/13	< 12	< 24	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< **20**	< 1	< 1	< 22	< 7
HP-10	09/25/13	< 17	< 14	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 14	< 1	< 2	< 23	< 7
HP-2	06/25/13	< 12	< 9	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< **18**	< 1	< 1	< 21	< 7
HP-2	09/24/13	< 18	45 ± 25	< 2	< 2	< 5	< 2	< 4	< 2	< 3	< 11	< 2	< 2	< 20	< 6
HP-5	06/25/13	< 14	< 9	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< **20**	< 1	< 1	< 23	< 7
HP-5	09/25/13	< 17	< 13	< 2	< 2	< 4	< 1	< 3	< 2	< 3	< 10	< 1	< 2	< 17	< 5
HP-7	06/25/13	< 12	< 25	< 1	< 1	< 4	< 1	< 2	< 1	< 2	< **18**	< 1	< 1	< 22	< 8
HP-7	09/25/13	< 19	< 18	< 2	< 2	< 4	< 2	< 3	< 2	< 4	< 11	< 2	< 2	< 18	< 6
MW-LS-104S	06/25/13	< 12	< 11	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 12	< 1	< 1	< 18	< 5
MW-LS-104S	12/06/13	< 45	< 53	< 5	< 5	< 10	< 5	< 9	< 6	< 8	< 15	< 4	< 6	< 34	< 10
MW-LS-105S	06/25/13	< 15	46 ± 28	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< **18**	< 1	< 1	< 22	< 7
MW-LS-105S	09/24/13	< 17	52 ± 24	< 1	< 2	< 4	< 2	< 3	< 2	< 3	< **10**	< 1	< 2	< 17	< 5
MW-LS-106S	06/26/13	< 13	< 34	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< **17**	< 1	< 1	< 22	< 6
MW-LS-106S	09/25/13	< 22	< 21	< 2	< 2	< 5	< 2	< 5	< 2	< 4	< 13	< 2	< 2	< 22	< 8
MW-LS-107S	06/25/13	< 15	< 13	< 1	< 2	< 4	< 1	< 3	< 2	< 3	< **22**	< 1	< 1	< 27	< 7
MW-LS-107S	09/24/13	< 18	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 12	< 2	< 2	< 20	< 7
MW-LS-111S	06/26/13	< 12	< 10	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< **18**	< 1	< 1	< 21	< 7
MW-LS-111S	09/25/13	< 23	< 21	< 2	< 3	< 6	< 2	< 4	< 3	< 5	< 14	< 2	< 2	< 24	< 8
RW-LS-100S	06/25/13	< 12	36 ± 24	< 1	< 1	< 3	< 1	< 2	< 1	< 2	< 13	< 1	< 1	< 16	< 5
RW-LS-100S	12/05/13	< 53	< 98	< 5	< 5	< 10	< 5	< 11	< 6	< 10	< 14	< 4	< 5	< 35	< 10
TW-LS-116S	12/05/13	< 47	< 50	< 4	< 5	< 11	< 4	< 9	< 6	< 10	< 15	< 5	< 5	< 36	< 11
TW-LS-118S	12/05/13	< 33	< 80	< 4	< 4	< 7	< 4	< 8	< 4	< 8	< 12	< 4	< 4	< 25	< 8
TW-LS-119S	12/05/13	< 47	< 106	< 5	< 5	< 15	< 6	< 11	< 6	< 10	< 13	< 5	< 5	< 32	< 12

BOLDED VALUES INDICATE LLD COULD NOT BE MET DUE TO AGE OF SAMPLE AT TIME OF RECEIPT AT THE LABORATORY

TABLE B-I.3 **CONCENTRATIONS OF HARD TO DETECTS IN GROUNDWATER SAMPLES COLLECTED AS PART OF THE RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM, LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Am-241	Cm-242	Cm-243/244	Pu-238	Pu-239/240	U-234	U-235	U-238	Fe-55	Ni-63
HP-5	12/09/13	< 0.09	< 0.04	< 0.02	< 0.11	< 0.13	0.49 ± 0.24	< 0.12	0.61 ± 0.26		
MW-LS-104S	06/25/13	< 0.09	< 0.06	< 0.07	< 0.12	< 0.07	0.88 ± 0.25	< 0.02	0.97 ± 0.27	< 64	< 3.4
MW-LS-105S	12/06/13	< 0.08	< 0.06	< 0.09	< 0.06	< 0.12	1.86 ± 0.53	< 0.10	0.96 ± 0.36	< 148	< 5.0
MW-LS-107S	12/06/13	< 0.02	< 0.02	< 0.02	< 0.13	< 0.14	5.64 ± 0.82	< 0.04	3.11 ± 0.56	< 108	< 4.7
MW-LS-111S	12/19/13	< 0.09	< 0.07	< 0.02	< 0.11	< 0.12	21.2 ± 1.88	0.86 ± 0.26	11.6 ± 1.17	< 137	< 4.1
RW-LS-100S	06/25/13	< 0.09	< 0.05	< 0.02	< 0.15	< 0.11	< 0.02	< 0.04	< 0.02	< 104	< 3.3
RW-LS-100S	09/24/13	< 0.14	< 0.08	< 0.09	< 0.09	< 0.16	< 0.14	< 0.10	< 0.20	< 82	< 3.9

TABLE B-II.1 **CONCENTRATIONS OF TRITIUM, STRONTIUM, GROSS ALPHA AND GROSS BETA IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE		H-3	Sr-89	Sr-90	Gr-A (Dis)	Gr-A (Sus)	Gr-B (Dis)	Gr-B (Sus)
SW-LS-101	03/29/13		< 173						
SW-LS-101	06/26/13		< 190						
SW-LS-101	09/25/13		< 173						
SW-LS-101	12/05/13	Original	263 ± 129						
SW-LS-101	12/05/13	Recount	221 ± 126						
SW-LS-101	12/05/13	Reanalysis	193 ± 123						
SW-LS-102	03/29/13		692 ± 144						
SW-LS-102	06/26/13		< 185						
SW-LS-102	09/25/13		3290 ± 375						
SW-LS-102	12/05/13		1320 ± 190						
SW-LS-103	03/29/13		315 ± 125						
SW-LS-103	06/26/13		235 ± 131						
SW-LS-103	09/25/13		927 ± 153	< 3.9	< 0.7	< 1.2	< 0.8	14.3 ± 1.5	< 1.6
SW-LS-103	12/05/13		1020 ± 173						
SW-LS-106	03/29/13		283 ± 124						
SW-LS-106	06/25/13		284 ± 133						
SW-LS-106	09/25/13		1060 ± 167	< 3.5	< 0.5	< 1.2	< 0.9	12.2 ± 1.4	< 1.7
SW-LS-106	12/11/13		1050 ± 177						

TABLE B-II.2 **CONCENTRATIONS OF GAMMA EMITTERS IN SURFACE WATER SAMPLES COLLECTED IN THE VICINITY OF LASALLE COUNTY STATION, 2013**

RESULTS IN UNITS OF PCI/LITER ± 2 SIGMA

SITE	COLLECTION DATE	Be-7	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Nb-95	Zr-95	I-131	Cs-134	Cs-137	Ba-140	La-140
SW-LS-101	06/26/13	< 20	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< **23**	< 2	< 2	< 29	< 10
SW-LS-101	09/25/13	< 19	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 4	< 9	< 2	< 2	< 18	< 5
SW-LS-102	06/26/13	< 10	< 8	< 1	< 1	< 2	< 1	< 2	< 1	< 2	< 13	< 1	< 1	< 15	< 5
SW-LS-103	06/26/13	< 13	< 26	< 1	< 1	< 4	< 1	< 2	< 1	< 2	< **18**	< 1	< 1	< 22	< 8
SW-LS-103	09/25/13	< 20	49 ± 28	< 2	< 2	< 5	< 2	< 4	< 2	< 4	< 10	< 2	< 2	< 19	< 5
SW-LS-106	06/25/13	< 16	< 31	< 1	< 1	< 3	< 1	< 2	< 1	< 3	< **25**	< 1	< 1	< 25	< 6
SW-LS-106	09/25/13	< 25	< 19	< 2	< 3	< 5	< 2	< 5	< 3	< 5	< 13	< 2	< 2	< 22	< 7

BOLDED VALUES INDICATE LLD COULD NOT BE MET DUE TO AGE OF SAMPLE AT TIME OF RECEIPT AT THE LABORATORY