

April 30, 2009

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U.S. Nuclear Regulatory Commission
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Ladies and Gentlemen:

**DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
FACILITY OPERATING LICENSE NPF-30
2008 ANNUAL RADIOLOGICAL
ENVIRONMENTAL OPERATING REPORT**

Please find enclosed the 2008 Annual Radiological Environmental Operating Report for Callaway Plant. This report is submitted in accordance with Section 5.6.2 of the Technical Specifications and Appendix B to the Callaway Plant Operating License.

If there are any questions, please contact us.

Sincerely,

A handwritten signature in black ink, appearing to read "Scott Sandbothe".

Scott Sandbothe
Manager, Regulatory Affairs

DJW/nls

Attachment: Annual Radiological Environmental Operating Report

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**AMEREN UE, CALLAWAY PLANT
FULTON, MISSOURI**

DOCKET NO. 50-483

**ANNUAL REPORT
to the**

UNITED STATES NUCLEAR REGULATORY COMMISSION

Radiation Environmental Operating Report

January 1 to December 31, 2008

Prepared by

**ENVIRONMENTAL, Inc.
Midwest Laboratory**

Submitted by

**UNION ELECTRIC CO.
dba AmerenUE Corp.**

Project No. 8036

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PREFACE

This Annual Radiological Environmental Operating Report describes the AmerenUE Corp., Callaway Plant Radiological Environmental Monitoring Program (REMP), and the program results for the calendar year 2008. It is submitted in accordance with section 5.6.2 of the Callaway Plant Technical Specifications.

Staff members of the Environmental, Inc., Midwest Laboratory were responsible for the acquisition of data presented in this report. Environmental samples were collected by AmerenUE personnel or contractors to AmerenUE and shipped to Environmental, Inc. – Midwest Laboratory and Framatone for analysis.

The report was prepared by Environmental, Inc., Midwest Laboratory for the AmerenUE, Callaway Plant.

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1.0 INTRODUCTION

This report presents an analysis of the results of the Radiological Environmental Monitoring Program (REMP) conducted during 2008 for the AmerenUE Corp., Callaway Plant.

The objectives of the REMP are to monitor potential critical pathways of radioactive effluent to man and determine the radiological impact on the environment caused by operation of Callaway Plant. The radiological environmental monitoring program was initiated in April 1982.

Callaway Plant consists of one 3565 MWt pressurized water reactor, which achieved initial criticality on October 2, 1984. The plant is located on a plateau approximately ten miles southeast of the City of Fulton in Callaway County, Missouri and approximately eighty miles west of the St. Louis metropolitan area. The Missouri River flows by the site in an easterly direction approximately five miles south of the site at its closest point.

Tabulation of the individual analyses for the year 2008 is included in Part II of this report.

2.0 SUMMARY

The Radiological Environmental Monitoring Program, as required by the U.S. Nuclear Regulatory Commission (NRC) Technical Specifications for the Callaway Plant is herein described. Results for the year 2008 are summarized and discussed.

For the year, the Callaway Plant was operated in compliance with Off Site Dose Calculation Manual (ODCM) requirements. Comparison of results for 2008 show no significant differences to historical data. Results from the REMP indicate the Callaway Plant has had no significant radiological impact on the health and safety of the public or on the environment.

3.0 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

3.1 Program Design and Data Interpretation

The purpose of the Radiological Environmental Monitoring Program at the Callaway Plant is to assess the impact of the plant on its environment. For this purpose, samples are collected from waterborne, airborne, ingestion, and terrestrial pathways and analyzed for radioactive content. Ambient gamma radiation levels are monitored by thermoluminescent dosimeters (TLDs).

Sources of environmental radiation can include the following:

- (1) Natural background radiation arising from cosmic rays and primordial radionuclides;
- (2) Fallout from atmospheric nuclear detonations;
- (3) Releases from nuclear power plants; and
- (4) Industrial and medical radioactive waste.

In interpreting the data, effects due to operation of the Callaway Plant must be distinguished from those due to other sources.

A major interpretive aid in assessment of these effects is the design of the monitoring program at the Callaway Plant, based on the indicator-control concept. Most types of samples are collected at indicator locations (nearby, downwind, or downstream) and at control locations (distant, upwind, or upstream). A station effect would be indicated if the radiation level at an indicator location was significantly larger than that at the control location. The difference would have to be greater than could be accounted for by typical fluctuations in radiation levels arising from other sources.

An additional interpretive technique involves analyses for specific radionuclides present in the environmental samples collected from the Callaway site. The monitoring program includes analyses for iodine-131, a fission product, and tritium, which is produced by cosmic rays, atmospheric nuclear detonations, and also by nuclear power plants. Most samples are analyzed for gamma-emitting isotopes, with results for the following groups quantified: zirconium-95, cesium-137, and cerium-144. These three gamma-emitting isotopes are selected as radiological impact indicators because of the different characteristic proportions in which they appear in the fission product mix produced by a nuclear reactor and that produced by a nuclear detonation. Each of the three isotopes is produced in roughly equivalent amounts by a reactor: each constitutes about 10% of the total activity of fission products ten days after reactor shutdown. On the other hand, ten days after a nuclear explosion, the contributions of zirconium-95, cerium-144, and cesium-137 to the activity of the resulting debris are in the approximate ratio 4:1:0.03 (Eisenbud, 1963).

The other group quantified consists of niobium-95, ruthenium-103 and -106, cesium-134, barium-lanthanum-140, and cerium-141. These isotopes are released in small quantities by nuclear power plants, but to date their major source of injection into the general environment has been atmospheric nuclear testing. Nuclides of the next group, manganese-54, cobalt-58 and -60, and zinc-65, are activation products and arise from activation of corrosion products. They are typical components of nuclear power plant effluents, but are not produced in significant quantities by nuclear detonation.

Nuclides of the final group, beryllium-7, which is of cosmogenic origin, and potassium-40, a naturally-occurring isotope, were chosen as calibration monitors and should not be considered radiological impact indicators.

Other means of distinguishing sources of environmental radiation can be employed in interpreting the data. Current radiation levels can be compared with previous levels, including pre-operational data. Results of the monitoring program can be related to those obtained in other parts of the world. Finally, results can be related to events known to cause elevated levels of radiation in the environment, e.g., a nuclear accident.

3.2 Program Description

The sampling and analysis schedules for the environmental radiological monitoring program at the Callaway Plant are summarized in Tables 5.1 and 5.2 and briefly reviewed below. Table 5.1 identifies sampling locations and specifies as to type (indicator or control) and its distance, direction, and sector relative to the reactor site. The types of samples collected at each location, required analyses and the frequency of collections are presented in Tables 5.2.

To monitor the air environment, airborne particulates and airborne iodine samples are collected by continuous pumping, at five locations. The airborne particulates are collected on glass fiber filters and the airborne iodine through an activated charcoal cartridge. Filters and cartridges are exchanged weekly.

The ingestion pathway is monitored by sampling of milk (if available), fish and green leafy vegetation.

Milk samples are collected semimonthly during the grazing season (April through September) and monthly during the winter. Samples are analyzed for iodine-131 and gamma-emitting isotopes.

Monthly during the growing season, edible green leafy vegetation is collected from both indicator and control locations. Vegetation samples typically consist of mustard greens, turnip greens, cabbage, lettuce, collards, radish greens, Swiss chard, broccoli and poke. Other edible broad leaf vegetation is collected if primary varieties are not available. The samples are analyzed for iodine-131 and other gamma-emitting isotopes.

This pathway is also monitored by upstream and downstream semiannual collections of fish. The five most abundant recreational or commercial fish species are collected. Samples are analyzed for gamma-emitting isotopes.

The waterborne pathway is monitored by sampling surface water, ground water and drinking water, and bottom and shoreline sediments.

Monthly composite samples of surface water from the Missouri River are collected from one indicator location (SO2) and from one control location (SO1). The samples are analyzed for gross alpha, gross beta, tritium and gamma-emitting isotopes.

Ground water is collected quarterly from two deep aquifer sampling wells (F05 and F15), and two drinking water wells (D01 and PW1). The samples are analyzed for gross beta, tritium, iodine-131 and gamma emitting isotopes.

An additional forty-five groundwater well (CA-WWA) and pond surface water (CA-SWA) locations, both onsite and along the discharge pipeline, Table 5.1, were added to the permanent program in 2008, and analyzed for tritium. An analysis for gamma-emitting isotopes is performed on select locations. Collections are scheduled quarterly or semi-annually.

Additional testing of ground and surface water samples is included in Part II, App. C.

Twenty-one drinking water wells (CA-DWA) Table 5.1, sampled quarterly, were added to the program in 2008. Analyses may include tritium and gamma-emitting isotopes.

River bottom sediment is collected semiannually at the plant's intake (A) and discharge (C). The samples are taken from water at least 2 meters deep to prevent influence of bank erosion. Shoreline sediments are collected semiannually in the same area as bottom sediment. These samples are collected within two feet of the edge of the water. The samples are analyzed for gamma-emitting isotopes.

3.2 Program Description (continued)

Another pathway considered is direct ambient gamma radiation. This exposure is monitored by thermoluminescent dosimeters (TLDs), at forty-three locations in and around the Callaway site. The TLDs are placed in 16 sectors around the plant as specified in the ODCM-RECS. Three locations are designated as controls (IDM-26, IDM-27 and IDM-60). The TLDs are placed at each location and are exchanged and analyzed quarterly.

To monitor the terrestrial environment, soil is collected annually from seven indicator locations (F2, PR3, F6, PR7, W2, W3, W4) and two control locations (V3, W1). The samples are analyzed for gross alpha, gross beta and gamma-emitting isotopes. Additional testing of soil and sediment samples is included in Part II, App. C.

3.3 Program Execution

The program was executed as described in the preceding section with the following exceptions.

(1) Air Particulates / Air Iodine:

A partial sample was collected from air sampling stations A-8 (405 m3) for the week ending 07-03-08, the shorter run-time possibly due to storms in the area.

No viable air particulate / air iodine sample was available from location A-8 for the week ending 08-14-08. A power outage limited the sampler pump run-time to only 14 hours.

(2) Groundwater:

MW-009 was not sampled during the 3rd quarter, 2008. There was damage to the well from excavation activity during installation of a new discharge pipeline.

Excavation for a new essential service water pipeline blocked access to well #937E. No sample was available for the fourth quarter, 2008. Sampling of 937E will resume upon completion of the construction work.

(3) Milk:

A replacement for location M-08 was not available for the January, 2008 collection. A new provider (M-09) was added to the program in February, 2008.

Milk was not available from location M-10 for the September 23 collection and for the period from October 28 through December, 2008. The goats did not produce enough milk.

(4) Direct Radiation:

TLDs for locations IDM-45 and IDM-49 were missing for the 3rd quarter, 2008. Vandalism is suspected. The TLDs were replaced for the 4th quarter. The TLD at location IDM-10 was submerged during flooding in the 3rd quarter. The TLD appeared undamaged, but the data could be considered suspect.

(5) Fish:

Fish sampling for Spring, 2008 was delayed due to flood conditions on the Missouri River.

(6) Farm Crops:

Soybeans were not available for collection in 2008 from locations FC1, FC2, FC3 and FC4. The fields were flooded prior to the harvest and the crops were destroyed.

3.3 Program Execution (continued)

(7) Surface Water:

The automatic river sampler at location S02 became inoperable on 09/15/08 due to flooding of the equipment vault. The flooding also prohibited grab sampling. Grab sampling was resumed on 09/18/08.

(8) Vegetation:

Station V-15 did not provide samples during 2008. Sampling continued at Station V-14 as compensatory action.

- (9) The ODCM was revised effective July 8, 2008 to require gamma spectroscopic analysis on each particulate air sample (REMP airborne sampling stations A1, A7, A8, A9, and B3). Plant procedure HTP-ZZ-07101, Appendix A, was revised to reflect the changes to the ODCM, however, the laboratory was not notified, and the required gamma spectroscopic analyses were not performed. Affected samples are those airborne particulate filters collected July 10, 2008 through January 1, 2009. (CAR 200903137)

The subject weekly samples were analyzed for gross beta and results were consistent with historical values. Quarterly composites of the weekly samples were also analyzed by gamma spectroscopy. There was no indication of a plant effect. (Sec. 4.2)

The subject samples are available and the laboratory will perform the analyses pursuant to the ODCM requirements. A supplemental report will be provided upon completion of the analyses.

3.4 Laboratory Procedures

The iodine-131 analyses in milk were made using a sensitive radiochemical procedure involving separation of the iodine by ion-exchange, solvent extraction and subsequent beta counting.

Gamma-spectroscopic analyses were performed with HPGe detectors. Levels of iodine-131 in vegetation and concentrations of airborne iodine-131 in charcoal samples were also determined by gamma spectroscopy.

Tritium was measured by liquid scintillation.

Analytical Procedures used by Environmental, Inc. are on file and are available for inspection. Procedures are based on those prescribed by the Health and Safety Laboratory of the U.S. Dep't of Energy, Edition 28, 1997, U.S. Environmental Protection Agency for Measurement of Radioactivity in Drinking Water, 1980, and the U.S. Environmental Protection Agency, EERF, Radiochemical Procedures Manual, 1984.

Environmental, Inc., Midwest Laboratory has a comprehensive quality control/quality assurance program designed to assure the reliability of data obtained. Details of the QA Program are presented elsewhere (Environmental, Inc., Midwest Laboratory, 2003). The QA Program includes participation in Interlaboratory Comparison (crosscheck) Programs. Results obtained through Quality control samples and crosscheck program results are presented in Appendix A.

Environmental TLDs are processed by Framatome. The laboratory meets the requirements of Reg. Guide 4.13 and is accredited by NVLAP for photon, beta and photon/beta mixture categories, in accordance with ANSI N 13.11.

3.5 Program Modifications

Milk was no longer available from location M-08 for 2008. Two new milk suppliers, M-09 (Control) and M-10 (Indicator), were added to the program in 2008.

The Pate Farm (V-15) was added to the program in 2008 to include a vegetable location with a higher D/Q value.

On July 8, 2008, the ODCM sampling and analysis requirements were revised as described in FSARCN 08-018. The change to the ODCM will be submitted as required in the Annual Effluent Release Report (AERR). Significant changes were:

- Eliminated the gross beta analysis requirement for airborne particulate samples in favor of gamma spectroscopic analysis.
- Added samples pursuant to NEI 07-07, "Industry Groundwater Protection Initiative-Final Guidance Document" and ANI Guideline 06-01, "Potential for Unmonitored and Unplanned Off-site Releases of Radioactive Material". Samples added include 24 groundwater well samples, 12 potable well water samples, surface water samples from 9 onsite ponds, shoreline sediment from 4 onsite sludge ponds, 5 soil samples, and 10 samples of food or non-food crops grown on Ameren property traversed by the discharge pipeline.
- Added an upstream sample of shoreline sediment (control station).
- Revised to allow the use of Optically Stimulated Luminescent Dosimeters (OSLD) for monitoring of direct radiation. The use of Thermoluminescent Dosimeters (TLD) continues to be allowed by the ODCM.
- Added a requirement, pursuant to ANI Guideline 06-01, to analyze for Hard to Detect (HTD) nuclides if gamma emitting nuclides of plant origin are detected in non-potable well water or surface water samples from onsite ponds, or if nuclides of plant origin are detected in potable groundwater. The HTD nuclides are defined in the ODCM as Sr89, Sr90, Fe55, Ni63, Np237, Pu238, Pu239/240, Pu241, Am241, Cm242 and Cm243/244 .

Table 5.2a summarizes the ODCM sample collection and analysis requirements prior to July 8, 2008, and Table 5.2b summarizes the ODCM sample collection and analysis requirements beginning July 8, 2008.

3.6 Detection and Reporting Limits

Table 5.3 gives the minimum required detection limits for radiological environmental sample analysis. For each sample type, the table lists the detection level for each isotope. The lower limit of detection (LLD) used in this report is described in NRC Regulatory Guide 4.1 Rev. 1, "Program for Monitoring Radioactivity in the Environs of Nuclear Power Plants" and the NRC Radiological Assessment Branch Technical Position, Rev. 1, November 1979, "An Acceptable Radiological Environmental Monitoring Program".

3.7 Land Use Census

The Land Use Census is performed annually during the growing season. In 2007, the survey was expanded from a five mile radius to a six mile canvassing radius of the Callaway Plant. The location of the nearest resident, milking animal, and garden greater than 50 square meters was identified by contacting residents by phone, mail and/or in field surveys for each of the sixteen meteorological sectors using the midpoint of the two units.

The census was also expanded to include drinking water wells along Mud Creek and Logan Creek. No new drinking water wells were identified in 2008.

The Land Use Census was completed on October 31, 2008. The results of the census are presented in Table 5.4. The table includes radial direction and distance from the Callaway Plant for each location. These parameters were determined using a combination of map position, aerial photography, and Global Positioning System (GPS) receiver.

Missouri river water intake, within 10 river miles downstream of the plant, is checked, and new construction identified. No new water intake was developed in 2008.

4.0 RESULTS AND DISCUSSION

All collections and analyses were made as scheduled, except for the listing in Table 5.5.

Results are summarized in Table 5.6 as recommended by the Nuclear Regulatory Commission. For each type of analysis and sample medium, the table lists the mean and range of all indicator and control locations, as well as that location with the highest mean and range.

The tabulated results of all measurements are not included in this section, although references to these results will be made in the discussion. A complete tabulation of results for 2008 is contained in Part II of the Annual Report on the Radiological Environmental Monitoring Program for the Callaway Plant.

4.1 Atmospheric Nuclear Detonations and Nuclear Accidents

There were no reported nuclear accidents or atmospheric nuclear testing done in 2008.

4.2 Program Findings

Results obtained show background levels of radioactivity in the environmental samples collected in 2008.

Airborne Particulates

All five air particulate sampling locations are considered indicators. One station is located at the community with the highest D/Q, another on the outskirts of Fulton, Missouri.

The average annual gross beta concentrations in airborne particulates averaged (0.024 pCi/m³) and ranged from 0.011 to 0.056 pCi/m³, similar to levels observed from 1998 through 2007. Averages are tabulated below.

Year	Average (pCi/m ³)	Minimum	Maximum
1998	0.023	0.006	0.058
1999	0.025	0.008	0.048
2000	0.030	0.012	0.085
2001	0.023	0.006	0.054
2002	0.024	0.010	0.043
2003	0.023	0.009	0.041
2004	0.021	0.010	0.049
2005	0.024	0.005	0.052
2006	0.023	0.010	0.039
2007	0.024	0.011	0.056
2008	0.022	0.009	0.054

Average annual gross beta concentrations in airborne particulates.

4.2 Program Findings (continued)

Airborne Particulates

During 2008, there were fourteen weekly samples with gross beta activities above the base line action level of 0.037 pCi/m³. Gamma spectral analysis was performed on these filters and no gamma emitting isotopes of plant origin were detected.

Gamma spectroscopic analysis of quarterly composites of air particulate filters yielded similar results for all locations. Beryllium-7, which is produced continuously in the upper atmosphere by cosmic radiation, was detected, with an average activity of 0.072 pCi/ m³. All other gamma-emitting isotopes were below their respective LLD limits.

Airborne Iodine

Weekly levels of airborne iodine-131 were below the lower limit of detection (LLD) of 0.07 pCi/m³ in all samples.

Direct Radiation (TLDs)

Forty-three TLDs were placed in 16 sectors around the Callaway site. Measurements from the forty indicator locations averaged 16.5 mrem /quarter. The three control locations averaged 15.6 mrem/quarter. The readings ranged from 11.0 to 20.0 mrem /quarter, with the highest readings from control location CA-IDM-27, with an average of 18.1 mrem /quarter. The differences are statistically insignificant.

The TLD readings are consistent with previously accumulated data and no effects from plant operation were identified.

Milk

Iodine-131 results were below the detection limit of 0.5 pCi/L in all samples.

No gamma-emitting isotopes, except naturally occurring potassium-40, were detected in any milk samples. This is consistent with the finding of the National Center for Radiological Health that most radiocontaminants in feed do not find their way into milk due to the selective metabolism of the cow. The common exceptions are radioisotopes of potassium, cesium, strontium, barium, and iodine (National Center for Radiological Health, 1968).

In summary, milk data for 2008 show no radiological effects of plant operation.

Vegetation

Iodine-131 concentrations in broadleaf vegetation were below the LLD level of 39.6 pCi/kg wet weight in all samples.

Except for potassium-40, which was observed in all vegetation samples, all other gamma-emitting isotopes were below detection limits. No effect from plant operation is indicated.

4.2 Program Findings (continued)

Fish

All gamma-emitting isotopes, except naturally-occurring potassium-40, in edible portions were below detection limits. The potassium-40 levels were similar at both indicator and control locations (2,867 and 2,717 pCi/kg wet, respectively).

No plant effect on the fish population is indicated.

Soil

Cesium-137 activity was detected at both indicator and control locations, at average concentrations of 523 and 231 pCi/kg dry, respectively. The cesium-137 activity is similar to or less than levels observed from 1998 through 2007, these levels are generally attributable to deposition of fallout from previous decades.

Naturally-occurring potassium-40 averaged 11,784 pCi/kg dry weight.

Analysis results for soil samples in 2008 were consistent with previously accumulated data and no plant operational effects were identified.

Surface Water

The automatic sampler at location S01 was operable 100% of the time during 2008 and 94% of the time at location S02. Grab samples were taken as required.

Tritium was the only radionuclide detected in surface water samples collected during 2008. Three of twelve surface water samples collected at indicator location S02, contained measurable levels of tritium with a mean concentration of 398 pCi/L. The results are less than 2.5% of the reporting limit in surface water and well within regulatory requirements. Tritium results for location S02 are being trended along with monthly liquid H-3 releases and Missouri river flow. The 2008 results are consistent with previous operational levels and there was no significant radiological impact on the health and safety of the public or the environment.

Gamma spectroscopic analysis for surface water samples were consistent with previously accumulated data and no plant operational effects were identified.

Ground and Drinking Water (potable water)

Potable ground water from wells D-01 and PW-01 was tested for gross beta, tritium, iodine-131 and gamma-emitting isotopes. The mean gross beta activity measured 5.5 pCi/L, ranging from 4.0 to 8.6 pCi/L and similar to levels observed from 1998 through 2007. Iodine-131, tritium and gamma-emitting isotopes all measured below detection levels.

An additional twenty-one wells were added to the program in 2008 and monitored for tritium. No activity was measured above detection level (179 pCi/L) in any of the samples. Ten of the wells were monitored for gamma-emitters. No activities were detected above the respective LLDs.

Analysis results for ground water samples were consistent with previously accumulated data and no plant operational effects were identified.

Wells and Ponds (non-potable water)

Ground water from wells F-05 and F-15 was tested for gross beta, tritium, iodine-131 and gamma-emitting isotopes. The gross beta activity averaged 9.5 pCi/L, ranging from 8.6 to 10.6 pCi/L. Iodine-131, tritium and gamma-emitting isotopes all measured below detection levels.

Forty-five additional indicator locations, on-site and along the discharge pipeline, were included in the REMP in 2008, and analyzed for tritium. Activity was detected in 36 of the 166 samples tested, at an average activity of 305 pCi/L. The highest concentrations were observed from samples taken at on-site location 936, with an average activity of 551 pCi/L.

Wells OW-1 through OW-5, 936, 937A through 937F are located in the Plant Protected Area, adjacent to the powerblock. Tritium activity in these wells is believed to be the result of washout from gaseous effluents. The absence of tritium in on-site ponds (Pond-1, Pond-2, Outfalls 010 through 015, and sludge lagoon #4) indicate there is no off-site effect from the washout.

The low level tritium activity observed in wells MW-014 and MW-015 is due to normal operation of air release valves (ARVs) in the discharge pipeline. The pipeline has been replaced and the ARVs have been eliminated. The new discharge pipeline has a single vacuum breaker, which is completely contained to prevent possible leakage to the ground water.

Samples from wells 936, 937A through 937F, MW-004 through MW-008 and MW-012 were also analyzed for gamma-emitting isotopes. No activities were detected above the respective LLDs.

Sediments

Bottom sediments were collected in July and November, 2008, and analyzed for gamma-emitting isotopes. Trace Cs-137 activity was detected in one of two control samples at a concentration of 43.0 pCi/kg dry weight. Potassium-40 activity ranged from 11,892 – 13,913 pCi/kg dry weight and averaged 12,851 pCi/kg dry weight.

Shoreline sediments were also collected in July and November, 2008. A nearly identical distribution of Cs-137 was observed at the control location at a concentration of 41.0 pCi/kg dry weight. Potassium-40 activity ranged from 12,660 – 13,853 pCi/kg dry weight and averaged 13,277 pCi/kg dry weight.

Potassium-40 is a naturally occurring isotope. The slight cesium-137 activities observed are indicative of the influence of fallout deposition. All other gamma-emitting isotopes were below detection limits. No effect from the plant operation is indicated.

5.0 TABLES AND FIGURES

Table 5.1. Sampling Locations, continued.

Location Code	Distance / Direction ¹	Description	Sample Types ²
1a	10.8 mi. NW	City of Fulton on Hwy Z, 0.65 mi. East of Business 54, West of Campus Apartments.	IDM
3	1.2 mi. NW	0.1 mi. West of Hwy CC on Gravel Rd., 0.8 mi. South Hwy O, Utility Pole No. 18559.	IDM
5	1.3 mi. ENE	Primary Meteorological Tower.	IDM
6	2.0 mi. W	Cty Rd. 428, 1.2 mi. West of Hwy CC, Utility Pole No. 18609.	IDM
7	1.4 mi. S	Cty Rd. 459, 2.6 mi. North of Hwy 94, Utility Pole No. 35097.	IDM
9	3.8 mi. S	NW Side of the Cty Rd. 459 and Hwy 94 Junction, Utility Pole No. 06754.	IDM
10	3.9 mi. SSE	Hwy 94, 1.8 mi. East of Cty Rd. 459, Utility Pole No. 12182.	IDM
11a	4.7 mi. SE	City of Portland, Utility Pole No. 12110.	IDM
14	4.9 mi. ESE	SE Side of Intersection D and 94, Utility Pole No. 11940.	IDM
17	3.8 mi. E	Cty Rd. 4053, 0.3 mi. East of Hwy 94, Kingdom Telephone Company, Pole No. 3X12.	IDM
18a	3.7 mi. ENE	East side of Hwy D, 0.5 mi. South of O, Utility Pole No. 38579.	IDM
20	4.7 mi. NE	City of Readsville, Utility Pole No. 12830.	IDM
21	3.8 mi. NNE	Cty Rd. 155, 1.9 mi. North of Hwy O, Utility Pole No. 19100.	IDM
22a	1.9 mi. NNE	North side of Hwy O, 100 feet East of Cty Rd. 150, Utility Pole No. 31094.	IDM
23	6.6 mi. NNE	City of Yucatan, Utility Pole No. 12670.	IDM
26 ³	11.7 mi. E	Town of Americus, Utility Pole No. 11159.	IDM
27 ³	9.3 mi. ESE	Town of Bluffton, Utility Pole No. 11496.	IDM
30a	4.4 mi. SSW	City of Steedman, N side of Belgian Dr., 150 feet East of Hwy CC, Pole No. 06557.	IDM
31a	7.8 mi. SW	City of Mokane, Hwy C and Cty Rd. 400, 0.9 mi. North of Hwy 94, Utility Pole.	IDM
32	5.4 mi. WSW	Hwy VV, 0.6 mi. West of Cty Rd. 447, Utility Pole No. 27031.	IDM
32a	5.0 mi. WSW	Cty Rd. 447, Utility Pole No. 06354.	IDM
33	7.4 mi. W	City of Hams Prairie, SE of Hwy C and AD Junction.	IDM
34	9.5 mi. WNW	NE Side of Hwy C and Cty Rd. 408 Junction.	IDM
35	5.8 mi. NNW	City of Toledo, Utility Pole No. 17684.	IDM

Table 5.1. Sampling Locations, continued.

Location Code	Distance / Direction ¹	Description	Sample Types ²
36	4.9 mi. N	Cty Rd. 155, 0.8 mi. South of Cty Rd. 132, Utility Pole No. 19137	IDM
37	0.5 mi. SSW	Cty Rd. 459, 0.9 mi. South of Hwy CC, Utility Pole No. 35077.	IDM
38	4.6 mi. NNW	Cty Rd. 133, 1.5 mi. South of Hwy UU, Utility Pole No. 34708.	IDM
39	5.4 mi. NW	Cty Rd. 111, Utility Pole No. 17516.	IDM
39a	5.0 mi. NW	Cty Rd. 111, Utility Pole No. 17526.	IDM
40	4.2 mi. WNW	NE Side of Cty Rd. 112 and Hwy O, Utility Pole No. 18145.	IDM
41	4.9 mi. W	Hwy AD, 2.8 mi. East of Hwy C, Utility Pole No. 18239.	IDM
42	4.4 mi. SW	Cty Rd. 447, 2.6 mi. North of Cty Rd. 463, Utility Pole No. 06326.	IDM
43	0.5 mi. SW	Cty Rd. 459, 0.7 mi. South of Hwy CC, Utility Pole No. 35073.	IDM
44	1.6 mi. WSW	Hwy CC, 1.0 mi. South of Cty Rd. 459, Utility Pole No. 18769.	IDM
45	1.0 mi. WNW	Cty Rd. 428, 0.1 mi. West of Hwy CC, Utility Pole No. 18580.	IDM
46	1.5 mi. NNW	NE Side of Hwy CC and Cty Rd. 466 Intersection, Utility Pole No. 28242.	IDM
47	1.0 mi. N	Cty Rd. 448, 0.9 mi. South of Hwy O, Utility Pole No. 28151.	IDM
48	0.4 mi. NE	Cty Rd. 448, 1.5 mi. South of Hwy O, Plant Security Sign Post.	IDM
49	1.6 mi. E	Cty Rd. 448, Utility Pole No. 06959, Reform Wildlife Mgmt. Parking Area.	IDM
50	0.9 mi. SSE	Cty Rd. 459, 3.3 mi. North of Hwy 94, Utility Pole No. 35086	IDM
51a	0.3 mi. SE	Owner Control Fence, SE of the Water Treatment Plant.	IDM
52	0.4 mi. ESE	Light Pole Near the East Plant Security Fence.	IDM
60 ³	13.5 mi. SW	Utility Pole No. 43744 just past Tebbetts City sign.	IDM
A1	1.3 mi. ENE	Primary Meteorological Tower.	APT, AIO
A7	9.5 mi. NW	C. Bartley Farm, Fulton, MO.	APT, AIO
A8	0.9 mi. NNE	Cty Rd. 448, 0.9 miles South of Hwy O.	APT, AIO
A9	1.9 mi. NNW	Community of Reform.	APT, AIO
B3	1.8 mi. NNW	0.3 mi. East of the O and CC Junction, Utility Pole No. 50422.	APT, AIO
D01	5.0 mi. SE	Holzhouser Grocery Store/Tavern (Portland, MO).	DWA
PW1	Onsite	Callaway Cafeteria.	DWA
F05	0.9 mi. SSE	Offsite Groundwater Monitoring well.	WWA
F15	0.4 mi. NNE	Onsite Groundwater Monitoring well.	WWA

Table 5.1. Sampling Locations, continued.

Location Code	Distance / Direction ¹	Description	Sample Types ²
M6	2.6 mi. NW	Pierce Farm	MLK
M9 ³	13.5 mi. SW	Ferguson Farm, Tebbetts, MO.	MLK
M10	3.8 mi. SW	Dodd Farm, Steedman, MO.	MLK
V3 ³	15.0 mi. SW	Beazley Farm, West of Tebbetts, MO.	SOL
V9	2.0 mi. WNW	Meehan Farm.	FPL
V11	3.2 mi. NW	Hickman Farm.	FPL
V12 ³	18.7 mi. WSW	Kissock Farm, South of New Bloomfield, MO	FPL
V14	3.0 mi. NNE	Amorine Farm, Williamsburg, MO	FPL
V15	2.4 mi. NNE	Pate Farm, Steedman, MO	FPL
A ^{3,4}	4.9 mi. SSE	0.6 River Miles Upstream of Discharge North Bank.	AQS, AQF
C ⁴	4.9 mi. SE	1.0 River Miles Downstream of Discharge North Bank.	AQS, AQF
S01 ³	4.7 mi. SSE	105 feet Upstream of Discharge North Bank.	SWA
S02	4.9 mi. SE	1.1 River Miles Downstream of Discharge North Bank.	SWA
F2	1.64 mi. SW	Callaway Plant Forest Ecology Plot F2.	SOL
F6	1.72 mi. NE	Callaway Plant Forest Ecology Plot F6.	SOL
PR3	1.02 mi. ESE	Callaway Plant Forest Ecology Plot PR3.	SOL
PR7	0.45 mi. NNW	Callaway Plant Forest Ecology Plot PR7.	SOL
W4	0.68 mi. SSE	Callaway Plant Wetlands, SW Bank.	SOL
W2	0.60 mi. SSE	Callaway Plant Wetlands, Inlet Area.	SOL
W1 ³	0.61 mi. SE	Callaway Plant Wetlands, High Ground.	SOL
W3	0.72 mi. SSE	Callaway Plant Wetlands, Discharge Area.	SOL
FC1	-	Between discharge pipeline MH-8 and the Katy Trail	FC
FC2	-	Between discharge pipeline MH-5 and MH-3B.	FC
FC3	-	Between Hwy 94 and the barge loading dock access road.	FC
FC4 ³	-	Location unlikely to be influenced by Plant operations.	FC

Table 5.1. Sampling Locations, Wells and Ponds (non-potable water).

Location Code	Distance / Direction ¹	Description	Sample Types ²
OW-1	Inside OCA	UHS Pond Berm	WWA
OW-2	Inside OCA	UHS Pond Berm	WWA
OW-3	Inside OCA	UHS Pond Berm	WWA
OW-4	Inside OCA	UHS Pond Berm	WWA
OW-5	Inside OCA	UHS Pond Berm	WWA
MW-001	0.3 mi. NNW	Outside OCA , Groundwater Monitoring Well	WWA
MW-002	0.4 mi. SSW	Outside OCA , Groundwater Monitoring Well	WWA
MW-003	0.6 mi. SE	Outside OCA , Groundwater Monitoring Well	WWA
MW-004	3.7 mi. SSE	Dillon, Groundwater Monitoring Well	WWA
MW-005	3.8 mi. SSE	Brownlee / Hudson, Groundwater Monitoring Well	WWA
MW-006	3.0 mi. S	Ward, Groundwater Monitoring Well	WWA
MW-007	3.0 mi. S	Ward, Groundwater Monitoring Well	WWA
MW-008	2.2 mi. SSE	Ward, Groundwater Monitoring Well	WWA
MW-009	3.2 mi. S	Pipeline, Groundwater Monitoring Well	WWA
MW-010	3.1 mi. S	Pipeline, Groundwater Monitoring Well	WWA
MW-011	2.6 mi. S	Pipeline, Groundwater Monitoring Well	WWA
MW-012	3.0 mi. S	Ward, Groundwater Monitoring Well	WWA
MW-013	0.8 mi. SSE	Pipeline, Groundwater Monitoring Well	WWA
MW-014	3.7 mi. S	Pipeline, Groundwater Monitoring Well	WWA
MW-015	3.9 mi. SSE	Pipeline, Groundwater Monitoring Well	WWA
MW-016	4.5 mi. SSE	Pipeline, Groundwater Monitoring Well	WWA
MW-501	0.5 mi. ESE	Landfill	WWA
MW-502	0.5 mi. ENE	Landfill	WWA
GWS	Inside OCA	Ground Water Sump, Plant East of containment and SFPB	WWA
936	Inside OCA	Diesel Fuel Remediation Well, Plant SE of SFPB	WWA
937C	Inside OCA	Monitoring Well, Plant East of Radwaste Building Drum Storage.	WWA
937D	Inside OCA	Monitoring Well, Plant South of Discharge Monitor Tanks.	WWA
937E	Inside OCA	Granular Fill Monitoring Well	WWA
937F	Inside OCA	Granular Fill Monitoring Well	WWA
M-2	0.5 mi. NW	Groundwater Monitoring Well	WWA
M-7	0.8 mi. S	Groundwater Monitoring Well	WWA
UHS	Inside OCA	UHS Pond	SWA
Unit 2	Inside OCA	Unit 2 Pond	SWA
CTBD	Inside OCA	Cooling Tower Blowdown	SWA
POND 01	0.6 mi. W	Fishing Pond	SWA
POND 02	0.7 mi. SW	Fishing Pond	SWA
Outfall 010	0.6 mi. NE	Stormwater Run-Off Pond	SWA
Outfall 011	1.0 mi. ENE	Stormwater Run-Off Pond	SWA
Outfall 012	0.5 mi. S	Stormwater Run-Off Pond	SWA
Outfall 013	0.5 mi. S	Stormwater Run-Off Pond	SWA
Outfall 014	0.6 mi. NNW	Stormwater Run-Off Pond	SWA
Outfall 015	0.7 mi. N	Stormwater Run-Off Pond	SWA
Sludge Lagoon # 4	0.8 mi. SSE	On service Sewage Sludge Lagoon	SWA

Table 5.1. Sampling Locations, Potable Well Water.

Location Code	Distance / Direction ¹	Description	Sample Types ²
1	2.7 mi. SSE	Miller, Roman, 9136 County Road 461	DWA
2	3.0 mi. S	Miller, Robert, 9205 County Road 461	DWA
3	2.9 mi. SSE	Ward, Rick & Nancy, 9204 County Road 448	DWA
4	2.6 mi. SSE	Miller, Albert, 9057 County Road 448	DWA
5	2.5 mi. SSE	Hux, Ron, 8802 County Road 448	DWA
6	2.2 mi. SE	Lindeman, Henry, 8754 County Road 448	DWA
7	2.1 mi. ESE	Kriete, Stan, 8304 County Road 448	DWA
8	3.4 mi. SSW	Brandt, John, 9400 County Road 457	DWA
9	2.9 mi. SSW	Clardy, Scott & Tammy, 9142 County Road 457	DWA
10	2.7 mi. SSW	Dillon, Susan, 9076 County Road 457	DWA
11	3.3 mi. SSE	Dillon, Harry, 9291 Dillon Drive	DWA
12	3.6 mi. SSE	Dillon, Joe, 9549 County Road 464	DWA
14	3.9 mi. SSE	Hinnah, Donald, 9360 Sycamore Valley Road	DWA
15	3.9 mi. SSE	Schmid, Herbert 9363 Schmid Way	DWA
16	3.1 mi. SSE	Smith, Rick, 9602 County Road 468	DWA
17	3.1 mi. SSE	McGinn, David, 9704 County Road 468	DWA
18	3.4 mi. SSE	McGonigal, Jerry, 9790 County Road 468	DWA
19	3.1 mi. SSE	Hoover, Darin, 9538 County Road 468	DWA
20	3.7 mi. SSE	Schmid, Charlie, 9349 Schmid Way	DWA
21	2.5 mi. ESE	Baumgarth, Phillip, 8729 County Road 469	DWA
22	4.8 mi. SE	Robert Plummer, 10402 State Road 94	DWA

¹ Distances are measured from the midpoint of the two reactors as described in Final Safety Analysis Report (FSAR) Sec. 2.1.1.1.

² AIO = Air Iodine, APT = Air Particulate, AQF = Fish, AQS = Sediment, FPL = Leafy Green Vegetables, FC = Food Crops, IDM = TLD, MLK = Milk, SOL = Soil, SWA = Surface Water, DWA = Drinking Water, WWA = Ground Water.

³ Control Location.

⁴ The fish collection area for location "A" is between 0.6 and 3.0 river miles upstream of the plant discharge on the north bank. Location "C" is sampled between the discharge area and 1.5 miles downstream of the discharge, on the north bank. The expanded collection areas guarantee sufficient habitat to collect the required number of species.

Figure 5.1. Radiological Environmental Monitoring Program, Air Sampling Stations

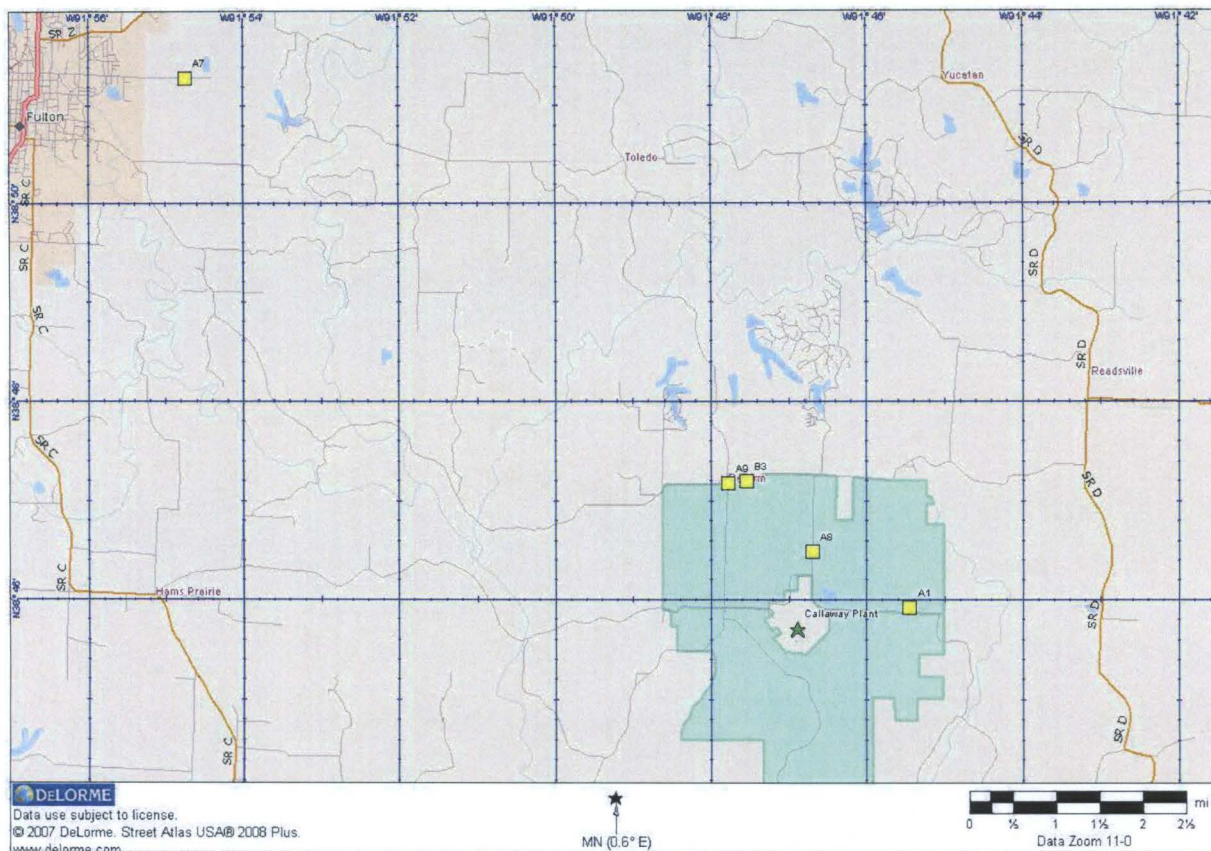


Figure 5.2 Direct Radiation Monitoring Stations, Inner Ring Locations.

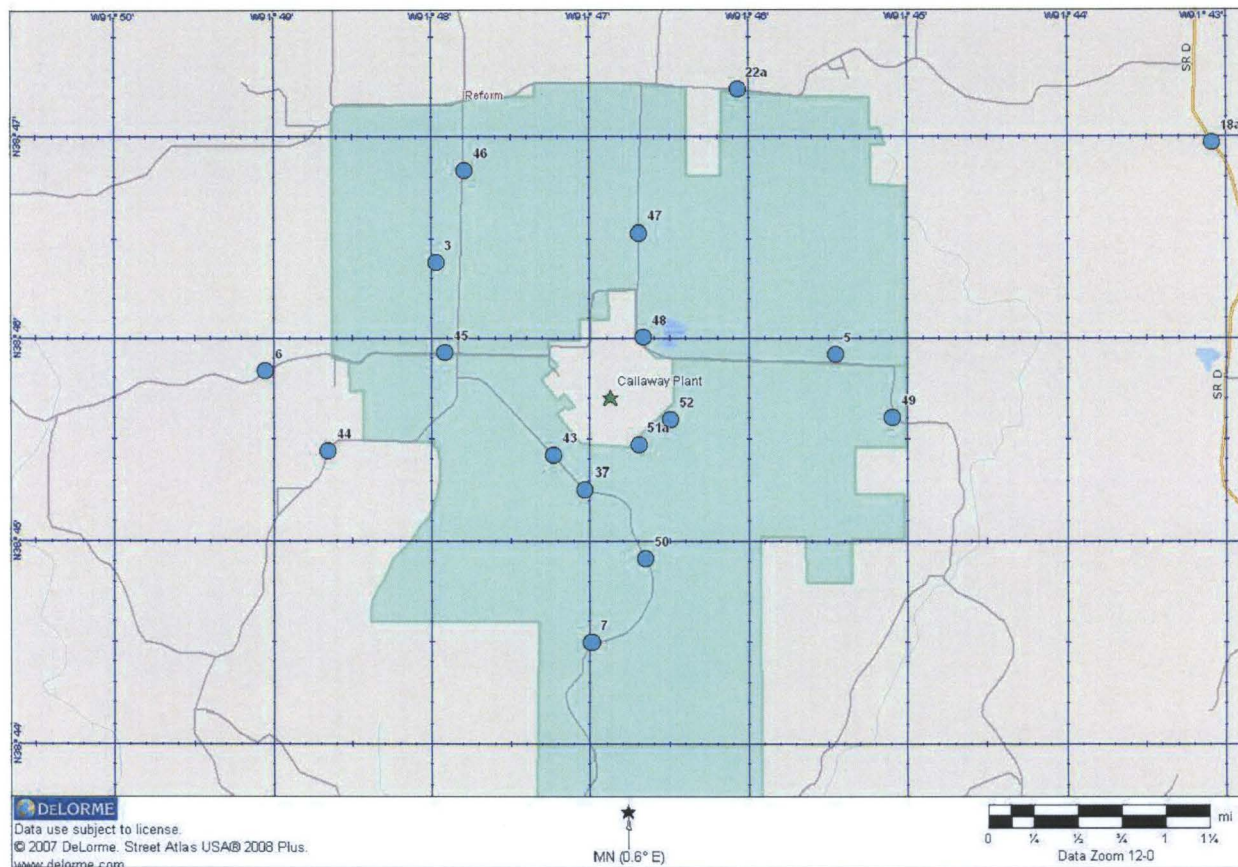


Figure 5.2b. Direct Radiation Monitoring, Outer Ring and Special Interest Locations.

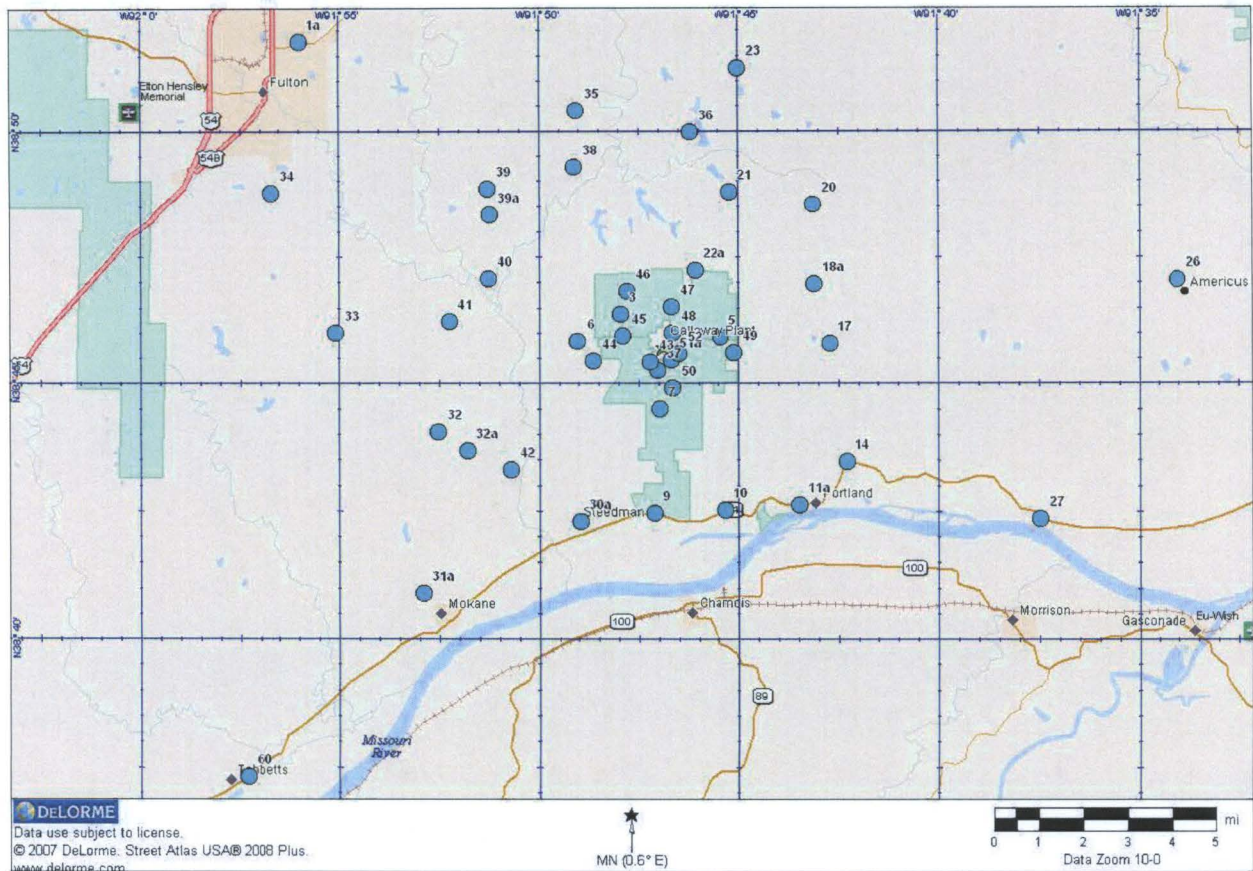


Figure 5.3. Drinking Well Water sample locations.

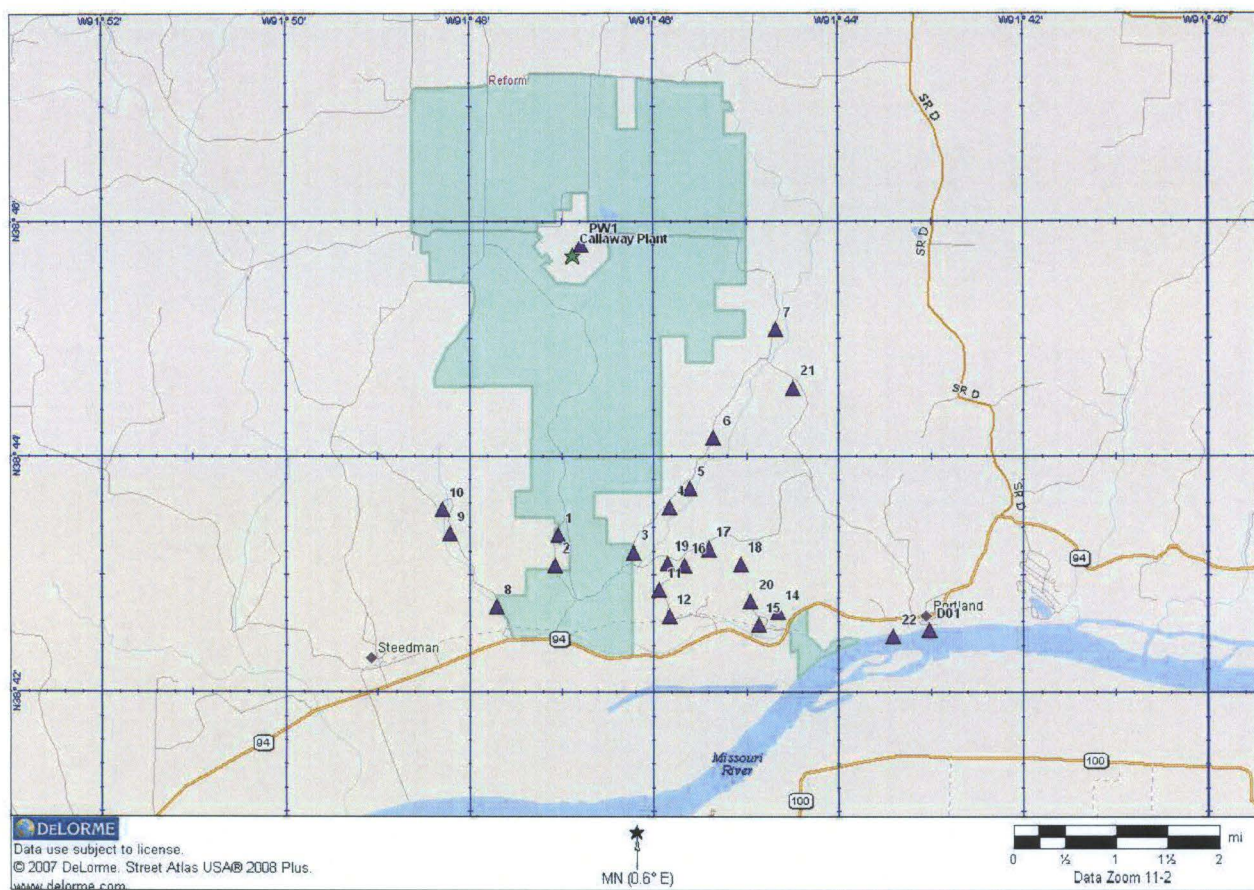


Figure 5.4a. Groundwater Monitoring Wells, Owner Controlled Area and Vicinity.

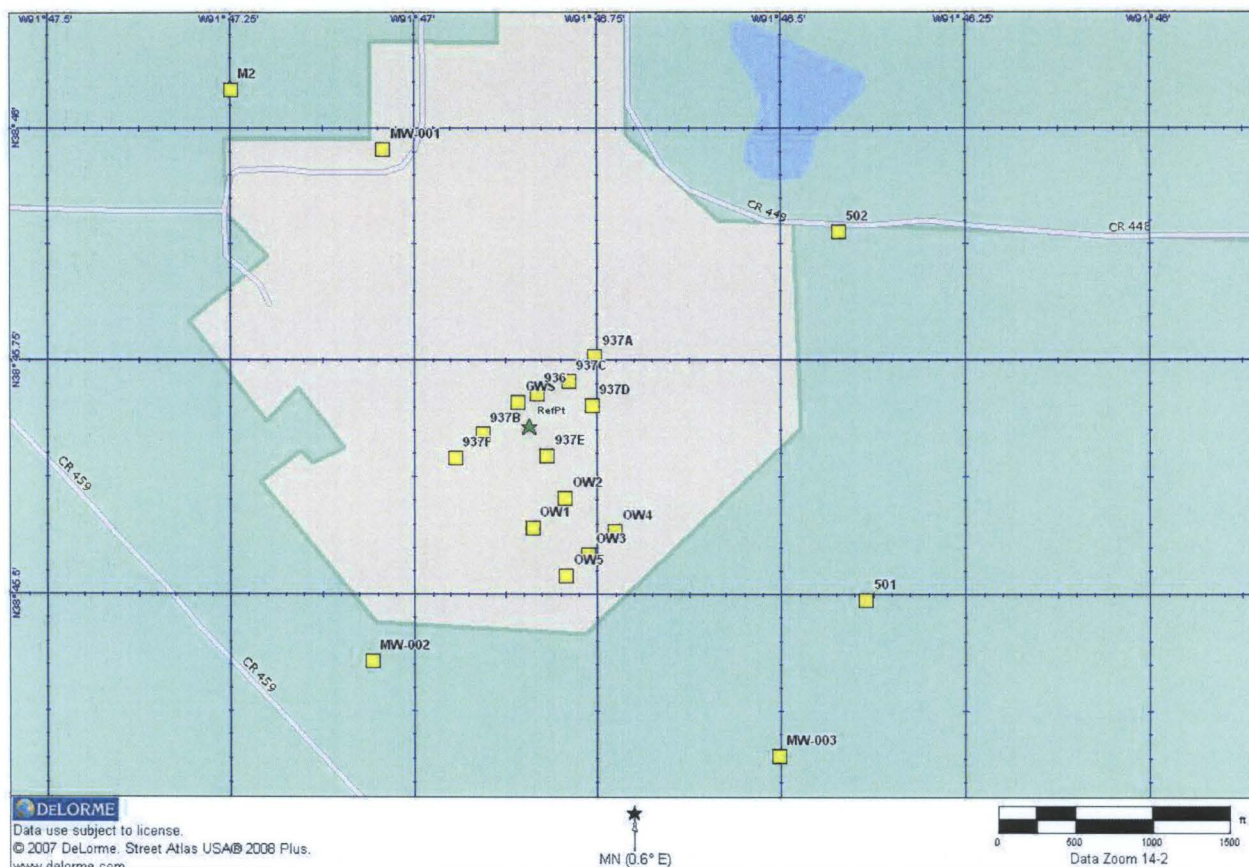


Figure 5.4b. Groundwater Monitoring Wells, Outside the Owner Controlled Area.

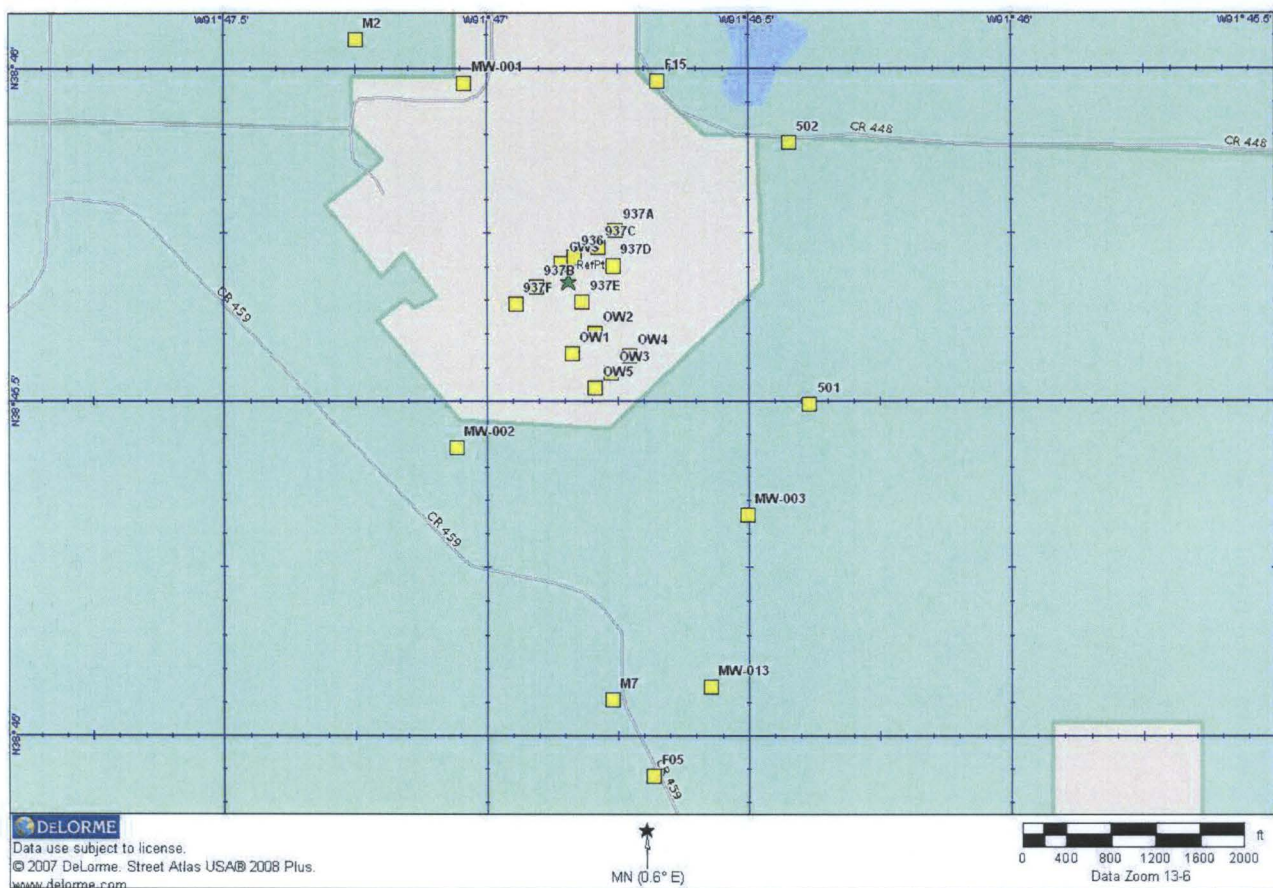


Figure 5.4c. Groundwater Monitoring Wells, Highway 94 Area.

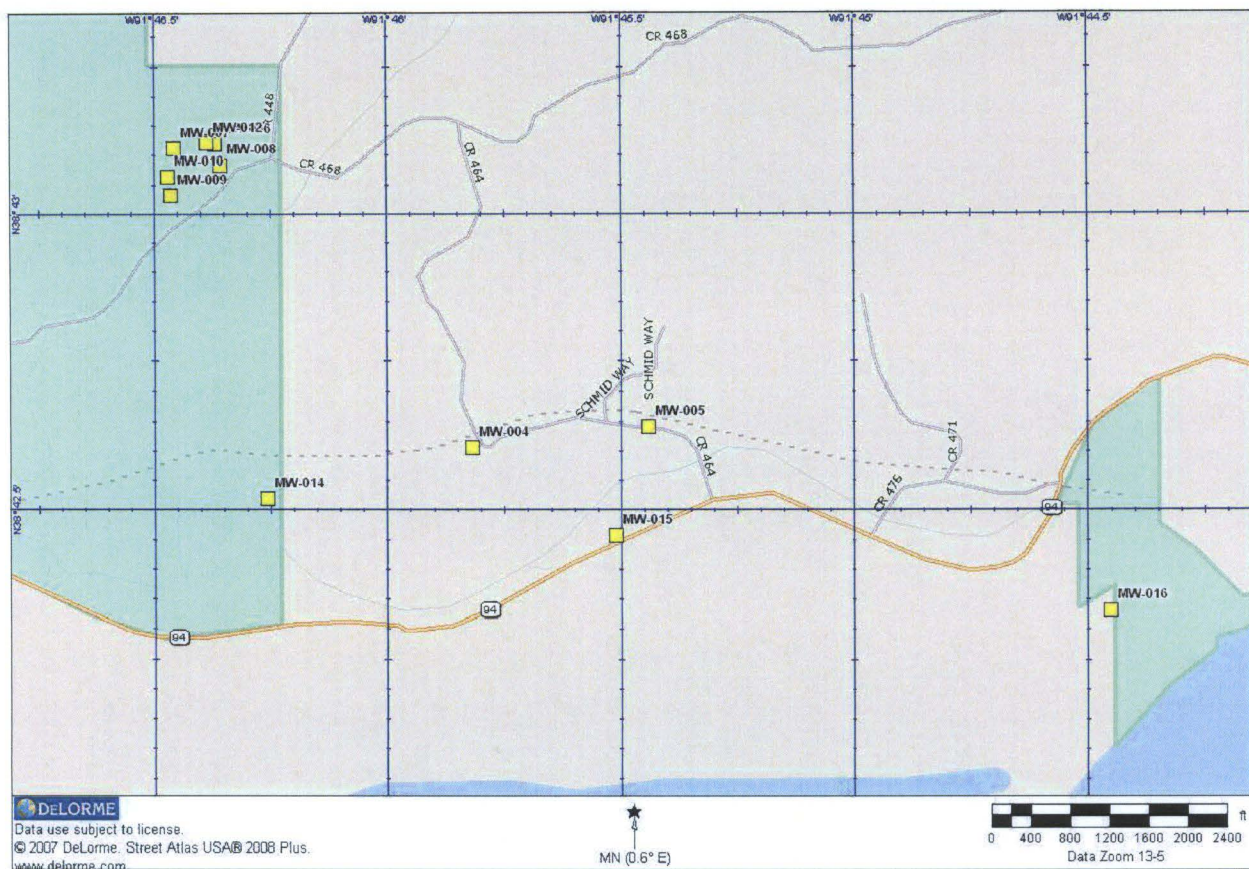


Figure 5.4d. Groundwater Monitoring Wells, Logan Creek Area.

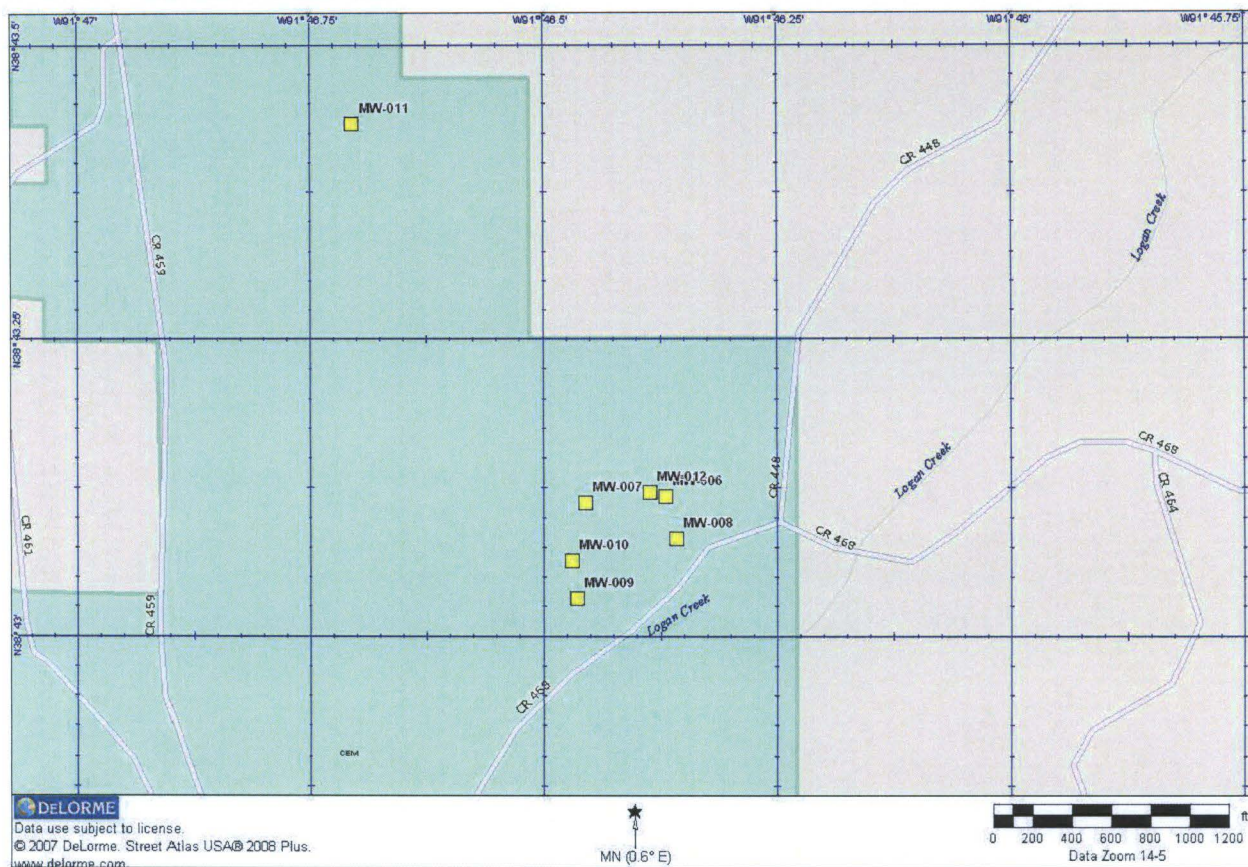


Figure 5.4e. Pond locations (on-site).

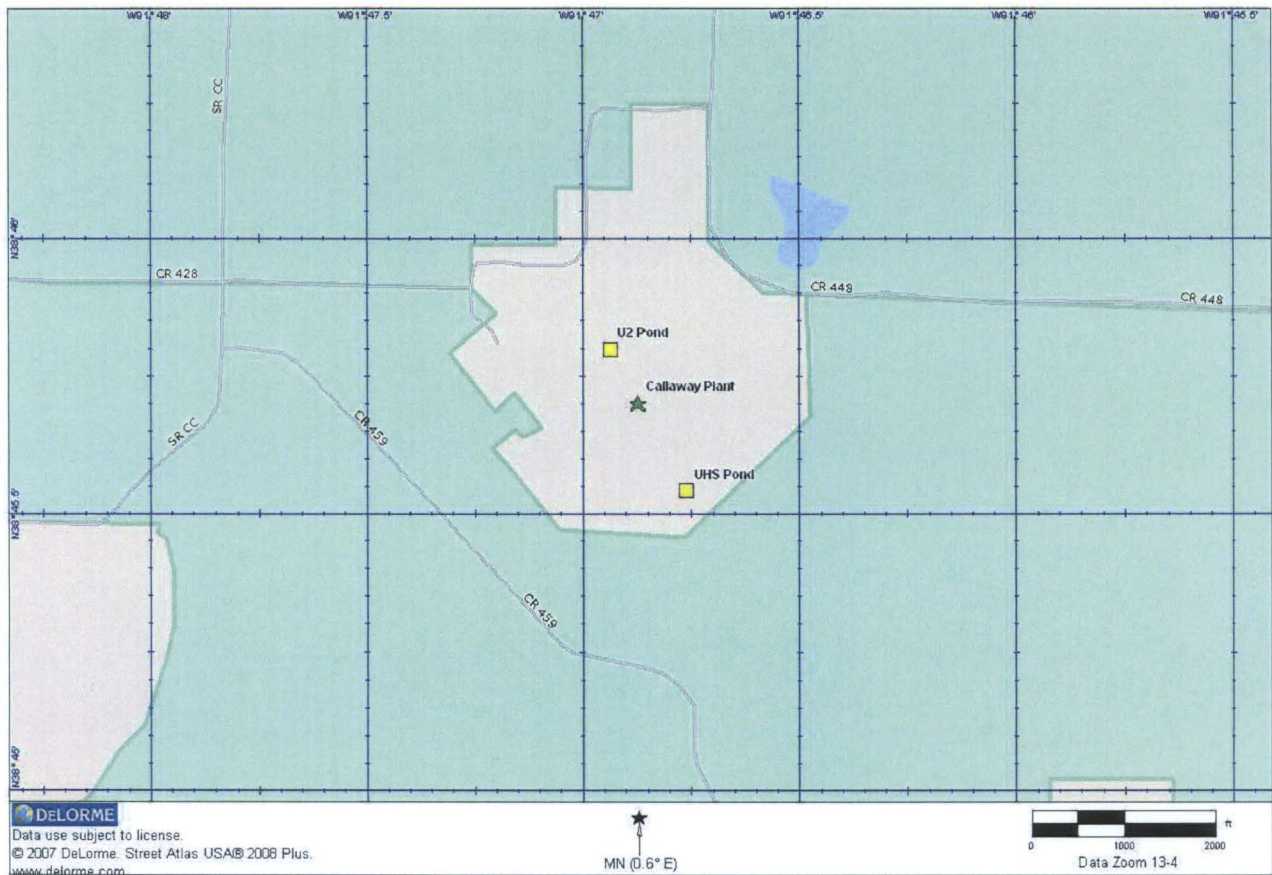


Figure 5.5. Milk and Edible Vegetation Samples.

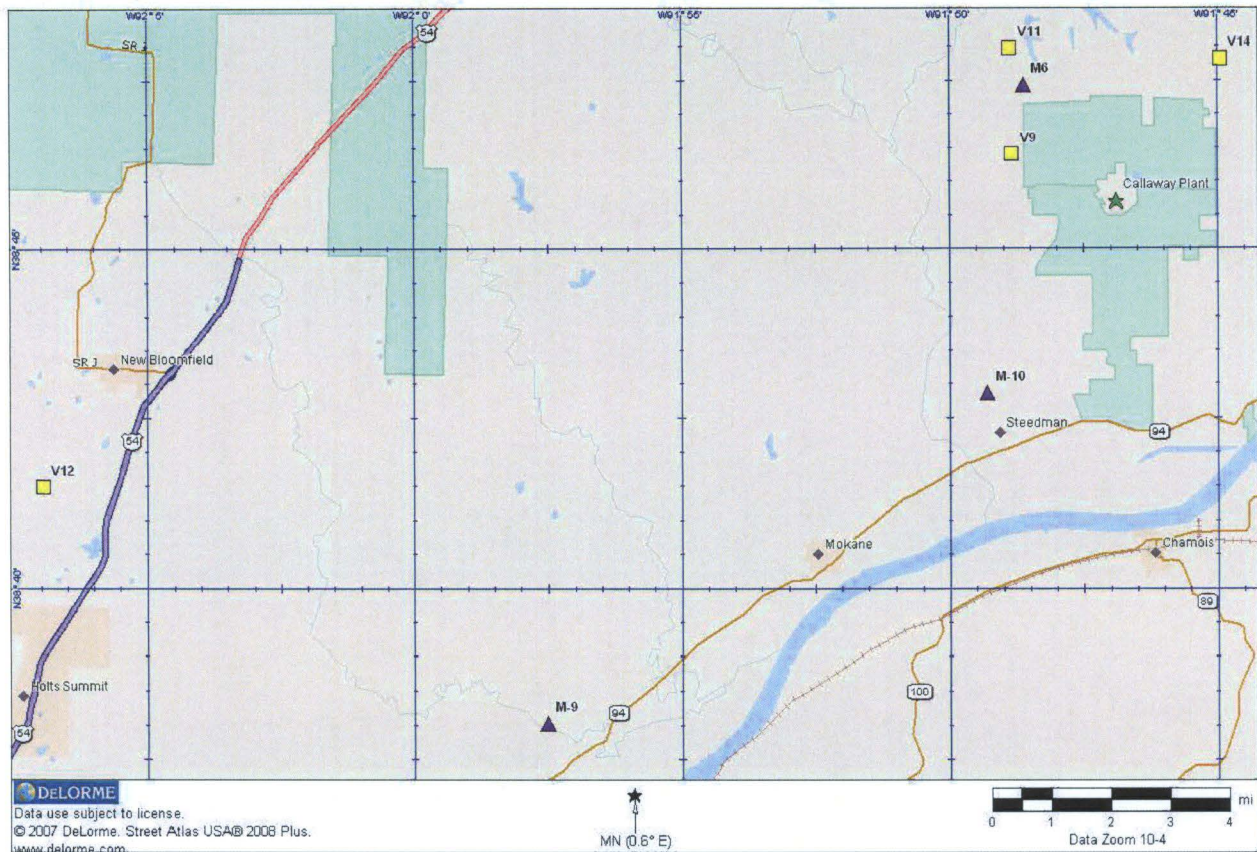


Figure 5.6. Soybean sampling locations.



Figure 5.7a. Soil Samples, Near Plant locations.

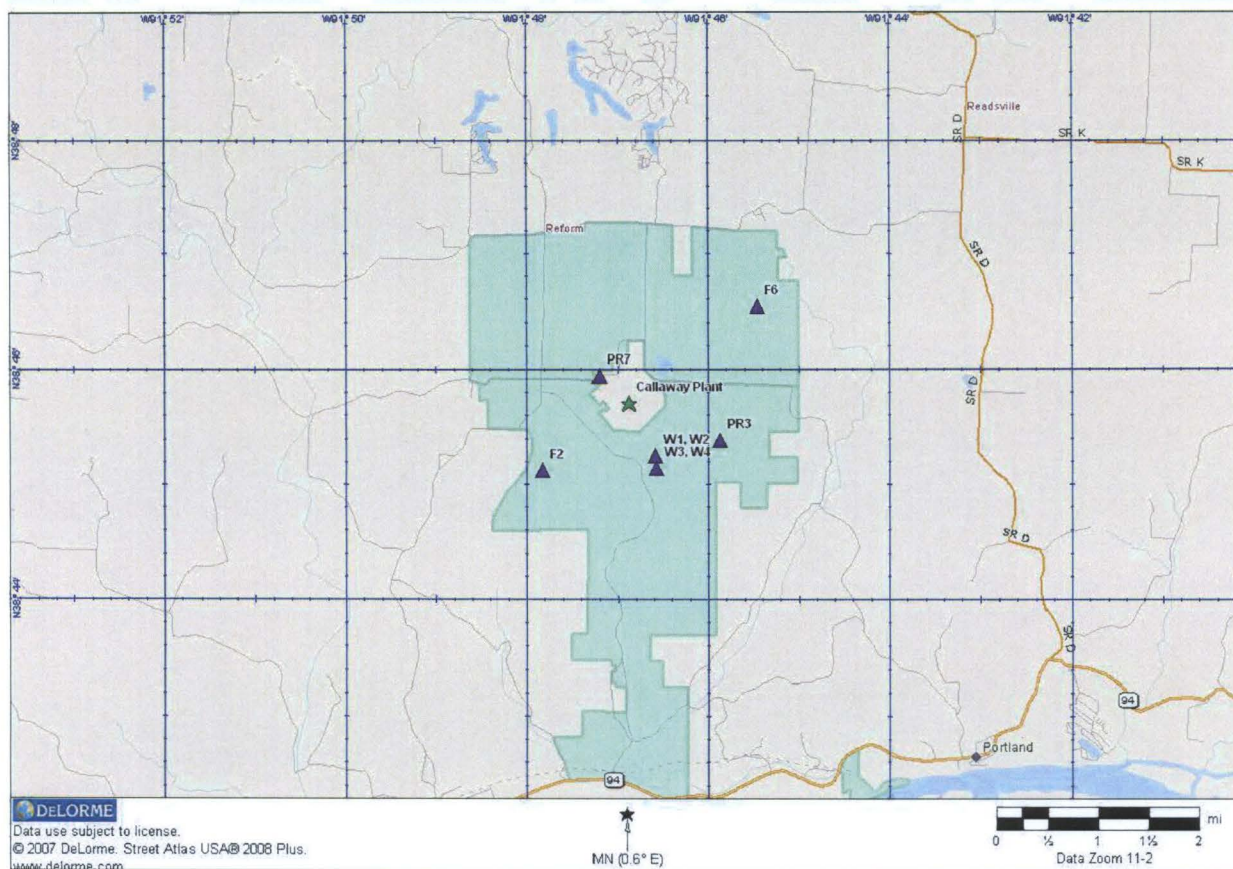


Figure 5.7b. Soil Samples, Distant locations

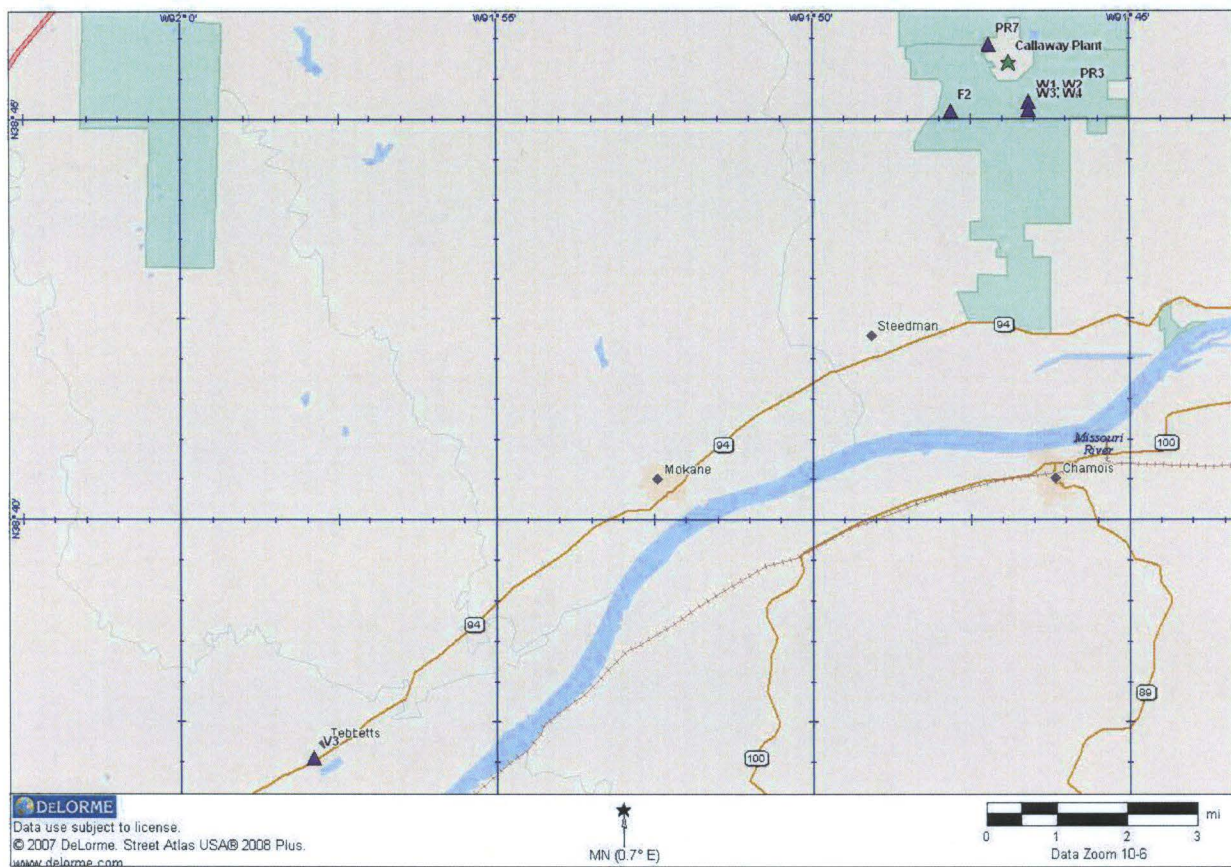


Figure 5.8. Fish, Sediment and Surface Water locations.

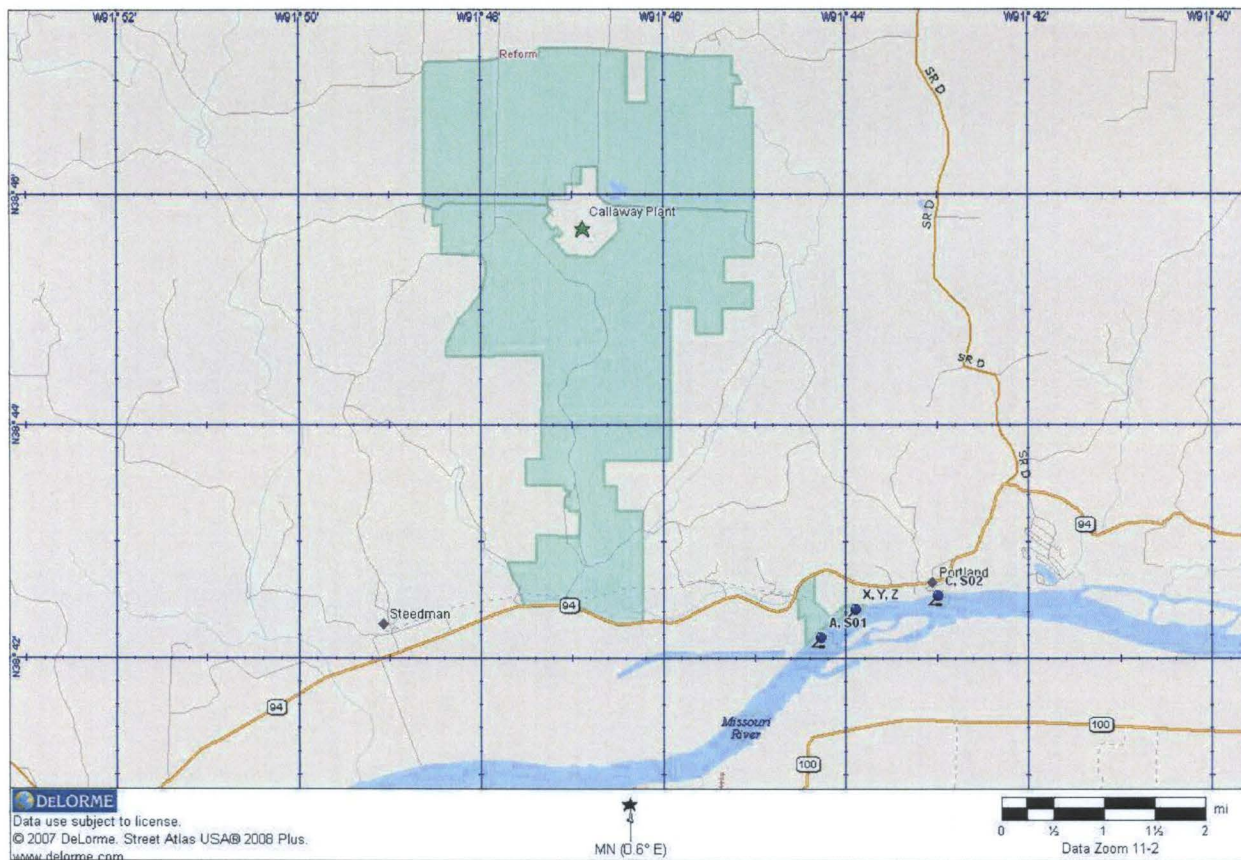


Table 5.2a. Collection Frequencies and Required Analyses (January 1 through July 7, 2008) ¹

Sample Type	Sample Code	Collection Frequency	Required Analyses
Direct radiation	IDM	Quarterly	Deep Dose Equivalent (DDE)
Airborne Iodine	AIO	Weekly	¹³¹ I
Airborne Particulate	APT	Weekly	Gr. Beta weekly ² ; PGE on quarterly filter composite.
Surface water (river)	SWA	Monthly composite	PGE and ³ H
Shoreline sediment	AQS	Semiannually	PGE
Bottom sediment ³	AQS	Semiannually	PGE
Milk	MLK	Semimonthly during grazing season, monthly during the non-grazing season.	PGE and ¹³¹ I
Leafy green vegetables	FPL	Monthly when available. ⁴	PGE and ¹³¹ I
Fish	AQF	Semiannually	PGE on edible portion

¹ Samples required by ODCM and NPDES permit.
Additional sampling is performed as a continuation of the preoperational monitoring program.

² If gross beta activity is greater than the established base line activity level, gamma isotopic analysis is performed on the individual sample.

³ Required by NPDES permit.

⁴ The growing season is defined as the months of May through November; however, the growing season will vary from year to year due to weather conditions.

Table 5.2b. Collection Frequencies and Required Analyses (July 8 through December 31, 2008) ¹

Sample Type	Sample Code	Collection Frequency	Required Analyses
Direct radiation	IDM	Quarterly	Deep Dose Equivalent (DDE)
Airborne Iodine	AIO	Weekly	¹³¹ I
Airborne Particulate	APT	Weekly	PGE each sample
Surface water (river)	SWA	Monthly composite	PGE and ³ H
Surface water (onsite ponds)	SWA	Semiannually	PGE and ³ H. If contaminated with gamma emitting nuclides of plant origin, analyze for HTD nuclides.
Groundwater (not potable)	WWA	Quarterly	PGE and ³ H. If contaminated with gamma emitting nuclides of plant origin, analyze for HTD nuclides.
Well water- potable	DWA	Quarterly	PGE and ³ H. If contaminated with gamma emitting nuclides of plant origin, analyze for HTD nuclides.
Shoreline sediment	AQS	Semiannually	PGE
Bottom sediment ²	AQS	Semiannually	PGE
Sludge pond sediment	SOL	Annually	PGE
Soil	SOL	Annually	PGE
Milk	MLK	Semimonthly during grazing season, monthly during the non-grazing season.	PGE and ¹³¹ I
Leafy green vegetables	FPL	Monthly when available ⁴	PGE and ¹³¹ I
Inedible food crops	FC	At time of harvest	PGE and ³ H
Fish	AQF	Semiannually	PGE on edible portion

¹ Samples required by ODCM unless specified otherwise.

² Required by NPDES permit.

³ The grazing season is defined as April 15- December 15, but will vary according to weather conditions.

Table 5.3. Minimum Required Detection Capabilities for REMP Sample Analysis¹

Analysis	Water (pCi/L)	Airborne (pCi/m ³)	Fish (pCi/kg wet)	Milk (pCi/L)	Food Products (pCi/kg wet)	Soil and Sediment (pCi/kg dry)
Gross beta	4	0.01				
H-3	3000/2000 ³					
Mn-54	15		130			
Fe-59	30		260			
Co-58/60	15		130			
Zn-65	30		260			
Zr-Nb-95 ²	15					
I-131	1000/1 ³	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-La-140 ²	15			15		

¹ This list does not mean only these nuclides will be detected and reported. Other peaks which are measurable and identifiable will be reported.

² Total activity, parent plus daughter activity.

³ LLDs for Surface and Drinking / Ground water are the same, with the exception of H-3 and I-131. The Drinking / Ground water LLDs for H-3 and I-131 are 2000 and 1 pCi/liter respectively.

Table 5.4 2008 Land Use Census Results

Closest Receptor in Miles

Sector	Residence	Garden	Milk¹
N(A)	1.8	5.6	NI
NNE(B)	2.2	2.4	NI
NE(C)	2.3	4.0	NI
ENE(D)	1.7	2.9	NI
E(E)	3.5	3.8	NI
ESE(F)	2.1	4.4	NI
SE(G)	2.2	4.7	NI
SSE(H)	2.5	2.5	3.2 **
S(J)	2.7	2.9	NI
SSW(K)	2.4	2.8	NI
SW(L)	2.6	3.1	3.3
WSW(M)	1.2	3.2	NI
W(N)	1.6	2.3	4.0 **
WNW(P)	1.9	1.9	2.4 *
NW(Q)	2.1	3.2	2.6
NNW(R)	1.8	2.0	NI

¹ NI = None Identified.

* Declined to participate in the program.

** May have milk animals later, none at current time.

Table 5.5. Missed collections and analyses, Callaway Plant.

Sample Type	Analysis	Location(s)	Collection Date or Period	Comments
APT / AIO	I-131, Gamma	A-8	08-14-08	No viable sample. 14 hour run-time due to power outage.
APT	Gamma	A-1, A-7, A-8 A-8, A-9, B-3	07-08-08 to 12-31-08	The ODCM required PGE analysis on weekly filters after July 08, 2008. The changes were not communicated to the primary laboratory.
MI	I-131, Gamma	M-8	01-08-08	No milk available; cow died.
MI	I-131, Gamma	M-10	09-23-08 10-28-08 - 12-08-08	No milk available; goats not producing.
FC	H-3, Gamma	FC-1, 2, 3, 4	3 rd Qtr, 2008	Harvest destroyed due to flooding.
WWA	H-3	MW-9	3 rd Qtr, 2008	Well damaged during excavation of new pipeline.
WWA	H-3, Gamma	937E	4th Qtr, 2008	Well access blocked by excavation for new pipeline.
TLD	Ambient Gamma	CA-IDM-45	3 rd Qtr, 2008	Missing in the field.
TLD	Ambient Gamma	CA-IDM-49	3 rd Qtr, 2008	Missing in the field.

Table 5.6 Radiological Environmental Monitoring Program Summary

Sample Type Type (Units)	Type and Number of Analyses ^a	LLD ^b	Indicator Locations Mean (F) ^c Range ^c	Location with Highest Annual Mean		Control Locations Mean (F) ^c Range ^c	Number Non- Routine Results ^e
				Location ^d	Mean (F) ^c Range ^c		
Waterborne Pathway							
Surface Water (pCi/L)	GA 24	1.5	4.3 (10/12) (1.9-4.9)	SW-02 4.7 mi. SSE	4.3 (10/12) (1.9-4.9)	3.3 (12/12) (2.0-4.7)	0
	GB (TR) 24	1.0	5.9 (12/12) (2.2-8.9)	SW-01 4.7 mi. SSE	6.4 (12/11) (3.9-10.2)	6.4 (12/11) (3.9-10.2)	0
	H-3 24	180	398 (3/12) (315-507)	SW-02 4.9 mi. SE	398 (3/12) (315-507)	< LLD	0
	GS 24						
	Mn-54	15	< LLD	-	-	< LLD	0
	Fe-59	30	< LLD	-	-	< LLD	0
	Co-58	15	< LLD	-	-	< LLD	0
	Co-60	15	< LLD	-	-	< LLD	0
	Zn-65	30	< LLD	-	-	< LLD	0
	Zr-Nb-95	15	< LLD	-	-	< LLD	0
	I-131	1000	< LLD	-	-	< LLD	0
	Cs-134	15	< LLD	-	-	< LLD	0
	Cs-137	18	< LLD	-	-	< LLD	0
	Ba-La-140	15	< LLD	-	-	< LLD	0
Drinking Well Water (pCi/L)	GB 8	1.0	5.51 (7/8) (4.0-8.6)	PW-001 Onsite	6.6 (4/4) (5.4-8.6)	None -	0
	H-3 92	179	< LLD	-	-	None	0
	I-131 8	0.4	< LLD	-	-	None	0
	GS 28						
	Mn-54	15	< LLD	-	-	None	0
	Fe-59	30	< LLD	-	-	None	0
	Co-58	15	< LLD	-	-	None	0
	Co-60	15	< LLD	-	-	None	0
	Zn-65	30	< LLD	-	-	None	0
	Zr-Nb-95	15	< LLD	-	-	None	0
	Cs-134	15	< LLD	-	-	None	0
	Cs-137	18	< LLD	-	-	None	0
	Ba-La-140	15	< LLD	-	-	None	0
	Wells and Ponds (non-potable) (pCi/L)	H-3 174	180	305 (36/174) (182-1479)	936, Onsite Powerblock	551 (4/4) (183-1479)	None
GB 8		1.0	9.5 (8/8) (8.6-10.6)	F-15, Onsite Well	9.8 (4/4) (8.6-10.6)	None -	0
I-131 8		0.5	< LLD	-	-	None	0
GS 75							
Mn-54		15	< LLD	-	-	None	0
Fe-59		30	< LLD	-	-	None	0
Co-58		15	< LLD	-	-	None	0
Co-60		15	< LLD	-	-	None	0
Zn-65		30	< LLD	-	-	None	0
Zr-Nb-95		15	< LLD	-	-	None	0
Cs-134		15	< LLD	-	-	None	0
Cs-137		18	< LLD	-	-	None	0
Ba-La-140		15	< LLD	-	-	None	0

Table 5.6 Radiological Environmental Monitoring Program Summary

Sample Type (Units)	Type and Number of Analyses ^a	LLD ^b	Indicator Locations Mean (F) ^c Range ^c	Location with Highest Annual Mean		Control Locations Mean (F) ^c Range ^c	Number Non-Routine Results ^a	
				Location ^d	Mean (F) ^c Range ^c			
Waterborne Pathway (continued)								
Sediments (pCi/kgdry)	GS K-40	8 50.0	13073 (4/4) (12638-13913)	CA-AQS-C 4.9 mi. SE	13073 (4/4) (12638-13913)	13055 (4/4) (11892-13853)	0	
	Mn-54	24.5	< LLD	-	-	< LLD	0	
	Fe-59	61.0	< LLD	-	-	< LLD	0	
	Co-58	28.2	< LLD	-	-	< LLD	0	
	Co-60	16.1	< LLD	-	-	< LLD	0	
	Zr-Nb-95	33.6	< LLD	-	-	< LLD	0	
	Cs-134	17.6	< LLD	-	-	< LLD	0	
	Cs-137	24.8	< LLD	CA-AQS-A 4.9 mi. SSE	41.9 (2/4) (40.9-42.8)	41.9 (2/4) (40.9-42.8)	0	
	Ba-La-140	90.0	< LLD	-	-	< LLD	0	
Direct Radiation								
(Quarterly TLDs) (mR/90days)	Gamma	170	3.0	16.5 (158/158) (11.0-19.2)	CA-IDM-27, 9.3 mi. ESE	18.1 (4/4) (17.0-20.0)	15.6 (12/12) (11.0-20.0)	0
Airborne Pathway								
Airborne Particulates (pCi/m ³)	GB	259	0.002	0.022 (259/259) (0.009-0.054)	A-1, Met Tower 1.3 mi. ENE	0.023 (52/52) (0.011-0.054)	None	0
	GS	20						
	Be-7	0.020	0.072 (20/20) (0.056-0.097)	B-3 1.8 mi. NNW	0.079 (4/4) (0.063-0.097)	None	0	
	Co-58	0.0006	< LLD	-	-	None	0	
	Co-60	0.0007	< LLD	-	-	None	0	
	Zr-Nb-95	0.0007	< LLD	-	-	None	0	
	Cs-134	0.0006	< LLD	-	-	None	0	
	Cs-137	0.0006	< LLD	-	-	None	0	
	Ba-La-140	0.0020	< LLD	-	-	None	0	
Ce-144	0.0037	< LLD	-	-	None	0		
Airborne Iodine (pCi/m3)	I-131	259	0.07	< LLD	-	-	< LLD	0

Table 5.6 Radiological Environmental Monitoring Program Summary

Sample Type (Units)	Type and Number of Analyses ^a	LLD ^b	Indicator Locations Mean (F) ^c Range ^c	Location with Highest Annual Mean		Control Locations Mean (F) ^c Range ^c	Number Non- Routine Results ^e
				Location ^d	Mean (F) ^c Range ^c		
Ingestion Pathway							
Vegetation (pCi/kg wet)	GA 38	103	243 (25/35) (106-495)	V-11, 3.2 mi. NW	291 (9/9) (143-473)	288 (2/3) (180-396)	0
	GB 38	50	5404 (35/35) (2685-9597)	V-9, 2.0 mi. WNW	6191 (17/17) (4308-9597)	5731 (3/3) (3725-8755)	0
	GS 38						
	K-40	100	4343 (35/35) (2339-6395)	V-12, 18.7 mi. WSW	4852 (3/3) (3000-8260)	4852 (3/3) (3000-8260)	0
	Mn-54	28.7	< LLD	-	-	< LLD	0
	Co-58	29.1	< LLD	-	-	< LLD	0
	Co-60	22.1	< LLD	-	-	< LLD	0
	I-131	39.6	< LLD	-	-	< LLD	0
	Cs-134	23.4	< LLD	-	-	< LLD	0
	Cs-137	29.2	< LLD	-	-	< LLD	0
Fish (Flesh) (pCi/kg wet)	GS 19						
	K-40	100	2867 (10/10) (2644-3206)	CA-AQF-C 4.9 mi. SE	2867 (10/10) (2644-3206)	2717 (9/9) (2453-3157)	0
	Mn-54	20.0	< LLD	-	-		0
	Fe-59	77.7	< LLD	-	-		0
	Co-58	26.0	< LLD	-	-		0
	Co-60	20.3	< LLD	-	-		0
	Zn-65	60.5	< LLD	-	-		0
	Cs-134	19.8	< LLD	-	-		0
	Cs-137	22.3	< LLD	-	-		0
Milk (pCi/L)	I-131 49	1.0	< LLD	-	-	< LLD	0
	GS 49						
	K-40	100	1287 (31/31) (1007-2003)	M-10 2.53 mi. SSE	1559 (12/12) (1007-2003)	1277 (18/18) (788-1481)	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

Table 5.6 Radiological Environmental Monitoring Program Summary

Sample Type Type (Units)	Type and Number of Analyses ^a	LLD ^b	Indicator Locations Mean (F) ^c Range ^c	Location with Highest Annual Mean		Control Locations Mean (F) ^c Range ^c	Number Non- Routine Results ^e
				Location ^d	Mean (F) ^c		
					Range ^c		
Soil							
Soil (pCi/kg dry)	GA 18	1.0	15761 (14/14) (8897-21610)	F-002 1.64 mi. SW	18233 (2/2) (17880-18585)	16030 (4/4) (10509-19635)	0
	GB 18	2.0	28564 (14/14) (23848-32609)	W-001 0.61 mi. SE	35345 (2/2) (33821-36869)	33941 (4/4) (31827-36869)	0
	GS 18						
	K-40	50.0	11971 (14/14) (9792-16494)	V-003 0.12 mi. N	15230 (2/2) (15002-15458)	14825 (4/4) (13922-15458)	0
	Mn-54	40.7	< LLD	-	-	< LLD	0
	Fe-59	142.3	< LLD	-	-	< LLD	0
	Co-58	83.6	< LLD	-	-	< LLD	0
	Co-60	43.1	< LLD	-	-	< LLD	0
	Zr-Nb-95	135.8	< LLD	-	-	< LLD	0
	Cs-134	43.6	< LLD	-	-	< LLD	0
	Cs-137	24.8	523 (14/14) (39-947)	F-006 1.72 mi. NE	860 (2/2) (773-947)	182 (4/4) (109-248)	0
	Ba-La-140	635.6	< LLD	-	-	< LLD	0

^a GA = gross alpha, GB = gross beta, GS = gamma spectroscopy, SS = suspended solids, DS = dissolved solids, TR = total residue.

^b LLD = nominal lower limit of detection based on a 4.66 sigma counting error for background sample.

^c Mean and range are based on detectable measurements only (i.e., >LLD) Fraction of detectable measurements at specified locations is indicated in parentheses (F).

^d Locations are specified by station code (Table 5.2) and distance (miles) and direction relative to reactor site.

^e Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.

6.0 REFERENCES

Arnold, J. R. and H. A. Al-Salih. 1955. Beryllium-7 Produced by Cosmic Rays. Science 121: 451-453.

Eisenbud, M. 1963. Environmental Radioactivity, McGraw-Hill, New York, New York, pp. 213, 275-276.

Environmental, Inc., Midwest Laboratory. 2001 - 2008. Environmental Radiological Monitoring Program for the Callaway Plant, Annual Report - Part II, Data Tabulations and Analyses, January - December, 2000 - 2007.

_____ 2003. Quality Assurance Program Manual, Rev. 1, 21 October 2003.

_____ 2005. Quality Control Procedures Manual, Rev. 1, 17 September 2005.

_____ 2003. Quality Control Program, Rev. 1, 21 August 2003.

Gold, S., H. W. Barkhau, B. Shlein, and B. Kahn, 1964. Measurement of Naturally Occurring Radionuclides in Air, in the Natural Environment, University of Chicago Press, Chicago, Illinois, 369-382.

National Center for Radiological Health, 1968. Radiological Health and Data Reports, Vol. 9, Number 12, 730-746.

Teledyne Brown Engineering Environmental Services, Midwest Laboratory. 1999 - 2000. Environmental Radiological Monitoring Program for the Callaway Plant, Annual Report - Part II, Data Tabulations and Analyses, January - December, 1998 - 1999.

U.S. Environmental Protection Agency, 2007. RadNet, formerly Environmental Radiation Ambient Monitoring System, Gross Beta in Air (MO) 1981 – 2006, Gross Beta in Drinking Water (MO) 1982– 2004.

Wilson, D. W., G. M. Ward and J. E. Johnson. 1969. In Environmental Contamination by Radioactive Materials, International Atomic Energy Agency. p.125.



APPENDIX A

INTERLABORATORY COMPARISON PROGRAM RESULTS

NOTE: Environmental Inc., Midwest Laboratory participates in intercomparison studies administered by Environmental Resources Associates, and serves as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada. Results are reported in Appendix A. TLD Intercomparison results, in-house spikes, blanks, duplicates and mixed analyte performance evaluation program results are also reported. Appendix A is updated four times a year; the complete Appendix is included in March, June, September and December monthly progress reports only.

January, 2008 through December, 2008

Appendix A

Interlaboratory Comparison Program Results

Environmental, Inc., Midwest Laboratory has participated in interlaboratory comparison (crosscheck) programs since the formulation of its quality control program in December 1971. These programs are operated by agencies which supply environmental type samples containing concentrations of radionuclides known to the issuing agency but not to participant laboratories. The purpose of such a program is to provide an independent check on a laboratory's analytical procedures and to alert it of any possible problems.

Participant laboratories measure the concentration of specified radionuclides and report them to the issuing agency. Several months later, the agency reports the known values to the participant laboratories and specifies control limits. Results consistently higher or lower than the known values or outside the control limits indicate a need to check the instruments or procedures used.

Results in Table A-1 were obtained through participation in the environmental sample crosscheck program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the U.S. EPA Environmental Monitoring Systems Laboratory, Las Vegas, Nevada.

Table A-2 is intentionally left blank.

Table A-3 lists results of the analyses on in-house "spiked" samples for the past twelve months. All samples are prepared using NIST traceable sources. Data for previous years available upon request.

Table A-4 lists results of the analyses on in-house "blank" samples for the past twelve months. Data for previous years available upon request.

Table A-5 lists REMP specific analytical results from the in-house "duplicate" program for the past twelve months. Acceptance is based on the difference of the results being less than the sum of the errors. Complete analytical data for duplicate analyses is available upon request.

The results in Table A-6 were obtained through participation in the Mixed Analyte Performance Evaluation Program.

Results in Table A-7 were obtained through participation in the environmental sample crosscheck program administered by Environmental Resources Associates, serving as a replacement for studies conducted previously by the Environmental Measurement Laboratory Quality Assessment Program (EML).

Attachment A lists the laboratory precision at the 1 sigma level for various analyses. The acceptance criteria in Table A-3 is set at ± 2 sigma.

Out-of-limit results are explained directly below the result.

Attachment A

ACCEPTANCE CRITERIA FOR "SPIKED" SAMPLES

LABORATORY PRECISION: ONE STANDARD DEVIATION VALUES FOR VARIOUS ANALYSES^a

Analysis	Level	One standard deviation for single determination
Gamma Emitters	5 to 100 pCi/liter or kg > 100 pCi/liter or kg	5.0 pCi/liter 5% of known value
Strontium-89 ^b	5 to 50 pCi/liter or kg > 50 pCi/liter or kg	5.0 pCi/liter 10% of known value
Strontium-90 ^b	2 to 30 pCi/liter or kg > 30 pCi/liter or kg	5.0 pCi/liter 10% of known value
Potassium-40	≥ 0.1 g/liter or kg	5% of known value
Gross alpha	≤ 20 pCi/liter > 20 pCi/liter	5.0 pCi/liter 25% of known value
Gross beta	≤ 100 pCi/liter > 100 pCi/liter	5.0 pCi/liter 5% of known value
Tritium	≤ 4,000 pCi/liter > 4,000 pCi/liter	± 1σ = 169.85 x (known) ^{0.0933} 10% of known value
Radium-226,-228	≥ 0.1 pCi/liter	15% of known value
Plutonium	≥ 0.1 pCi/liter, gram, or sample	10% of known value
Iodine-131, Iodine-129 ^b	≤ 55 pCi/liter > 55 pCi/liter	6 pCi/liter 10% of known value
Uranium-238, Nickel-63 ^b Technetium-99 ^b	≤ 35 pCi/liter > 35 pCi/liter	6 pCi/liter 15% of known value
Iron-55 ^b	50 to 100 pCi/liter > 100 pCi/liter	10 pCi/liter 10% of known value
Other Analyses ^b	---	20% of known value

^a From EPA publication, "Environmental Radioactivity Laboratory Intercomparison Studies
Program, Fiscal Year, 1981-1982, EPA-600/4-81-004.

^b Laboratory limit.

TABLE A-1. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.

Lab Code	Date	Analysis	Concentration (pCi/L)			Acceptance
			Laboratory Result ^b	ERA Result ^c	Control Limits	
STW-1148	03/24/08	Sr-89	50.6 ± 2.4	60.4	48.6 - 68.2	Pass
STW-1148	03/24/08	Sr-90	42.4 ± 1.4	39.2	28.8 - 45.1	Pass
STW-1149	03/24/08	Ba-133	56.9 ± 5.4	58.3	48.3 - 64.3	Pass
STW-1149	03/24/08	Co-60	73.9 ± 1.6	76.6	68.9 - 86.7	Pass
STW-1149	03/24/08	Cs-134	50.2 ± 1.9	46.6	37.4 - 51.3	Pass
STW-1149	03/24/08	Cs-137	97.7 ± 2.2	102.0	91.8 - 115.0	Pass
STW-1149	03/24/08	Zn-65	109.9 ± 5.8	106.0	95.4 - 126.0	Pass
STW-1150	03/24/08	Gr. Alpha	43.7 ± 7.5	50.8	26.5 - 63.7	Pass
STW-1150	03/24/08	Gr. Beta	36.4 ± 1.8	51.4	35.0 - 58.4	Pass
STW-1151	03/24/08	I-131	29.3 ± 1.4	28.7	23.9 - 33.6	Pass
STW-1152	03/24/08	Ra-226	15.0 ± 1.1	15.3	11.4 - 17.6	Pass
STW-1152	03/24/08	Ra-228	18.4 ± 1.8	17.0	11.4 - 20.4	Pass
STW-1152	03/24/08	Uranium	23.4 ± 1.3	24.6	19.8 - 27.6	Pass
STW-1153	03/24/08	H-3	12551.0 ± 207.0	12000.0	10400.0 - 13200.0	Pass
STW-1154	07/07/08	Sr-89	24.9 ± 3.5	28.7	20.4 - 35.3	Pass
STW-1154	07/07/08	Sr-90	39.7 ± 0.5	40.0	29.4 - 46.0	Pass
STW-1155	07/07/08	Ba-133	45.0 ± 1.2	46.6	38.1 - 51.8	Pass
STW-1155	07/07/08	Co-60	24.9 ± 3.0	25.7	22.3 - 31.0	Pass
STW-1155	07/07/08	Cs-134	90.4 ± 5.3	93.2	76.6 - 102.0	Pass
STW-1155	07/07/08	Cs-137	57.1 ± 2.8	54.6	49.1 - 62.9	Pass
STW-1155	07/07/08	Zn-65	102.9 ± 7.3	98.8	88.9 - 118.0	Pass
STW-1156	07/07/08	Gr. Alpha	24.8 ± 1.6	30.7	15.7 - 40.0	Pass
STW-1156	07/07/08	Gr. Beta	23.9 ± 0.9	25.8	16.1 - 33.7	Pass
STW-1157	07/07/08	Ra-226	8.0 ± 0.6	8.1	6.1 - 9.5	Pass
STW-1157	07/07/08	Ra-228	7.7 ± 0.8	7.4	4.7 - 9.5	Pass
STW-1157	07/07/08	Uranium	11.2 ± 0.3	11.3	8.9 - 13.0	Pass
STW-1164	10/06/08	Sr-89	42.2 ± 3.2	48.7	38.2 - 56.1	Pass
STW-1164	10/06/08	Sr-90	35.4 ± 1.2	33.6	24.6 - 38.8	Pass
STW-1165	10/06/08	Ba-133	56.9 ± 1.0	63.5	52.8 - 69.9	Pass
STW-1165	10/06/08	Co-60	47.6 ± 1.3	49.1	44.2 - 56.6	Pass
STW-1165	10/06/08	Cs-134	26.4 ± 4.0	25.6	19.7 - 28.4	Pass
STW-1165	10/06/08	Cs-137	24.3 ± 0.7	25.6	21.6 - 31.2	Pass
STW-1165	10/06/08	Zn-65	72.0 ± 2.9	68.6	61.2 - 83.0	Pass
STW-1166	10/06/08	Gr. Alpha	24.2 ± 4.8	26.9	13.6 - 35.5	Pass
STW-1166	10/06/08	Gr. Beta	32.6 ± 1.0	38.0	25.1 - 45.5	Pass
STW-1167	10/06/08	I-131	29.0 ± 0.3	28.1	23.4 - 33.0	Pass
STW-1168	10/06/08	Ra-226	15.0 ± 1.0	16.1	12.0 - 18.4	Pass
STW-1168	10/06/08	Ra-228	16.0 ± 1.0	14.1	9.4 - 17.1	Pass
STW-1168	10/06/08	Uranium	47.8 ± 2.0	50.3	40.8 - 55.9	Pass
STW-1169	10/06/08	H-3	2357.0 ± 66.0	2220.0	1830.0 - 2460.0	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 A-2. Table has been intentionally omitted.

TABLE A-3. In-House "Spike" Samples

Lab Code ^b	Date	Analysis	Concentration (pCi/L) ^a			Acceptance
			Laboratory results 2s, n=1 ^c	Known Activity	Control Limits ^d	
SPW-111	1/14/2008	Tc-99	32.20 ± 0.85	32.34	20.34 - 44.34	Pass
SPW-298	1/31/2008	Ni-63	213.55 ± 3.07	212.58	148.81 - 276.35	Pass
W-11708	1/17/2008	Ra-226	11.34 ± 0.43	12.69	8.88 - 16.50	Pass
SPW-711	2/25/2008	U-238	33.56 ± 1.74	41.70	29.19 - 54.21	Pass
SPAP-881	3/11/2008	Cs-134	19.29 ± 1.53	20.09	10.09 - 30.09	Pass
SPAP-881	3/11/2008	Cs-137	114.04 ± 3.03	113.90	102.51 - 125.29	Pass
SPAP-883	3/11/2008	Gr. Beta ^e	54.56 ± 0.12	51.64	30.98 - 72.30	Pass
SPMI-885	3/11/2008	Sr-90	45.93 ± 1.60	45.13	36.10 - 54.16	Pass
SPW-887	3/11/2008	Sr-90	38.82 ± 1.60	45.13	36.10 - 54.16	Pass
SPW-889	3/11/2008	H-3	67325.00 ± 725.00	67384.00	53907.20 - 80860.80	Pass
W-31808	3/18/2008	Gr. Alpha	19.51 ± 0.40	20.08	10.04 - 30.12	Pass
W-31808	3/18/2008	Gr. Beta	47.20 ± 0.42	45.67	35.67 - 55.67	Pass
SPMI-885	3/24/2008	Cs-134	40.93 ± 1.55	39.69	29.69 - 49.69	Pass
SPMI-885	3/24/2008	Cs-137	61.36 ± 2.82	56.91	46.91 - 66.91	Pass
SPW-887	3/24/2008	Cs-134	40.68 ± 1.44	39.69	29.69 - 49.69	Pass
SPW-887	3/24/2008	Cs-137	58.52 ± 2.93	56.91	46.91 - 66.91	Pass
SPW-1282	4/2/2008	U-238	41.30 ± 1.78	41.70	29.19 - 54.21	Pass
W-40308	4/3/2008	Ra-226	15.17 ± 0.50	12.69	8.88 - 16.50	Pass
SPW-5580	4/7/2008	H-3	211.02 ± 7.71	240.00	0.00 - 806.46	Pass
SPW-1562	4/8/2008	Ra-228	28.93 ± 2.09	30.51	21.36 - 39.66	Pass
SPW-1560	4/10/2008	Tc-99	29.74 ± 0.84	32.34	20.34 - 44.34	Pass
SPW-1621	4/16/2008	Fe-55	27205.80 ± 982.90	28370.00	22696.00 - 34044.00	Pass
W-51508	5/15/2008	Gr. Alpha	24.01 ± 0.41	20.08	10.04 - 30.12	Pass
W-51508	5/15/2008	Gr. Beta	47.97 ± 0.41	45.68	35.68 - 55.68	Pass
SPAP-2673	6/2/2008	Cs-134	17.39 ± 1.32	18.60	8.60 - 28.60	Pass
SPAP-2673	6/2/2008	Cs-137	106.82 ± 3.42	113.30	101.97 - 124.63	Pass
SPAP-2674	6/2/2008	Gr. Beta ^e	53.57 ± 0.13	51.40	30.84 - 71.96	Pass
SPF-2745	6/2/2008	Cs-134	0.34 ± 0.02	0.37	0.22 - 0.52	Pass
SPF-2745	6/2/2008	Cs-137	2.06 ± 0.04	2.27	1.36 - 3.18	Pass
SPMI-2677	6/3/2008	Cs-137	53.99 ± 6.15	56.66	46.66 - 66.66	Pass
SPMI-2677A	6/3/2008	I-131	26.64 ± 0.59	28.58	16.58 - 40.58	Pass
SPW-2677	6/3/2008	Cs-134	40.30 ± 3.35	37.21	27.21 - 47.21	Pass
SPW-2677	6/3/2008	I-131(G)	25.92 ± 4.48	28.58	18.58 - 38.58	Pass
SPMI-2679	6/3/2008	Cs-134	35.02 ± 2.93	37.21	27.21 - 47.21	Pass
SPMI-2679	6/3/2008	Cs-137	58.49 ± 6.05	56.66	46.66 - 66.66	Pass
SPMI-2679	6/3/2008	I-131(G)	25.30 ± 4.97	28.58	18.58 - 38.58	Pass
SPMI-2679A	6/3/2008	I-131	30.37 ± 0.50	28.58	16.58 - 40.58	Pass
SPVE-2681	6/3/2008	I-131(G)	1.11 ± 0.06	0.95	0.57 - 1.33	Pass
SPW-2683	6/2/2008	Ni-63	2151.70 ± 10.22	2119.30	1483.51 - 2755.09	Pass
SPW-2685	6/2/2008	H-3	64927.20 ± 704.80	66540.80	53232.64 - 79848.96	Pass
SPW-2689	6/2/2008	C-14	4405.40 ± 15.21	4742.00	2845.20 - 6638.80	Pass

TABLE A-3. In-House "Spike" Samples

Lab Code ^b	Date	Analysis	Concentration (pCi/L) ^a			Acceptance
			Laboratory results 2s, n=1	Known Activity	Control Limits ^c	
W-81408	8/14/2008	Ra-226	12.98 ± 0.35	12.69	8.88 - 16.50	Pass
SPW-1562	8/14/2008	Ra-228	29.09 ± 2.46	30.51	21.36 - 39.66	Pass
SPW-81808	8/18/2008	U-238	42.59 ± 1.96	41.70	29.19 - 54.21	Pass
W-81808	8/18/2008	Gr. Alpha	21.36 ± 0.42	20.08	10.04 - 30.12	Pass
W-81808	8/18/2008	Gr. Beta	49.33 ± 1.01	45.68	35.68 - 55.68	Pass
W-112008	11/20/2008	Gr. Alpha	20.13 ± 0.40	20.08	10.04 - 30.12	Pass
W-112008	11/20/2008	Gr. Beta	48.28 ± 0.42	45.60	35.60 - 55.60	Pass
SPAP-6839	12/5/2008	Cs-134	15.39 ± 2.72	15.68	5.68 - 25.68	Pass
SPAP-6839	12/5/2008	Cs-137	111.45 ± 9.85	112.00	100.80 - 123.20	Pass
SPAP-6841	12/5/2008	Gr. Beta ^e	49.26 ± 0.12	50.72	30.43 - 71.01	Pass
SPW-6843	12/5/2008	C-14	19377.50 ± 55.27	23708.00	14224.80 - 33191.20	Pass
SPW-6845	12/5/2008	Fe-55	7068.30 ± 692.30	6028.00	4822.40 - 7233.60	Pass
SPW-6847	12/5/2008	Tc-99	37.71 ± 1.33	32.34	20.34 - 44.34	Pass
SPW-6849	12/5/2008	Ni-63	232.56 ± 3.26	211.34	147.94 - 274.74	Pass
SPW-6851	12/5/2008	H-3	63664.00 ± 8745.00	64674.00	51739.20 - 77608.80	Pass
SPF-6859	12/5/2008	Cs-134	0.63 ± 0.02	0.63	0.38 - 0.88	Pass
SPF-6859	12/5/2008	Cs-137	2.35 ± 0.01	2.24	1.34 - 3.14	Pass
SPW-7059	12/19/2008	Sr-90	49.19 ± 2.62	44.33	35.46 - 53.20	Pass
SPMI-7061	12/19/2008	Sr-90	39.39 ± 2.19	44.33	35.46 - 53.20	Pass

^a Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/m³), and solid samples (pCi/g).

^b Laboratory codes as follows: W (water), MI (milk), AP (air filter), SO (soil), VE (vegetation),
CH (charcoal canister), F (fish).

^c Results are based on single determinations.

^d Control limits are established from the precision values listed in Attachment A of this report, adjusted to ± 2σ.

^e Control limits based on the laboratory limit, Attachment A ("Other Analyses").

NOTE: For fish, Jello is used for the Spike matrix. For Vegetation, cabbage is used for the Spike matrix.

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis ^b	Concentration (pCi/L) ^a		Acceptance Criteria (4.66 σ)
				Laboratory results (4.66σ)		
				LLD	Activity ^c	
SPW-17	Water	1/3/2008	U-238	0.09	0.01 ± 0.07	1
SPW-112	Water	1/14/2008	Tc-99	4.70	-0.06 ± 2.85	10
W-11408	Water	1/14/2008	Ra-226	0.05	0.05 ± 0.04	1
SPAP-880	Air Filter	3/11/2008	Cs-134	0.91	-	100
SPAP-880	Air Filter	3/11/2008	Cs-137	1.13	-	100
SPW-888	Water	3/11/2008	H-3	159.99	-78.90 ± 80.40	200
W-31808	Water	3/18/2008	Gr. Alpha	0.42	-0.05 ± 0.29	1
W-31808	Water	3/18/2008	Gr. Beta	0.72	0.09 ± 0.51	3.2
SPMI-884	Milk	3/24/2008	Cs-134	2.79	-	10
SPMI-884	Milk	3/24/2008	Cs-137	3.36	-	10
W-40308	Water	4/3/2008	Ra-226	0.04	0.05 ± 0.03	1
SPW-1563	Water	4/8/2008	Ra-228	0.57	0.31 ± 0.30	2
SPW-1561	Water	4/10/2008	Tc-99	4.77	-3.42 ± 2.85	10
SPW-1621	Water	4/16/2008	Fe-55	668.50	-170.70 ± 397.20	1000
SPW-2451	Water	5/22/2008	U-238	0.21	0.35 ± 0.24	1
SPW-2676	Water	6/2/2008	Cs-134	2.03	-	10
SPW-2676	Water	6/2/2008	Cs-134	3.60	-	10
SPW-2676	Water	6/2/2008	Cs-137	2.38	-	10
SPW-2677	Water	6/2/2008	Cs-134	2.78	-	10
SPW-2677	Water	6/2/2008	I-131(G)	3.49	-	20
SPW-2677	Water	6/2/2008	I-131(G)	5.25	-	20
SPF-2744	Fish	6/2/2008	Cs-134	5.48	-	100
SPF-2744	Fish	6/2/2008	Cs-137	4.83	-	100
SPW-2676	Water	6/3/2008	I-131	0.18	0.01 ± 0.11	0.5
SPMI-2678	Milk	6/3/2008	I-131	0.22	0.12 ± 0.15	0.5
SPVE-2680	Vegetation	6/3/2008	I-131(G)	0.01	-	20
SPW-3581	Water	7/14/2008	U-238	0.10	0.13 ± 0.12	1
W-80708	Water	8/7/2008	Gr. Alpha	0.63	-0.02 ± 0.44	1
W-80708	Water	8/7/2008	Gr. Beta	1.43	-0.47 ± 0.99	3.2
W-81408	Water	8/14/2008	Ra-226	0.06	0.14 ± 0.04	1
SPW-1563	Water	8/14/2008	Ra-228	0.79	0.89 ± 0.47	2
SPW-81808	Water	8/18/2008	U-238	0.18	0.04 ± 0.13	1

TABLE A-4. In-House "Blank" Samples

Lab Code	Sample Type	Date	Analysis ^b	Concentration (pCi/L) ^a		
				Laboratory results (4.66σ)		Acceptance
				LLD	Activity ^c	Criteria (4.66 σ)
W-112008	Water	11/20/2008	Gr. Alpha	0.40	0.02 ± 0.28	1
W-112008	Water	11/20/2008	Gr. Beta	0.75	-0.16 ± 0.52	3.2
SPAP-6838	Air Filter	12/5/2008	Cs-134	1.01	-	100
SPAP-6838	Air Filter	12/5/2008	Cs-137	0.95	-	100
SPAP-6840	Air Filter	12/5/2008	Gr. Beta	0.96	2.69 ± 0.64	3.2
SPW-6842	Water	12/5/2008	C-14	7.79	-3.04 ± 4.05	200
SPW-6844	Water	12/5/2008	Fe-55	715.10	21.70 ± 435.10	1000
SPW-6846	Water	12/5/2008	Tc-99	1.36	-0.47 ± 0.82	10
SPW-6848	Water	12/5/2008	Ni-63	1.94	3.08 ± 1.23	20
SPF-6858	Fish	12/5/2008	Cs-134	1.53	-	100
SPF-6858	Fish	12/5/2008	Cs-137	3.92	-	100
SPW-7058	Water	12/19/2008	Cs-134	2.62	-	10
SPW-7058	Water	12/19/2008	Cs-137	2.39	-	10
SPW-7058	Water	12/19/2008	Sr-90	0.65	-0.28 ± 0.26	1
SPMI-7060	Milk	12/19/2008	Cs-134	2.18	-	10
SPMI-7060	Milk	12/19/2008	Cs-137	3.87	-	10
SPMI-7060	Milk	12/19/2008	I-131(G)	2.80	-	20
SPMI-7060 ^d	Milk	12/19/2008	Sr-90	0.53	0.76 ± 0.34	1

^a Liquid sample results are reported in pCi/Liter, air filters(pCi/filter), charcoal (pCi/charcoal canister), and solid samples (pCi/kg).

^b I-131(G); iodine-131 as analyzed by gamma spectroscopy.

^c Activity reported is a net activity result. For gamma spectroscopic analysis, activity detected below the LLD value is not reported.

^d Low levels of Sr-90 are still detected in the environment. A concentration of (1-5 pCi/L) in milk is not unusual.

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L) ^a		Averaged Result	Acceptance
			First Result	Second Result		
AP-8809, 8810	1/2/2008	Be-7	0.06 ± 0.02	0.06 ± 0.01	0.06 ± 0.01	Pass
CF-42, 43	1/2/2008	Gr. Beta	8.88 ± 0.19	8.99 ± 0.19	8.94 ± 0.13	Pass
CF-42, 43	1/2/2008	K-40	5.08 ± 0.29	5.19 ± 0.30	5.14 ± 0.21	Pass
DW-80020, 80021	1/7/2008	Gr. Alpha	2.28 ± 0.84	1.98 ± 0.86	2.13 ± 0.60	Pass
U-169, 170	1/10/2008	Beta-K40	7.50 ± 5.50	11.70 ± 5.10	9.60 ± 3.75	Pass
SO-8836, 8837	1/14/2008	Cs-137	0.80 ± 0.05	0.75 ± 0.05	0.77 ± 0.03	Pass
SO-8836, 8837	1/14/2008	Gr. Alpha	13.30 ± 4.31	15.58 ± 4.10	14.44 ± 2.98	Pass
SO-8836, 8837	1/14/2008	Gr. Alpha	33.68 ± 3.73	29.21 ± 3.10	31.45 ± 2.43	Pass
SO-8836, 8837	1/14/2008	K-40	12.31 ± 0.74	12.96 ± 0.73	12.64 ± 0.52	Pass
DW-80045, 80046	1/15/2008	Gr. Alpha	2.94 ± 1.13	3.41 ± 1.04	3.17 ± 0.77	Pass
DW-80045, 80046	1/15/2008	Gr. Beta	1.86 ± 0.66	1.36 ± 0.63	1.61 ± 0.45	Pass
MI-138, 139	1/15/2008	K-40	1262.40 ± 81.70	1396.20 ± 154.20	1329.30 ± 87.25	Pass
LW-190, 191	1/16/2008	Gr. Beta	2.85 ± 1.07	1.64 ± 1.02	2.24 ± 0.74	Pass
DW-8008, 8009	1/16/2008	Ra-226	2.77 ± 0.20	3.11 ± 0.22	2.94 ± 0.15	Pass
DW-8008, 8009	1/16/2008	Ra-228	3.95 ± 0.74	3.96 ± 0.77	3.96 ± 0.53	Pass
DW-80057, 80058	1/21/2008	Gr. Alpha	6.77 ± 0.66	7.91 ± 1.73	7.34 ± 0.92	Pass
DW-80057, 80058	1/21/2008	Gr. Beta	13.83 ± 0.97	14.78 ± 1.01	14.31 ± 0.70	Pass
SWU-479, 480	1/29/2008	Gr. Beta	4.49 ± 1.13	3.13 ± 1.14	3.81 ± 0.80	Pass
W-920, 921	2/4/2008	Gr. Beta	4.20 ± 1.30	3.30 ± 1.30	3.75 ± 0.92	Pass
SW-540, 541	2/12/2008	Gr. Alpha	2.75 ± 1.16	4.01 ± 1.18	3.38 ± 0.83	Pass
SW-540, 541	2/12/2008	Gr. Beta	6.46 ± 1.11	6.71 ± 1.03	6.59 ± 0.76	Pass
DW-80155, 80156 ^b	2/12/2008	Ra-226	2.55 ± 0.22	2.01 ± 0.16	2.28 ± 0.14	Fail
DW-80155, 80156	2/12/2008	Ra-228	1.86 ± 0.70	1.53 ± 0.67	1.70 ± 0.48	Pass
DW-80165, 80166	2/20/2008	Gr. Alpha	1.51 ± 0.90	0.80 ± 1.05	1.16 ± 0.69	Pass
DW-80166, 80167	2/20/2008	Ra-226	0.40 ± 0.09	0.46 ± 0.09	0.43 ± 0.06	Pass
DW-80166, 80167	2/20/2008	Ra-228	1.44 ± 0.52	1.42 ± 0.57	1.43 ± 0.39	Pass
DW-80166, 80167	2/20/2008	Uranium	0.69 ± 0.25	0.69 ± 0.26	0.69 ± 0.18	Pass
W-1413, 1414	3/3/2008	Gr. Beta	7.50 ± 3.00	3.70 ± 2.60	5.60 ± 1.98	Pass
DW-80189, 80190	3/11/2008	Ra-226	4.41 ± 0.30	4.09 ± 0.25	4.25 ± 0.20	Pass
DW-80189, 80190	3/11/2008	Ra-228	1.99 ± 0.65	2.17 ± 0.66	2.08 ± 0.46	Pass
MI-1006, 1007	3/12/2008	K-40	1451.90 ± 112.80	1409.50 ± 111.40	1430.70 ± 79.27	Pass
MI-1006, 1007	3/12/2008	Sr-90	0.48 ± 0.31	0.97 ± 0.38	0.72 ± 0.24	Pass
DW-80205, 80206	3/14/2008	Gr. Alpha	3.64 ± 0.80	3.39 ± 0.82	3.52 ± 0.57	Pass
DW-80202, 80203	3/14/2008	Ra-226	3.16 ± 0.21	3.00 ± 0.19	3.08 ± 0.14	Pass
DW-80202, 80203	3/14/2008	Ra-228	2.40 ± 1.00	2.07 ± 0.69	2.24 ± 0.61	Pass
DW-80208, 80209	3/14/2008	U-233/4	1.32 ± 0.25	1.29 ± 0.36	1.31 ± 0.22	Pass
SG-1080, 1081	3/18/2008	Pb-214	3.99 ± 0.30	4.15 ± 0.29	4.07 ± 0.21	Pass
SO-1195, 1196	3/18/2008	U-233/4	0.14 ± 0.02	0.14 ± 0.02	0.14 ± 0.01	Pass
SO-1195, 1196	3/18/2008	U-238	0.13 ± 0.02	0.13 ± 0.02	0.13 ± 0.01	Pass
WW-1242, 1243	3/24/2008	Gr. Beta	10.36 ± 1.63	9.06 ± 1.55	9.71 ± 1.13	Pass
AP-1519, 1520	4/2/2008	Be-7	0.07 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	Pass
W-1565, 1566	4/2/2008	Gr. Alpha	0.82 ± 0.64	1.58 ± 0.72	1.20 ± 0.48	Pass
W-1565, 1566	4/2/2008	Gr. Beta	3.73 ± 0.86	5.51 ± 1.09	4.62 ± 0.69	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L) ^a		Averaged Result	Acceptance
			First Result	Second Result		
DW-80255, 80256	4/8/2008	Ra-226	0.19 ± 0.08	0.28 ± 0.11	0.24 ± 0.07	Pass
DW-80255, 80256	4/8/2008	Ra-228	1.79 ± 0.57	1.32 ± 0.55	1.56 ± 0.40	Pass
DW-80259, 80260	4/8/2008	Gr. Alpha	3.39 ± 0.82	3.62 ± 0.82	3.51 ± 0.58	Pass
DW-80301, 80302	4/11/2008	Ra-226	0.47 ± 0.09	0.47 ± 0.09	0.47 ± 0.06	Pass
DW-80301, 80302	4/11/2008	Ra-228	1.02 ± 0.42	0.82 ± 0.45	0.92 ± 0.31	Pass
SO-1913, 1914	4/15/2008	K-40	12.79 ± 0.73	13.88 ± 0.85	13.34 ± 0.56	Pass
DW-80313, 80314	4/16/2008	Ra-226	3.39 ± 0.22	3.28 ± 0.21	3.34 ± 0.15	Pass
DW-80313, 80314	4/16/2008	Ra-228	4.27 ± 0.72	5.14 ± 0.77	4.71 ± 0.53	Pass
SWU-2087, 2088	4/29/2008	Gr. Beta	2.20 ± 0.60	3.50 ± 0.90	2.85 ± 0.54	Pass
LW-2297, 2298	4/30/2008	Gr. Beta	1.41 ± 0.43	1.02 ± 0.40	1.22 ± 0.30	Pass
LW-2321, 2322	4/30/2008	Gr. Beta	1.33 ± 0.54	1.23 ± 0.54	1.28 ± 0.38	Pass
BS-2063, 2064	5/1/2008	Gr. Beta	13.71 ± 2.06	17.60 ± 2.49	15.66 ± 1.62	Pass
SG-2229, 2230	5/5/2008	Ac-228	26.25 ± 2.70	24.90 ± 2.55	25.58 ± 1.86	Pass
W-2792, 2793	5/5/2008	Gr. Beta	7.20 ± 2.30	7.00 ± 2.50	7.10 ± 1.70	Pass
SG-2229, 2230	5/5/2008	Pb-214	23.28 ± 0.30	23.54 ± 0.33	23.41 ± 0.22	Pass
F-2850, 2851	5/7/2008	Cs-137	3.37 ± 0.21	3.16 ± 0.19	3.27 ± 0.14	Pass
DW-80376, 80377	5/9/2008	Ra-226	0.94 ± 0.13	1.07 ± 0.13	1.01 ± 0.09	Pass
DW-80376, 80377	5/9/2008	Ra-228	2.05 ± 0.57	1.40 ± 0.51	1.73 ± 0.38	Pass
MI-2363, 2364	5/14/2008	K-40	1335.40 ± 111.20	1510.70 ± 124.30	1423.05 ± 83.39	Pass
SG-2752, 2753	5/14/2008	Be-7	264.60 ± 83.90	222.80 ± 93.10	243.70 ± 62.66	Pass
SG-2752, 2753	5/14/2008	Cs-137	64.80 ± 6.00	68.90 ± 5.80	66.85 ± 4.17	Pass
SG-2752, 2753	5/14/2008	Gr. Alpha	19.35 ± 3.48	22.88 ± 4.04	21.12 ± 2.67	Pass
SG-2752, 2753	5/14/2008	Gr. Beta	30.53 ± 2.40	33.31 ± 2.71	31.92 ± 1.81	Pass
SG-2752, 2753	5/14/2008	K-40	9121.90 ± 191.80	9183.70 ± 194.20	9152.80 ± 136.47	Pass
DW-80389, 80390	5/14/2008	Ra-226	2.99 ± 0.36	2.58 ± 0.31	2.79 ± 0.24	Pass
DW-80389, 80390	5/14/2008	Ra-228	2.87 ± 0.68	1.73 ± 0.57	2.30 ± 0.44	Pass
DW-80392, 80393	5/14/2008	Gr. Alpha	19.94 ± 1.30	17.89 ± 1.26	18.92 ± 0.91	Pass
DW-80394, 80395	5/14/2008	U-233/4	2.03 ± 0.27	2.54 ± 0.39	2.29 ± 0.24	Pass
BS-2490, 2491	5/16/2008	Cs-137	6.81 ± 1.20	6.76 ± 1.23	6.78 ± 0.86	Pass
WW-2462, 2463	5/19/2008	H-3	158.61 ± 80.90	205.63 ± 83.06	182.12 ± 57.97	Pass
W-2826, 2827	5/27/2008	Gr. Alpha	3.47 ± 2.23	4.22 ± 2.20	3.84 ± 1.57	Pass
W-2826, 2827	5/27/2008	Gr. Beta	10.67 ± 1.92	9.43 ± 1.76	10.05 ± 1.30	Pass
SG-3378, 3379	6/2/2008	Gr. Alpha	6.51 ± 1.15	7.83 ± 1.32	7.17 ± 0.88	Pass
SG-3378, 3379	6/2/2008	Gr. Beta	16.23 ± 0.95	15.76 ± 1.06	16.00 ± 0.71	Pass
SG-3393, 3394	6/4/2008	Be-7	0.82 ± 0.23	0.66 ± 0.33	0.74 ± 0.20	Pass
SG-3393, 3394	6/4/2008	Cs-137	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	Pass
SG-3393, 3394	6/4/2008	Gr. Alpha	18.96 ± 3.49	16.96 ± 3.34	17.96 ± 2.42	Pass
SG-3393, 3394	6/4/2008	Gr. Beta	30.01 ± 2.49	30.17 ± 2.56	30.09 ± 1.79	Pass
SG-3393, 3394	6/4/2008	K-40	9.78 ± 0.30	10.00 ± 0.28	9.89 ± 0.21	Pass
LW-2939, 2940	6/12/2008	Gr. Beta	1.46 ± 0.59	1.74 ± 0.59	1.60 ± 0.42	Pass
WW-3053, 3054	6/17/2008	Gr. Beta	4.28 ± 0.83	5.27 ± 0.91	4.77 ± 0.61	Pass
SW-3154, 3155	6/24/2008	Gr. Beta	2.15 ± 1.01	2.79 ± 0.97	2.47 ± 0.70	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L) ^a		Averaged Result	Acceptance
			First Result	Second Result		
BS-3245, 3246	6/27/2008	Co-60	108.84 ± 44.14	91.10 ± 22.32	99.97 ± 24.73	Pass
BS-3245, 3246	6/27/2008	Cs-137	952.18 ± 52.78	941.56 ± 13.61	946.87 ± 27.25	Pass
XW-1080, 1081	6/30/2008	Fe-55	2.96 ± 0.32	2.71 ± 0.30	2.84 ± 0.22	Pass
XW-3786, 3787	6/30/2008	Fe-55	2.96 ± 0.32	2.71 ± 0.30	2.84 ± 0.22	Pass
G-3274, 3275	7/1/2008	Gr. Beta	7.65 ± 0.24	7.44 ± 0.24	7.55 ± 0.17	Pass
SL-3295, 3296	7/1/2008	Gr. Beta	3.76 ± 0.24	3.64 ± 0.24	3.70 ± 0.17	Pass
AP-3531, 3532	7/1/2008	Be-7	0.10 ± 0.01	0.08 ± 0.01	0.09 ± 0.01	Pass
AP-3663, 3664	7/2/2008	Be-7	0.08 ± 0.01	0.08 ± 0.02	0.08 ± 0.01	Pass
AP-3690, 3691	7/2/2008	Be-7	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	Pass
W-4333, 4334	7/7/2008	Gr. Beta	7.20 ± 1.90	7.70 ± 1.70	7.45 ± 1.27	Pass
W-4840, 4841	7/7/2008	Gr. Beta	6.70 ± 1.60	6.70 ± 1.80	6.70 ± 1.20	Pass
DW-80415, 80416	7/7/2008	Ra-226	2.81 ± 0.47	2.00 ± 0.34	2.41 ± 0.29	Pass
SG-3964, 3965	7/9/2008	Be-7	1.35 ± 0.23	1.51 ± 0.22	1.43 ± 0.16	Pass
SG-3964, 3965	7/9/2008	Cs-137	0.04 ± 0.01	0.04 ± 0.01	0.04 ± 0.00	Pass
SG-3964, 3965	7/9/2008	Gr. Alpha	23.17 ± 3.39	18.76 ± 3.24	20.97 ± 2.34	Pass
SG-3964, 3965	7/9/2008	Gr. Beta	28.99 ± 2.12	29.25 ± 2.31	29.12 ± 1.57	Pass
SG-3964, 3965	7/9/2008	K-40	6.86 ± 0.19	6.84 ± 0.17	6.85 ± 0.13	Pass
DW-80427, 80428	7/9/2008	Ra-226	3.25 ± 0.24	3.27 ± 0.20	3.26 ± 0.16	Pass
DW-80427, 80428	7/9/2008	Ra-228	2.65 ± 0.67	3.25 ± 0.72	2.95 ± 0.49	Pass
DW-80451, 80452	7/15/2008	Ra-226	1.02 ± 0.10	0.96 ± 0.12	0.99 ± 0.08	Pass
DW-80451, 80452	7/15/2008	Ra-228	1.09 ± 0.62	1.14 ± 0.60	1.12 ± 0.43	Pass
DW-80481, 80482	7/16/2008	Ra-226	1.20 ± 0.13	1.40 ± 0.14	1.30 ± 0.10	Pass
DW-80481, 80482	7/16/2008	Ra-228	1.69 ± 0.68	1.65 ± 0.77	1.67 ± 0.51	Pass
MI-3842, 3843	7/21/2008	K-40	1282.60 ± 108.30	1379.00 ± 111.40	1330.80 ± 77.68	Pass
MI-3892, 3893	7/28/2008	K-40	1371.50 ± 102.90	1501.20 ± 111.80	1436.35 ± 75.97	Pass
DW-4067, 4068	7/29/2008	Gr. Beta	10.46 ± 2.37	14.25 ± 2.78	12.36 ± 1.83	Pass
SWT-4158, 4159	7/29/2008	Gr. Beta	1.58 ± 0.45	1.80 ± 0.47	1.69 ± 0.33	Pass
LW-4221, 4222	7/31/2008	Gr. Beta	1.35 ± 0.56	0.91 ± 0.52	1.13 ± 0.38	Pass
LW-4242, 4243	7/31/2008	Gr. Beta	1.36 ± 0.56	1.18 ± 0.53	1.27 ± 0.38	Pass
VE-4046, 4047	8/4/2008	Be-7	0.77 ± 0.13	0.82 ± 0.19	0.80 ± 0.12	Pass
VE-4046, 4047	8/4/2008	Gr. Beta	8.81 ± 0.36	8.34 ± 0.31	8.58 ± 0.24	Pass
VE-4046, 4047	8/4/2008	K-40	5.17 ± 0.34	5.33 ± 0.42	5.25 ± 0.27	Pass
W-4821, 4822	8/4/2008	Gr. Alpha	1.70 ± 0.80	1.70 ± 0.90	1.70 ± 0.60	Pass
W-4821, 4822	8/4/2008	Gr. Beta	3.90 ± 0.80	3.70 ± 0.90	3.80 ± 0.60	Pass
W-4801, 4802	8/5/2008	Gr. Alpha	4.40 ± 2.40	4.80 ± 2.30	4.60 ± 1.66	Pass
W-4801, 4802	8/5/2008	Gr. Beta	13.20 ± 1.30	14.50 ± 1.40	13.85 ± 0.96	Pass
DW-80522, 80523	8/5/2008	Ra-226	0.50 ± 0.12	0.28 ± 0.12	0.39 ± 0.08	Pass
DW-80522, 80523	8/5/2008	Ra-228	1.23 ± 0.60	1.09 ± 0.57	1.16 ± 0.41	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L) ^a		Averaged Result	Acceptance
			First Result	Second Result		
DW-80531, 80532	8/5/2008	Gr. Alpha	18.90 ± 1.86	17.80 ± 1.96	18.35 ± 1.35	Pass
DW-80534, 80535	8/5/2008	Ra-226	3.01 ± 0.18	3.33 ± 0.18	3.17 ± 0.13	Pass
DW-80534, 80535	8/5/2008	Ra-228	2.24 ± 0.59	2.12 ± 0.59	2.18 ± 0.42	Pass
SG-4584, 4585	8/6/2008	Be-7	7.11 ± 0.20	7.44 ± 0.37	7.27 ± 0.21	Pass
SG-4584, 4585	8/6/2008	Cs-137	0.05 ± 0.01	0.04 ± 0.01	0.04 ± 0.00	Pass
SG-4584, 4585	8/6/2008	K-40	7.88 ± 10.18	8.02 ± 0.21	7.95 ± 5.09	Pass
SG-4584, 4585	8/6/2008	Ra-226	3.94 ± 0.18	3.74 ± 0.22	3.84 ± 0.14	Pass
SG-4573, 4574	8/13/2008	Gr. Alpha	240.72 ± 8.74	251.53 ± 9.56	246.13 ± 6.48	Pass
SG-4573, 4574	8/13/2008	Gr. Beta	201.60 ± 4.28	206.88 ± 4.71	204.24 ± 3.18	Pass
SG-4584, 4585	8/13/2008	Gr. Alpha	14.07 ± 3.10	12.97 ± 3.04	13.52 ± 2.17	Pass
SG-4584, 4585	8/13/2008	Gr. Beta	22.08 ± 2.36	23.02 ± 2.34	22.55 ± 1.66	Pass
DW-80547, 80548	8/13/2008	Gr. Alpha	3.33 ± 1.11	3.88 ± 1.07	3.61 ± 0.77	Pass
DW-80551, 80552	8/13/2008	U-233/4	2.57 ± 0.48	2.13 ± 0.46	2.35 ± 0.33	Pass
DW-80553, 80554	8/13/2008	Ra-226	0.92 ± 0.14	1.21 ± 0.17	1.07 ± 0.11	Pass
DW-80553, 80554	8/13/2008	Ra-228	2.20 ± 0.61	1.64 ± 0.56	1.92 ± 0.41	Pass
DW-80566, 80567	8/20/2008	Ra-226	1.10 ± 0.11	1.10 ± 0.10	1.10 ± 0.07	Pass
DW-80566, 80567	8/20/2008	Ra-228	2.01 ± 0.58	1.74 ± 0.58	1.88 ± 0.41	Pass
VE-4647, 4648	8/27/2008	K-40	1.97 ± 0.17	2.00 ± 0.21	1.99 ± 0.14	Pass
SL-4690, 4691	9/2/2008	Gr. Beta	2.28 ± 0.25	2.35 ± 0.24	2.32 ± 0.17	Pass
ME-4732, 4733	9/2/2008	Gr. Beta	2.86 ± 0.09	2.70 ± 0.09	2.78 ± 0.06	Pass
ME-4732, 4733	9/2/2008	K-40	2.44 ± 0.37	2.82 ± 0.51	2.63 ± 0.32	Pass
SG-5180, 5181	9/3/2008	Be-7	15.50 ± 0.43	15.54 ± 0.38	15.52 ± 0.29	Pass
SG-5180, 5181	9/3/2008	Cs-137	0.07 ± 0.01	0.07 ± 0.01	0.07 ± 0.01	Pass
SG-5180, 5181	9/3/2008	Gr. Alpha	18.74 ± 3.33	17.61 ± 3.15	18.18 ± 2.29	Pass
SG-5180, 5181	9/3/2008	Gr. Beta	29.19 ± 2.10	28.49 ± 2.15	28.84 ± 1.50	Pass
SG-5180, 5181	9/3/2008	K-40	8.55 ± 0.32	8.11 ± 0.27	8.33 ± 0.21	Pass
SG-5187, 5188	9/3/2008	Be-7	6.18 ± 0.54	5.90 ± 0.77	6.04 ± 0.47	Pass
SG-5187, 5188	9/3/2008	K-40	7.16 ± 0.60	7.29 ± 0.60	7.23 ± 0.42	Pass
SG-5193, 5194	9/3/2008	Gr. Alpha	5.80 ± 1.30	7.00 ± 1.50	6.40 ± 0.99	Pass
SG-5193, 5194	9/3/2008	Gr. Beta	15.60 ± 1.10	15.60 ± 1.10	15.60 ± 0.78	Pass
DW-4871, 4872	9/5/2008	I-131	1.15 ± 0.27	1.16 ± 0.31	1.16 ± 0.21	Pass
VE-5022, 5023	9/10/2008	K-40	1.27 ± 0.14	1.11 ± 0.06	1.19 ± 0.08	Pass
DW-5337, 5338	9/10/2008	Gr. Beta	3.00 ± 1.07	2.19 ± 1.05	2.60 ± 0.75	Pass
WW-4977, 4978	9/17/2008	Gr. Beta	3.71 ± 1.10	2.32 ± 1.11	3.01 ± 0.78	Pass
BS-5088, 5089	9/19/2008	K-40	10493 ± 607	10299 ± 470	10396 ± 384	Pass
DW-80584, 80585	9/19/2008	U-233/4	3.01 ± 0.52	2.44 ± 0.47	2.73 ± 0.35	Pass
DW-80584, 80585	9/19/2008	U-238	0.70 ± 0.25	0.27 ± 0.18	0.49 ± 0.15	Pass
DW-80579, 80580	9/25/2008	Gr. Alpha	10.69 ± 1.31	12.84 ± 1.51	11.77 ± 1.00	Pass
DW-80579, 80580	9/25/2008	Ra-226	3.13 ± 0.22	2.89 ± 0.21	3.01 ± 0.15	Pass
DW-80579, 80580	9/25/2008	Ra-228	3.03 ± 0.73	1.98 ± 0.69	2.51 ± 0.50	Pass
G-5389, 5390	10/1/2008	Be-7	1.49 ± 0.32	1.36 ± 0.28	1.43 ± 0.21	Pass
G-5389, 5390	10/1/2008	Gr. Beta	10.86 ± 0.24	11.18 ± 0.25	11.02 ± 0.17	Pass
G-5389, 5390	10/1/2008	K-40	7.42 ± 0.67	8.06 ± 0.63	7.74 ± 0.46	Pass

TABLE A-5. In-House "Duplicate" Samples

Lab Code	Date	Analysis	Concentration (pCi/L) ^a		Averaged Result	Acceptance
			First Result	Second Result		
AP-5814, 5815	10/1/2008	Be-7	0.08 ± 0.01	0.08 ± 0.01	0.08 ± 0.01	Pass
SG-6111, 6112	10/6/2008	Gr. Alpha	9.34 ± 1.82	8.95 ± 1.67	9.15 ± 1.24	Pass
SG-6111, 6112	10/6/2008	Gr. Beta	17.46 ± 1.46	18.86 ± 1.35	18.16 ± 0.99	Pass
DW-80592, 80593	10/7/2008	Gr. Alpha	2.30 ± 1.14	1.57 ± 0.88	1.94 ± 0.72	Pass
DW-80594, 80595	10/7/2008	Ra-228	1.41 ± 0.55	1.22 ± 0.50	1.32 ± 0.37	Pass
DW-80650, 80651	10/8/2008	Gr. Alpha	1.30 ± 0.86	0.12 ± 0.79	0.71 ± 0.58	Pass
DW-80650, 80651	10/8/2008	Gr. Beta	2.92 ± 0.69	3.03 ± 0.64	2.98 ± 0.47	Pass
DW-80629, 80630	10/13/2008	Ra-226	3.12 ± 0.18	2.87 ± 0.17	3.00 ± 0.12	Pass
DW-80629, 80630	10/13/2008	Ra-228	2.71 ± 0.80	3.28 ± 0.81	3.00 ± 0.57	Pass
DW-80663, 80664	10/13/2008	Gr. Alpha	5.91 ± 1.70	3.14 ± 1.44	4.53 ± 1.11	Pass
MI-5572, 5573	10/14/2008	K-40	1391.00 ± 97.39	1443.90 ± 110.60	1417.45 ± 73.68	Pass
MI-5603, 5604	10/14/2008	K-40	1412.80 ± 109.30	1413.80 ± 110.50	1413.30 ± 77.71	Pass
DW-80676, 80677	10/20/2008	Gr. Alpha	12.20 ± 1.48	11.87 ± 1.54	12.04 ± 1.07	Pass
DW-80676, 80677	10/20/2008	Ra-226	5.04 ± 0.25	5.10 ± 0.25	5.07 ± 0.18	Pass
DW-80676, 80677	10/20/2008	Ra-228	5.87 ± 0.86	6.98 ± 0.95	6.43 ± 0.64	Pass
SW-80687, 80688	10/22/2008	Gr. Alpha	3.42 ± 1.03	2.98 ± 1.01	3.20 ± 0.72	Pass
DW-80729, 80730	10/30/2008	Gr. Alpha	8.40 ± 1.45	7.76 ± 2.00	8.08 ± 1.24	Pass
DW-80729, 80730	10/30/2008	Gr. Beta	16.94 ± 1.45	15.41 ± 1.37	16.18 ± 1.00	Pass
DW-80738, 80739	10/31/2008	U-233/4	2.94 ± 0.50	3.06 ± 0.63	3.00 ± 0.40	Pass
DW-80747, 80748	10/31/2008	Ra-226	0.60 ± 0.09	0.50 ± 0.08	0.55 ± 0.06	Pass
DW-80747, 80748	10/31/2008	Ra-228	1.33 ± 0.59	1.38 ± 0.60	1.36 ± 0.42	Pass
BS-6271, 6272	11/3/2008	Gr. Beta	12.26 ± 1.69	13.78 ± 1.84	13.02 ± 1.25	Pass
SS-6593, 6594	11/19/2008	K-40	12.35 ± 0.57	13.10 ± 0.76	12.73 ± 0.48	Pass
MI-7046, 7047	12/16/2008	K-40	1380.10 ± 109.80	1477.30 ± 98.32	1428.70 ± 73.69	Pass
DW-80698, 80699	12/23/2008	Ra-226	3.13 ± 0.22	3.21 ± 0.23	3.17 ± 0.16	Pass
DW-80698, 80699	12/23/2008	Ra-228	5.48 ± 0.91	5.86 ± 0.93	5.67 ± 0.65	Pass
SW-7281, 7282	12/30/2008	Gr. Beta	0.87 ± 0.54	1.35 ± 0.54	1.11 ± 0.38	Pass

Note: Duplicate analyses are performed on every twentieth sample received in-house. Results are not listed for those analyses with activities that measure below the LLD.

^a Results are reported in units of pCi/L, except for air filters (pCi/Filter), food products, vegetation, soil, sediment (pCi/g).

^b A program deviation report is on file. The calculation, instrument background and performance test were satisfactory.

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)^a.

Lab Code ^c	Date	Analysis	Concentration ^b		Control Limits ^d	Acceptance
			Laboratory result	Known Activity		
STW-1137	01/01/08	Am-241	1.27 ± 0.06	1.23	0.86 - 1.60	Pass
STW-1137	01/01/08	Co-57	23.80 ± 0.60	22.80	16.00 - 29.60	Pass
STW-1137	01/01/08	Co-60	8.60 ± 0.50	8.40	5.88 - 10.92	Pass
STW-1137	01/01/08	Cs-134	-0.02 ± 0.10	0.00	-1.00 - 1.00	Pass
STW-1137	01/01/08	Cs-137	0.00 ± 0.10	0.00	-1.00 - 1.00	Pass
STW-1137	01/01/08	Fe-55	32.60 ± 11.60	36.50	25.60 - 47.50	Pass
STW-1137	01/01/08	H-3	515.10 ± 12.70	472.00	330.00 - 614.00	Pass
STW-1137	01/01/08	Mn-54	12.90 ± 0.80	12.10	8.50 - 15.70	Pass
STW-1137	01/01/08	Ni-63	29.50 ± 2.30	30.70	21.50 - 39.90	Pass
STW-1137	01/01/08	Pu-238	0.60 ± 0.06	0.73	0.51 - 0.95	Pass
STW-1137	01/01/08	Pu-239/40	0.019 ± 0.015	0.01	0.00 - 1.00	Pass
STW-1137	01/01/08	Sr-90	12.00 ± 1.50	11.40	7.98 - 14.82	Pass
STW-1137	01/01/08	Tc-99	9.40 ± 1.70	11.20	7.80 - 14.60	Pass
STW-1137	01/01/08	U-233/4	3.37 ± 0.20	3.63	2.54 - 4.72	Pass
STW-1137	01/01/08	U-238	3.63 ± 0.21	3.74	2.62 - 4.86	Pass
STW-1137	01/01/08	Zn-65	16.90 ± 1.40	16.30	11.40 - 21.20	Pass
STW-1138	01/01/08	Gr. Alpha	0.96 ± 0.14	1.40	0.00 - 2.80	Pass
STW-1138	01/01/08	Gr. Beta	2.30 ± 0.15	2.43	1.22 - 3.65	Pass
STAP-1139	01/01/08	Co-57	3.90 ± 0.07	3.55	2.49 - 4.62	Pass
STAP-1139	01/01/08	Co-60	1.43 ± 0.07	1.31	0.92 - 1.70	Pass
STAP-1139	01/01/08	Cs-134	2.59 ± 0.16	2.52	1.76 - 3.28	Pass
STAP-1139	01/01/08	Cs-137	3.05 ± 0.12	2.70	1.89 - 3.51	Pass
STAP-1139	01/01/08	Mn-54	0.43 ± 0.58	0.00	0.00 - 1.00	Pass
STAP-1139	01/01/08	Pu-238	0.080 ± 0.016	0.11	0.07 - 0.14	Pass
STAP-1139	01/01/08	Pu-239/40	0.12 ± 0.02	0.11	0.08 - 0.15	Pass
STAP-1139	01/01/08	Sr-90	1.30 ± 0.27	1.55	1.08 - 2.01	Pass
STAP-1139 ^e	01/01/08	U-233/4	0.43 ± 0.03	0.22	0.15 - 0.28	Fail
STAP-1139 ^e	01/01/08	U-238	0.44 ± 0.03	0.23	0.16 - 0.29	Fail
STAP-1139	01/01/08	Zn-65	2.36 ± 0.18	2.04	1.43 - 2.65	Pass
STAP-1140	01/01/08	Gr. Alpha	0.11 ± 0.03	0.35	0.00 - 0.70	Pass
STAP-1140	01/01/08	Gr. Beta	0.34 ± 0.04	0.29	0.14 - 0.43	Pass
STVE-1141	01/01/08	Co-57	8.30 ± 0.18	6.89	4.82 - 8.96	Pass
STVE-1141	01/01/08	Co-60	3.03 ± 0.13	2.77	1.94 - 3.60	Pass
STVE-1141	01/01/08	Cs-134	6.53 ± 0.29	6.28	4.40 - 8.16	Pass
STVE-1141	01/01/08	Cs-137	3.90 ± 0.19	3.41	2.39 - 4.43	Pass
STVE-1141	01/01/08	Mn-54	5.43 ± 0.21	4.74	3.32 - 6.16	Pass
STVE-1141	01/01/08	Zn-65	0.033 ± 0.10	0.00	0.00 - 1.00	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)^a.

Lab Code ^c	Date	Analysis	Concentration ^b		Control Limits ^d	Acceptance
			Laboratory result	Known Activity		
STSO-1142	01/01/08	Co-57	483.00 ± 3.00	421.00	295.00 - 547.00	Pass
STSO-1142	01/01/08	Co-60	3.00 ± 0.80	2.90	0.00 - 5.00	Pass
STSO-1142	01/01/08	Cs-134	896.50 ± 7.40	854.00	598.00 - 1110.00	Pass
STSO-1142	01/01/08	Cs-137	624.40 ± 4.10	545.00	382.00 - 709.00	Pass
STSO-1142	01/01/08	Mn-54	667.20 ± 3.80	570.00	399.00 - 741.00	Pass
STSO-1142	01/01/08	Ni-63	536.00 ± 15.50	640.00	448.00 - 832.00	Pass
STSO-1142	01/01/08	Pu-238	78.60 ± 4.80	72.80	51.00 - 94.60	Pass
STSO-1142	01/01/08	Pu-239/40	89.10 ± 4.50	90.10	63.10 - 117.10	Pass
STSO-1142	01/01/08	U-233/4	134.41 ± 5.40	142.00	99.00 - 185.00	Pass
STSO-1142	01/01/08	U-238	139.00 ± 5.50	148.00	104.00 - 192.00	Pass
STSO-1142	01/01/08	Zn-65	0.093 ± 0.91	0.00	0.00 - 1.00	Pass
STSO-1158	08/01/08	Am-241	57.73 ± 4.78	69.10	48.40 - 89.80	Pass
STSO-1158	08/01/08	Co-57	353.02 ± 2.01	333.00	233.00 - 433.00	Pass
STSO-1158	08/01/08	Co-60	151.99 ± 1.58	145.00	102.00 - 189.00	Pass
STSO-1158	08/01/08	Cs-134	499.72 ± 2.65	581.00	407.00 - 755.00	Pass
STSO-1158	08/01/08	Cs-137	2.54 ± 0.25	2.80	0.00 - 5.00	Pass
STSO-1158	08/01/08	K-40	643.94 ± 15.50	570.00	399.00 - 741.00	Pass
STSO-1158	08/01/08	Mn-54	452.14 ± 2.96	415.00	291.00 - 540.00	Pass
STSO-1158	08/01/08	Ni-63	803.09 ± 17.01	760.00	532.00 - 988.00	Pass
STSO-1158	08/01/08	Pu-238	0.12 ± 0.54	0.00	0.00 - 5.00	Pass
STSO-1158	08/01/08	Pu-239/40	60.88 ± 5.89	55.60	38.90 - 72.30	Pass
STSO-1158	08/01/08	Sr-90	1.95 ± 2.04	0.00	0.00 - 5.00	Pass
STSO-1158 [†]	08/01/08	Tc-99	337.00 ± 17.30	335.00	235.00 - 436.00	Pass
STSO-1158	08/01/08	U-238	315.67 ± 11.29	303.00	212.00 - 394.00	Pass
STSO-1158	08/01/08	Zn-65	0.10 ± 2.04	0.00	0.00 - 5.00	Pass
STVE-1159	08/01/08	Co-57	8.52 ± 0.23	7.10	5.00 - 9.20	Pass
STVE-1159	08/01/08	Co-60	5.08 ± 0.19	4.70	3.30 - 6.10	Pass
STVE-1159	08/01/08	Cs-134	5.26 ± 0.18	5.50	3.90 - 7.20	Pass
STVE-1159	08/01/08	Cs-137	0.01 ± 0.14	0.00	0.00 - 1.00	Pass
STVE-1159	08/01/08	Mn-54	6.39 ± 0.28	5.80	4.10 - 7.50	Pass
STVE-1159	08/01/08	Zn-65	7.73 ± 0.45	6.90	4.80 - 9.00	Pass

TABLE A-6. Department of Energy's Mixed Analyte Performance Evaluation Program (MAPEP)^a.

Lab Code ^c	Date	Analysis	Concentration ^b		Control Limits ^d	Acceptance
			Laboratory result	Known Activity		
STW-1162 ^g	08/01/08	Am-241	0.20 ± 0.06	0.00	0.00 - 0.10	Fail
STW-1162	08/01/08	Co-57	0.03 ± 0.16	0.00	0.00 - 5.00	Pass
STW-1162	08/01/08	Co-60	11.27 ± 0.23	11.60	8.10 - 15.10	Pass
STW-1162	08/01/08	Cs-134	17.93 ± 0.52	19.50	13.70 - 25.40	Pass
STW-1162	08/01/08	Cs-137	23.72 ± 0.43	23.60	16.50 - 30.70	Pass
STW-1162	08/01/08	Fe-55	43.36 ± 16.81	46.20	32.30 - 60.10	Pass
STW-1162	08/01/08	H-3	385.15 ± 8.93	341.00	239.00 - 443.00	Pass
STW-1162	08/01/08	Mn-54	13.87 ± 0.37	13.70	9.60 - 17.80	Pass
STW-1162 ^h	08/01/08	Ni-63	10.77 ± 2.01	0.00	0.00 - 5.00	Fail
STW-1162 ⁱ	08/01/08	Pu-238	0.33 ± 0.06	0.50	0.40 - 0.70	Fail
STW-1162	08/01/08	Pu-239/40	0.14 ± 0.15	0.00	0.00 - 0.20	Pass
STW-1162	08/01/08	Sr-90	6.49 ± 1.12	6.45	4.52 - 8.39	Pass
STW-1162 ^j	08/01/08	Tc-99	1.80 ± 0.62	3.76	2.63 - 4.89	Fail
STW-1162	08/01/08	U-233/4	3.33 ± 0.18	3.44	2.41 - 4.47	Pass
STW-1162	08/01/08	U-238	3.38 ± 0.18	3.55	2.49 - 4.62	Pass
STW-1162	08/01/08	Zn-65	17.64 ± 0.61	17.10	12.00 - 22.20	Pass
STW-1163	08/01/08	Gr. Alpha	0.08 ± 0.04	0.00	0.00 - 0.56	Pass
STW-1163	08/01/08	Gr. Beta	0.12 ± 0.05	0.00	0.00 - 1.85	Pass

^a Results obtained by Environmental, Inc., Midwest Laboratory as a participant in the Department of Energy's Mixed Analyte Performance Evaluation Program, Idaho Operations office, Idaho Falls, Idaho

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

^c Laboratory codes as follows: STW (water), STAP (air filter), STSO (soil), STVE (vegetation).

^d MAPEP results are presented as the known values and expected laboratory precision (1 sigma, 1 determination) and control limits as defined by the MAPEP.

^e The results of a repeat analysis were still unacceptable. A spiked air filter was prepared (known activity 4.17 pCi/filter) to verify the methodology; results of the spike analysis were acceptable, 4.64 pCi/filter.

^f Corrected result. An error in calculation was found.

^g Included in the testing series as a "false positive". Result of reanalysis, 0.04 ± 0.01 Bq/L.

^h Included in the testing series as a "false positive". Result of reanalysis, 3.78 ± 2.03 Bq/L.

ⁱ The reason for the deviation is unknown. Result of the original sample recount: 0.47 ± 0.07 Bq/L. The analysis was then repeated from the beginning. Result of reanalysis: 0.51 ± 0.07 Bq/L.

^j The lower result was due to a higher than average background count used in the calculation. Average background result: 4.11 ± 0.6

TABLE A-7. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.

Lab Code ^b	Date	Analysis	Concentration (pCi/L)		Control Limits	Acceptance
			Laboratory Result ^c	ERA Result ^d		
STAP-1143	03/24/08	Am-241	60.48 ± 3.52	50.1	29.3 - 68.7	Pass
STAP-1143	03/24/08	Co-60	650.72 ± 3.00	730.0	565.0 - 912.0	Pass
STAP-1143	03/24/08	Cs-134	467.50 ± 5.53	523.0	341.0 - 647.0	Pass
STAP-1143	03/24/08	Cs-137	1375.90 ± 25.41	1450.0	1090.0 - 1900.0	Pass
STAP-1143	03/24/08	Fe-55	145.60 ± 28.94	241.0	106.0 - 375.0	Pass
STAP-1143 ^e	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STAP-1143	03/24/08	Pu-238	53.65 ± 1.54	46.8	32.1 - 61.5	Pass
STAP-1143	03/24/08	Pu-239/40	70.44 ± 3.11	64.1	46.5 - 83.0	Pass
STAP-1143	03/24/08	Sr-90	157.60 ± 7.70	152.0	66.9 - 236.0	Pass
STAP-1143	03/24/08	U-233/4	62.15 ± 3.41	66.7	42.0 - 98.8	Pass
STAP-1143	03/24/08	U-238	64.11 ± 3.29	66.2	42.4 - 94.0	Pass
STAP-1143	03/24/08	Uranium	128.40 ± 3.29	136.0	69.5 - 216.0	Pass
STAP-1143	03/24/08	Zn-65	889.90 ± 15.90	872.0	604.0 - 1210.0	Pass
STAP-1144	03/24/08	Gr. Alpha	13.08 ± 1.09	8.8	4.56 - 13.2	Pass
STAP-1144	03/24/08	Gr. Beta	99.90 ± 3.09	92.2	56.80 - 135.0	Pass
STSO-1145	03/24/08	Ac-228	1269.02 ± 36.81	1180.0	757.0 - 1660.0	Pass
STSO-1145	03/24/08	Am-241	1268.50 ± 85.80	1230.0	735.0 - 1580.0	Pass
STSO-1145	03/24/08	Bi-212	1407.10 ± 56.64	1360.0	357.0 - 2030.0	Pass
STSO-1145	03/24/08	Bi-214	2145.50 ± 305.63	1790.0	1100.0 - 2570.0	Pass
STSO-1145	03/24/08	Co-60	5219.70 ± 90.30	5130.0	3730.0 - 6890.0	Pass
STSO-1145	03/24/08	Cs-134	5427.30 ± 102.94	5640.0	3630.0 - 6790.0	Pass
STSO-1145	03/24/08	Cs-137	6346.60 ± 201.80	6010.0	4600.0 - 7810.0	Pass
STSO-1145	03/24/08	K-40	11052.70 ± 181.80	11000.0	7980.0 - 14900.0	Pass
STSO-1145 ^e	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STSO-1145	03/24/08	Pb-212	1198.20 ± 96.58	1080.0	697.0 - 1520.0	Pass
STSO-1145	03/24/08	Pb-214	2253.30 ± 291.60	2020.0	1210.0 - 3010.0	Pass
STSO-1145	03/24/08	Sr-90	6407.00 ± 277.00	5360.0	1940.0 - 8750.0	Pass
STSO-1145	03/24/08	Th-234	2421.80 ± 321.00	2030.0	644.0 - 3870.0	Pass
STSO-1145 ^f	03/24/08	U-233/4	1227.93 ± 91.52	2050.0	1240.0 - 2580.0	Fail
STSO-1145	03/24/08	U-238	1319.90 ± 48.81	2030.0	1240.0 - 2580.0	Pass
STSO-1145	03/24/08	Uranium	2592.00 ± 140.50	4180.0	2380.0 - 5640.0	Pass
STSO-1145	03/24/08	Zn-65	2936.20 ± 73.50	2660.0	2110.0 - 3570.0	Pass

TABLE A-7. Interlaboratory Comparison Crosscheck program, Environmental Resource Associates (ERA)^a.

Lab Code ^b	Date	Analysis	Concentration (pCi/L)		Control Limits	Acceptance
			Laboratory Result ^c	ERA Result ^d		
STVE-1146	03/24/08	Am-241	1261.50 ± 73.90	1260.0	718.0 - 1730.0	Pass
STVE-1146	03/24/08	Cm-244	1152.50 ± 57.44	1200.0	591.0 - 1870.0	Pass
STVE-1146	03/24/08	Co-60	912.41 ± 13.59	888.0	600.0 - 1280.0	Pass
STVE-1146	03/24/08	Cs-134	1547.70 ± 38.81	1540.0	882.0 - 2130.0	Pass
STVE-1146	03/24/08	Cs-137	1163.80 ± 20.62	1100.0	807.0 - 1530.0	Pass
STVE-1146	03/24/08	K-40	22186.00 ± 339.40	24600.0	17700.0 - 34800.0	Pass
STVE-1146 ^e	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STVE-1146	03/24/08	Sr-90	3825.90 ± 140.66	4130.0	2310.0 - 5480.0	Pass
STVE-1146	03/24/08	U-233/4	2753.30 ± 227.90	3070.0	2110.0 - 4070.0	Pass
STVE-1146	03/24/08	U-238	2697.10 ± 143.20	3050.0	2140.0 - 3850.0	Pass
STVE-1146	03/24/08	Uranium	5586.10 ± 455.20	6260.0	4300.0 - 8080.0	Pass
STVE-1146	03/24/08	Zn-65	1676.80 ± 43.00	1430.0	1030.0 - 1960.0	Pass
STW-1147	03/24/08	Am-241	97.56 ± 1.02	90.9	62.0 - 124.0	Pass
STW-1147	03/24/08	Co-60	1430.00 ± 33.33	1420.0	1240.0 - 1680.0	Pass
STW-1147	03/24/08	Cs-134	730.18 ± 33.39	751.0	555.0 - 862.0	Pass
STW-1147	03/24/08	Cs-137	1947.80 ± 13.80	1990.0	1690.0 - 2380.0	Pass
STW-1147	03/24/08	Fe-55	1422.70 ± 172.16	2080.0	1210.0 - 2780.0	Pass
STW-1147 ^e	03/24/08	Mn-54	0.00 ± 0.00	0.0	0.0 - 10.0	Pass
STW-1147	03/24/08	Pu-238	144.16 ± 4.54	135.0	102.0 - 168.0	Pass
STW-1147	03/24/08	Pu-239/40	82.16 ± 2.50	80.7	62.4 - 99.8	Pass
STW-1147	03/24/08	Sr-90	512.03 ± 43.37	512.0	325.0 - 684.0	Pass
STW-1147	03/24/08	U-233/4	74.40 ± 1.20	81.0	61.0 - 104.0	Pass
STW-1147	03/24/08	U-238	75.10 ± 1.35	80.3	61.3 - 99.5	Pass
STW-1147	03/24/08	Uranium	152.10 ± 2.55	165.0	119.0 - 220.0	Pass
STW-1147	03/24/08	Zn-65	708.90 ± 29.00	694.0	588.0 - 865.0	Pass
STW-1120	03/19/07	Uranium	339.60 ± 10.66	391.0	282.0 - 521.0	Pass
STW-1120	03/19/07	Zn-65	2009.00 ± 36.40	1910.0	1600.0 - 2410.0	Pass

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

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

^c Unless otherwise indicated, the laboratory result is given as the mean ± standard deviation for three determinations.

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

^e Included in the testing series as a "false positive". No activity expected.

^f The analysis was repeated by leaching and total dissolution methods. Total dissolution yielded results within expected range. Results of the reanalysis: U-233,4, 1655 ± 95 pCi/kg. U-238 1805 ± 97 pCi/kg.

APPENDIX B

DATA REPORTING CONVENTIONS

Data Reporting Conventions

- 1.0. All activities, except gross alpha and gross beta, are decay corrected to collection time or the end of the collection period.

2.0. Single Measurements

Each single measurement is reported as follows: $x \pm s$

where: x = value of the measurement;

$s = 2\sigma$ counting uncertainty (corresponding to the 95% confidence level).

In cases where the activity is less than the lower limit of detection L , it is reported as: $< L$,

where L = the lower limit of detection based on 4.66σ uncertainty for a background sample.

3.0. Duplicate analyses

3.1 Individual results: For two analysis results; $x_1 \pm s_1$ and $x_2 \pm s_2$

Reported result: $x \pm s$; where $x = (1/2)(x_1 + x_2)$ and $s = (1/2)\sqrt{s_1^2 + s_2^2}$

3.2. Individual results: $< L_1, < L_2$ Reported result: $< L$, where L = lower of L_1 and L_2

3.3. Individual results: $x \pm s, < L$ Reported result: $x \pm s$ if $x \geq L$; $< L$ otherwise.

4.0. Computation of Averages and Standard Deviations

- 4.1 Averages and standard deviations listed in the tables are computed from all of the individual measurements over the period averaged; for example, an annual standard deviation would not be the average of quarterly standard deviations. The average \bar{x} and standard deviation s of a set of n numbers x_1, x_2, \dots, x_n are defined as follows:

$$\bar{x} = \frac{1}{n} \sum x \qquad s = \sqrt{\frac{\sum (x - \bar{x})^2}{n-1}}$$

- 4.2 Values below the highest lower limit of detection are not included in the average.
- 4.3 If all values in the averaging group are less than the highest LLD, the highest LLD is reported.
- 4.4 If all but one of the values are less than the highest LLD, the single value x and associated two sigma error is reported.
- 4.5 In rounding off, the following rules are followed:
- 4.5.1. If the number following those to be retained is less than 5, the number is dropped, and the retained number s are kept unchanged. As an example, 11.443 is rounded off to 11.44.
- 4.5.2. If the number following those to be retained is equal to or greater than 5, the number is dropped and the last retained number is raised by 1. As an example, 11.445 is rounded off to 11.45.

Appendix C.

NON-RADIOLOGICAL MONITORING PROGRAM

Appendix C. NON-RADIOLOGICAL MONITORING PROGRAM

1.0, Introduction

Union Electric Company, d.b.a. AmerenUE, in accordance with federal regulations and a desire to maintain the quality of the local environment around Callaway Plant has implemented an Environmental Protection Plan, (EPP) contained in Appendix B of the Callaway Plant Operating License.

The objective of the EPP is to provide for protection of non-radiological environmental values during operation of the Callaway Plant.

This report describes the conduct of the EPP for the Callaway Plant during 2008.

NON-RADIOLOGICAL MONITORING PROGRAM (continued)

2.0. Unusual or Important Events

No unusual or important events reportable under the EPP Section 4.1 were identified during 2008.

3.0. EPP Non-compliances

During 2008, there were no non-compliances with the EPP.

4.0. Nonroutine Reports

There were no nonroutine reports submitted in accordance with the EPP, Section 5.4.2 in 2008.

NON-RADIOLOGICAL MONITORING PROGRAM (continued)

Callaway Project 21502, New Technical Training Facility

5.0. Plant Design and Operation Environmental Evaluations.

This section lists all changes in the plant design, operation, tests or experiments installed during 2008, which could involve a potentially significant unreviewed environmental question in accordance with section 3.1 of Appendix B.

During 2008, there were two plant designs that could have involved a potentially significant unreviewed environmental question. The interpretations and conclusions regarding these plant changes along with a description of the change and activity are presented below.

Description of Modification:

This modification covers the construction of a new technical training facility located near the current Callaway Plant training center. This facility will be a one-story building of approximately 32,800 gross square feet with an adjoining parking area. This facility is designed to incorporate offices, classrooms, laboratory and shop areas. It is estimated that approximately 4.6 acres of land will be disturbed during construction of this facility. The new facility will tie-in to existing utilities including plant potable water, sewer, and fire protection systems so there will be no new discharges.

The chemistry training lab will contain two chemical hoods with one exhausting from the building. The chemical sinks will tie into the building drain system and this small quantity of incidental laboratory chemicals will be routed to the existing sanitary sewer. The loading on the existing sewage treatment facility will not change with the construction of this facility as the number of plant staff is not increasing.

The Missouri Department of Natural Resources (DNR) was contacted concerning the tie in for potable water for this facility. DNR indicated that the project could be considered a service connection tie-in and not a main extension. Therefore, a drinking water construction permit application was not required.

Storm water drainage from approximately 3.3 acres of this site will be to Storm Water Outfall #013 (NPDES Permit MO-0098001). Approximately 1.3 acres of the project will drain towards the Plant Operations Access Road to Mud Creek via an unnamed tributary. This required that a Land Disturbance Storm Water Permit be obtained prior to beginning construction, as more than one acre of land will be disturbed. A formal Storm Water Pollution Prevention Plan along with a Best Management Practices Plan was submitted to the Missouri DNR Northwest Regional Office and the land disturbance permit was issued September 14, 2007.

NON-RADIOLOGICAL MONITORING PROGRAM (continued)

The Cultural Resources Management Plan was reviewed and no significant archeological sites were identified at the proposed location for the new technical training facility.

The new technical training facility was started in December 2007 with an expected completion date in the early 2009.

Evaluation of Change:

As part of this evaluation for construction of the new technical training facility, both the Callaway Plant ER and FES-OL were reviewed for any previously evaluated adverse environmental impacts and any adverse environmental impacts not previously evaluated. This modification involves construction of a new training building located between the existing plant employee parking area and County Road 459. The project site was previously disturbed during initial plant construction. Utilities including potable water, drinking water, and drains will be connected to existing Callaway systems already permitted by the State of Missouri. Construction of the new technical training facility did not adversely impact the environment as the construction will be confined to areas previously disturbed and storm water runoff will be controlled as agreed upon with the Missouri DNR.

FSARCN 07-047, New Recycle Hold-up Tanks Diaphragm**Description of Modification:**

Revise the FSAR to add discussion on the new diaphragms installed in the Recycle Holdup Tanks (RHUT) by plant modification MP 06-0102. This modification package installed a new diaphragm to restore the diaphragm that was part of original plant design removed by MP 95-1013. As a result of the Modification, FSARCN 07-047 will insert the FSAR text that was removed by FSARCNs 03-007 and 96-001 associated with plant modification MP 95-1013. In addition, this change will add the RHUTs to the list of components serviced with nitrogen.

Evaluation of Change:

Since this FSARCN will restore the FSAR text back to the original design, the ER or FES-OL as modified by supplements to the FES-OL or environmental impact appraisals is not impacted by this Change.



AMEREN UE, CALLAWAY PLANT
FULTON, MISSOURI
DOCKET NO. 50-483

RADIOLOGICAL ENVIRONMENTAL
MONITORING PROGRAM (REMP)

ANNUAL REPORT - PART II
DATA TABULATIONS AND ANALYSES

January 1 to December 31, 2008

Prepared by

ENVIRONMENTAL, Inc.
Midwest Laboratory

Submitted by

Union Electric Co.
dba AmerenUE Corp.

Project No. 8036

Approved :

Bronia Grob, M.S.
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1.0 INTRODUCTION

The following constitutes a supplement to the Annual Report for the Radiological Environmental Monitoring Program conducted at the AmerenUE, Callaway Plant, Fulton, Missouri in 2008. Results of completed analyses are presented in the attached tables.

For information regarding sampling locations, type and frequency of collection, and sample codes, refer to Part I, Tables 5.1 - 5.2 and Figures 5.1 through 5.8.

Analyses results from additional sampling may be found in Appendix C.

2.0 DATA TABLES

CALLAWAY

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: A-1

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>	<u>Required LLD</u>		<u>0.010</u>
01-10-08	426	0.028 ± 0.003	07-10-08	423	0.014 ± 0.003
01-17-08	428	0.054 ± 0.004	07-17-08	428	0.019 ± 0.003
01-24-08	431	0.033 ± 0.003	07-24-08	433	0.021 ± 0.003
01-31-08	423	0.023 ± 0.003	07-31-08	423	0.017 ± 0.003
02-07-08	431	0.030 ± 0.003	08-07-08	428	0.029 ± 0.003
02-14-08	428	0.034 ± 0.003	08-14-08	428	0.023 ± 0.003
02-21-08	315	0.030 ± 0.004	08-21-08	431	0.023 ± 0.003
02-28-08	428	0.020 ± 0.003	08-28-08	428	0.022 ± 0.003
03-06-08	431	0.025 ± 0.003	09-04-08	433	0.025 ± 0.003
03-13-08	426	0.035 ± 0.003	09-11-08	418	0.019 ± 0.003
03-20-08	428	0.013 ± 0.003	09-18-08	423	0.011 ± 0.002
03-28-08	487	0.019 ± 0.003	09-25-08	428	0.030 ± 0.003
04-03-08	370	0.016 ± 0.003	10-02-08	428	0.036 ± 0.003
1st Quarter Mean ± s.d.		0.028 ± 0.011	3rd Quarter Mean ± s.d.		0.022 ± 0.007
04-10-08	428	0.018 ± 0.003	10-09-08	428	0.032 ± 0.003
04-17-08	428	0.014 ± 0.003	10-16-08	428	0.018 ± 0.003
04-24-08	431	0.020 ± 0.003	10-23-08	431	0.023 ± 0.003
05-01-08	426	0.025 ± 0.003	10-30-08	423	0.016 ± 0.003
05-08-08	428	0.023 ± 0.003	11-06-08	431	0.041 ± 0.003
05-15-08	428	0.014 ± 0.003	11-13-08	433	0.015 ± 0.002
05-22-08	428	0.019 ± 0.003	11-20-08	426	0.021 ± 0.003
05-29-08	431	0.016 ± 0.003	11-28-08	492	0.028 ± 0.003
06-05-08	426	0.019 ± 0.003	12-04-08	370	0.015 ± 0.003
06-12-08	433	0.012 ± 0.003	12-11-08	426	0.027 ± 0.003
06-19-08	423	0.014 ± 0.003	12-18-08	428	0.029 ± 0.003
06-26-08	428	0.020 ± 0.003	12-26-08	494	0.038 ± 0.003
07-03-08	431	0.016 ± 0.003	01-01-09	359	0.024 ± 0.003
2nd Quarter Mean ± s.d.		0.018 ± 0.004	4th Quarter Mean ± s.d.		0.025 ± 0.008
Cumulative Average					0.023
Previous Annual Average					0.025

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

CALLAWAY

Table 2. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: B-3

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>	<u>Required LLD</u>		<u>0.010</u>
01-10-08	423	0.023 ± 0.003	07-10-08	423	0.017 ± 0.003
01-17-08	428	0.042 ± 0.004	07-17-08	428	0.020 ± 0.003
01-24-08	428	0.027 ± 0.003	07-24-08	433	0.025 ± 0.003
01-31-08	413	0.020 ± 0.003	07-31-08	423	0.020 ± 0.003
02-07-08	433	0.024 ± 0.003	08-07-08	428	0.035 ± 0.003
02-14-08	428	0.028 ± 0.003	08-14-08	514	0.020 ± 0.002
02-21-08	431	0.023 ± 0.003	08-21-08	431	0.026 ± 0.003
02-28-08	426	0.020 ± 0.003	08-28-08	428	0.025 ± 0.003
03-06-08	431	0.024 ± 0.003	09-04-08	433	0.027 ± 0.003
03-13-08	426	0.033 ± 0.003	09-11-08	423	0.019 ± 0.003
03-20-08	431	0.015 ± 0.003	09-18-08	426	0.013 ± 0.002
03-28-08	484	0.017 ± 0.003	09-25-08	428	0.030 ± 0.003
04-03-08	367	0.015 ± 0.003	10-02-08	423	0.038 ± 0.003
1st Quarter Mean ± s.d.		0.024 ± 0.007	3rd Quarter Mean ± s.d.		0.024 ± 0.007
04-10-08	433	0.020 ± 0.003	10-09-08	433	0.029 ± 0.003
04-17-08	426	0.013 ± 0.003	10-16-08	426	0.021 ± 0.003
04-24-08	431	0.017 ± 0.003	10-23-08	431	0.021 ± 0.003
05-01-08	426	0.024 ± 0.003	10-30-08	426	0.018 ± 0.003
05-08-08	431	0.021 ± 0.003	11-06-08	431	0.041 ± 0.003
05-15-08	428	0.013 ± 0.003	11-13-08	431	0.013 ± 0.002
05-22-08	428	0.018 ± 0.003	11-20-08	431	0.025 ± 0.003
05-29-08	431	0.017 ± 0.003	11-28-08	489	0.027 ± 0.003
06-05-08	426	0.020 ± 0.003	12-04-08	367	0.016 ± 0.003
06-12-08	433	0.012 ± 0.003	12-11-08	428	0.023 ± 0.003
06-19-08	426	0.015 ± 0.003	12-18-08	428	0.033 ± 0.003
06-26-08	428	0.020 ± 0.003	12-26-08	494	0.033 ± 0.003
07-03-08	428	0.016 ± 0.003	01-01-09	359	0.027 ± 0.003
2nd Quarter Mean ± s.d.		0.017 ± 0.003	4th Quarter Mean ± s.d.		0.025 ± 0.008
Cumulative Average					0.023
Previous Annual Average					0.024

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

CALLAWAY

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: A-7

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>	<u>Required LLD</u>		<u>0.010</u>
01-10-08	426	0.024 ± 0.003	07-10-08	426	0.015 ± 0.003
01-17-08	433	0.038 ± 0.004	07-17-08	431	0.018 ± 0.003
01-24-08	428	0.026 ± 0.003	07-24-08	421	0.022 ± 0.003
01-31-08	423	0.015 ± 0.003	07-31-08	433	0.017 ± 0.003
02-07-08	428	0.018 ± 0.003	08-07-08	426	0.029 ± 0.003
02-14-08	431	0.026 ± 0.003	08-14-08	433	0.020 ± 0.003
02-21-08	428	0.025 ± 0.003	08-21-08	426	0.022 ± 0.003
02-28-08	423	0.019 ± 0.003	08-28-08	428	0.021 ± 0.003
03-06-08	431	0.021 ± 0.003	09-04-08	433	0.026 ± 0.003
03-13-08	426	0.024 ± 0.003	09-11-08	426	0.018 ± 0.003
03-20-08	428	0.012 ± 0.003	09-18-08	426	0.014 ± 0.003
03-28-08	489	0.014 ± 0.003	09-25-08	426	0.026 ± 0.003
04-03-08	370	0.011 ± 0.003	10-02-08	456	0.028 ± 0.003
1st Quarter Mean ± s.d.		0.021 ± 0.008	3rd Quarter Mean ± s.d.		0.021 ± 0.005
04-10-08	426	0.017 ± 0.003	10-09-08	403	0.023 ± 0.003
04-17-08	428	0.011 ± 0.003	10-16-08	428	0.018 ± 0.003
04-24-08	431	0.016 ± 0.003	10-23-08	428	0.018 ± 0.003
05-01-08	426	0.021 ± 0.003	10-30-08	426	0.016 ± 0.003
05-08-08	431	0.022 ± 0.003	11-06-08	431	0.034 ± 0.003
05-15-08	418	0.013 ± 0.003	11-13-08	433	0.015 ± 0.002
05-22-08	428	0.015 ± 0.003	11-20-08	423	0.019 ± 0.003
05-29-08	426	0.015 ± 0.003	11-28-08	492	0.022 ± 0.003
06-05-08	428	0.020 ± 0.003	12-04-08	362	0.014 ± 0.003
06-12-08	428	0.012 ± 0.003	12-11-08	433	0.021 ± 0.003
06-19-08	428	0.013 ± 0.003	12-18-08	431	0.024 ± 0.003
06-26-08	428	0.018 ± 0.003	12-26-08	489	0.036 ± 0.003
07-03-08	431	0.015 ± 0.003	01-01-09	359	0.022 ± 0.003
2nd Quarter Mean ± s.d.		0.016 ± 0.004	4th Quarter Mean ± s.d.		0.022 ± 0.007
Cumulative Average					0.020
Previous Annual Average					0.025

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

CALLAWAY

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: A-8

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>		<u>0.010</u>	<u>Required LLD</u>		<u>0.010</u>
01-10-08	426	0.024 ± 0.003	07-10-08	423	0.014 ± 0.003
01-17-08	428	0.044 ± 0.004	07-17-08	428	0.017 ± 0.003
01-24-08	431	0.024 ± 0.003	07-24-08	433	0.021 ± 0.003
01-31-08	408	0.021 ± 0.003	07-31-08	423	0.015 ± 0.003
02-07-08	433	0.019 ± 0.003	08-07-08	428	0.025 ± 0.003
02-14-08	428	0.030 ± 0.003	08-14-08		ND ^c
02-21-08	426	0.026 ± 0.003	08-21-08	426	0.019 ± 0.003
02-28-08	426	0.020 ± 0.003	08-28-08	428	0.018 ± 0.003
03-06-08	431	0.020 ± 0.003	09-04-08	433	0.023 ± 0.003
03-13-08	426	0.028 ± 0.003	09-11-08	423	0.017 ± 0.003
03-20-08	428	0.013 ± 0.003	09-18-08	426	0.009 ± 0.002
03-28-08	487	0.014 ± 0.003	09-25-08	428	0.025 ± 0.003
04-03-08	370	0.016 ± 0.003	10-02-08	426	0.030 ± 0.003
1st Quarter Mean ± s.d.		0.023 ± 0.008	3rd Quarter Mean ± s.d.		0.019 ± 0.006
04-10-08	428	0.020 ± 0.003	10-09-08	431	0.022 ± 0.003
04-17-08	428	0.012 ± 0.003	10-16-08	332	0.022 ± 0.003
04-24-08	431	0.018 ± 0.003	10-23-08	431	0.023 ± 0.003
05-01-08	426	0.020 ± 0.003	10-30-08	426	0.018 ± 0.003
05-08-08	428	0.023 ± 0.003	11-06-08	428	0.040 ± 0.003
05-15-08	415	0.013 ± 0.003	11-13-08	433	0.014 ± 0.002
05-22-08	426	0.017 ± 0.003	11-20-08	428	0.022 ± 0.003
05-29-08	431	0.013 ± 0.003	11-28-08	489	0.024 ± 0.003
06-05-08	428	0.020 ± 0.003	12-04-08	370	0.017 ± 0.003
06-12-08	431	0.011 ± 0.003	12-11-08	428	0.019 ± 0.003
06-19-08	426	0.012 ± 0.003	12-18-08	426	0.027 ± 0.003
06-26-08	428	0.018 ± 0.003	12-26-08	494	0.035 ± 0.003
07-03-08	405	0.014 ± 0.003 ^b	01-01-09	359	0.021 ± 0.003
2nd Quarter Mean ± s.d.		0.016 ± 0.004	4th Quarter Mean ± s.d.		0.023 ± 0.007
Cumulative Average					0.021
Previous Annual Average					0.024

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

^b Low volume possibly due to temporary power outage from storms in area.

^c "ND" = No data; see Table 2.0, Listing of Missed Samples.

CALLAWAY

Table 1. Airborne particulates and charcoal canisters, analyses for gross beta and iodine-131^a.

Location: A-9

Units: pCi/m³

Collection: Continuous, weekly exchange.

Date Collected	Volume (m ³)	Gross Beta	Date Collected	Volume (m ³)	Gross Beta
<u>Required LLD</u>			<u>Required LLD</u>		
<u>0.010</u>			<u>0.010</u>		
01-10-08	423	0.025 ± 0.003	07-10-08	423	0.018 ± 0.003
01-17-08	428	0.051 ± 0.004	07-17-08	428	0.019 ± 0.003
01-24-08	433	0.027 ± 0.003	07-24-08	428	0.026 ± 0.003
01-31-08	421	0.019 ± 0.003	07-31-08	428	0.019 ± 0.003
02-07-08	433	0.025 ± 0.003	08-07-08	428	0.034 ± 0.003
02-14-08	431	0.031 ± 0.003	08-14-08	428	0.021 ± 0.003
02-21-08	428	0.030 ± 0.003	08-21-08	433	0.025 ± 0.003
02-28-08	423	0.024 ± 0.003	08-28-08	428	0.024 ± 0.003
03-06-08	431	0.025 ± 0.003	09-04-08	431	0.027 ± 0.003
03-13-08	426	0.035 ± 0.003	09-11-08	426	0.021 ± 0.003
03-20-08	428	0.015 ± 0.003	09-18-08	423	0.012 ± 0.002
03-28-08	484	0.017 ± 0.003	09-25-08	428	0.032 ± 0.003
04-03-08	367	0.016 ± 0.003	10-02-08	426	0.038 ± 0.003
1st Quarter Mean ± s.d.		0.026 ± 0.010	3rd Quarter Mean ± s.d.		0.024 ± 0.007
04-10-08	433	0.018 ± 0.003	10-09-08	431	0.029 ± 0.003
04-17-08	426	0.014 ± 0.003	10-16-08	428	0.018 ± 0.003
04-24-08	431	0.017 ± 0.003	10-23-08	433	0.022 ± 0.003
05-01-08	426	0.024 ± 0.003	10-30-08	423	0.017 ± 0.003
05-08-08	426	0.021 ± 0.003	11-06-08	428	0.043 ± 0.003
05-15-08	431	0.016 ± 0.003	11-13-08	431	0.013 ± 0.002
05-22-08	426	0.017 ± 0.003	11-20-08	433	0.022 ± 0.003
05-29-08	431	0.013 ± 0.003	11-28-08	489	0.023 ± 0.003
06-05-08	428	0.020 ± 0.003	12-04-08	367	0.014 ± 0.003
06-12-08	433	0.013 ± 0.003	12-11-08	428	0.022 ± 0.003
06-19-08	426	0.015 ± 0.003	12-18-08	426	0.031 ± 0.003
06-26-08	428	0.019 ± 0.003	12-26-08	497	0.037 ± 0.003
07-03-08	428	0.015 ± 0.003	01-01-09	359	0.024 ± 0.003
2nd Quarter Mean ± s.d.		0.017 ± 0.003	4th Quarter Mean ± s.d.		0.024 ± 0.009
Cumulative Average					0.023
Previous Annual Average					0.023

^a Iodine-131 concentrations are < 0.07 pCi/m³ unless noted otherwise.

CALLAWAY

Table 2. Airborne particulates, analyses for gamma-emitting isotopes.
Collection : Quarterly composites of weekly collections.
Units: pCi/m³

		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
Location		A-1			
Lab Code	Req. LLD	CAAP- 1504	CAAP- 3676	CAAP- 5943	CAAP- 7463
Volume	-	5451	5569	5554	5569
Be-7	-	0.069 ± 0.011	0.085 ± 0.011	0.061 ± 0.012	0.067 ± 0.012
Co-58	-	< 0.0002	< 0.0003	< 0.0005	< 0.0004
Co-60	-	< 0.0005	< 0.0005	< 0.0004	< 0.0005
Zr-Nb-95	-	< 0.0006	< 0.0003	< 0.0006	< 0.0005
Cs-134	0.050	< 0.0003	< 0.0005	< 0.0005	< 0.0004
Cs-137	0.060	< 0.0004	< 0.0004	< 0.0003	< 0.0004
Ba-La-140	-	< 0.0008	< 0.0008	< 0.0015	< 0.0010
Ce-144	-	< 0.0018	< 0.0028	< 0.0029	< 0.0020
Location		A-7			
Lab Code	Req. LLD	CAAP- 1505	CAAP- 3677	CAAP- 5944	CAAP- 7464
Volume	-	5564	5556	5590	5539
Be-7	-	0.061 ± 0.011	0.082 ± 0.011	0.064 ± 0.011	0.063 ± 0.012
Co-58	-	< 0.0005	< 0.0002	< 0.0006	< 0.0003
Co-60	-	< 0.0003	< 0.0005	< 0.0005	< 0.0006
Zr-Nb-95	-	< 0.0006	< 0.0002	< 0.0004	< 0.0005
Cs-134	0.050	< 0.0001	< 0.0005	< 0.0003	< 0.0003
Cs-137	0.060	< 0.0004	< 0.0003	< 0.0004	< 0.0005
Ba-La-140	-	< 0.0008	< 0.0008	< 0.0015	< 0.0010
Ce-144	-	< 0.0029	< 0.0028	< 0.0029	< 0.0017
Location		A-8			
Lab Code	Req. LLD	CAAP- 1506	CAAP- 3678	CAAP- 5945	CAAP- 7466
Volume	-	5546	5531	5126	5476
Be-7	-	0.064 ± 0.011	0.093 ± 0.014	0.056 ± 0.011	0.059 ± 0.012
Co-58	-	< 0.0004	< 0.0002	< 0.0004	< 0.0004
Co-60	-	< 0.0005	< 0.0005	< 0.0006	< 0.0005
Zr-Nb-95	-	< 0.0004	< 0.0004	< 0.0006	< 0.0006
Cs-134	0.050	< 0.0004	< 0.0002	< 0.0004	< 0.0004
Cs-137	0.060	< 0.0004	< 0.0004	< 0.0003	< 0.0004
Ba-La-140	-	< 0.0007	< 0.0008	< 0.0016	< 0.0011
Ce-144	-	< 0.0029	< 0.0024	< 0.0037	< 0.0020

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Table 2. Airborne particulates, analyses for gamma-emitting isotopes.
Collection : Quarterly composites of weekly collections.
Units: pCi/m³

		1st Qtr.	2nd Qtr.	3rd Qtr.	4th Qtr.
A-9					
Lab Code	Req. LLD	CAAP- 1507	CAAP- 3679	CAAP- 5946	CAAP- 7467
Volume	-	5556	5572	5559	5574
Be-7	-	0.064 ± 0.008	0.095 ± 0.011	0.078 ± 0.013	0.060 ± 0.010
Co-58	-	< 0.0005	< 0.0002	< 0.0004	< 0.0003
Co-60	-	< 0.0003	< 0.0006	< 0.0004	< 0.0005
Zr-Nb-95	-	< 0.0005	< 0.0004	< 0.0003	< 0.0005
Cs-134	0.050	< 0.0004	< 0.0004	< 0.0005	< 0.0005
Cs-137	0.060	< 0.0003	< 0.0003	< 0.0004	< 0.0005
Ba-La-140	-	< 0.0007	< 0.0008	< 0.0015	< 0.0011
Ce-144	-	< 0.0024	< 0.0033	< 0.0025	< 0.0016
B-3					
Lab Code	Req. LLD	CAAP- 1508	CAAP- 3680	CAAP- 5948	CAAP- 7468
Volume	-	5549	5575	5642	5574
Be-7	-	0.080 ± 0.011	0.097 ± 0.012	0.078 ± 0.012	0.063 ± 0.011
Co-58	-	< 0.0003	< 0.0005	< 0.0004	< 0.0004
Co-60	-	< 0.0007	< 0.0004	< 0.0004	< 0.0005
Zr-Nb-95	-	< 0.0007	< 0.0004	< 0.0004	< 0.0006
Cs-134	0.050	< 0.0002	< 0.0003	< 0.0004	< 0.0006
Cs-137	0.060	< 0.0006	< 0.0004	< 0.0003	< 0.0006
Ba-La-140	-	< 0.0013	< 0.0008	< 0.0017	< 0.0020
Ce-144	-	< 0.0025	< 0.0026	< 0.0037	< 0.0025

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Table 2. 1 Airborne particulates, analyses for gamma-emitting isotopes ^a.
Collection: Weekly Collections
Units: pCi/m³

Location		A-1		
Lab Code		CAAP- 717	CAAP- 6514	CAAP- 7353
Date Collected	Required	01-17-08	11-06-08	12-26-08
Volume (m ³)	LLD	428	431	494
Be-7	-	< 0.070	0.23 ± 0.072	0.09 ± 0.054
Co-58	-	< 0.007	< 0.004	< 0.003
Co-60	-	< 0.006	< 0.006	< 0.005
Zr-95	-	< 0.007	< 0.005	< 0.008
Cs-134	0.050	< 0.003	< 0.005	< 0.005
Cs-137	0.060	< 0.005	< 0.004	< 0.004
Ba-La-140	-	< 0.036	< 0.009	< 0.009
Ce-144	-	< 0.024	< 0.029	< 0.023

Location		B-3		
Lab Code		CAAP- 721	CAAP- 5626	CAAP- 6517
Date Collected	Required	01-17-08	10-02-08	11-06-08
Volume (m ³)	LLD	428	423	431
Be-7	-	< 0.078	0.16 ± 0.079	0.25 ± 0.080
Co-58	-	< 0.005	< 0.005	< 0.007
Co-60	-	< 0.005	< 0.006	< 0.004
Zr-95	-	< 0.016	< 0.012	< 0.014
Cs-134	0.050	< 0.004	< 0.005	< 0.006
Cs-137	0.060	< 0.004	< 0.006	< 0.006
Ba-La-140	-	< 0.037	< 0.010	< 0.008
Ce-144	-	< 0.027	< 0.021	< 0.032

Location		A-7	
Lab Code		CAAP- 718	CAAP- 7354
Date Collected	Required	01-17-08	12-26-08
Volume (m ³)	LLD	433	489
Be-7	-	< 0.077	< 0.058
Co-58	-	< 0.005	< 0.005
Co-60	-	< 0.006	< 0.005
Zr-95	-	< 0.009	< 0.005
Cs-134	0.050	< 0.004	< 0.003
Cs-137	0.060	< 0.005	< 0.003
Ba-La-140	-	< 0.038	< 0.009
Ce-144	-	< 0.014	< 0.022

^a Gamma spectroscopic analysis is performed on air filters exceeding a gross beta activity of 0.037 pCi/m³.

CALLAWAY

Table 2. 1 Airborne particulates, analyses for gamma-emitting isotopes ^a.
Collection: Weekly Collections
Units: pCi/m³

Location		A-8	
Lab Code		CAAP- 719	CAAP- 6515
Date Collected	Required	01-17-08	11-06-08
Volume (m ³)	LLD	428	428
Be-7	-	0.097 ± 0.054	0.22 ± 0.060
Co-58	-	< 0.004	< 0.004
Co-60	-	< 0.005	< 0.005
Zr-95	-	< 0.008	< 0.009
Cs-134	0.050	< 0.003	< 0.004
Cs-137	0.060	< 0.003	< 0.004
Ba-La-140	-	< 0.036	< 0.008
Ce-144	-	< 0.027	< 0.028

Location		A-9			
Lab Code		CAAP- 720	CAAP- 5624	CAAP- 6516	CAAP- 7355
Date Collected	Required	01-17-08	10-02-08	11-06-08	12-26-08
Volume (m ³)	LLD	428	426	428	497
Be-7	-	< 0.084	0.12 ± 0.062	0.22 ± 0.070	0.10 ± 0.055
Co-58	-	< 0.008	< 0.003	< 0.007	< 0.004
Co-60	-	< 0.006	< 0.005	< 0.006	< 0.005
Zr-95	-	< 0.009	< 0.008	< 0.010	< 0.010
Cs-134	0.050	< 0.005	< 0.004	< 0.005	< 0.003
Cs-137	0.060	< 0.003	< 0.003	< 0.004	< 0.004
Ba-La-140	-	< 0.036	< 0.007	< 0.010	< 0.012
Ce-144	-	< 0.030	< 0.031	< 0.029	< 0.024

^a Gamma spectroscopic analysis is performed on air filters exceeding a gross beta activity of 0.037 pCi/m³.

CALLAWAY

Table 3. Milk, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Semimonthly during grazing season, monthly otherwise.

Units: pCi/L

Location		CA-MLK-M6					
Date	Lab	Concentration (pCi/L)					
Collected	Code	I-131	K-40	Zn-65	Cs-134	Cs-137	Ba-La-140
Required LLDs		1	-	-	15	18	15
01-08-08	CAMI -63	< 0.3	1041 ± 79	< 6.2	< 3.3	< 3.3	< 4.6
02-12-08	CAMI -543	< 0.2	1169 ± 148	< 7.6	< 3.8	< 6.2	< 3.4
03-11-08	CAMI -979	< 0.2	1258 ± 114	< 6.7	< 3.2	< 3.5	< 2.4
04-08-08	CAMI -1483	< 0.3	1450 ± 127	< 6.4	< 3.6	< 4.2	< 1.6
05-13-08	CAMI -2318	< 0.3	1494 ± 105	< 8.1	< 3.6	< 4.1	< 2.4
05-27-08	CAMI -2498	< 0.2	1323 ± 117	< 5.2	< 3.3	< 3.6	< 2.3
06-07-08	CAMI -2911	< 0.4	1536 ± 122	< 5.7	< 3.5	< 4.3	< 1.7
06-23-08	CAMI -3116	< 0.4	1475 ± 121	< 8.2	< 3.4	< 3.3	< 6.7
07-08-08	CAMI -3431	< 0.4	1325 ± 111	< 5.9	< 2.7	< 4.0	< 3.1
07-22-08	CAMI -3764	< 0.3	1410 ± 185	< 10.2	< 5.7	< 7.5	< 2.6
08-12-08	CAMI -4234	< 0.2	1217 ± 173	< 7.9	< 5.5	< 5.3	< 2.1
08-26-08	CAMI -4528	< 0.3	1262 ± 121	< 7.0	< 4.4	< 5.5	< 4.4
09-09-08	CAMI -4876	< 0.4	1328 ± 112	< 4.9	< 2.9	< 4.3	< 4.0
09-23-08	CAMI -5097	< 0.3	1202 ± 154	< 11.2	< 5.1	< 6.1	< 2.9
10-14-08	CAMI -5567	< 0.3	1193 ± 108	< 8.4	< 2.7	< 3.8	< 1.5
10-28-08	CAMI -5977	< 0.4	1165 ± 113	< 3.5	< 2.9	< 4.5	< 1.4
11-12-08	CAMI -6460	< 0.4	1266 ± 120	< 11.2	< 3.3	< 5.2	< 2.7
11-25-08	CAMI -6683	< 0.4	1113 ± 92	< 4.8	< 3.1	< 3.5	< 1.7
12-09-08	CAMI -6909	< 0.3	1235 ± 157	< 9.3	< 4.4	< 5.8	< 3.0

CALLAWAY

Table 3. Milk, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Semimonthly during grazing season, monthly otherwise.

Units: pCi/L

Location		CA-MLK-M9					
Date	Lab	Concentration (pCi/L)					
Collected	Code	I-131	K-40	Zn-65	Cs-134	Cs-137	Ba-La-140
Required LLDs		1	-	-	15	18	15
01-08-08	NS ^a	-	-	-	-	-	-
02-12-08	NS ^a	-	-	-	-	-	-
02-13-08	CAMI -550 ^b	< 0.4	1362 ± 152	< 8.7	< 3.8	< 2.7	< 3.5
03-11-08	CAMI -980	< 0.3	1129 ± 103	< 8.6	< 3.2	< 4.3	< 2.8
04-07-08	CAMI -1484	< 0.2	1196 ± 110	< 3.0	< 2.9	< 3.7	< 2.3
05-13-08	CAMI -2319	< 0.3	1481 ± 97	< 7.0	< 2.4	< 2.9	< 2.1
05-27-08	CAMI -2499	< 0.2	1375 ± 188	< 5.5	< 6.2	< 4.0	< 5.0
06-09-08	CAMI -2912	< 0.4	1181 ± 109	< 2.7	< 3.1	< 3.4	< 2.4
06-22-08	CAMI -3117	< 0.4	1333 ± 123	< 7.4	< 3.4	< 4.2	< 3.9
07-07-08	CAMI -3432	< 0.3	788 ± 87	< 3.2	< 2.6	< 3.1	< 2.3
07-21-08	CAMI -3765	< 0.3	1123 ± 100	< 3.6	< 3.0	< 3.3	< 2.3
08-11-08	CAMI -4235	< 0.3	1429 ± 127	< 7.2	< 3.3	< 3.8	< 2.7
08-26-08	CAMI -4529	< 0.4	1437 ± 107	< 3.8	< 2.5	< 3.6	< 2.3
09-08-08	CAMI -4877	< 0.4	1410 ± 127	< 9.1	< 2.1	< 4.1	< 2.8
09-22-08	CAMI -5124	< 0.4	1286 ± 106	< 8.3	< 2.7	< 4.6	< 3.0
10-13-08	CAMI -5568	< 0.3	1237 ± 128	< 8.8	< 4.2	< 4.9	< 2.3
10-27-08	CAMI -5978	< 0.2	1229 ± 151	< 17.4	< 5.8	< 6.1	< 5.0
11-12-08	CAMI -6461	< 0.4	1458 ± 111	< 6.4	< 3.1	< 3.5	< 2.7
11-23-08	CAMI -6684	< 0.4	1223 ± 97	< 5.9	< 2.5	< 2.7	< 3.2
12-08-08	CAMI -6910	< 0.4	1314 ± 117	< 5.1	< 3.7	< 5.2	< 4.1

^a "NS" = No sample; see Table 2.0, Listing of Missed Samples.

^b Location replaced M-8 in February 2008.

CALLAWAY

Table 3. Milk, analyses for iodine-131 and gamma-emitting isotopes.

Collection: Semimonthly during grazing season, monthly otherwise.
Units: pCi/L

Location		CA-MLK-M10 ^a					
Date	Lab	Concentration (pCi/L)					
Collected	Code	I-131	K-40	Zn-65	Cs-134	Cs-137	Ba-La-140
Required LLDs		1	-	-	15	18	15
03-11-08	CAMI -981	< 0.4	1007 ± 124	< 10.4	< 2.9	< 4.4	< 3.4
04-07-08	CAMI -1485	< 0.3	1220 ± 113	< 3.4	< 3.0	< 4.4	< 2.7
05-13-08	CAMI -2320	< 0.3	1715 ± 111	< 6.7	< 3.1	< 2.0	< 2.1
05-27-08	CAMI -2500	< 0.2	1493 ± 134	< 8.6	< 3.8	< 1.8	< 2.1
06-07-08	CAMI -2913	< 0.4	1718 ± 123	< 5.5	< 2.8	< 4.8	< 2.1
06-19-08	CAMI -3118	< 0.5	1751 ± 122	< 7.3	< 3.4	< 3.9	< 1.9
07-04-08	CAMI -3433	< 0.4	1460 ± 132	< 7.7	< 4.7	< 5.1	< 3.2
07-21-08	CAMI -3766	< 0.3	1454 ± 185	< 16.3	< 2.8	< 6.0	< 2.7
08-11-08	CAMI -4236	< 0.3	1558 ± 118	< 8.8	< 3.3	< 5.3	< 2.5
08-26-08	CAMI -4530	< 0.4	1672 ± 154	< 8.9	< 4.6	< 5.3	< 6.7
09-09-08	CAMI -4878	< 0.4	2003 ± 159	< 11.2	< 5.4	< 6.1	< 3.8
09-23-08	NS ^b	-	-	-	-	-	-
10-14-08	CAMI -5569	< 0.2	1652 ± 132	< 10.7	< 3.8	< 4.7	< 4.1
10-28-08	NS ^b	-	-	-	-	-	-
11-12-08	NS ^b	-	-	-	-	-	-
11-23-08	NS ^b	-	-	-	-	-	-
12-08-08	NS ^b	-	-	-	-	-	-

^a Location added in March of 2008.

^b "NS" = No sample; see Table 2.0, Listing of Missed Samples.

CALLAWAY

Table 4. Vegetation, analyses for gross alpha, gross beta, iodine-131 and gamma-emitting isotopes.
Collection: Monthly, during growing season
Units: pCi/kg wet

Location		CA-FPL-V9			
Lab Code	Req. LLD	CAVE- 2915	CAVE- 2916	CAVE- 3439	CAVE- 3440
Date Collected	-	06-10-08	06-10-08	07-07-08	07-07-08
Sample Type	-	Lettuce	Mustard	Lettuce	Collards
Gross Alpha	-	284 ± 97	< 62	106 ± 66	< 79
Gross Beta	-	4555 ± 174	4308 ± 135	7664 ± 194	6485 ± 209
K-40	-	3141 ± 251	3027 ± 239	5675 ± 428	5276 ± 391
Mn-54	-	< 8.1	< 6.6	< 10.9	< 9.0
Co-58	-	< 7.1	< 7.8	< 13.6	< 9.9
Co-60	-	< 6.8	< 2.4	< 9.9	< 6.3
I-131	60	< 11.4	< 12.3	< 14.2	< 16.5
Cs-134	60	< 8.0	< 5.7	< 11.2	< 12.2
Cs-137	80	< 9.8	< 7.6	< 14.2	< 12.3
Lab Code	Req. LLD	CAVE- 5098	CAVE- 5099	CAVE- 5100	CAVE- 5979
Date Collected	-	09-22-08	09-22-08	09-22-08	10-27-08
Sample Type	-	Collards	Mustard	Turnips	Lettuce
Gross Alpha	-	< 62	< 63	< 51	120 ± 45
Gross Beta	-	6489 ± 188	5820 ± 166	5360 ± 139	5435 ± 129
K-40	-	4978 ± 404	4701 ± 365	4915 ± 491	3971 ± 434
Mn-54	-	< 11.7	< 9.3	< 17.1	< 15.8
Co-58	-	< 11.6	< 8.2	< 15.5	< 13.9
Co-60	-	< 13.6	< 14.6	< 15.4	< 17.3
I-131	60	< 15.9	< 13.3	< 18.4	< 19.3
Cs-134	60	< 13.5	< 8.4	< 13.1	< 10.8
Cs-137	80	< 13.8	< 13.2	< 9.8	< 9.8
Lab Code	Req. LLD	CAVE- 5980	CAVE- 5981	CAVE- 5982	CAVE- 5983
Date Collected	-	10-27-08	10-27-08	10-27-08	10-27-08
Sample Type	-	Collards	Mustard	Turnip	Swiss Chard
Gross Alpha	-	181 ± 60	179 ± 57	168 ± 71	156 ± 70
Gross Beta	-	5671 ± 150	6406 ± 152	6018 ± 156	7575 ± 180
K-40	-	4614 ± 420	5262 ± 558	5313 ± 397	5276 ± 560
Mn-54	-	< 11.6	< 21.4	< 9.2	< 15.5
Co-58	-	< 7.9	< 18.7	< 6.3	< 21.9
Co-60	-	< 7.5	< 15.0	< 7.5	< 20.3
I-131	60	< 15.0	< 24.6	< 18.9	< 27.0
Cs-134	60	< 10.5	< 12.3	< 9.4	< 15.0
Cs-137	80	< 16.2	< 18.2	< 12.8	< 11.4

CALLAWAY

Table 4. Vegetation, analyses for gross alpha, gross beta, iodine-131 and gamma-emitting isotopes.
Collection: Monthly, during growing season
Units: pCi/kg wet

Location		CA-FPL-V9			
Lab Code	Req. LLD	CAVE- 6462	CAVE- 6463	CAVE- 6464	CAVE- 6465
Date Collected	-	11-11-08	11-11-08	11-11-08	11-11-08
Sample Type	-	Swiss Chard	Collards	Turnip greens	Mustard greens
Gross Alpha	-	< 82	89 ± 53	< 103	< 64
Gross Beta	-	9597 ± 246	6207 ± 176	7071 ± 233	5403 ± 171
K-40	-	6395 ± 595	4523 ± 360	4665 ± 332	4761 ± 358
Mn-54	-	< 17.7	< 10.5	< 9.7	< 9.8
Co-58	-	< 14.4	< 12.8	< 9.1	< 10.8
Co-60	-	< 22.1	< 15.7	< 6.2	< 7.9
I-131	60	< 24.8	< 20.7	< 15.9	< 23.3
Cs-134	60	< 16.2	< 10.6	< 7.1	< 11.5
Cs-137	80	< 18.0	< 9.2	< 11.7	< 11.9
Lab Code	Req. LLD	CAVE- 6466			
Date Collected	-	11-11-08			
Sample Type	-	Lettuce			
Gross Alpha	-	< 51			
Gross Beta	-	5175 ± 138			
K-40	-	4227 ± 313			
Mn-54	-	< 4.9			
Co-58	-	< 6.6			
Co-60	-	< 10.1			
I-131	60	< 8.9			
Cs-134	60	< 8.4			
Cs-137	80	< 10.9			

CALLAWAY

Table 4. Vegetation, analyses for gross alpha, gross beta, iodine-131 and gamma-emitting isotopes.
Collection: Monthly, during growing season
Units: pCi/kg wet

Location		CA-FPL-V11			
Lab Code	Req. LLD	CAVE- 3113	CAVE- 3114	CAVE- 3441	CAVE- 3442
Date Collected	-	06-23-08	06-23-08	07-07-08	07-07-08
Sample Type	-	Swiss Chard	Lettuce	Swiss Chard	Lettuce
Gross Alpha	-	309 ± 136	143 ± 72	473 ± 164	361 ± 140
Gross Beta	-	6227 ± 261	5723 ± 192	5951 ± 282	6205 ± 265
K-40	-	4832 ± 429	4595 ± 452	5632 ± 717	5512 ± 530
Mn-54	-	< 11.1	< 14.3	< 28.7	< 18.7
Co-58	-	< 12.7	< 8.7	< 29.1	< 19.0
Co-60	-	< 9.8	< 10.2	< 9.6	< 21.1
I-131	60	< 21.1	< 25.8	< 25.5	< 35.5
Cs-134	60	< 12.9	< 11.5	< 23.4	< 21.2
Cs-137	80	< 14.5	< 12.4	< 29.2	< 22.7
Lab Code	Req. LLD	CAVE- 4256	CAVE- 4257	CAVE- 4879	CAVE- 4880
Date Collected	-	08-11-08	08-11-08	09-08-08	09-08-08
Sample Type	-	Swiss Chard	Lettuce	Lettuce	Swiss Chard
Gross Alpha	-	285 ± 114	426 ± 123	252 ± 96	177 ± 89
Gross Beta	-	5285 ± 231	7512 ± 240	6372 ± 224	5055 ± 199
K-40	-	4461 ± 335	5725 ± 449	4189 ± 318	3408 ± 228
Mn-54	-	< 10.1	< 15.9	< 11.6	< 7.6
Co-58	-	< 6.1	< 10.1	< 8.4	< 7.2
Co-60	-	< 8.3	< 8.3	< 13.9	< 5.4
I-131	60	< 16.6	< 15.7	< 21.0	< 18.3
Cs-134	60	< 8.1	< 12.8	< 9.8	< 8.7
Cs-137	80	< 11.4	< 16.0	< 12.2	< 9.2
Lab Code	Req. LLD	CAVE- 5570			
Date Collected	-	10-13-08			
Sample Type	-	Turnip			
Gross Alpha	-	191 ± 99			
Gross Beta	-	3841 ± 208			
K-40	-	2982 ± 321			
Mn-54	-	< 12.4			
Co-58	-	< 9.1			
Co-60	-	< 7.6			
I-131	60	< 21.2			
Cs-134	60	< 9.8			
Cs-137	80	< 13.4			

CALLAWAY

Table 4. Vegetation, analyses for gross alpha, gross beta, iodine-131 and gamma-emitting isotopes.
Collection: Monthly, during growing season
Units: pCi/kg wet

Location		CA-FPL-V12		
Lab Code	Req. LLD	CAVE- 3115	CAVE- 4258	CAVE- 4881
Date Collected	-	06-24-08	08-12-08	09-09-08
Sample Type	-	Poke Weed	Cabbage	Cabbage
Gross Alpha	-	180 ± 88	396 ± 134	< 79
Gross Beta	-	8755 ± 263	4713 ± 229	3725 ± 143
K-40	-	8260 ± 778	3000 ± 362	3296 ± 326
Mn-54	-	< 12.6	< 12.5	< 8.6
Co-58	-	< 19.0	< 8.3	< 7.2
Co-60	-	< 20.9	< 12.5	< 9.0
I-131	60	< 39.6	< 25.7	< 39.4
Cs-134	60	< 16.9	< 11.0	< 10.3
Cs-137	80	< 22.9	< 9.1	< 9.8

CALLAWAY

Table 4. Vegetation, analyses for gross alpha, gross beta, iodine-131 and gamma-emitting isotopes.
Collection: Monthly, during growing season
Units: pCi/kg wet

Location		CA-FPL-V14			
Lab Code	Req. LLD	CAVE- 2917	CAVE- 3443	CAVE- 3444	CAVE- 4259
Date Collected	-	06-10-08	07-08-08	07-08-08	08-11-08
Sample Type	-	Turnips	Brussel Sprouts	Turnips	Brussel Sprouts
Gross Alpha	-	428 ± 122	80 ± 50	122 ± 51	222 ± 83
Gross Beta	-	4025 ± 180	3887 ± 145	2685 ± 110	4960 ± 178
K-40	-	3396 ± 306	3597 ± 476	2339 ± 38	4694 ± 288
Mn-54	-	< 14.3	< 17.0	< 1.5	< 9.4
Co-58	-	< 10.2	< 9.1	< 2.3	< 3.2
Co-60	-	< 11.4	< 16.1	< 1.1	< 6.2
I-131	60	< 22.2	< 30.6	< 1.3 ^a	< 13.0
Cs-134	60	< 9.9	< 18.3	< 1.0	< 6.7
Cs-137	80	< 13.7	< 21.2	< 1.4	< 11.5
Lab Code	Req. LLD	CAVE- 4260	CAVE- 4261	CAVE- 4882	CAVE- 5571
Date Collected	-	08-11-08	08-11-08	09-08-08	10-13-08
Sample Type	-	Lettuce	Turnip Greens	Turnips	Turnip
Gross Alpha	-	156 ± 65	301 ± 99	495 ± 154	338 ± 112
Gross Beta	-	4296 ± 151	4099 ± 180	4241 ± 225	4808 ± 200
K-40	-	3990 ± 469	3588 ± 325	3828 ± 357	3807 ± 307
Mn-54	-	< 19.6	< 8.2	< 11.4	< 8.7
Co-58	-	< 15.5	< 7.3	< 8.4	< 8.4
Co-60	-	< 14.6	< 8.0	< 9.3	< 11.7
I-131	60	< 25.2	< 13.3	< 29.3	< 11.8
Cs-134	60	< 17.6	< 12.4	< 12.6	< 8.6
Cs-137	80	< 18.3	< 16.1	< 16.9	< 12.4
Lab Code	Req. LLD	CAVE- 6467			
Date Collected	-	11-11-08			
Sample Type	-	Turnip Greens			
Gross Alpha	-	131 ± 80			
Gross Beta	-	5034 ± 202			
K-40	-	3955 ± 352			
Mn-54	-	< 10.9			
Co-58	-	< 7.1			
Co-60	-	< 10.3			
I-131	60	< 14.2			
Cs-134	60	< 8.2			
Cs-137	80	< 14.5			

^a I-131 reported at time of counting; LLD not reached due to delay in analysis.

CALLAWAY

Table 5. Soil, analyses for gross alpha, gross beta and gamma-emitting isotopes.

Collection: Annually

Units: pCi/kg dry

Location		SOL-F-002-#1	SOL-F-002-#2	SOL-F-006-#1	SOL-F-006-#2
Lab Code	Req. LLD	CASO- 6009	CASO- 6010	CASO- 6011	CASO- 6012
Date Collected	-	10-22-08	10-22-08	10-22-08	10-22-08
Gross Alpha	-	18585 ± 4601	17880 ± 4447	13935 ± 4100	21610 ± 4600
Gross Beta	-	29744 ± 3468	30721 ± 3531	32298 ± 3672	32609 ± 3303
K-40	-	11007 ± 733	11646 ± 692	9909 ± 716	10531 ± 710
Mn-54	-	< 33.6	< 25.7	< 25.5	< 32.0
Fe-59	-	< 58.7	< 114.6	< 125.1	< 37.9
Co-58	-	< 33.0	< 12.1	< 49.8	< 24.7
Co-60	-	< 20.4	< 20.1	< 26.3	< 21.1
Zr-Nb-95	-	< 40.8	< 30.6	< 98.9	< 29.2
Cs-134	150	< 13.8	< 9.0	< 22.6	< 9.8
Cs-137	180	634 ± 51.9	625 ± 49.2	947 ± 57.4	773 ± 51.7
Ba-La-140	-	< 193.4	< 127.7	< 372.8	< 229.7

Location		SOL-PR-003-#1	SOL-PR-003-#2	SOL-PR-007-#1	SOL-PR-007-#2
Lab Code	Req. LLD	CASO- 6013	CASO- 6015	CASO- 6016	CASO- 6017
Date Collected	-	10-22-08	10-22-08	10-21-08	10-21-08
Gross Alpha	-	14736 ± 3823	19341 ± 4351	14505 ± 4323	13711 ± 4109
Gross Beta	-	25438 ± 3058	25216 ± 2940	24063 ± 2848	27527 ± 3168
K-40	-	10827 ± 732	10941 ± 983	11592 ± 681	10926 ± 952
Mn-54	-	< 26.2	< 39.1	< 30.1	< 39.7
Fe-59	-	< 105.6	< 128.1	< 113.6	< 117.2
Co-58	-	< 31.9	< 69.4	< 24.3	< 39.9
Co-60	-	< 19.7	< 43.1	< 26.1	< 25.3
Zr-Nb-95	-	< 82.4	< 70.3	< 83.1	< 86.6
Cs-134	150	< 19.1	< 43.6	< 21.5	< 32.6
Cs-137	180	194 ± 35.0	530 ± 68.0	260 ± 43.5	223 ± 50.9
Ba-La-140	-	< 250.6	< 443.3	< 429.4	< 635.6

Location		SOL-V-003-#1	SOL-V-003-#2
Lab Code	Req. LLD	CASO- 6018	CASO- 6019
Date Collected	-	10-22-08	10-22-08
Gross Alpha	-	19635 ± 4985	10509 ± 3567
Gross Beta	-	31827 ± 3924	33246 ± 3594
K-40	-	15002 ± 808	15458 ± 804
Mn-54	-	< 28.9	< 28.5
Fe-59	-	< 42.7	< 82.7
Co-58	-	< 21.6	< 32.0
Co-60	-	< 21.2	< 7.7
Zr-Nb-95	-	< 67.5	< 49.9
Cs-134	150	< 15.8	< 21.6
Cs-137	180	248 ± 38.7	214 ± 31.6
Ba-La-140	-	< 142.9	< 97.2

CALLAWAY

Table 5. Soil, analyses for gross alpha, gross beta and gamma-emitting isotopes.
Collection: Annually
Units: pCi/kg dry

Location		SOL-W-001-#1	SOL-W-001-#2	SOL-W-002-#1	SOL-W-002-#2
Lab Code	Req. LLD	CASO- 6020	CASO- 6021	CASO- 6022	CASO- 6023
Date Collected	-	10-21-08	10-21-08	10-21-08	10-21-08
Gross Alpha	-	16569 ± 4358	17405 ± 4645	15191 ± 4175	8897 ± 3249
Gross Beta	-	33821 ± 3659	36869 ± 3986	31571 ± 3598	30009 ± 3229
K-40	-	14916 ± 1176	13922 ± 810	15622 ± 894	14041 ± 733
Mn-54	-	< 40.7	< 34.4	< 31.5	< 26.5
Fe-59	-	< 132.9	< 128.8	< 92.1	< 73.3
Co-58	-	< 83.6	< 32.8	< 48.1	< 27.7
Co-60	-	< 38.4	< 29.0	< 27.1	< 18.2
Zr-Nb-95	-	< 125.4	< 97.5	< 64.7	< 49.0
Cs-134	150	< 36.9	< 20.4	< 25.4	< 17.2
Cs-137	180	156 ± 61.3	109.1 ± 26.5	134 ± 47.0	82 ± 26.3
Ba-La-140	-	< 476.6	< 615.0	< 315.3	< 251.4

Location		SOL-W-003-#1	SOL-W-003-#2	SOL-W-004-#1	SOL-W-004-#2
Lab Code	Req. LLD	CASO- 6024	CASO- 6025	CASO- 6026	CASO- 6027
Date Collected	-	10-21-08	10-21-08	10-21-08	10-21-08
Gross Alpha	-	11208 ± 3489	15030 ± 3836	19334 ± 4462	15319 ± 4436
Gross Beta	-	23848 ± 3025	24547 ± 2830	31063 ± 3309	29830 ± 3099
K-40	-	12738 ± 832	16494 ± 1211	9792 ± 693	11896 ± 753
Mn-54	-	< 33.1	< 40.7	< 32.1	< 32.2
Fe-59	-	< 142.3	< 89.2	< 87.1	< 126.6
Co-58	-	< 42.2	< 40.1	< 36.5	< 39.5
Co-60	-	< 24.1	< 29.9	< 24.6	< 19.5
Zr-Nb-95	-	< 90.7	< 135.8	< 122.6	< 117.0
Cs-134	150	< 25.3	< 28.8	< 22.6	< 21.1
Cs-137	180	122.8 ± 45.0	111.1 ± 37.8	39.1 ± 23.4	45.2 ± 25.2
Ba-La-140	-	< 379.2	< 469.8	< 576.3	< 421.1

CALLAWAY

Table 6. Surface water, analyses for gross alpha, gross beta, tritium and gamma-emitting isotopes.

Collection: Monthly
Location: CA-SWA-S01 Units: pCi/L

Lab Code	Required	CASW- 162	CASW- 540	CASW- 990	CASW- 1500
Date Collected	LLD	01-15-08	02-12-08	03-11-08	04-08-08
Gross alpha	-	2.0 ± 1.1	2.8 ± 1.2	3.4 ± 1.3	3.9 ± 1.3
Gross beta	4	5.7 ± 0.9	6.5 ± 1.1	10.2 ± 1.4	5.2 ± 0.9
H-3	3000	< 180	< 117	< 149	< 151
Mn-54	15	< 2.6	< 2.9	< 2.4	< 3.6
Fe-59	30	< 6.9	< 7.2	< 5.2	< 8.1
Co-58	15	< 4.4	< 3.5	< 1.7	< 2.4
Co-60	15	< 2.8	< 4.0	< 4.1	< 3.6
Zn-65	30	< 6.3	< 2.6	< 4.2	< 5.0
Zr-Nb-95	15	< 4.7	< 3.6	< 4.5	< 3.4
I-131	1000	< 7.6	< 5.3	< 4.5	< 4.4
Cs-134	15	< 3.8	< 3.9	< 3.3	< 4.0
Cs-137	18	< 3.6	< 4.6	< 3.4	< 3.0
Ba-La-140	15	< 3.4	< 1.8	< 2.4	< 4.7

Lab Code	Required	CASW- 2250	CASW- 2735	CASW- 3609	CASW- 4197
Date Collected	LLD	05-06-08	06-03-08	07-09-08	08-06-08
Gross alpha	-	4.7 ± 1.2	3.5 ± 1.4	2.9 ± 1.4	2.7 ± 1.0
Gross beta	4	5.5 ± 0.8	8.2 ± 1.4	4.2 ± 1.2	6.0 ± 0.9
H-3	3000	< 146	< 167	< 140	< 147
Mn-54	15	< 4.8	< 4.2	< 4.6	< 3.4
Fe-59	30	< 4.8	< 6.7	< 5.2	< 6.2
Co-58	15	< 6.2	< 4.5	< 5.3	< 2.7
Co-60	15	< 3.1	< 4.3	< 4.2	< 4.6
Zn-65	30	< 6.8	< 4.2	< 8.3	< 3.9
Zr-Nb-95	15	< 4.0	< 5.3	< 3.1	< 3.4
I-131	1000	< 8.6	< 7.7	< 10.3	< 6.5
Cs-134	15	< 5.0	< 4.3	< 5.6	< 4.6
Cs-137	18	< 4.6	< 2.8	< 5.5	< 4.2
Ba-La-140	15	< 5.7	< 7.8	< 2.8	< 3.7

Lab Code	Required	CASW- 4721	CASW- 5400	CASW- 6725	CASW- 7158
Date Collected	LLD	09-02-08	10-01-08	11-26-08	12-23-08
Gross alpha	-	2.1 ± 1.1	4.6 ± 2.2	2.9 ± 1.7	3.5 ± 0.7 ^a
Gross beta	4	3.9 ± 0.8	9.8 ± 2.9	4.3 ± 1.3	7.6 ± 0.5 ^a
H-3	3000	< 152	< 152	< 139	< 173
Mn-54	15	< 3.0	< 5.0	< 0.9	< 2.1
Fe-59	30	< 3.1	< 8.7	< 2.0	< 5.4
Co-58	15	< 2.1	< 3.9	< 1.0	< 1.1
Co-60	15	< 2.5	< 4.4	< 1.3	< 1.3
Zn-65	30	< 5.2	< 8.7	< 1.5	< 2.1
Zr-Nb-95	15	< 3.6	< 3.0	< 1.3	< 3.8
I-131	1000	< 7.3	< 10.4	< 19.0	< 14.4
Cs-134	15	< 2.2	< 2.9	< 1.0	< 1.9
Cs-137	18	< 3.2	< 6.5	< 0.8	< 2.1
Ba-La-140	15	< 3.0	< 3.3	< 2.5	< 3.2

^a Sample was counted longer to achieve a lower alpha LLD.

CALLAWAY

Table 6. Surface water, analyses for gross alpha, gross beta, tritium and gamma-emitting isotopes.

Collection: Monthly		Units: pCi/L			
Location: CA-SWA-S02					
Lab Code	Required	CASW- 163	CASW- 542	CASW- 991	CASW- 1501
Date Collected	LLD	01-15-08	02-12-08	03-11-08	04-08-08
Gross alpha	-	1.9 ± 1.1	3.5 ± 1.1	2.8 ± 1.1	< 1.4
Gross beta	4	4.9 ± 0.8	6.2 ± 1.0	6.1 ± 1.2	5.7 ± 0.9
H-3	3000	< 180	< 117	< 149	< 151
Mn-54	15	< 3.3	< 3.5	< 2.4	< 5.6
Fe-59	30	< 7.0	< 6.8	< 3.1	< 4.8
Co-58	15	< 4.2	< 4.1	< 2.2	< 4.7
Co-60	15	< 2.4	< 2.7	< 2.3	< 4.3
Zn-65	30	< 5.4	< 3.9	< 4.9	< 10.4
Zr-Nb-95	15	< 3.6	< 3.7	< 2.4	< 4.7
I-131	1000	< 6.1	< 3.6	< 4.1	< 5.6
Cs-134	15	< 3.7	< 3.8	< 3.0	< 5.6
Cs-137	18	< 4.3	< 3.5	< 2.8	< 3.9
Ba-La-140	15	< 4.2	< 4.4	< 2.2	< 6.3
Lab Code	Required	CASW- 2251	CASW- 2736	CASW- 3610	CASW- 4198
Date Collected	LLD	05-06-08	06-03-08	07-09-08	08-06-08
Gross alpha	-	4.8 ± 1.3	4.4 ± 1.5	< 1.5	2.0 ± 1.0
Gross beta	4	5.3 ± 0.8	8.9 ± 1.3	2.2 ± 1.0	6.0 ± 0.9
H-3	3000	155 ± 84	< 167	< 140	315 ± 91
Mn-54	15	< 3.7	< 2.3	< 2.6	< 4.2
Fe-59	30	< 5.2	< 4.3	< 3.0	< 4.5
Co-58	15	< 3.8	< 2.6	< 2.3	< 1.7
Co-60	15	< 2.4	< 2.5	< 2.5	< 2.6
Zn-65	30	< 9.8	< 2.8	< 3.2	< 5.1
Zr-Nb-95	15	< 3.6	< 2.8	< 3.3	< 2.7
I-131	1000	< 11.8	< 5.7	< 8.5	< 7.0
Cs-134	15	< 3.6	< 3.4	< 2.6	< 3.5
Cs-137	18	< 6.8	< 3.3	< 3.1	< 2.8
Ba-La-140	15	< 6.5	< 1.6	< 5.5	< 4.1
Lab Code	Required	CASW- 4722	CASW- 5401	CASW- 6726	CASW- 7159
Date Collected	LLD	09-02-08	10-01-08	11-26-08	12-23-08
Gross alpha	-	2.2 ± 1.1	4.9 ± 2.2	3.5 ± 1.8	2.9 ± 1.6
Gross beta	4	5.1 ± 0.8	7.2 ± 2.5	5.1 ± 1.3	8.6 ± 1.4
H-3	3000	507 ± 100	372 ± 94	< 147	< 173
Mn-54	15	< 2.2	< 4.8	< 2.2	< 1.6
Fe-59	30	< 3.9	< 6.5	< 4.6	< 4.2
Co-58	15	< 2.4	< 4.9	< 2.8	< 2.5
Co-60	15	< 1.9	< 4.4	< 1.5	< 1.9
Zn-65	30	< 3.9	< 4.7	< 5.1	< 2.1
Zr-Nb-95	15	< 3.9	< 4.1	< 3.6	< 2.8
I-131	1000	< 9.9	< 12.6	< 38.8	< 12.4
Cs-134	15	< 2.8	< 5.0	< 2.5	< 1.8
Cs-137	18	< 2.6	< 5.5	< 2.5	< 2.2
Ba-La-140	15	< 4.0	< 5.6	< 7.9	< 5.5

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Table 7. Ground water, analyses for gross beta, tritium, iodine-131 and gamma-emitting isotopes.

Collection: Quarterly
Units: pCi/L

Location CA-DWA-D01					
Quarter Lab Code	Required LLD	1st Quarter CAWW- 203	2nd Quarter CAWW- 1544	3rd Quarter CAWW- 3868	4th Quarter CAWW- 5560
Gross Beta	4	4.0 ± 1.2	< 2.2	4.2 ± 1.0	4.0 ± 1.0
H-3	2000	< 179	< 151	< 145	< 151
I-131	1	< 0.3	< 0.4	< 0.3	< 0.3
Mn-54	15	< 3.9	< 1.9	< 1.8	< 2.9
Fe-59	30	< 3.7	< 4.5	< 6.0	< 4.4
Co-58	15	< 4.8	< 2.2	< 2.6	< 1.8
Co-60	15	< 5.5	< 2.3	< 3.2	< 2.4
Zn-65	30	< 6.9	< 5.0	< 6.7	< 3.6
Zr-Nb-95	15	< 5.1	< 2.3	< 3.0	< 2.4
Cs-134	15	< 3.7	< 2.6	< 2.9	< 2.7
Cs-137	18	< 4.9	< 2.8	< 4.7	< 2.8
Ba-La-140	15	< 3.3	< 2.6	< 3.7	< 2.3

Location CA-DWA-PW-001					
Quarter Lab Code	Required LLD	1st Qtr. CAWW- 206	2nd Qtr. CAWW- 1545	3rd Qtr. CAWW- 3871	4th Qtr. CAWW- 5561
Gross Beta	4	8.6 ± 1.3	5.4 ± 1.3	5.9 ± 0.9	6.5 ± 1.0
H-3	2000	< 153	< 151	< 145	< 151
I-131	1	< 0.4	< 0.3	< 0.2	< 0.3
Mn-54	15	< 5.5	< 2.1	< 4.2	< 3.6
Fe-59	30	< 9.6	< 5.5	< 7.2	< 6.5
Co-58	15	< 3.5	< 1.4	< 3.7	< 2.4
Co-60	15	< 4.0	< 2.1	< 4.4	< 2.2
Zn-65	30	< 4.0	< 4.1	< 4.3	< 4.7
Zr-Nb-95	15	< 4.2	< 2.3	< 3.3	< 2.3
Cs-134	15	< 3.4	< 3.3	< 3.9	< 3.7
Cs-137	18	< 4.0	< 2.6	< 4.3	< 2.6
Ba-La-140	15	< 3.5	< 4.4	< 3.2	< 4.3

CALLAWAY

Table 7. Ground water, analyses for gross beta, tritium, iodine-131 and gamma-emitting isotopes.

Collection: Quarterly

Units: pCi/L

Location		CA-WWA-F05			
Quarter Lab Code	Required LLD	1st Quarter CAWW- 204	2nd Quarter CAWW- 1964	3rd Quarter CAWW- 3869	4th Quarter CAWW- 5558
Gross Beta	4	9.2 ± 1.4	6.4 ± 1.0	12.4 ± 1.2	8.6 ± 1.1
H-3	2000	< 153	< 158	< 145	< 151
I-131	1	< 0.4	< 0.3	< 0.3	< 0.3
Mn-54	15	< 2.3	< 2.9	< 3.2	< 1.7
Fe-59	30	< 3.0	< 5.5	< 4.4	< 5.0
Co-58	15	< 2.6	< 4.7	< 1.1	< 1.9
Co-60	15	< 2.6	< 4.3	< 3.0	< 2.2
Zn-65	30	< 2.7	< 6.1	< 4.6	< 4.7
Zr-Nb-95	15	< 2.8	< 3.6	< 2.7	< 2.5
Cs-134	15	< 2.1	< 4.3	< 3.0	< 2.3
Cs-137	18	< 2.3	< 4.9	< 2.8	< 1.5
Ba-La-140	15	< 1.7	< 5.1	< 3.8	< 1.4

Location		CA-WWA-F015			
Quarter Lab Code	Required LLD	1st Quarter CAWW- 205	2nd Quarter CAWW- 1543	3rd Quarter CAWW- 3870	4th Quarter CAWW- 5559
Gross Beta	4	10.0 ± 1.5	8.6 ± 1.4	10.6 ± 1.2	9.8 ± 1.0
H-3	2000	< 153	< 151	< 145	< 151
I-131	1	< 0.4	< 0.5	< 0.3	< 0.3
Mn-54	15	< 3.4	< 2.2	< 3.0	< 2.7
Fe-59	30	< 7.9	< 5.3	< 8.4	< 4.4
Co-58	15	< 4.0	< 2.5	< 3.7	< 1.5
Co-60	15	< 2.8	< 2.3	< 3.9	< 1.8
Zn-65	30	< 2.0	< 4.2	< 2.3	< 4.0
Zr-Nb-95	15	< 2.2	< 3.6	< 3.7	< 1.9
Cs-134	15	< 3.3	< 2.4	< 3.9	< 2.3
Cs-137	18	< 4.1	< 2.1	< 3.0	< 2.6
Ba-La-140	15	< 4.3	< 2.6	< 4.2	< 2.9

Table 7. Drinking Water wells, analysis for tritium.

Collection: Quarterly
Units: pCi/L

Lab Code	Location	Date Collected	Tritium (pCi/L)
1st Quarter			
CADW-675	CA-DWA-1	2/19/2008	< 149
CADW-676	CA-DWA-2	2/19/2008	< 149
CADW-677	CA-DWA-3	2/19/2008	< 149
CADW-678	CA-DWA-4	2/20/2008	< 149
CADW-679	CA-DWA-5	2/19/2008	< 149
CADW-680	CA-DWA-6	2/19/2008	< 149
CADW-681	CA-DWA-7	2/19/2008	< 149
CADW-682	CA-DWA-8	2/19/2008	< 149
CADW-683	CA-DWA-9	2/19/2008	< 149
CADW-684	CA-DWA-10	2/19/2008	< 149
CADW-685	CA-DWA-11	2/19/2008	< 149
CADW-686	CA-DWA-12	2/19/2008	< 149
CADW-687	CA-DWA-14	2/19/2008	< 149
CADW-689	CA-DWA-15	2/19/2008	< 149
CADW-690	CA-DWA-16	2/19/2008	< 149
CADW-691	CA-DWA-17	2/19/2008	< 149
CADW-692	CA-DWA-18	2/19/2008	< 149
CADW-693	CA-DWA-19	2/19/2008	< 149
CADW-694	CA-DWA-20	2/19/2008	< 149
CADW-695	CA-DWA-21	2/19/2008	< 149
CADW-696	CA-DWA-22	2/19/2008	< 149
2nd Quarter			
CADW-2505	CA-DWA-1	5/24/2008	< 170
CADW-2506	CA-DWA-2	5/24/2008	< 170
CADW-2507	CA-DWA-3	5/24/2008	< 170
CADW-2508	CA-DWA-4	5/27/2008	< 170
CADW-2509	CA-DWA-5	5/24/2008	< 170
CADW-2510	CA-DWA-6	5/24/2008	< 170
CADW-2511	CA-DWA-7	5/24/2008	< 170
CADW-2513	CA-DWA-8	5/24/2008	< 170
CADW-2514	CA-DWA-9	5/24/2008	< 170
CADW-2515	CA-DWA-10	5/24/2008	< 170
CADW-2516	CA-DWA-11	5/24/2008	< 170
CADW-2517	CA-DWA-12	5/24/2008	< 170
CADW-2518	CA-DWA-14	5/24/2008	< 170
CADW-2519	CA-DWA-15	5/24/2008	< 170
CADW-2520	CA-DWA-16	5/24/2008	< 170
CADW-2521	CA-DWA-17	5/24/2008	< 170
CADW-2522	CA-DWA-18	5/24/2008	< 170
CADW-2523	CA-DWA-19	5/24/2008	< 170
CADW-2524	CA-DWA-20	5/24/2008	< 170
CADW-2525	CA-DWA-21	5/24/2008	< 170
CADW-2526	CA-DWA-22	5/24/2008	< 170

Table 7. Drinking Water wells, analysis for tritium.

Collection: Quarterly
Units: pCi/L

Lab Code	Location	Date Collected	Tritium (pCi/L)
3rd Quarter			
CADW-4475	CA-DWA-1	8/19/2008	< 146
CADW-4476	CA-DWA-2	8/19/2008	< 146
CADW-4477	CA-DWA-3	8/19/2008	< 146
CADW-4478	CA-DWA-4	8/19/2008	< 146
CADW-4479	CA-DWA-5	8/19/2008	< 143
CADW-4480	CA-DWA-6	8/19/2008	< 152
CADW-4481	CA-DWA-7	8/19/2008	< 152
CADW-4482	CA-DWA-8	8/19/2008	< 152
CADW-4484	CA-DWA-9	8/19/2008	< 152
CADW-4485	CA-DWA-10	8/19/2008	< 152
CADW-4486	CA-DWA-11	8/19/2008	< 152
CADW-4487	CA-DWA-12	8/19/2008	< 152
CADW-4488	CA-DWA-14	8/19/2008	< 143
CADW-4489	CA-DWA-15	8/19/2008	< 143
CADW-4490	CA-DWA-16	8/19/2008	< 152
CADW-4491	CA-DWA-17	8/19/2008	< 152
CADW-4492	CA-DWA-18	8/19/2008	< 152
CADW-4493	CA-DWA-19	8/19/2008	< 152
CADW-4494	CA-DWA-20	8/19/2008	< 152
CADW-4495	CA-DWA-21	8/19/2008	< 152
CADW-4496	CA-DWA-22	8/19/2008	< 152
4th Quarter			
CADW-6713	CA-DWA-1	11/21/2008	< 147
CADW-6714	CA-DWA-2	11/21/2008	< 147
CADW-6703	CA-DWA-3	11/21/2008	< 147
CADW-6712	CA-DWA-4	11/24/2008	< 147
CADW-6704	CA-DWA-5	11/21/2008	< 147
CADW-6705	CA-DWA-6	11/21/2008	< 147
CADW-6706	CA-DWA-7	11/21/2008	< 147
CADW-6707	CA-DWA-8	11/21/2008	< 147
CADW-6708	CA-DWA-9	11/21/2008	< 147
CADW-6709	CA-DWA-10	11/21/2008	< 147
CADW-6716	CA-DWA-11	11/21/2008	< 147
CADW-6710	CA-DWA-12	11/21/2008	< 147
CADW-6717	CA-DWA-14	11/21/2008	< 147
CADW-6724	CA-DWA-15	11/24/2008	< 147
CADW-6721	CA-DWA-16	11/21/2008	< 147
CADW-6720	CA-DWA-17	11/21/2008	< 147
CADW-6719	CA-DWA-18	11/21/2008	< 147
CADW-6723	CA-DWA-19	11/21/2008	< 147
CADW-6718	CA-DWA-20	11/21/2008	< 147
CADW-6715	CA-DWA-21	11/21/2008	< 147
CADW-6711	CA-DWA-22	11/21/2008	< 147

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Table 7. Drinking Water Wells, analysis for gamma-emitting isotopes.

Collection: Quarterly^a Units: pCi/L

Location		CA-DWA-003 (Ward)	
Lab Code	Required	CADW- 4497	CADW- 6703
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 4.4	< 3.1
Fe-59	30	< 7.1	< 3.9
Co-58	15	< 2.0	< 3.6
Co-60	15	< 3.4	< 2.3
Zn-65	30	< 5.7	< 3.5
Zr-Nb-95	15	< 3.8	< 3.1
Cs-134	15	< 4.2	< 2.8
Cs-137	18	< 2.4	< 3.0
Ba-La-140	15	< 5.1	< 11.7
Location		CA-DWA-004 (Miller)	
Lab Code	Required	CADW- 4498	CADW- 6712
Collection Date	LLD	08-20-08	11-24-08
Mn-54	15	< 2.8	< 1.2
Fe-59	30	< 11.4	< 2.2
Co-58	15	< 5.1	< 1.2
Co-60	15	< 6.7	< 1.2
Zn-65	30	< 8.2	< 1.9
Zr-Nb-95	15	< 5.3	< 2.2
Cs-134	15	< 4.7	< 0.9
Cs-137	18	< 3.1	< 1.2
Ba-La-140	15	< 4.1	< 4.8
Location		CA-DWA-005 (Hux)	
Lab Code	Required	CADW- 4499	CADW- 6704
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 1.3	< 1.2
Fe-59	30	< 3.2	< 3.1
Co-58	15	< 2.4	< 1.3
Co-60	15	< 3.0	< 1.2
Zn-65	30	< 5.3	< 2.1
Zr-Nb-95	15	< 2.6	< 2.1
Cs-134	15	< 1.8	< 1.3
Cs-137	18	< 3.1	< 1.3
Ba-La-140	15	< 4.7	< 6.6
Location		CA-DWA-006 (Lindeman)	
Lab Code	Required	CADW- 4500	CADW- 6705
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 1.9	< 1.0
Fe-59	30	< 5.0	< 2.9
Co-58	15	< 2.7	< 1.0
Co-60	15	< 3.4	< 0.9
Zn-65	30	< 3.9	< 2.0
Zr-Nb-95	15	< 3.2	< 1.5
Cs-134	15	< 2.9	< 1.1
Cs-137	18	< 3.0	< 0.8
Ba-La-140	15	< 5.6	< 2.6

^a Sampling required by the ODCM after the second half of 2008.

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Table 7. Drinking Water Wells, analysis for gamma-emitting isotopes.

Collection: Quarterly ^a Units: pCi/L

Location		CA-DWA-007 (Kriete)	
Lab Code	Required	CADW- 4501	CADW- 6706
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 2.0	< 2.1
Fe-59	30	< 2.5	< 6.3
Co-58	15	< 2.8	< 2.8
Co-60	15	< 2.0	< 2.2
Zn-65	30	< 2.5	< 2.2
Zr-Nb-95	15	< 3.8	< 3.9
Cs-134	15	< 2.4	< 2.1
Cs-137	18	< 2.2	< 1.9
Ba-La-140	15	< 3.4	< 8.5
Location		CA-DWA-008 (Brandt)	
Lab Code	Required	CADW- 4502	CADW- 6707
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 2.1	< 2.2
Fe-59	30	< 4.2	< 5.1
Co-58	15	< 1.6	< 3.6
Co-60	15	< 2.5	< 2.5
Zn-65	30	< 3.3	< 3.6
Zr-Nb-95	15	< 4.1	< 3.7
Cs-134	15	< 2.2	< 2.6
Cs-137	18	< 3.7	< 2.6
Ba-La-140	15	< 4.6	< 3.9
Location		CA-DWA-009 (Clardy)	
Lab Code	Required	CADW- 4503	CADW- 6708
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 2.0	< 1.3
Fe-59	30	< 6.6	< 3.4
Co-58	15	< 3.7	< 1.4
Co-60	15	< 7.3	< 1.1
Zn-65	30	< 7.0	< 1.9
Zr-Nb-95	15	< 2.6	< 2.3
Cs-134	15	< 3.9	< 1.1
Cs-137	18	< 5.8	< 1.0
Ba-La-140	15	< 2.6	< 4.5
Location		CA-DWA-010 (Dillon)	
Lab Code	Required	CADW- 4505	CADW- 6709
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 3.6	< 0.9
Fe-59	30	< 4.9	< 2.8
Co-58	15	< 2.4	< 1.2
Co-60	15	< 3.3	< 1.3
Zn-65	30	< 5.1	< 1.7
Zr-Nb-95	15	< 2.5	< 1.5
Cs-134	15	< 3.1	< 1.2
Cs-137	18	< 2.9	< 1.0
Ba-La-140	15	< 4.6	< 5.5

^a Sampling required by the ODCM after the second half of 2008.

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Table 7. Drinking Water Wells, analysis for gamma-emitting isotopes.

Collection: Quarterly^a Units: pCi/L

Location		CA-DWA-012 (Dillon)	
Lab Code	Required	CADW- 4506	CADW- 6710
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 2.9	< 1.5
Fe-59	30	< 3.9	< 5.2
Co-58	15	< 3.9	< 2.2
Co-60	15	< 3.0	< 1.9
Zn-65	30	< 3.2	< 2.5
Zr-Nb-95	15	< 3.8	< 2.8
Cs-134	15	< 2.6	< 1.9
Cs-137	18	< 4.0	< 1.9
Ba-La-140	15	< 7.1	< 3.4

Location		CA-DWA-022 (Plummer)	
Lab Code	Required	CADW- 4507	CADW- 6711
Collection Date	LLD	08-20-08	11-21-08
Mn-54	15	< 2.2	< 1.2
Fe-59	30	< 3.5	< 3.2
Co-58	15	< 2.1	< 1.1
Co-60	15	< 2.5	< 0.9
Zn-65	30	< 5.5	< 1.9
Zr-Nb-95	15	< 3.9	< 1.8
Cs-134	15	< 2.7	< 0.9
Cs-137	18	< 2.7	< 1.2
Ba-La-140	15	< 6.8	< 3.2

^a Sampling required by the ODCM after the second half of 2008.

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Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium and gamma-emitting isotopes.
Collection: Quarterly
Units: pCi/L

Location 936 (Granular Fill Monitoring Well)					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 343	CAWW- 1939	CAWW- 4020	CAWW- 5992
Collection Date		01-10-08	04-14-08	07-17-08	10-08-08
H-3	2000	327 ± 108	1479 ± 132	213 ± 93	183 ± 86
Mn-54	15	< 2.2	< 2.7	< 2.2	< 1.8
Fe-59	30	< 4.7	< 5.8	< 4.3	< 10.0
Co-58	15	< 2.5	< 2.3	< 2.0	< 4.5
Co-60	15	< 1.5	< 2.7	< 1.7	< 2.3
Zn-65	30	< 4.7	< 3.9	< 2.0	< 3.0
Zr-Nb-95	15	< 5.0	< 3.4	< 2.7	< 4.9
Cs-134	15	< 2.0	< 3.0	< 1.7	< 3.0
Cs-137	18	< 1.9	< 2.0	< 2.2	< 1.5
Ba-La-140	15	< 17.1	< 3.2	< 5.9	< 12.1

Location 937A (Granular Fill Monitoring Well)					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 315	CAWW- 1941	CAWW- 4024	CAWW- 6003
Collection Date		01-11-08	04-14-08	07-17-08	10-17-08
H-3	2000	< 155	< 158	< 138	< 161
Mn-54	15	< 1.0	< 1.6	< 2.7	< 1.6
Fe-59	30	< 4.1	< 8.4	< 6.5	< 4.0
Co-58	15	< 1.2	< 3.3	< 1.4	< 1.9
Co-60	15	< 1.4	< 1.8	< 2.0	< 1.4
Zn-65	30	< 2.4	< 5.5	< 4.8	< 3.3
Zr-Nb-95	15	< 2.5	< 3.6	< 4.2	< 2.9
Cs-134	15	< 1.0	< 2.7	< 1.8	< 1.6
Cs-137	18	< 1.1	< 2.7	< 2.2	< 1.8
Ba-La-140	15	< 6.9	< 3.3	< 5.2	< 5.9

Location 937B (Granular Fill Monitoring Well)					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 340	CAWW- 1925	CAWW- 4018	CAWW- 5987
Collection Date		01-10-08	04-07-08	07-17-08	10-07-08
H-3	2000	388 ± 110	271 ± 91	255 ± 84	200 ± 90
Mn-54	15	< 1.2	< 1.9	< 1.5	< 1.0
Fe-59	30	< 2.8	< 1.6	< 3.6	< 3.3
Co-58	15	< 1.1	< 2.9	< 1.8	< 1.5
Co-60	15	< 1.1	< 1.4	< 1.3	< 1.2
Zn-65	30	< 2.3	< 2.4	< 3.3	< 2.3
Zr-Nb-95	15	< 2.7	< 4.1	< 2.1	< 2.2
Cs-134	15	< 0.9	< 2.2	< 1.7	< 0.9
Cs-137	18	< 0.9	< 3.3	< 1.7	< 1.2
Ba-La-140	15	< 6.4	< 5.5	< 4.8	< 7.3

CALLAWAY

Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium and gamma-emitting isotopes.
Collection: Quarterly
Units: pCi/L

Location 937C (Granular Fill Monitoring Well)					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 314	CAWW- 1940	CAWW- 4023	CAWW- 5996
Collection Date		01-10-08	04-14-08	07-17-08	10-08-08
H-3	2000	< 155	< 158	222 ± 93	< 154
Mn-54	15	< 1.3	< 2.7	< 1.1	< 1.8
Fe-59	30	< 4.4	< 5.0	< 3.1	< 7.2
Co-58	15	< 1.6	< 1.4	< 1.2	< 1.7
Co-60	15	< 1.2	< 2.9	< 1.5	< 2.2
Zn-65	30	< 2.4	< 3.8	< 2.8	< 3.8
Zr-Nb-95	15	< 2.4	< 3.9	< 2.2	< 4.0
Cs-134	15	< 1.4	< 3.5	< 1.6	< 2.3
Cs-137	18	< 1.3	< 3.6	< 1.3	< 2.2
Ba-La-140	15	< 6.8	< 4.3	< 3.4	< 9.8

Location 937D (Granular Fill Monitoring Well)					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 341	CAWW- 1926	CAWW- 4021	CAWW- 5991
Collection Date		01-10-08	04-09-08	07-17-08	10-08-08
H-3	2000	189 ± 103	< 158	148 ± 90	< 154
Mn-54	15	< 4.1	< 3.3	< 1.4	< 1.1
Fe-59	30	< 10.3	< 5.6	< 4.0	< 3.5
Co-58	15	< 3.7	< 2.9	< 1.3	< 1.3
Co-60	15	< 3.7	< 1.9	< 1.4	< 0.7
Zn-65	30	< 6.9	< 4.4	< 3.6	< 2.2
Zr-Nb-95	15	< 6.2	< 2.5	< 2.8	< 1.5
Cs-134	15	< 3.2	< 2.8	< 1.7	< 1.0
Cs-137	18	< 3.0	< 2.5	< 1.0	< 0.8
Ba-La-140	15	< 15.7	< 3.4	< 3.5	< 3.4

Location 937E (Granular Fill Monitoring Well)					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 342	CAWW- 1917	CAWW- 4043	ND ^a
Collection Date		01-10-08	04-07-08	07-30-08	
H-3	2000	342 ± 108	281 ± 91	193 ± 86	
Mn-54	15	< 1.7	< 3.1	< 1.6	
Fe-59	30	< 3.9	< 5.8	< 4.3	
Co-58	15	< 1.6	< 1.5	< 2.6	
Co-60	15	< 0.9	< 2.4	< 3.0	
Zn-65	30	< 3.0	< 4.0	< 5.1	
Zr-Nb-95	15	< 3.2	< 4.7	< 2.7	
Cs-134	15	< 1.6	< 3.6	< 2.4	
Cs-137	18	< 1.7	< 1.5	< 2.7	
Ba-La-140	15	< 11.3	< 4.7	< 4.0	

^a ND, No data, access to the well was blocked during excavation, Out of service.

CALLAWAY

Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium and gamma-emitting isotopes.

Collection: Quarterly
Units: pCi/L

937F (Granular Fill Monitoring Well)					
Location					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 339	CAWW- 1924	CAWW- 4017	CAWW- 5986
Collection Date		01-10-08	04-07-08	07-17-08	10-07-08
H-3	2000	205 ± 104	< 158	297 ± 86	< 161
Mn-54	15	< 1.2	< 3.0	< 2.4	< 2.5
Fe-59	30	< 2.3	< 8.0	< 3.9	< 5.6
Co-58	15	< 1.0	< 3.4	< 1.8	< 2.8
Co-60	15	< 1.4	< 2.6	< 2.2	< 2.6
Zn-65	30	< 1.8	< 3.8	< 3.9	< 4.1
Zr-Nb-95	15	< 2.5	< 4.5	< 3.5	< 2.5
Cs-134	15	< 0.9	< 2.9	< 2.4	< 2.2
Cs-137	18	< 1.1	< 3.7	< 2.8	< 2.2
Ba-La-140	15	< 7.0	< 3.1	< 4.7	< 5.6

GWS (Groundwater Sump)					
Location					
Quarter	Required	1st Qtr	2nd Qtr.	3rd Qtr.	4th Qtr.
Lab Code	LLD	CAWW- 313	CAWW- 1938	CAWW- 4019	CAWW- 5994
Collection Date		01-10-08	04-14-08	07-17-08	10-08-08
H-3	2000	< 155	< 158	163 ± 96	< 161
Mn-54	15	< 1.1	< 2.0	< 1.8	< 0.9
Fe-59	30	< 3.8	< 7.3	< 5.3	< 2.6
Co-58	15	< 2.4	< 3.4	< 1.5	< 1.4
Co-60	15	< 1.7	< 2.2	< 1.6	< 1.4
Zn-65	30	< 3.3	< 4.0	< 3.9	< 1.8
Zr-Nb-95	15	< 3.2	< 2.6	< 2.5	< 1.4
Cs-134	15	< 1.5	< 2.6	< 1.4	< 1.2
Cs-137	18	< 1.3	< 1.5	< 2.1	< 1.3
Ba-La-140	15	< 7.6	< 3.2	< 5.2	< 7.4

CALLAWAY

Table 8. Wells and Ponds, (non-potable), analysis for tritium and gamma-emitting isotopes.

Collection: Quarterly
Units: pCi/L

Location		MW-004			
Lab Code	Required	CAWW- 317	CAWW- 1928	CAWW- 4014	CAWW- 6000
Collection Date	LLD	01-11-08	04-09-08	07-15-08	10-13-08
H-3	2000	< 155	< 158	< 148	< 161
Mn-54	15	< 1.6	< 3.0	< 2.0	< 2.0
Fe-59	30	< 4.8	< 4.7	< 2.2	< 5.8
Co-58	15	< 2.5	< 3.1	< 2.2	< 2.2
Co-60	15	< 1.7	< 1.9	< 1.4	< 2.3
Zn-65	30	< 2.7	< 2.7	< 3.5	< 3.0
Zr-Nb-95	15	< 4.6	< 4.3	< 2.1	< 3.9
Cs-134	15	< 2.2	< 3.7	< 1.9	< 1.9
Cs-137	18	< 1.6	< 3.5	< 2.2	< 2.7
Ba-La-140	15	< 14.8	< 9.4	< 4.3	< 4.2

Location		MW-005			
Lab Code	Required	CAWW- 318	CAWW- 1929	CAWW- 4015	CAWW- 6001
Collection Date	LLD	01-11-08	04-09-08	07-15-08	10-13-08
H-3	2000	< 155	< 158	< 148	< 161
Mn-54	15	< 0.9	< 1.8	< 2.1	< 1.1
Fe-59	30	< 4.9	< 5.2	< 5.5	< 2.3
Co-58	15	< 1.9	< 1.9	< 2.2	< 1.1
Co-60	15	< 1.3	< 2.1	< 2.5	< 1.0
Zn-65	30	< 2.6	< 1.4	< 2.8	< 2.2
Zr-Nb-95	15	< 2.3	< 4.0	< 2.7	< 1.3
Cs-134	15	< 1.2	< 2.6	< 2.7	< 1.1
Cs-137	18	< 1.2	< 2.8	< 2.2	< 1.2
Ba-La-140	15	< 11.4	< 4.9	< 6.0	< 5.4

Location		MW-006			
Lab Code	Required	CAWW- 332	CAWW- 1936	CAWW- 4011	CAWW- 6004
Collection Date	LLD	01-07-08	04-11-08	07-15-08	10-17-08
H-3	2000	< 155	< 158	< 148	< 161
Mn-54	15	< 1.9	< 2.3	< 1.5	< 1.5
Fe-59	30	< 5.0	< 4.7	< 2.6	< 4.8
Co-58	15	< 2.3	< 1.8	< 1.7	< 2.1
Co-60	15	< 1.8	< 1.9	< 2.0	< 1.7
Zn-65	30	< 2.1	< 3.5	< 3.8	< 3.3
Zr-Nb-95	15	< 4.0	< 3.5	< 2.5	< 2.2
Cs-134	15	< 1.8	< 2.3	< 1.3	< 1.3
Cs-137	18	< 2.1	< 2.1	< 1.6	< 1.6
Ba-La-140	15	< 11.8	< 6.8	< 4.1	< 6.1

CALLAWAY

Table 8. Wells and Ponds, (non-potable), analysis for tritium and gamma-emitting isotopes.

Collection: Monthly
Units: pCi/L

Location		MW-007			
Lab Code	Required	CAWW- 329	CAWW- 628	CAWW- 1044	CAWW- 1937
Collection Date	LLD	01-07-08	02-13-08	03-13-08	04-11-08
H-3	2000	< 155	< 180	< 150	< 158
Mn-54	15	< 1.8	< 5.1	ND ^a	< 2.7
Fe-59	30	< 5.4	< 8.5	-	< 8.1
Co-58	15	< 2.5	< 4.2	-	< 3.4
Co-60	15	< 2.6	< 2.7	-	< 1.9
Zn-65	30	< 3.9	< 4.5	-	< 2.6
Zr-Nb-95	15	< 4.1	< 5.2	-	< 3.4
Cs-134	15	< 3.0	< 4.4	-	< 3.0
Cs-137	18	< 1.7	< 2.5	-	< 3.5
Ba-La-140	15	< 5.5	< 3.7	-	< 3.7

Location					
Lab Code	Required	CAWW- 2429	CAWW- 3013	CAWW- 4012	CAWW- 4399
Collection Date	LLD	05-12-08	06-09-08	07-15-08	08-06-08
H-3	2000	< 146	< 167	< 148	< 147
Mn-54	15	ND ^a	< 2.2	< 1.5	< 1.6
Fe-59	30	-	< 7.4	< 4.6	< 6.0
Co-58	15	-	< 2.7	< 2.3	< 2.4
Co-60	15	-	< 2.5	< 2.3	< 2.0
Zn-65	30	-	< 4.7	< 3.2	< 3.3
Zr-Nb-95	15	-	< 3.9	< 2.3	< 3.7
Cs-134	15	-	< 2.6	< 1.8	< 2.2
Cs-137	18	-	< 2.8	< 1.5	< 2.8
Ba-La-140	15	-	< 6.6	< 5.4	< 4.0

Location					
Lab Code	Required	CAWW- 5049	CAWW- 6005	CAWW- 6698	CAWW- 7093
Collection Date	LLD	09-10-08	10-17-08	11-18-08	12-12-08
H-3	2000	< 153	< 154	< 139	< 167
Mn-54	15	< 2.1	< 1.0	< 2.4	< 2.2
Fe-59	30	< 5.5	< 2.4	< 4.0	< 6.2
Co-58	15	< 2.7	< 0.9	< 2.1	< 2.4
Co-60	15	< 2.0	< 1.3	< 2.4	< 1.9
Zn-65	30	< 3.1	< 2.6	< 4.9	< 3.3
Zr-Nb-95	15	< 3.6	< 2.3	< 2.8	< 3.6
Cs-134	15	< 2.4	< 1.0	< 2.9	< 1.8
Cs-137	18	< 2.5	< 1.2	< 3.4	< 1.7
Ba-La-140	15	< 7.9	< 5.4	< 6.4	< 3.1

^a Analysis for gamma-emitters was not required by the ODCM until the second half of 2008.

CALLAWAY

Table 8. Wells and Ponds, (non-potable), analysis for tritium and gamma-emitting isotopes.

Collection: Monthly
Units: pCi/L

Location		MW-008			
Lab Code	Required	CAWW- 330	CAWW- 629	CAWW- 1045	CAWW- 1933
Collection Date	LLD	01-07-08	02-13-08	03-13-08	04-11-08
H-3	2000	< 155	< 180	< 150	< 158
Mn-54	15	< 2.0	< 2.0	ND ^a	< 3.1
Fe-59	30	< 5.1	< 4.4	-	< 6.2
Co-58	15	< 2.1	< 2.6	-	< 2.2
Co-60	15	< 1.2	< 3.7	-	< 2.1
Zn-65	30	< 3.7	< 5.0	-	< 2.4
Zr-Nb-95	15	< 2.9	< 5.9	-	< 3.4
Cs-134	15	< 2.2	< 3.3	-	< 2.7
Cs-137	18	< 1.9	< 2.5	-	< 2.9
Ba-La-140	15	< 12.4	< 3.9	-	< 5.8

Lab Code	Required	CAWW- 2430	CAWW- 3015	CAWW- 4013	CAWW- 4400
Collection Date	LLD	05-12-08	06-09-08	07-15-08	08-06-08
H-3	2000	< 146	< 167	< 148	< 147
Mn-54	15	ND ^a	< 2.8	< 2.5	< 2.1
Fe-59	30	-	< 5.2	< 7.0	< 2.9
Co-58	15	-	< 2.9	< 2.2	< 2.2
Co-60	15	-	< 1.8	< 2.0	< 2.2
Zn-65	30	-	< 4.4	< 4.0	< 3.5
Zr-Nb-95	15	-	< 4.2	< 2.5	< 3.2
Cs-134	15	-	< 2.3	< 2.8	< 2.8
Cs-137	18	-	< 2.6	< 3.4	< 1.7
Ba-La-140	15	-	< 3.3	< 5.8	< 7.7

Lab Code	Required	CAWW- 5050	CAWW- 6006	CAWW- 6699	CAWW- 7094
Collection Date	LLD	09-10-08	10-17-08	11-18-08	12-12-08
H-3	2000	< 153	< 161	< 139	< 167
Mn-54	15	< 2.1	< 1.3	< 2.5	< 1.8
Fe-59	30	< 6.7	< 3.1	< 5.5	< 7.7
Co-58	15	< 2.3	< 1.3	< 1.7	< 2.3
Co-60	15	< 1.8	< 0.7	< 1.8	< 2.3
Zn-65	30	< 5.9	< 2.2	< 4.5	< 2.5
Zr-Nb-95	15	< 4.0	< 2.2	< 3.0	< 2.7
Cs-134	15	< 2.3	< 1.2	< 3.0	< 2.5
Cs-137	18	< 2.0	< 1.1	< 2.5	< 2.3
Ba-La-140	15	< 4.5	< 3.2	< 10.4	< 9.6

^a Analysis for gamma-emitters was not required by the ODCM until the second half of 2008.

CALLAWAY

Table 8. Wells and Ponds, (non-potable), analysis for tritium and gamma-emitting isotopes.

Collection: Quarterly
Units: pCi/L

Location		MW-012			
Lab Code	Required	CAWW- 331	CAWW- 1934	CAWW- 4010	CAWW- 6008
Collection Date	LLD	01-07-08	04-11-08	07-15-08	10-21-08
H-3	2000	< 155	< 158	< 148	< 161
Mn-54	15	< 1.4	< 2.5	< 1.8	< 0.8
Fe-59	30	< 6.8	< 5.2	< 2.8	< 4.1
Co-58	15	< 2.6	< 4.1	< 1.6	< 1.2
Co-60	15	< 2.1	< 3.2	< 1.2	< 1.5
Zn-65	30	< 4.4	< 4.0	< 2.9	< 2.7
Zr-Nb-95	15	< 5.3	< 4.3	< 2.6	< 2.6
Cs-134	15	< 2.3	< 3.0	< 1.3	< 1.4
Cs-137	18	< 2.6	< 3.1	< 1.9	< 1.5
Ba-La-140	15	< 13.7	< 4.8	< 4.3	< 2.6

CALLAWAY

Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium.
Collection: Quarterly Units: pCi/L

MW-001 (Outside OCA)					
Location					
Lab Code	Required	CAWW- 319	CAWW- 1932	CAWW- 4044	CAWW- 5365
Collection Date	LLD	01-11-08	04-09-08	07-30-08	10-01-08
H-3	2000	< 175	< 151	< 147	< 149
MW-002 (Outside OCA)					
Location					
Lab Code	Required	CAWW- 345	CAWW- 1948	CAWW- 4041	CAWW- 5999
Collection Date	LLD	01-21-08	04-23-08	07-24-08	10-13-08
H-3	2000	< 158	< 150	< 145	< 154
MW-003 (Outside OCA)					
Location					
Lab Code	Required	CAWW- 344	CAWW- 1952	CAWW- 4038	CAWW- 5371
Collection Date	LLD	01-21-08	04-23-08	07-23-08	10-02-08
H-3	2000	< 158	< 158	< 145	< 157
MW-009 (Pipeline)					
Location					
Lab Code	Required	CAWW- 322	CAWW- 1945	ND ^a	CAWW- 6002
Collection Date	LLD	01-14-08	04-14-08		10-13-08
H-3	2000	< 155	< 150		< 154
MW-010 (Pipeline)					
Location					
Lab Code	Required	CAWW- 323	CAWW- 1944	CAWW- 4039	CAWW- 5370
Collection Date	LLD	01-14-08	04-14-08	07-23-08	10-02-08
H-3	2000	< 175	< 150	< 145	< 157
MW-011 (Pipeline)					
Location					
Lab Code	Required	ND ^b	CAWW- 1949	CAWW- 4042	CAWW- 5369
Collection Date	LLD		04-23-08	07-25-08	10-02-08
H-3	2000		< 150	< 145	< 149
MW-013 (Pipeline)					
Location					
Lab Code	Required	CAWW- 327	CAWW- 1950	CAWW- 4036	CAWW- 5368
Collection Date	LLD	01-15-08	04-23-08	07-21-08	10-02-08
H-3	2000	< 175	< 158	< 137	< 149
MW-014 (Pipeline)					
Location					
Lab Code	Required	CAWW- 324	CAWW- 1931	CAWW- 4035	CAWW- 5366
Collection Date	LLD	01-15-08	04-09-08	07-21-08	10-02-08
H-3	2000	< 175	167 ± 83	266 ± 85	168 ± 86

^a ND, No data, the well was damaged during excavation activity.

^b ND, not required by the ODCM during the 1st and 2nd quarters, 2008.

CALLAWAY

Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium.

Collection: Quarterly

Units:

pCi/L

MW-015 (Pipeline)					
Location					
Lab Code	Required	CAWW- 326	CAWW- 1930	CAWW- 4029	CAWW- 5362
Collection Date	LLD	01-15-08	04-09-08	07-18-08	10-01-08
H-3	2000	207 ± 101	182 ± 83	278 ± 95	< 149
MW-016 (Pipeline)					
Location					
Lab Code	Required	CAWW- 348	CAWW- 1927	CAWW- 4028	CAWW- 5361
Collection Date	LLD	01-11-08	04-09-08	07-18-08	10-01-08
H-3	2000	< 158	< 151	< 138	< 149
MW-501 (Landfill)					
Location					
Lab Code	Required	CAWW- 632	CAWW- 2432	CAWW- 4402	CAWW- 6686
Collection Date	LLD	02-19-08	05-14-08	08-12-08	11-13-08
H-3	2000	< 151	< 146	< 147	< 139
MW-502 (Landfill)					
Location					
Lab Code	Required	CAWW- 633	CAWW- 2433	CAWW- 4403	CAWW- 6685
Collection Date	LLD	02-19-08	05-13-08	08-12-08	11-13-08
H-3	2000	< 151	< 146	< 147	< 139
MW-2					
Location					
Lab Code	Required	CAWW- 321	CAWW- 1946	CAWW- 4037	CAWW- 5984
Collection Date	LLD	01-14-08	04-15-08	07-23-08	10-03-08
H-3	2000	< 175	< 150	< 145	< 152
M-7					
Location					
Lab Code	Required	CAWW- 347	CAWW- 1943	CAWW- 4040	CAWW- 5367
Collection Date	LLD	01-21-08	04-14-08	07-24-08	10-02-08
H-3	2000	< 158	< 150	< 145	< 149

CALLAWAY

Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium.

Collection: Quarterly

Units:

pCi/L

Location		UHS Pond			
Lab Code	Required	CAWW- 334	CAWW- 1919	CAWW- 4022	CAWW- 5988
Collection Date	LLD	01-09-08	04-07-08	07-17-08	10-07-08
H-3	2000	245 ± 105	< 151	166 ± 91	< 154
Location		OW-1 (UHS Pond)			
Lab Code	Required	CAWW- 337	CAWW- 1923	CAWW- 4030	CAWW- 5995
Collection Date	LLD	01-09-08	04-07-08	07-21-08	10-08-08
H-3	2000	197 ± 92	< 151	269 ± 95	177 ± 88
Location		OW-2 (UHS Pond)			
Lab Code	Required	CAWW- 338	CAWW- 1922	CAWW- 4034	CAWW- 5997
Collection Date	LLD	01-09-08	04-07-08	07-21-08	10-09-08
H-3	2000	345 ± 108	188 ± 84	209 ± 82	173 ± 88
Location		OW-3 (UHS Pond)			
Lab Code	Required	CAWW- 335	CAWW- 1921	CAWW- 4033	CAWW- 5990
Collection Date	LLD	01-09-08	04-07-08	07-21-08	10-07-08
H-3	2000	< 158	< 151	< 145	< 152
Location		OW-4 (UHS Pond)			
Lab Code	Required	CAWW- 336	CAWW- 1918	CAWW- 4032	CAWW- 5998
Collection Date	LLD	01-09-08	04-07-08	07-21-08	10-09-08
H-3	2000	203 ± 92	349 ± 91	255 ± 94	316 ± 92
Location		OW-5(UHS Pond)			
Lab Code	Required	CAWW- 333	CAWW- 1920	CAWW- 4031	CAWW- 6007
Collection Date	LLD	01-09-08	04-07-08	07-21-08	10-09-08
H-3	2000	421 ± 101	385 ± 92	421 ± 100	476 ± 99
Location		Unit 2 Pond			
Lab Code	Required	CAWW- 316	CAWW- 1942	CAWW- 4016	CAWW- 5989
Collection Date	LLD	01-11-08	04-14-08	07-15-08	10-09-08
H-3	2000	194 ± 91	< 150	214 ± 88	178 ± 93
Location		CTBD (Cooling Tower Blowdown)			
Lab Code	Required	CAWW- 52	CAWW- 1546	CAWW- 3331	CAWW- 5423
Collection Date	LLD	01-02-08	04-02-08	07-02-08	10-01-08
H-3	2000	298 ± 103	< 151	< 171	< 145

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Table 8. Wells and Ponds, (Non Drinking Water Wells, analysis for tritium.

Collection: Semiannual ^a		Units: pCi/L
Location POND 01		
Lab Code	Required	CAWW- 4533
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location POND 02		
Lab Code	Required	CAWW- 4534
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Sludge Lagoon #4		
Lab Code	Required	CAWW- 4541
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Outfall 010		
Lab Code	Required	CAWW- 4535
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Outfall 011		
Lab Code	Required	CAWW- 4536
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Outfall 012		
Lab Code	Required	CAWW- 4537
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Outfall 013		
Lab Code	Required	CAWW- 4538
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Outfall 014		
Lab Code	Required	CAWW- 4539
Collection Date	LLD	08-25-08
H-3	2000	< 146
Location Outfall 015		
Lab Code	Required	CAWW- 4540
Collection Date	LLD	08-25-08
H-3	2000	< 146

^a Sampling required by the ODCM after the second half of 2008.

CALLAWAY

Table 9. Bottom sediments, analysis for gamma-emitting isotopes.

Collection: Semiannually

Units: pCi/kg dry

Location		CA-AQS-A	
Lab Code	Req. LLD	CABS- 4093	CABS- 6534
Date Collected	-	07-23-08	11-03-08
K-40	-	12961 ± 629	11892 ± 552
Mn-54	-	< 24.5	< 16.1
Fe-59	-	< 36.6	< 30.4
Co-58	-	< 23.6	< 16.2
Co-60	-	< 15.2	< 16.1
Zr-Nb-95	-	< 33.6	< 32.1
Cs-134	150	< 17.4	< 10.3
Cs-137	180	43 ± 23.4	< 18.3
Ba-La-140	-	< 31.1	< 68.4

Location		CA-AQS-C	
Lab Code	Req. LLD	CABS- 4095	CABS- 6535
Date Collected	-	07-23-08	11-03-08
K-40	-	13913 ± 646	12638 ± 593
Mn-54	-	< 22.3	< 20.3
Fe-59	-	< 46.7	< 30.9
Co-58	-	< 17.2	< 18.0
Co-60	-	< 14.0	< 14.9
Zr-Nb-95	-	< 26.4	< 30.4
Cs-134	150	< 11.4	< 8.8
Cs-137	180	< 20.5	< 16.6
Ba-La-140	-	< 52.2	< 78.3

CALLAWAY

Table 10. Shoreline sediments, analyses for gamma-emitting isotopes.

Collection: Semiannually

Units: pCi/kg dry

Location		CA-AQS-A	
Lab Code	Req. LLD	CASS- 4094	CASS- 6536
Date Collected	-	07-23-08	11-03-08
K-40	-	13853 ± 693	13513 ± 681
Mn-54	-	< 22.4	< 21.6
Fe-59	-	< 39.9	< 32.1
Co-58	-	< 27.6	< 28.2
Co-60	-	< 9.7	< 15.7
Zr-Nb-95	-	< 23.8	< 29.8
Cs-134	150	< 16.7	< 16.9
Cs-137	180	< 24.8	40.9 ± 18.5
Ba-La-140	-	< 30.5	< 78.9

Location		CA-AQS-C	
Lab Code	Req. LLD	CASS- 4096	CASS- 6537
Date Collected	-	07-23-08	11-03-08
K-40	-	13081 ± 582	12660 ± 628
Mn-54	-	< 18.3	< 24.4
Fe-59	-	< 42.6	< 61.0
Co-58	-	< 15.9	< 17.3
Co-60	-	< 5.6	< 14.5
Zr-Nb-95	-	< 28.4	< 17.1
Cs-134	150	< 9.4	< 17.6
Cs-137	180	< 13.5	< 15.4
Ba-La-140	-	< 32.4	< 90.0

CALLAWAY

Table 11. Fish, analyses for gamma-emitting isotopes.

Collection: Semiannually

Units: pCi/kg wet

Location		CA-AQF-A				
Lab Code	Req. LLD	CAF- 4083	CAF- 4084	CAF- 4085	CAF- 4086	CAF- 6523
Date Collected		07-23-08	07-23-08	07-23-08	07-23-08	11-03-08
Sample Type		Ch. Catfish	Carp	Silver Carp	Carp sucker	Drum
K-40	-	3157 ± 371	2535 ± 328	2767 ± 483	2980 ± 352	2453 ± 337
Mn-54	130	< 8.8	< 12.0	< 15.7	< 16.2	< 12.8
Fe-59	260	< 25.6	< 35.7	< 71.4	< 41.6	< 26.5
Co-58	130	< 10.8	< 9.1	< 23.1	< 15.4	< 9.5
Co-60	130	< 10.2	< 12.4	< 15.6	< 8.5	< 10.8
Zn-65	260	< 10.4	< 10.8	< 39.4	< 22.4	< 11.0
Cs-134	130	< 6.5	< 13.5	< 15.9	< 14.7	< 8.5
Cs-137	150	< 9.0	< 8.6	< 15.5	< 16.2	< 7.0
Lab Code	Req. LLD	CAF- 6524	CAF- 6525	CAF- 6526	CAF- 6527	
Date Collected		11-03-08	11-03-08	11-03-08	11-03-08	
Sample Type		Carp sucker	Carp	Ch. Catfish	Buffalo	
K-40	-	2617 ± 324	2818 ± 338	2536 ± 333	2591 ± 433	
Mn-54	130	< 11.7	< 10.9	< 8.1	< 15.8	
Fe-59	260	< 28.4	< 29.3	< 27.1	< 46.6	
Co-58	130	< 7.3	< 10.0	< 7.3	< 11.9	
Co-60	130	< 12.7	< 9.9	< 12.0	< 17.5	
Zn-65	260	< 23.4	< 10.7	< 24.9	< 35.6	
Cs-134	130	< 6.5	< 5.5	< 12.8	< 16.0	
Cs-137	150	< 11.7	< 7.3	< 14.3	< 10.5	

CALLAWAY

Table 11. Fish, analyses for gamma-emitting isotopes.
Collection: Semiannually
Units: pCi/kg wet

Location		CA-AQF-C				
Lab Code	Req. LLD	CAF- 4087	CAF- 4088	CAF- 4089	CAF- 4091	CAF- 4092
Date Collected		07-23-08	07-23-08	07-23-08	07-23-08	07-23-08
Sample Type		Ch. Catfish	Carp	Silver Carp	Carp sucker	Drum
K-40	-	3092 ± 465	2865 ± 379	2878 ± 367	2940 ± 388	3206 ± 417
Mn-54	130	< 10.8	< 11.2	< 9.9	< 7.7	< 18.0
Fe-59	260	< 48.9	< 30.0	< 33.0	< 37.0	< 46.0
Co-58	130	< 26.0	< 9.0	< 7.6	< 8.8	< 10.1
Co-60	130	< 20.3	< 17.4	< 13.6	< 9.5	< 14.2
Zn-65	260	< 60.5	< 16.6	< 22.3	< 24.4	< 33.7
Cs-134	130	< 18.3	< 13.0	< 6.4	< 10.1	< 15.7
Cs-137	150	< 9.7	< 14.6	< 8.9	< 10.5	< 11.9

Lab Code	Req. LLD	CAF- 6529	CAF- 6530	CAF- 6531	CAF- 6532	CAF- 6533
Date Collected		11-03-08	11-03-08	11-03-08	11-03-08	11-03-08
Sample Type		Drum	Carp sucker	Carp	Ch. Catfish	Buffalo
K-40	-	2644 ± 498	2769 ± 343	2660 ± 334	2852 ± 450	2761 ± 462
Mn-54	130	< 20.0	< 12.0	< 6.4	< 15.5	< 11.2
Fe-59	260	< 58.4	< 33.0	< 39.8	< 77.7	< 44.4
Co-58	130	< 23.6	< 8.3	< 14.9	< 25.2	< 24.1
Co-60	130	< 14.9	< 14.5	< 13.4	< 16.2	< 19.8
Zn-65	260	< 48.4	< 20.3	< 19.6	< 22.5	< 29.9
Cs-134	130	< 19.8	< 9.8	< 9.0	< 13.5	< 9.7
Cs-137	150	< 19.5	< 12.4	< 10.6	< 18.7	< 22.3

Table 12. Direct Radiation (quarterly exposure)

Location	Gamma Dose (mrem/90 days)			
	QTR 1	QTR 2	QTR 3	QTR 4
CA-IDM-1A	17.71	16.04	16.49	16.43
CA-IDM-3	19.02	17.10	17.26	17.50
CA-IDM-5	16.79	14.95	15.17	15.28
CA-IDM-6	18.37	16.94	15.33	17.03
CA-IDM-7	18.23	15.71	15.85	16.59
CA-IDM-9	16.09	15.17	14.96	15.51
CA-IDM-10	19.04	17.49	16.19	16.90
CA-IDM-11A	18.13	17.64	16.99	17.38
CA-IDM-14	17.84	16.67	14.65	16.42
CA-IDM-17	18.27	16.47	15.47	17.22
CA-IDM-18A	18.85	16.50	16.52	16.38
CA-IDM-20	18.73	17.10	16.07	17.46
CA-IDM-21	18.80	15.97	15.15	16.24
CA-IDM-22A	17.73	16.12	16.21	15.93
CA-IDM-23	18.71	17.03	17.16	16.97
CA-IDM-26 (C)	12.86	11.99	11.00	11.37
CA-IDM-27 (C)	19.98	17.74	17.03	17.81
CA-IDM-30A	16.83	15.64	15.27	15.88
CA-IDM-31A	17.70	16.89	16.71	16.62
CA-IDM-32	18.62	16.09	15.97	16.72
CA-IDM-32A	18.70	16.99	16.71	17.05
CA-IDM-33	16.87	16.98	16.73	15.77
CA-IDM-34	16.67	15.86	15.57	14.74
CA-IDM-35	16.55	14.81	14.93	15.08
CA-IDM-36	17.70	16.50	15.24	15.45
CA-IDM-37	17.35	16.49	15.67	16.06
CA-IDM-38	13.40	10.97	11.24	11.48
CA-IDM-39	19.02	15.93	15.37	15.84
CA-IDM-39A	17.19	16.63	16.54	16.70
CA-IDM-40	19.23	18.86	16.67	16.75
CA-IDM-41	17.49	15.52	16.49	15.83
CA-IDM-42	15.11	14.60	13.51	14.04
CA-IDM-43	18.66	16.56	15.26	16.60
CA-IDM-44	18.53	17.22	15.53	16.25
CA-IDM-45	17.14	14.85	Missing ^a	15.21
CA-IDM-46	19.06	16.79	16.31	16.41
CA-IDM-47	17.22	16.06	15.47	15.60
CA-IDM-48	18.47	16.65	16.54	16.87
CA-IDM-49	17.45	15.79	Missing ^a	16.00
CA-IDM-50	17.80	16.77	15.86	16.54
CA-IDM-51A	18.33	17.93	17.32	17.29
CA-IDM-52	17.94	17.58	16.82	16.93
CA-IDM-60	17.66	17.08	16.10	16.49

^a TLD and holder missing from assigned location.

Appendix C

Supplemental Analyses

Supplemental Samples

In 2006, the Nuclear Energy Institute (NEI), with the support of every nuclear utility in the United States, announced a voluntary nationwide Groundwater Protection Initiative.

From 2006 to 2008, a large number of supplemental samples were taken in response to the NEI Groundwater Protection Initiative.

Samples were taken from:

- Water from the cooling tower blowdown
- Water from onsite and offsite groundwater monitoring wells
- Water from nearby property owners who rely on well water for their drinking water supply

The permanent REMP program has been expanded to include the majority of these former supplemental sites. The locations were added to the ODCM in the second half of 2008. Supplemental samples in this Appendix include additional testing of the REMP sites not required by the ODCM and not detailed in Part I.

Previous sampling revealed some areas of low level contamination. All contamination has been confined to Ameren property, and there has been no contamination of the local drinking water supply.

Appendix C

Supplemental Analyses

	Introduction.....	i
C-1	Ground and surface water, analysis for tritium and gamma-emitting isotopes.....	C-1
C-2	Ground and surface water, analysis gross alpha, strontium-89 and strontium-90	C-5
C-3	Soil, analysis for tritium and gamma-emitting isotopes	C-6

C-1, Wells and Ponds (non-potable), analyses for tritium and gamma-emitting isotopes.

Location	Collection Date	Concentration (pCi/L)								
		H-3	Mn-54	Fe-59	Co-58	Co-60	Zr-Nb-95	Cs-134	Cs-137	La-140
936	5/28/2008	265 ± 93	< 2.5	< 2.6	< 2.0	< 2.7	< 2.7	< 2.7	< 3.7	< 2.8
936	6/16/2008	481 ± 103	< 3.6	< 6.1	< 3.2	< 3.2	< 4.6	< 2.9	< 4.3	< 3.1
936	8/8/2008	667 ± 100	< 2.1	< 3.1	< 1.4	< 1.6	< 2.6	< 2.5	< 2.6	< 4.1
936	9/12/2008	198 ± 84	< 2.4	< 4.4	< 2.3	< 1.7	< 3.5	< 2.0	< 1.9	< 4.9
936	11/17/2008	553 ± 95	< 3.7	< 4.6	< 4.1	< 3.3	< 6.4	< 3.4	< 5.4	< 9.3
936	12/12/2008	273 ± 114	< 2.1	< 4.8	< 3.1	< 2.1	< 2.5	< 2.1	< 2.5	< 4.7
937A	5/28/2008	< 149	< 3.7	< 4.8	< 1.7	< 2.4	< 4.7	< 4.1	< 3.9	< 1.3
937A	6/16/2008	< 167	< 2.8	< 6.8	< 2.0	< 2.9	< 3.6	< 2.5	< 2.6	< 3.2
937A	8/11/2008	< 147	< 1.9	< 4.1	< 2.5	< 2.6	< 3.4	< 2.2	< 3.2	< 4.2
937A	9/12/2008	< 153	< 4.1	< 4.0	< 4.0	< 3.6	< 2.6	< 3.1	< 2.2	< 6.5
937A	11/21/2008	< 139	< 1.8	< 4.8	< 2.0	< 2.9	< 4.0	< 2.2	< 2.6	< 4.6
937A	12/12/2008	< 167	< 1.0	< 5.7	< 2.7	< 1.9	< 3.3	< 1.9	< 2.8	< 4.1
937B	5/28/2008	325 ± 89	< 2.9	< 5.3	< 2.7	< 1.7	< 3.0	< 2.5	< 3.0	< 2.8
937B	6/16/2008	193 ± 92	< 5.2	< 5.8	< 2.9	< 3.5	< 6.7	< 4.4	< 3.6	< 7.4
937B	8/8/2008	297 ± 85	< 1.8	< 6.8	< 2.9	< 3.0	< 4.3	< 3.0	< 2.6	< 5.0
937B	9/12/2008	202 ± 84	< 2.6	< 5.7	< 2.6	< 3.1	< 4.9	< 2.5	< 3.3	< 7.3
937B	11/14/2008	225 ± 81	< 2.3	< 5.0	< 3.0	< 2.2	< 3.5	< 2.1	< 2.3	< 7.9
937B	12/11/2008	204 ± 112	< 1.7	< 7.0	< 2.9	< 2.3	< 4.5	< 2.4	< 1.9	< 3.5
937C	5/28/2008	< 154	< 3.9	< 5.0	< 2.2	< 3.0	< 3.4	< 4.0	< 3.8	< 2.8
937C	6/16/2008	216 ± 93	< 2.4	< 7.9	< 3.6	< 3.1	< 5.0	< 3.5	< 4.5	< 5.1
937C	8/11/2008	< 147	< 3.9	< 3.9	< 4.7	< 4.7	< 4.4	< 6.2	< 5.8	< 5.3
937C	9/12/2008	< 153	< 3.9	< 7.9	< 3.7	< 2.4	< 3.5	< 3.0	< 3.8	< 7.4
937C	11/17/2008	956 ± 110	< 1.2	< 6.3	< 1.7	< 2.7	< 5.1	< 3.0	< 3.8	< 5.3
937C	12/11/2008	206 ± 112	< 2.1	< 4.4	< 1.8	< 2.1	< 4.3	< 2.3	< 2.5	< 10.0
937D	5/28/2008	< 149	< 5.1	< 7.7	< 4.9	< 3.8	< 8.3	< 6.8	< 5.6	< 4.6
937D	6/16/2008	< 167	< 3.6	< 5.6	< 2.8	< 2.6	< 3.3	< 3.5	< 4.1	< 3.5
937D	8/8/2008	< 147	< 2.7	< 2.4	< 2.5	< 2.2	< 3.2	< 2.1	< 1.5	< 5.8
937D	9/12/2008	210 ± 84	< 1.4	< 4.8	< 2.4	< 2.1	< 3.6	< 1.9	< 2.1	< 5.0
937D	11/14/2008	177 ± 78	< 1.8	< 5.7	< 2.8	< 2.3	< 3.1	< 2.3	< 3.0	< 4.6
937D	12/11/2008	234 ± 113	< 2.6	< 4.8	< 2.6	< 2.0	< 4.6	< 2.0	< 1.6	< 9.8
937E	5/28/2008	331 ± 89	< 3.1	< 7.7	< 2.7	< 1.9	< 3.6	< 3.9	< 3.3	< 2.0
937E	6/16/2008	341 ± 98	< 2.6	< 6.0	< 3.0	< 2.8	< 2.1	< 4.1	< 2.9	< 4.0
937F	5/28/2008	< 149	< 2.4	< 2.0	< 2.2	< 1.9	< 2.7	< 2.5	< 3.1	< 1.7
937F	6/16/2008	183 ± 91	< 3.7	< 6.9	< 4.3	< 2.3	< 3.2	< 2.7	< 5.4	< 4.6
937F	8/8/2008	241 ± 82	< 3.5	< 5.3	< 1.6	< 2.8	< 2.3	< 3.1	< 3.3	< 7.2
937F	9/12/2008	179 ± 83	< 1.3	< 3.8	< 1.9	< 1.9	< 3.7	< 2.6	< 2.2	< 9.0
937F	11/14/2008	< 139	< 1.7	< 5.3	< 2.3	< 2.1	< 3.2	< 2.7	< 2.2	< 6.9
937F	12/11/2008	< 174	< 1.6	< 6.5	< 2.3	< 2.7	< 3.6	< 2.3	< 1.9	< 7.6
GWS	5/28/2008	194 ± 90	< 2.0	< 2.9	< 2.7	< 1.7	< 1.7	< 1.8	< 2.8	< 2.0
GWS	6/16/2008	1170 ± 127	< 3.1	< 4.1	< 3.0	< 2.0	< 2.6	< 3.0	< 2.6	< 5.1
GWS	8/11/2008	593 ± 111	< 3.0	< 3.3	< 2.1	< 1.8	< 3.3	< 2.0	< 3.6	< 4.1
GWS	9/12/2008	< 153	< 1.9	< 3.7	< 2.1	< 2.3	< 2.6	< 2.1	< 1.7	< 3.7
GWS	11/17/2008	< 139	< 3.1	< 5.9	< 2.8	< 1.7	< 3.0	< 2.8	< 3.0	< 3.4
GWS	12/11/2008	< 174	< 2.6	< 5.1	< 2.7	< 2.7	< 2.6	< 2.6	< 2.7	< 6.7

C-1, Wells and Ponds (non-potable), analyses for tritium and gamma-emitting isotopes.

Location	Collection Date	Concentration (pCi/L)								
		H-3	Mn-54	Fe-59	Co-58	Co-60	Zr-Nb-95	Cs-134	Cs-137	La-140
CTBD	1/9/2008	182 ± 87	-	-	-	-	-	-	-	-
CTBD	1/16/2008	< 182	-	-	-	-	-	-	-	-
CTBD	1/23/2008	< 182	-	-	-	-	-	-	-	-
CTBD	1/30/2008	< 174	-	-	-	-	-	-	-	-
CTBD	2/6/2008	< 153	-	-	-	-	-	-	-	-
CTBD	2/13/2008	< 177	-	-	-	-	-	-	-	-
CTBD	2/20/2008	< 177	-	-	-	-	-	-	-	-
CTBD	2/27/2008	< 156	-	-	-	-	-	-	-	-
CTBD	3/5/2008	< 177	-	-	-	-	-	-	-	-
CTBD	3/12/2008	< 175	-	-	-	-	-	-	-	-
CTBD	3/19/2008	< 152	-	-	-	-	-	-	-	-
CTBD	3/26/2008	< 180	-	-	-	-	-	-	-	-
CTBD	4/9/2008	< 162	-	-	-	-	-	-	-	-
CTBD	4/16/2008	< 150	-	-	-	-	-	-	-	-
CTBD	4/23/2008	< 158	-	-	-	-	-	-	-	-
CTBD	4/30/2008	< 154	-	-	-	-	-	-	-	-
CTBD	5/7/2008	< 143	-	-	-	-	-	-	-	-
CTBD	5/14/2008	< 146	-	-	-	-	-	-	-	-
CTBD	5/21/2008	< 151	-	-	-	-	-	-	-	-
CTBD	5/28/2008	< 170	-	-	-	-	-	-	-	-
CTBD	6/11/2008	< 173	-	-	-	-	-	-	-	-
CTBD	6/18/2008	< 169	-	-	-	-	-	-	-	-
CTBD	8/6/2008	< 147	-	-	-	-	-	-	-	-
MW-004	2/13/2008	< 180	< 2.6	< 3.7	< 2.8	< 2.9	< 3.8	< 3.5	< 3.8	< 3.4
MW-004	3/13/2008	< 150	-	-	-	-	-	-	-	-
MW-004	5/12/2008	< 146	-	-	-	-	-	-	-	-
MW-004	6/9/2008	< 167	< 2.9	< 6.1	< 3.5	< 1.7	< 5.2	< 2.9	< 4.0	< 6.4
MW-004	8/6/2008	< 147	< 2.6	< 5.0	< 2.8	< 2.3	< 3.1	< 2.5	< 3.3	< 3.8
MW-004	9/11/2008	< 153	< 2.7	< 4.8	< 2.2	< 2.3	< 3.5	< 2.6	< 2.9	< 5.8
MW-004	11/13/2008	< 161	< 2.3	< 3.9	< 2.1	< 2.3	< 2.7	< 2.5	< 2.2	< 10.1
MW-004	12/17/2008	< 167	< 3.0	< 6.1	< 1.6	< 2.9	< 4.1	< 3.0	< 2.7	< 5.4
MW-005	2/13/2008	< 152	< 1.8	< 4.3	< 2.8	< 2.7	< 2.7	< 2.6	< 2.9	< 1.9
MW-005	3/13/2008	< 150	-	-	-	-	-	-	-	-
MW-005	5/12/2008	< 146	-	-	-	-	-	-	-	-
MW-005	6/9/2008	< 167	< 2.1	< 3.6	< 2.8	< 2.2	< 4.0	< 1.8	< 2.3	< 4.1
MW-005	8/6/2008	< 147	< 3.3	< 5.5	< 2.8	< 2.9	< 3.6	< 2.8	< 3.5	< 6.1
MW-005	9/11/2008	< 153	< 1.2	< 3.0	< 2.0	< 1.7	< 2.7	< 2.0	< 1.8	< 3.8
MW-005	11/13/2008	< 139	< 1.8	< 4.3	< 3.0	< 1.6	< 4.0	< 2.4	< 2.5	< 5.8
MW-005	12/17/2008	< 167	< 3.3	< 5.2	< 2.3	< 2.1	< 3.5	< 2.3	< 2.4	< 3.1
MW-006	2/13/2008	< 180	< 4.1	< 5.1	< 5.2	< 4.7	< 3.8	< 5.0	< 3.2	< 2.8
MW-006	3/13/2008	< 150	-	-	-	-	-	-	-	-
MW-006	5/12/2008	< 146	-	-	-	-	-	-	-	-
MW-006	6/9/2008	< 167	< 1.7	< 6.3	< 2.6	< 2.5	< 2.9	< 2.9	< 2.9	< 2.5
MW-006	8/6/2008	< 147	< 2.7	< 7.2	< 2.7	< 2.4	< 4.8	< 2.4	< 2.9	< 7.5
MW-006	9/10/2008	< 153	< 2.6	< 5.0	< 1.8	< 1.9	< 4.2	< 2.1	< 2.8	< 6.1
MW-006	11/18/2008	< 139	< 2.7	< 7.6	< 2.6	< 1.6	< 3.9	< 2.7	< 2.0	< 10.9
MW-006	12/12/2008	< 167	< 2.3	< 4.9	< 2.3	< 1.6	< 3.0	< 2.3	< 2.1	< 5.4

C-1, Wells and Ponds (non-potable), analyses for tritium and gamma-emitting isotopes.

Location	Collection Date	Concentration (pCi/L)								
		H-3	Mn-54	Fe-59	Co-58	Co-60	Zr-Nb-95	Cs-134	Cs-137	La-140
MW-012	2/13/2008	< 180	< 4.0	< 10.9	< 3.8	< 3.0	< 4.7	< 5.0	< 2.7	< 5.8
MW-012	3/13/2008	< 150	-	-	-	-	-	-	-	-
MW-012	5/13/2008	< 146	-	-	-	-	-	-	-	-
MW-012	6/11/2008	< 167	< 2.2	< 4.7	< 1.2	< 2.3	< 3.1	< 3.0	< 2.9	< 4.4
MW-012	8/6/2008	< 147	< 2.7	< 4.9	< 1.7	< 2.7	< 2.3	< 2.5	< 2.7	< 4.0
MW-012	9/10/2008	< 153	< 1.9	< 5.1	< 3.4	< 2.0	< 4.0	< 2.3	< 3.1	< 5.2
MW-012	11/21/2008	< 139	< 2.4	< 6.0	< 2.1	< 2.5	< 2.4	< 2.3	< 2.1	< 5.3
MW-012	12/12/2008	< 167	< 2.3	< 6.1	< 2.7	< 2.2	< 3.6	< 2.9	< 1.9	< 4.2
MW-050	1/21/2008	< 175	-	-	-	-	-	-	-	-
MW-501	4/23/2008	< 158	-	-	-	-	-	-	-	-
MW-501	7/18/2008	< 138	-	-	-	-	-	-	-	-
MW-501	10/6/2008	< 152	-	-	-	-	-	-	-	-
MW-502	1/14/2008	< 175	-	-	-	-	-	-	-	-
MW-502	4/23/2008	< 150	-	-	-	-	-	-	-	-
MW-502	7/18/2008	< 137	-	-	-	-	-	-	-	-
MH-11 A	3/31/2008	947 ± 123	< 2.8	< 3.5	< 1.9	< 2.5	< 4.9	< 4.0	< 3.9	< 4.5
MH-11 A	4/23/2008	4736 ± 205	< 2.2	< 2.4	< 2.9	< 1.6	< 3.0	< 2.7	< 3.9	< 1.4
MH-11 INV B11 GWS	4/22/2008	< 150	-	-	-	-	-	-	-	-
MH-11 INV B11 GWS	4/23/2008	< 150	-	-	-	-	-	-	-	-
MH-11 INV B2 GWS	4/18/2008	< 146	< 4.7	< 5.4	< 2.1	< 2.9	< 6.3	< 5.0	< 4.2	< 3.2
MH-11 INV B3 GWS	4/18/2008	< 146	< 2.2	< 4.3	< 1.4	< 2.2	< 3.3	< 2.7	< 3.2	< 2.3
MH-11 INV B5 GWS	4/22/2008	< 150	-	-	-	-	-	-	-	-
MH-86/1	1/16/2008	241 ± 105	< 4.9	< 11.1	< 6.1	< 3.7	< 5.3	< 4.6	< 4.3	< 6.6
MH-86/4, ADJ. RISER (NEW PIPE)	8/26/2008	< 146	< 3.3	< 6.9	< 3.0	< 2.9	< 2.6	< 3.5	< 3.4	< 6.9
OSGSF	4/9/2008	599 ± 109	-	-	-	-	-	-	-	-
OSGSF WATER PUDDLE	4/9/2008	< 162	-	-	-	-	-	-	-	-
OSGSF WATER PUDDLE	4/9/2008	< 162	< 4.6	< 10.3	< 5.5	< 7.4	< 5.3	< 6.4	< 7.4	< 5.1
OW-1	5/29/2008	< 149	< 4.8	< 8.0	< 4.8	< 3.5	< 7.2	< 3.9	< 4.9	< 2.7
OW-2	5/29/2008	< 149	< 3.7	< 7.4	< 3.1	< 2.7	< 6.7	< 4.3	< 4.7	< 1.9
OW-3	5/29/2008	< 149	< 2.9	< 7.5	< 4.3	< 3.5	< 8.4	< 6.0	< 5.0	< 1.7
OW-4	5/29/2008	287 ± 87	< 2.5	< 4.7	< 1.9	< 2.6	< 4.2	< 4.2	< 4.2	< 3.7
OW-5	5/29/2008	471 ± 95	< 3.3	< 9.8	< 6.5	< 5.7	< 12.1	< 7.0	< 7.7	< 4.9
OW SEP. TO EQ. BASIN	5/1/2008	201 ± 87	< 3.2	< 8.1	< 2.9	< 3.1	< 2.2	< 2.6	< 3.4	< 2.7
SB-1	10/16/2008	< 157	< 4.1	< 8.5	< 3.6	< 3.2	< 5.5	< 2.9	< 3.4	< 7.0
SB-2	10/16/2008	< 157	< 3.6	< 7.0	< 3.0	< 4.1	< 6.4	< 3.2	< 3.8	< 4.7
SB-3	10/16/2008	< 157	< 3.1	< 6.7	< 3.6	< 3.1	< 3.7	< 2.3	< 3.3	< 5.8
SB-4	10/16/2008	< 157	< 3.6	< 4.5	< 3.6	< 3.4	< 4.3	< 2.8	< 3.5	< 5.1
SB-5	10/16/2008	< 157	< 4.9	< 10.0	< 4.3	< 5.7	< 6.3	< 3.8	< 4.9	< 7.8

C-1, Wells and Ponds (non-potable), analyses for tritium and gamma-emitting isotopes.

Location	Collection Date	Concentration (pCi/L)								
		H-3	Mn-54	Fe-59	Co-58	Co-60	Zr-Nb-95	Cs-134	Cs-137	La-140
UHS POND	6/17/2008	< 167	< 5.0	< 6.4	< 4.8	< 2.8	< 4.1	< 5.4	< 5.4	< 5.3
UHS POND	8/8/2008	< 147	< 3.4	< 3.4	< 2.8	< 2.5	< 2.8	< 2.1	< 2.4	< 5.4
UHS POND	9/12/2008	< 153	< 1.6	< 4.0	< 2.0	< 2.1	< 3.6	< 2.1	< 2.8	< 5.2
UHS POND	11/17/2008	258 ± 82	< 2.5	< 7.0	< 3.0	< 3.3	< 5.5	< 3.9	< 4.9	< 18.1
UHS POND	12/11/2008	< 174	< 1.7	< 8.8	< 2.2	< 2.5	< 3.0	< 1.9	< 2.9	< 11.1
UNIT 2 POND	6/17/2008	291 ± 96	< 3.8	< 5.8	< 4.1	< 1.8	< 5.7	< 3.2	< 5.2	< 6.3
UNIT 2 POND	8/8/2008	165 ± 79	< 2.6	< 2.9	< 3.1	< 2.6	< 1.9	< 2.4	< 2.1	< 4.7
UNIT 2 POND	9/12/2008	158 ± 82	< 2.5	< 3.8	< 2.1	< 1.9	< 3.2	< 2.8	< 2.1	< 6.9
UNIT 2 POND	11/17/2008	185 ± 79	< 3.2	< 13.9	< 3.4	< 4.7	< 6.5	< 5.7	< 3.9	< 10.4
UNIT 2 POND	12/11/2008	251 ± 114	< 1.3	< 3.5	< 1.2	< 1.2	< 1.7	< 1.1	< 1.0	< 3.3

C-2, Wells and Ponds (non-potable), , analyses for gross alpha, strontium-89 and strontium-90.

Location	Collection Date	Gross alpha	Sr-89	Sr-90
936	1/10/2008	-	< 0.9	< 0.5
936	4/14/2008	-	< 1.5	< 0.6
936	7/17/2008	-	< 1.4	< 0.5
936	10/8/2008	-	< 1.1	< 0.5
937A	1/11/2008	-	< 0.8	< 0.4
937A	4/14/2008	-	< 0.9	< 0.6
937A	7/17/2008	-	< 1.1	< 0.5
937A	10/17/2008	-	< 0.9	< 0.6
937B	1/10/2008	-	< 0.8	< 0.5
937B	4/7/2008	-	< 0.9	< 0.5
937B	7/17/2008	-	< 1.1	< 0.5
937B	10/7/2008	-	< 1.5	< 0.7
937C	1/10/2008	-	< 0.8	< 0.5
937C	4/14/2008	-	< 1.0	< 0.5
937C	7/17/2008	-	< 1.0	< 0.6
937C	10/8/2008	-	< 0.8	< 0.5
937D	1/10/2008	-	< 1.0	< 0.6
937D	4/9/2008	-	< 0.9	< 0.4
937D	7/17/2008	-	< 0.9	< 0.5
937D	10/8/2008	-	< 1.0	< 0.5
937E	1/10/2008	-	< 0.8	< 0.5
937E	4/7/2008	-	< 1.0	< 0.5
937E	7/30/2008	-	< 0.7	< 0.5
937F	1/10/2008	-	< 0.8	< 0.5
937F	4/7/2008	-	< 1.1	< 0.5
937F	7/17/2008	-	< 1.0	< 0.5
937F	10/7/2008	-	< 0.9	< 0.5
GWS	1/10/2008	-	< 1.0	< 0.5
GWS	4/14/2008	-	< 0.8	< 0.4
GWS	7/17/2008	-	< 1.1	< 0.7
GWS	10/8/2008	-	< 0.9	< 0.5
MH-86/4, ADJ. RISER (NEW PIPE)	8/26/2008	5.1 ± 1.2	-	-

C-3, Soil, Analyses for tritium and gamma-emitting isotopes.

Location	Collection Date	H-3 (pCi/L)	Concentration (pCi/kg dry)			
			Co-58	Co-60	Cs-134	Cs-137
MH-11 INV B1 (3-3.5)	4/17/2008	< 149	< 13.8	< 16.8	< 13.2	< 17.2
MH-11 INV B2 (3-5)	4/17/2008	< 149	< 9.6	< 9.0	< 14.9	< 17.9
MH-11 INV B2 (8-10)	4/17/2008	< 149	< 11.2	< 18.1	< 13.8	< 12.9
MH-11 INV B3 (3-5)	4/17/2008	< 149	< 10.5	< 11.1	< 20.0	< 21.5
MH-11 INV B3 (8-10)	4/17/2008	< 149	< 13.8	< 18.2	< 10.7	< 12.6
MH-11 INV B3 (13-14.5)	4/17/2008	< 149	< 12.0	< 16.9	< 19.0	< 16.8
MH-11 INV B4 (3-5)	4/17/2008	< 149	< 14.8	< 17.0	< 14.9	24.4 ± 14.4
MH-11 INV B4 (8-10)	4/17/2008	< 149	< 9.2	< 12.0	< 13.8	< 16.0
MH-11 INV B4 (13-14.5)	4/17/2008	< 149	< 6.2	< 13.8	< 10.2	< 6.9
MH-11 INV B4 (13-14.5)	4/17/2008	< 149	< 11.4	< 14.4	< 17.0	< 15.3
MH-11 INV B5 (3-5)	4/17/2008	< 149	< 12.3	< 11.9	< 13.4	35.7 ± 17.0
MH-11 INV B5 (8-9.5)	4/17/2008	150 ± 81	< 10.0	< 21.9	< 22.2	< 17.8
MH-11 INV B6 (3-5)	4/17/2008	< 149	< 12.2	< 13.6	< 10.5	< 22.1
MH-11 INV B6 (8-10)	4/17/2008	< 149	< 14.8	< 12.5	< 16.3	21.5 ± 12.9
MH-11 INV B6 (13-15)	4/17/2008	< 149	< 13.8	< 15.5	< 14.0	< 18.8
MH-11 INV B6 (18-20)	4/17/2008	< 149	< 18.6	< 22.7	< 22.5	< 22.6
MH-11A INV B7 (3-5)	4/21/2008	< 150	< 24.1	< 23.0	< 17.6	< 20.1
MH-11A INV B7 (8-9)	4/21/2008	< 150	< 11.8	< 9.7	< 12.0	< 12.2
MH-11A INV B8 (0.5-2)	4/21/2008	< 150	< 15.4	< 22.9	< 14.1	< 22.3
MH-11A INV B9 (0.5-1.5)	4/21/2008	< 150	< 12.2	< 13.0	< 14.8	< 17.6
MH-11A INV B10 (0.5-2.5)	4/21/2008	< 150	< 12.6	< 12.5	< 15.2	< 18.9
MH-11A INV B11 CENTER (4.5-5)	4/21/2008	< 150	< 10.3	< 24.3	< 19.6	< 23.7
MH-11A INV B11 CENTER (7-7.5)	4/21/2008	< 150	< 14.8	< 14.1	< 9.8	27.6 ± 14.7
MH 86-4A SINKHOLE	8/26/2008	3312 ± 310	< 18.1	< 15.7	< 19.2	< 11.6
MH 86-4 SINK HOLE BOTTOM SOIL	8/27/2008	3130 ± 177	< 7.6	< 8.1	< 9.2	< 7.8
SB-1, 20-22'	10/16/2008	< 147	< 32.6	< 43.5	< 37.0	93.7 ± 47.0
SB-1, 25-27'	10/16/2008	< 153	< 25.7	< 8.8	< 16.8	< 12.9
SB-2, 20-22'	10/16/2008	< 153	< 13.5	< 9.9	< 9.6	< 11.8
SB-3, 20-22'	10/16/2008	< 153	< 15.3	< 10.4	< 17.1	< 18.4
SB-3, 25-27'	10/16/2008	< 153	< 22.5	< 12.2	< 14.4	< 13.6
SB-3, 29-29'3"	10/16/2008	< 147	< 27.6	< 32.3	< 24.2	< 22.6
SB-4, 20-22'	10/16/2008	< 153	< 27.8	< 19.7	< 19.7	< 25.1
SB-4, 25-27'	10/16/2008	< 153	< 24.2	< 17.6	< 22.9	< 27.1
SB-4, 31-31'5"	10/16/2008	< 147	< 40.7	< 56.0	< 30.2	< 32.2
SB-5, 20-22'	10/16/2008	< 147	< 11.9	< 14.2	< 15.3	< 12.9
SB-6, 20-22'	10/16/2008	< 147	< 31.5	< 28.7	< 29.0	< 19.7
SB-6, 25-27'	10/16/2008	< 147	< 17.7	< 17.7	< 23.3	< 24.2
SB-6, 30-32'	10/16/2008	< 147	< 23.2	< 14.1	< 14.6	< 17.6