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Subject: **COLUMBIA GENERATING STATION, DOCKET NO. 50-397  
INDEPENDENT SPENT FUEL STORAGE INSTALLATION, DOCKET NO. 72-35  
2014 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT**

References: 1. Columbia Generating Station Technical Specification 5.6.1  
2. Independent Spent Fuel Storage Installation Technical Specification 5.4.b  
3. EFSEC Resolution No. 332, February 21, 2012

Dear Sir or Madam:

In accordance with the requirements of References 1-3, the subject report is submitted as an enclosure to this letter. If you have questions regarding this information, please contact TE Northstrom at (509) 377-8462.

Respectfully,

WG Hettel  
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Enclosure

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# COLUMBIA GENERATING STATION

## 2014 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT FOR THE COLUMBIA GENERATING STATION







## **COLUMBIA GENERATING STATION**

### **RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

### **2014 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT**

**For Calendar Year 2014**

**Preparation Date: April 2015**

**Submitted Date: May 2015**

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## **1.0 EXECUTIVE SUMMARY**

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The primary purpose of the Energy Northwest Radiological Environmental Monitoring Program (REMP) is to evaluate the radiological impact that Columbia Generating Station (CGS) operation may have on the environment. Sampling is performed as specified in the Offsite Dose Calculation Manual (ODCM) and agreements made with the State of Washington Energy Facility Site Evaluation Council (EFSEC). Additional sampling is also performed to meet Nuclear Energy Institute (NEI) guidelines or as an Energy Northwest initiative. The program also serves to validate CGS effluent measurements and exposure pathway models and to provide a documented, historical record of CGS impact on the environment. This report serves to document and communicate the program results and findings for calendar year 2014.

A variety of environmental samples are routinely collected and analyzed by the REMP. The types of samples collected include air, water, soil, sediment, milk, fish, and garden produce. Additionally, the program continuously monitors direct radiation at numerous locations surrounding CGS. Analysis results are trended and compared to results from control locations, results obtained in previous operational and pre-operational periods, and regulatory limits.

The results contained in this report show that all identified radiological impact to the environment attributable to CGS operation was limited to areas within the CGS controlled area. Standby Service Water sediment transferred to the sediment disposal area in 2013-2014 significantly increased the amount of radioactivity contained in the sediment disposal area. All routine sample results are consistent with the results obtained from control locations, results from the preoperational period, and historical results collected since CGS began commercial operation. All radioactive material identified outside the CGS controlled area was of natural origin or known to be present in the environment around CGS in the quantities identified. No radioactive material attributable to CGS operation was identified beyond the CGS controlled area. The results are consistent with and verify CGS effluent measurements and modeling of the exposure pathways. Below is a summary of the 2014 results by exposure pathway:

**Direct Radiation** - No impact was identified at locations beyond the CGS controlled area. Within the controlled area, the only impact identified was at locations known to be influenced by the Independent Spent Fuel Storage Installation (ISFSI) or radiation from the turbine building during operation.

**Airborne** - No impact due to CGS operation was identified. The radionuclide activity identified in soil samples was consistent with activity levels known to exist in Hanford area soils

**Waterborne** - No impact was identified at surface/drinking water locations outside the CGS controlled area. Low level tritium was identified in storm drain water and radionuclides related to CGS operation were identified in storm drain soil. All radioactivity identified in storm drain water and soil is attributed to recapture of CGS effluents. There remains some evidence that storm drain tritium may be influencing groundwater tritium at locations near the storm drain pond, but at levels significantly below regulatory limits. Tritium activity identified in all other groundwater samples was at levels historically observed and consistent with levels known to exist in Hanford groundwater. Tritium in sanitary waste water was limited to legacy tritium obtained in previous years from facilities operated by the Department of Energy. Radionuclide activity identified in river sediment is consistent with activity levels known to exist in Hanford area sediment and soils.

**Ingestion** - No impact was identified in any of the food sample results.

## **2.0 DEFINITIONS**

## 2.0 DEFINITIONS

**a priori:** refers to a “before the fact” limit that represent the capabilities of a measurement system and not a limit for a particular measurement.

**a posteriori:** refers to an “after the fact” limit determined for a particular measurement and not a limit for a measurement system.

**Airborne Activity Sampling:** Continuous sampling of air through the collection of particulates and radionuclides on filter media. Periodic soil samples are collected for gamma isotopic analysis to provide information on deposition to the soil from airborne releases.

**Alpha Particle ( $\alpha$ ):** A charged particle emitted from the nucleus of an atom having a mass and charge equal in magnitude of a helium nucleus.

**Becquerel (Bq):** One disintegration per second. One picocurie (pCi) equals 0.037 becquerel.

**Beta Particle ( $\beta$ ):** Charged particle emitted from the nucleus of an atom with a mass and charge equal in magnitude to that of an electron.

**Blank Sample:** A sample of the same media as the field sample being analyzed but without any radionuclide(s) being measured. It enables correction for the inherent sample background.

**CGS:** Columbia Generating Station, formerly referred to as WNP-2.

**CGS Controlled Area:** The area within a 1.2 mile radius of the CGS reactor building and a narrow corridor extending from CGS east to the Columbia River.

**CGS Protected Area:** The area within the security fence surrounding CGS. Access to this area requires a security badge or escort.

**Composite Sample:** A series of single collected portions (aliquots) analyzed as one sample. The aliquots making up the sample are collected at time intervals that are very short compared to the composite period.

**Control Station:** A sampling station in a location not likely to be affected by plant effluents due to its distance and/or direction from the Columbia Generating Station.

**Counting Error:** An estimate of the two-sigma uncertainty associated with the sample results based on respective count times.

$$+/-2\sqrt{(SampleCPM/CountTime + BkgCPM/CountTime)}$$

**Curie (Ci):** A measure of radioactivity; equal to  $3.7 \times 10^{10}$  disintegrations per second, or  $2.22 \times 10^{12}$  disintegrations per minute.

**Direct Radiation Monitoring:** The measurement of radiation dose at various distances from the plant is assessed using thermoluminescent dosimeters and pressurized ionization chambers.

**DOE:** U.S. Department of Energy.

**DOH:** Washington State Department of Health.

**EFSEC:** Energy Facility Site Evaluation Council.

**HEDP:** Hanford External Dosimetry Program. Supplier of environmental TLDs for the CGS REMP

**FFTF:** Fast Flux Test Facility. This facility is referred to as the DOE 400 area throughout this report.

**Flow Proportional Sampling:** Sample collection volume or frequency determined as a function of the flow rate of the water being sampled.

**Grab Sample:** A single discrete sample drawn at one point in time.

**IDC:** Energy Northwest Industrial Development Complex, formerly referred to as the WNP-1 and WNP-4 sites.

**Indicator Station:** A sampling location that is likely to be affected by plant effluents due to its proximity and/or direction from the Columbia Generating Station.

**Ingestion Pathway Monitoring:** The ingestion pathway includes milk, fish, and garden produce. Also sampled (under special circumstances) are other media such as vegetation and animal products such as eggs and meat when additional information about particular radionuclides is needed.

**ISFSI:** Independent Spent Fuel Storage Installation.

**Lower Limit of Detection (LLD):** The smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability with a 5% probability of a false conclusion that a blank observation represents "real" signal.

**Mean:** The average, i.e., the sum of results divided by the number of results.

**Microcurie:**  $3.7 \times 10^4$  disintegrations per second, or  $2.22 \times 10^6$  disintegrations per minute.

**Milliroentgen (mR):** 1/1000 Roentgen; a unit of exposure to X or gamma radiation.

**MDA:** Minimum Detectable Activity.

**MDC:** Minimum Detectable Concentration.

**NEI:** Nuclear Energy Institute

**NIST:** National Institute of Standards and Technology.

**NPDES:** National Pollutant Discharge Elimination System.

**NRC:** U.S. Nuclear Regulatory Commission.

**ODCM:** Offsite Dose Calculation Manual. Licensing document that contains the NRC mandated effluent and offsite radiological monitoring requirements.

**Picocurie (pCi):**  $1 \times 10^{-12}$  Curie or one millionth of a microcurie. 1 picocurie equal 0.037 becquerel or 2.22 disintegrations per minute

**Radioiodine:** Radioisotopes of iodine. For commercial nuclear reactors, iodine-131 to iodine-135 are the principle radioiodines of concern. Due to its longer half-life, iodine-131 is the most probable radioiodine identifiable in the environment.

**REMP:** Radiological Environmental Monitoring Program.

**Range:** The difference between the smallest and largest results.

**Restricted Area:** Any area where access is controlled for the purpose of protecting individuals from exposure to radiation or radioactive materials.

**Roentgen:** Unit of exposure to ionizing radiation in air.

**Site Certification Agreement (SCA):** The initial Columbia Generating Station licensing agreement with the State of Washington. The REMP sampling commitments in the SCA have been modified by EFSEC agreements.

**Spiked Sample:** A sample that has had a known quantity of radionuclide(s) added for the purposes of assessing analytical performance.

**Standard Deviation:** A measure of the scatter of a set of observations (or samples) around their mean value. Indicated by " $\sigma$ ".

**Standard Error of the Mean:** An estimate of the uncertainty associated with the mean of observation (or sample) averages. Also known as the standard deviation.

$$SE = \sqrt{\frac{S^2}{n}}$$

where  $S^2$ , the variance is

$$S^2 = \frac{1}{(n-1)} \sum^n (X_i - \bar{X})^2$$

**SWTF:** Sanitary Waste Treatment Facility. The sanitary waste processing facility for the Columbia Generating Station and other ENW facility near the CGS site.

**TEDA:** triethylene diamine. A compound used in charcoal cartridge filters to collect radioiodine.

**Thermoluminescent Dosimeter (TLD):** A device used to measure the amount of exposure to radiation. A crystal phosphor that stores energy proportional to the amount of exposure; the exposure level is determined by heating the crystal and reading the amount of emitted light.

## **3.0 INTRODUCTION**



### **3.0 INTRODUCTION**

#### **3.1 Site Description**

The Columbia Generating Station (CGS) is a 1230 MWe commercial nuclear power plant that achieved initial criticality on January 19, 1984. The plant is located in a sparsely populated shrub-steppe region within the Department of Energy (DOE) Hanford Site in southeastern Washington. The plant is approximately three miles west of the Columbia River and is surrounded on all sides by uninhabited desert land. The nearest large population centers are Richland, Pasco and Kennewick, which are 12 miles south, 18 miles southeast, and 21 miles southeast, respectively. The nearest privately owned lands are located approximately four miles east-northeast of the plant, across the Columbia River. The site has a bimodal wind pattern with winds primarily from the northwest and south.<sup>(1)</sup> The primary region of focus for REMP sampling is the farming region east of the plant.

Naturally occurring radionuclides exist in detectable quantities throughout the world and are seen in many of the samples collected for the REMP. Some examples of naturally occurring radionuclides that are frequently seen in samples are potassium-40, beryllium-7, actinium-228 (present as a decay product of radium-228), and radium-226. Additionally, some relatively long lived anthropogenic radioisotopes, such as strontium-90 and cesium-137, are also seen in some REMP samples; these radionuclides exist in measurable quantities throughout the world as a result of fallout from atmospheric nuclear weapons testing.<sup>(2, 3)</sup>

Due to the location of CGS on the Hanford Site, there are other sources of reactor produced radionuclides in close proximity to the plant. CGS is unique in the U.S. commercial nuclear power industry in this respect. Hanford related radionuclides, most notably tritium, are identified in some CGS REMP samples. Though the presence of these radionuclides in the vicinity of CGS are not necessarily reflective of CGS activity, changes in the levels of these radionuclides are monitored to assess any contribution that CGS may be making to the established background. The DOE has an active REMP program for the Hanford Site that overlaps the CGS REMP.

#### **3.2 Program Background**

The CGS REMP is designed to conform to the Nuclear Regulatory Commission (NRC) Regulatory Guide 4.1,<sup>(4)</sup> NUREG 1302,<sup>(5)</sup> and the 1979 NRC Branch Technical Position.<sup>(6)</sup> In addition, the REMP also meets the requirements of 10 CFR 72.44(d)(2) for coverage of the ISFSI.

The quality assurance aspects of the sampling program and the thermoluminescent dosimetry are conducted in accordance with Regulatory Guides 4.15<sup>(7)</sup> and 4.13.<sup>(8)</sup> The REMP also adheres to the requirements of the State of Washington Energy Facility Site Evaluation Council,<sup>(9)</sup> the Columbia Generating Station Technical Specifications,<sup>(10)</sup> and the Offsite Dose Calculation Manual.<sup>(11)</sup> These requirements cover the environmental sampling and sample analysis aspects of the program, and also the reporting and quality assurance requirements.

The preoperational phase of the program, which lasted from March 1978 until initial criticality in January 1984, provided a baseline of background environmental data. Variability in the background levels of radioactivity over time is due to differences in geologic composition, meteorological conditions, decay of nuclear testing fallout material in the environment, and seasonal changes. Variability in results may also have been introduced by changing analytical contractors and the use of different correction factors over the years.

The Energy Northwest Environmental Services Laboratory performed all routine REMP sampling and analyses in 2014. Thermoluminescent dosimeters (TLDs) used in the REMP were processed by the Hanford External Dosimetry Program (HEDP) operated by Mission Support Alliance (MSA).

In addition to evaluating the environmental concentrations against regulatory limits, the REMP may also compare results to state standards.<sup>(12, 13)</sup> The results may also be evaluated by comparing them to similar measurements made during the preoperational and previous operational periods and to the detection capabilities associated with the current methods of analysis.

### **3.3 Program Objectives**

The REMP provides an independent mechanism for determining the levels of radioactivity in the plant environs in order to empirically quantify and qualify any radiological effect plant operation may be making on the environment. The program serves to ensure that any accumulation of radionuclides in the environment resulting from station operation will be identified promptly and before they become significant or exceed established limits.

While in-plant monitoring programs are used to ensure that 10 CFR 20<sup>(14)</sup> and 10 CFR 50<sup>(15)</sup> criteria for releases of radioactive effluents are met, the REMP further verifies that the measured concentrations of radioactive material and levels of radiation observed in the environment are not higher than expected based on CGS effluent measurements and modeling of the exposure pathways.

## **4.0 PROGRAM DESCRIPTION**

## **4.0 PROGRAM DESCRIPTION**

The ODCM contains the CGS licensing based sampling requirements for the REMP. Additional sampling requirements are specified in resolutions with the State of Washington Energy Facility Site Evaluation Council (EFSEC) or are self-initiated in response to site specific or industry wide concerns. The sampling plan presented in Table 4-1 gives an overview of the REMP sampling routine, a summary of the sample locations, the specified collection frequency, and the types of analyses to be performed. The methods of sampling and sampling frequencies utilized in the program are mostly dictated by regulatory requirements. Factors such as nuclide half-lives and the major exposure pathways for the radionuclides potentially released from the plant have been taken into account in determining the sampling methodology.

### **4.1 Sample Locations**

One hundred and seven sampling locations (referred to as ‘stations’) were included in the monitoring program during 2014. More than one sample type may be collected at a sample station. Ninety eight indicator and three control stations were located within a 10-mile radius of CGS. Six additional stations were located beyond the ten mile radius of the plant, two were indicator locations and four were control locations. Sample stations are listed in Tables 4-1 and 4-2. Most station locations are shown in Figures 4-1 to 4-4.

The locations of most sample stations have been selected on the basis of an exposure pathway analysis. The exposure pathway analysis was based on factors such as weather patterns, anticipated emissions, likely receptors, and land use in the surrounding areas. Samples collected from stations located in areas that potentially could be influenced by CGS operation are used as indicators. Samples collected from locations that are not likely to be influenced by CGS operation serve as controls. Results from indicator stations are compared to the results from control stations and results obtained during the previous operational and preoperational years of the program in order to assess the impact CGS operation may be having on the environment.

### **4.2 Independent Spent Fuel Storage Installation (ISFSI)**

The Independent Spent Fuel Storage Installation (ISFSI) is a fenced, secured area constructed to provide a storage location for spent nuclear fuel. The spent fuel is stored in HI-STORM dry storage casks which are placed on concrete pads inside the facility. The pads are 30-feet wide by 135-feet long and each pad can hold up to 18 casks. The ISFSI is located approximately 500 meters north-northwest of the reactor building. Three security fences surround the ISFSI facility.

Direct radiation monitoring of the ISFSI is performed using TLDs placed at 10 different locations on the second of three security fences that surround the facility. The TLDs are exchanged quarterly. In addition, two other TLD stations, Station 121 located approximately 200 meters north of the turbine building and Station 122 located approximately 100 meters north of the ISFSI, were installed to monitor ISFSI direct radiation. Figure 4-1 shows the ISFSI location in relation to CGS and the position of the 2 additional TLD locations. Figure 4-4 shows the location of the 10 TLD stations located around the ISFSI. This arrangement of TLDs in conjunction with the radiological surveys conducted by the CGS Radiation Protection Department serve as the radiological monitoring program for the ISFSI.

### **4.3 Land Use Census**

A land use census covering the areas within a five mile radius of CGS is performed annually. The objective of the land use census is to identify the locations of the nearest milk animal, residence, and garden greater than 500 ft<sup>2</sup> producing broadleaf vegetation. This information is used to determine whether any site located during the census has a calculated dose or dose commitment greater than the sites currently monitored for the same exposure pathway. If a new location with a higher dose commitment was found, routine sampling of that dose pathway would be initiated at that new site. The results of the 2014 five miles land use census are presented in Table 4-3. A new garden greater than 500 ft<sup>2</sup> and two horses on pasture were identified within the five mile radius of CGS, no other changes from the 2013 land use census were observed.

### **4.4 Sampling Methods**

Energy Northwest personnel collect environmental samples in accordance with the program plan outlined in Table 4-1. Methods of sample collection and TLD handling are specified in REMP specific procedures. All routine REMP samples collected in 2014 were prepared for analysis at the Energy Northwest Environmental Services Laboratory located in Richland, WA. The section 4.4 subsections below give a general overview of the sampling methods used in the REMP. Generic descriptions of the REMP sample analysis methods are given in section 4.5.

#### **4.4.1 Direct Radiation**

Direct radiation dose levels are monitored with Harshaw Model 8807 thermoluminescent dosimeters (TLDs). The TLDs are placed in the field between three and five feet above the ground. TLDs are wrapped in aluminum foil and sealed in plastic bags to prevent damage. TLDs are exchanged on a quarterly basis.

The locations of the TLD stations are listed in Table 4-2 and are shown in Figures 4-1 through 4-4. Station 9A near Sunnyside, WA serves as the environmental TLD control location. Station 119C serves as the control for Station 119B (the cooling system sediment disposal basin). The remaining TLDs deployed in the field serve as indicator TLDs.

The TLDs are arranged in a series of rings that encircle CGS. The innermost ring of TLD stations, referred to as the “S” stations, are located inside the CGS site boundary at distances that range from 0.3-0.8 miles from the reactor building centerline. The second ring of TLDs, referred to as the “near plant” stations, are located at distances ranging from 0.9 to 2.1 miles from the reactor building. The outer ring of TLDs are located at distances that range from a little under three miles to around ten miles. A MicroRem dose rate meter is available as a backup device and to take real time readings as needed.

#### **4.4.2 Airborne - Particulate/Iodine**

Weekly air particulate and radioiodine (Iodine -131) samples are obtained through the use of low volume (1.5 cfm), constant flow-rate sampling units located at 12 locations. The samples collected at Station 9A (Figure 4-3) serve as controls, the samples collected at all other locations (Figures 4-1, 4-2, and 4-3) are indicators. Air particulate samples are collected using 47mm diameter glass fiber filters, air iodine samples are collected using Radeco CP-100 TEDA impregnated charcoal cartridges. The air particulate filter and charcoal cartridge are placed in tandem, particulate filter first, in a holder that attaches to the air inlet of the sampler unit. The sampler units are placed in ventilated metal weatherproof housings mounted on elevated platforms at each air sample location. The filter media are changed weekly. Four additional air sample monitor locations are available to monitor work at the DOE 618-11 burial site if needed.

#### 4.4.3 Water

Water sampling is performed to meet ODCM and State of Washington EFSEC requirements, comply with NEI guidelines, or as a CGS initiative. REMP water sampling can be categorized as follows:

- Intake-River/Drinking Water; two locations (Stations 26 and 29)
- Deep Groundwater; three locations (Stations 52, 31 and 32)
- Shallow Groundwater; ten locations (MW-3, 5, 6 and MW-8 through MW-14)
- Plant Discharge Water; one location (Station 27)
- Storm Drain Water; one location (Station 101)
- Sanitary Wastewater; one location (Station 102B)

The sample at Station 26 is obtained using a composite sampler that draws water from the plant intake water system (TMU). The source of this water is the Columbia River. The station serves as a control location, as it is upstream of the plant discharge location, and also as a drinking water location as drinking water for CGS comes from this source. Station 29 is a composite sampler located at the City of Richland Water Treatment Plant located 11 miles downstream of the plant discharge. Station 29 is an indicator station for both river and drinking water.

The ODCM requirement for a downstream water sample "near but beyond the mixing zone" is conservatively met by Station 27, a composite sampler that collects water from the cooling tower discharge line just prior to final discharge into the Columbia River. This sample reflects the radioactivity present in the plant discharge prior to any river dilution, rather than the concentrations that would be found after dilution in the mixing zone. Composite samples from Stations 26, 27, and 29 are collected monthly and analyzed for gamma emitting radionuclides, gross beta, and tritium.

Three drinking water wells on Energy Northwest property are used to provide deep groundwater samples. These wells are greater than 400 feet deep and provide samples from the confined aquifer under CGS. Station 52 is a deep well located 0.1 mile north of the CGS reactor building. Station 31 and 32 are deep wells at the IDC (ENW Industrial Development Complex) located 1.2 miles down gradient from CGS. Water from Station 52 can be used as a backup source for drinking water and fire protection. The IDC wells supply water for drinking and fire protection at the IDC site. All of these wells are considered indicator locations. Quarterly grab samples are collected from each well and analyzed for gamma emitting radionuclides and tritium.

Station 101 is a composite sampler that collects a representative sample of water flowing into the storm drain pond located east of CGS. The main sources of water to the pond are discharges from the potable water and plant makeup water demineralizer treatment systems. Storm water runoff from the CGS protected area is also directed to this location. Water discharges from CGS that have been verified to meet radiological environmental discharge limits are another potential source of water to the storm drain pond. Water is collected monthly using a flow-proportional composite sampler and analyzed for gross beta, gamma emitting radionuclides, and tritium. In November 2014, all storm drain pond water was redirected to a series of evaporation ponds. The Station 101 composite sampler was relocated and now samples only water coming from the CGS protected area before it enters one of the evaporation ponds.



The Sanitary Waste Treatment Facility (SWTF) receives sanitary waste water from CGS, the IDC (ENW Industrial Development Complex), and the Kootenai Building. Discharge standards and monitoring requirements for the SWTF are established in EFSEC Resolution No. 300.<sup>(16)</sup> The Station 102B composite sampler collects a representative sample of water flowing into the head works at the SWTF. Monthly samples are collected and analyzed for gross alpha, gross beta, tritium, and gamma emitting radionuclides. Transfer of sanitary waste water from the DOE 400 area was terminated in December 2013. Water from the DOE 400 area contained low level tritium as it was taken from aquifers known to have been contaminated by past DOE activities on the Hanford Site. Tritium in the SWTF stabilization ponds is the result of past transfers of DOE 400 sanitary waste water and not the result of CGS operation.

Routine quarterly grab samples are taken as part of the REMP from 10 shallow groundwater monitoring wells surrounding CGS. The monitoring well locations are shown in Figure 4-1. The shallow groundwater wells are all less than 100 feet deep and allow samples to be obtained from the unconfined aquifer under CGS. None of the wells are used for drinking water. Sampling from these locations is performed to meet NEI 07-07 guidelines<sup>(17)</sup> and requirements in the CGS NPDES permit.

#### **4.4.4 Soil**

Annual soil samples are a requirement of EFSEC Resolution No. 332.<sup>(9)</sup> For 2014, two soil samples were collected from locations near CGS, two samples from farmland in Franklin County east of CGS, and one sample from a control location near Sunnyside, WA. Each sample was collected from an area of approximately one square foot to a depth of approximately one inch. About two kilograms of soil was collected for each sample. Soil samples are analyzed for gamma activity on a dry weight basis.

#### **4.4.5 Sediment**

River sediment samples are collected semiannually as required by the ODCM and EFSEC Resolution No. 332.<sup>(9)</sup> The upstream sediment sample location (Station 33) is approximately two miles upriver from the plant discharge. The downstream sample (Station 34) is collected approximately one mile downstream from the plant discharge. Each sample consists of approximately two kilograms of shallow surface sediment scooped from areas known to be underwater during high water periods and where the potential for sediment accumulation is likely. Sediment samples are dried in an oven and then analyzed for gamma emitting radionuclides on a dry weight basis.

Cooling system sediment samples are collected and analyzed whenever cooling system sediment is added to the disposal cells (Station 119B, Figure 4-1). Disposal of cooling system sediment is made in accordance with EFSEC Resolution No. 299.<sup>(18)</sup> Pre-disposal samples are collected and analyzed prior to transfer to ensure the material will be within the limits specified in the EFSEC resolution. Following transfer, the material is allowed to dry and a post-disposal sample is collected and analyzed.

#### **4.4.6 Fish**

Annual fish sampling is usually performed in the fall. Fish samples collected from the Columbia River (Station 30) serve as indicator samples, whereas fish collected on the Snake River (Station 38) serve as control samples. Only edible portions of the fish are used to prepare the samples for analysis. Fish samples are analyzed for gamma emitting radionuclides on a wet weight basis. Three species of fish are collected; an anadromous species (salmon or steelhead), and two other resident species generally considered edible or potentially edible (typically carp, catfish, sucker, or whitefish). The same species are collected at each location. Anadromous species are typically obtained from local fish hatcheries through arrangements made

with the State of Washington Department of Fish and Wildlife. Resident species have been collected using hook and line fishing for the past two years.

#### **4.4.7 Milk**

Milk samples are collected monthly during the fall and winter months (October through March). During the spring and summer months when cows are more likely to be grazing or on fresh feed, milk samples are collected twice per month. Raw milk samples are collected within a few hours of milking and the samples are normally prepared and analyzed within four days. Milk samples were collected in 2014 from two locations. Station 36 in Franklin County serves as the indicator location and is the only known dairy within a ten mile radius of CGS. Station 9B near Sunnyside, WA serves as the control location.

#### **4.4.8 Garden Produce**

Samples of local garden produce are collected monthly during the growing season when the produce is readily available. Three types of garden produce are typically collected; root crops, fruits, and leafy vegetables. Control samples (Station 9C) are usually obtained from the lower Yakima Valley. Indicator samples (Station 37) are primarily collected from areas downstream of the CGS discharge where crops are irrigated with Columbia River water. The Riverview area of Pasco is the principle collection location for fruit and root crops. Collection of leafy vegetables is primarily made from locations that could potentially be influenced by CGS gaseous emissions. Vegetation samples may also be collected from locations closer to CGS; however none were collected in 2014. Garden and vegetable samples are typically puréed in a food processor and then analyzed for gamma emitting radionuclides on a wet weight basis. Only edible portions are used for analysis.

### **4.5 Sample Analyses**

General descriptions of the procedures used to analyze REMP samples are provided in the following sections. All REMP TLDs in 2014 were processed at the Hanford External Dosimetry Program (HEDP) laboratory located in Richland, WA. The HEDP is operated by Mission Support Alliance (MSA). All routine REMP field samples were collected and analyzed by Energy Northwest Environmental Services personnel. Samples are normally collected and analyzed within a short time period to ensure required detection sensitivities are met and to provide timely results. Sample count times are conservatively calculated to ensure required *a priori* LLDs are achieved. Table 4-4 lists the ODCM required LLDs and the nominal target LLD used in the Energy Northwest REMP program.

#### **4.5.1 Analysis of TLDs**

REMP TLDs are analyzed on a Harshaw Model 8800 hot gas reader. The reader is calibrated weekly and immediately prior to processing the environmental TLDs. The reader is calibrated with TLDs that have been given a known exposure from a cesium-137 source. Each group of environmental TLDs is processed with blank (freshly annealed) TLDs and spiked TLDs that have been given a known exposure. Exposure received by the field TLDs during transport is monitored with a set of 'trip' control dosimeters that accompany the field dosimeters to and from the field locations and while in storage. Another set of TLDs, the building controls, are used to determine the exposure of the TLDs at the storage location. The TLD exposure during transport to and from the field was determined from the difference between the building control results and the trip control results.

#### 4.5.2 Gross Beta Activity on Air Particulate Filters

Air particulate filters are counted directly in a gas flow proportional counter after a delay of several days to allow for the decay of radon and its progeny. Samples were counted using a Protean WPC-9550 instrument which allows automated sample counting and simultaneous alpha/beta determination. If gross beta activity is identified significantly above the mean of the control, gamma isotopic analysis is performed on the individual samples.

#### 4.5.3 Measurement of Gamma Emitting Radionuclides

Gamma isotopic analysis allows identification and quantification of gamma-emitting radionuclides that may be attributable to CGS effluents. Shielded, high purity germanium (HPGe) detectors are used to assay environmental samples for gamma emitting radionuclides. All samples are counted in standardized, calibrated geometries.

- **Liquids** – Measured aliquots of the liquid samples are poured into appropriately sized Marinelli beakers or plastic container. Sample results are corrected for decay during the collection period if applicable. Results are reported in pCi/liter.
- **Solids** – Soil, sludge, and sediment samples are dried and ground as needed. Foodstuff, biota (fish), and vegetation, are chopped finely or pureed and then analyzed wet (no drying is done). For foodstuff (including fish), only the edible portion of the sample is used. Sample aliquots are placed in tared containers and weighed. Results are reported in pCi/kg.
- **Charcoal Cartridges** – Typically four charcoal cartridges are counted simultaneously using a cartridge holding jig that positions the cartridges in a standardized geometry to the side of the detector. Detector calibration files are maintained for both face count and side count positions. If radioiodines are identified in the assay of a group, each charcoal cartridge in the group is assayed separately. Results are corrected for decay during the sample collection period. Results are reported in pCi/m<sup>3</sup>.
- **Air Particulate Filters** – At the end of each quarter, air particulate filters are composited on a station by station basis. The filters are stacked in a Petri dish and analyzed by gamma spectroscopy. Results are reported in pCi/m<sup>3</sup> and represent the total quarterly gamma activity collected at each station. Results are decay corrected to the midpoint of the sample collection period. If a radionuclide related to CGS operation is positively identified, the filters are separated and counted individually.

#### 4.5.4 Gross Alpha and Gross Beta Activity in Water

A measured aliquot of each sample is evaporated to a small volume then quantitatively transferred to a ribbed, stainless steel planchet. Final evaporation is normally done under a heat lamp. Residue mass is determined by weighing the planchet before and after mounting the sample. The planchet is counted for gross alpha and beta activity using a Protean WPC-9550 automatic gas flow proportional counter which allows automated sample counting and simultaneous alpha/beta determination. Results are corrected for sample self-absorption using the sample residue mass values. Results are reported in pCi/liter.

#### 4.5.5 Tritium in Water

The sample is distilled, then 8.0mL of the distillate is mixed with 12.0mL of scintillation cocktail. The sample mixture is analyzed on a Packard Tri-Carb 2900TR automatic liquid scintillation counter. Results are reported in pCi/liter.

#### 4.5.6 Strontium-89/90, Iron-55, and Nickel-63

These “hard to detect” analytes are not routinely analyzed as part of the CGS REMP. When needed, these analyses are performed under contract by Teledyne- Brown Environmental Services Laboratory located in Knoxville, TN using the vendor’s standard analysis procedures.

#### 4.5.7 Low Level Radioiodine in Milk and Water

Four liters of sample are first equilibrated with stable iodide carrier. Anion exchange resin is then added and mixed for a period sufficient to allow any iodine present in the sample to be captured by the resin. The resin is then isolated from the liquid sample and transferred to a small counting container. The radioiodine content is determined by gamma spectroscopy analysis. Results are reported in pCi/liter.

### 4.6 Data Analysis Methods

Counting results for low level samples are often within the counting error of the background determination; consequently results for these samples can be positive or negative values. Though most REMP analytical results are below the detection limit, an actual calculated value has been reported. In some cases the reported value is zero or a negative number. Reporting results in this manner is the preferred practice for low level environmental analyses as it gives an indication of positive or negative biases that may be present and prevents loss of individual results inherent in the use of “less than” (<) values. Also reported in most cases are the *a posteriori* MDA values. A nuclide is flagged as positively identified if its calculated value is greater than the MDA. A listing of the Energy Northwest nominal target LLDs (*a priori*) for each sample type is provided in Table 4-4; the ODCM required LLDs are also included for a comparison.

Data is trended following analysis for many of the sample types analyzed. For analyses such as gross beta on air particulate filters where results are normally above the detection limit, indicator results are plotted with the control results for better comparison. Analysis results that are normally below detection limits are plotted against historical data to monitor if trends may be evident.

Thermoluminescent dosimeter (TLD) data is presented in both units of mR/day and mR/standard quarter. TLD results in mR/day are calculated by taking the total exposure (in mR) determined for each TLD, correcting for storage background and any transit (or trip) exposure received during distribution and retrieval, then dividing by the number of days the TLD was in the field. The mR/standard quarter values are calculated by multiplying the mR/day value by 91.25 days (365/4). All TLD results are reported in units of exposure (Roentgen) and not in units of dose (Rem).

#### **4.7 Changes to the Sampling Program in 2014**

There were no major changes made to ODCM or EFSEC Resolution No. 332<sup>(9)</sup> mandated sampling in 2014. Sampling and analysis of shallow groundwater wells around CGS was continued as a routine part of the REMP. Sampling of the sanitary effluent line coming from the DOE 400 area (Station 102A) was terminated in December 2013 and no samples were obtained from this location in 2014 as CGS no longer accepts sanitary waste from the DOE 400 area. TLD Station 119B was moved in April to a location closer to the active sediment disposal pit in order to better assess any potential dose resulting from the sediment. The storm drain pond composite sampler, Station 101, was moved to a new location in November when the new evaporation ponds were put in service. The station now only samples storm drain and other non-radioactive system wastewater coming from the CGS protected area.

TABLE 4-1  
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SAMPLING PLAN

SAMPLE TYPE <sup>(a)</sup>	SAMPLE STATION <sup>(b)</sup> NUMBER	SAMPLE METHOD AND COLLECTION FREQUENCY <sup>(c)</sup>	TYPE AND FREQUENCY OF ANALYSIS
<b>AIRBORNE</b>			
Particulates and Radioiodine (6/12) <sup>(d)</sup>	1, 4-8, <u>9A</u> , 21, 23, 40, 48, and 57	Continuous sampling; weekly collection.	Weekly air filters gross beta and iodine cartridge gamma isotopic. Quarterly air filter composite gamma isotopic.
<b>DIRECT RADIATION</b>			
TLD <sup>(g)</sup> (34/79)	1-8, <u>9A</u> , 10-25, 40-47, 49-51, 53-56, 58, 65, 71-90, 119B, <u>119C</u> , 120-129, 136A-138A, 150-151.	Continuous monitoring, quarterly collection.	Radiation exposure monitoring processed on a quarterly frequency.
<b>WATERBORNE</b>			
River/Drinking Water <sup>(h)</sup> (3/3)	<u>26</u> , 27 and 29	Composite aliquots <sup>(i)</sup> ; monthly collection.	Monthly gamma isotopic, gross beta, and tritium. Iodine-131 <sup>(i)</sup> as required.
Storm Drain Water (0/1)	101	Composite aliquots <sup>(i)</sup> , monthly collection.	Monthly gamma isotopic, tritium, and gross beta.
Sanitary Waste Treatment Facility Water (0/1)	102B	Composite aliquots <sup>(i)</sup> , monthly collection.	Monthly gamma isotopic, gross beta, gross alpha, and tritium.
Ground Water (2/3) <sup>(k)</sup>	31, 32, and 52	Grab sample performed quarterly.	Quarterly gamma isotopic and tritium.
Ground Water Monitoring (0/10) <sup>(e)</sup>	MW-3, 5, 6, 8-14	Grab sample performed quarterly.	Quarterly gamma isotopic and tritium.
<b>SOIL AND SEDIMENT</b>			
Soil <sup>(l)</sup> (0/5)	<u>9A</u> , 1, 5, 21, 42	Grab sample performed annually.	Annual gamma isotopic. Strontium-90 <sup>(l)</sup> as required.
River Sediment (1/2) <sup>(l)</sup>	<u>33</u> and 34	Grab sample performed semiannually.	Semiannual gamma isotopic.
Cooling System Sediment Disposal Area (0/2)	119B, <u>119C</u>	Grab sample of dried sediment within 30 days of disposal date.	Gamma Isotopic. After disposal.
<b>INGESTION</b>			
Milk <sup>(m)</sup> (2/2)	<u>9B</u> , 36	Grab sample collected semimonthly during grazing season, monthly at other times.	Gamma isotopic, Iodine-131 each sample. Strontium-90. <sup>(n)</sup> as required
Fish <sup>(o)</sup> (2/2)	30, <u>38</u>	Grab samples collected annually.	Gamma isotopic each sample.
Garden Produce <sup>(p)</sup> (1/2)	<u>9C</u> , 37	Grab samples collected monthly or at time of harvest.	Gamma isotopic each sample.



**TABLE 4-1 FOOTNOTES:**

- (a) The fraction in parentheses for each sample type indicates the ratio of ODCM-required sample locations to the total number of sample locations currently being monitored in the surveillance program. Additional sampling is performed to meet EFSEC Resolution 332 requirements or as an ENW initiative.
- (b) The underlined sample location designates a control station.
- (c) Sample collection is performed at a frequency specified in the ODCM and EFSEC resolutions. Some sampling referenced in Table 4-1 is performed at CGS initiative. Sample deviations are permitted if samples are unobtainable due to hazardous conditions, seasonal availability, malfunction of automatic sampling equipment, or other legitimate reasons.
- (d) The ODCM specifies six air sample locations and EFSEC Resolution 332 specifies nine. Two of the air sample stations are maintained at CGS initiative and are not requirements of either the ODCM or EFSEC Resolution 332.
- (e) Sampling is performed to meet NEI 07-07 guidelines and NPDES requirements.
- (f) Soil samples are collected from five locations to satisfy EFSEC Resolution 332 requirements. Two samples are collected from locations near CGS, two from locations in Franklin County, and one collected from a control location. Sample locations listed in Table 4-1 are the locations sampled in 2014. EFSEC 332 requires strontium-90 analysis be performed if gamma analysis results are greater than a specified threshold.
- (g) TLD Stations 71-86 are not included among the 34 TLD stations required by the ODCM. Alternate designations for these stations are 1S-16S. EFSEC Resolution 332 requires 25 or more TLD stations to be located within a 10-mile radius of CGS. Other instruments, such as a pressurized ion chamber (PIC), may be used in place of or in addition to TLDs as per ODCM table 6.3.1-1 (b). CGS REMP maintains a uRem meter for this purpose.
- (h) The term "river/drinking water" is used throughout this report because the drinking water is taken from the Columbia River. Station 26, CGS makeup water intake from the Columbia River is both an upstream water sample and the drinking water sample location. Station 29 is a downstream drinking water sample location. The Station 27 sample, which is drawn from the plant discharge line, is taken in place of a "downstream" water sample near but beyond the mixing zone. It reflects the radioactivity present in the plant discharge prior to any river dilution. EFSEC Resolution 332 requires samples from at least one downstream drinking water location and samples from the plant intake and discharge water systems.
- (i) Composite samples are collected using automatic sampling equipment that collects samples based on a flow proportional or timed interval basis. If timed interval sampling is used, the interval period is short (e.g. hourly) relative to the compositing period (e.g. monthly).
- (j) When the dose calculated via ODCM methodology for consumption of water exceeds 1 mrem per year, low level iodine-131 analyses are performed on the drinking water samples.
- (k) Sampling from these locations fulfills ODCM table 6.3.1-1 3b requirements. EFSEC Resolution 332 requires sampling from at least one deep well used for fire protection and/or as a backup drinking water source.
- (l) Downstream sampling fulfills ODCM table 6.3.1-1 3d requirements. EFSEC Resolution 332 requires annual sediment samples upstream and downstream of the plant discharge.
- (m) ODCM table 6.3.1-1 4a milk collection requirements cannot strictly be met due to the lack of milking animals near CGS. Milk samples are collected from the nearest dairy potentially impacted by CGS operation and also from a control location at the frequency specified in the ODCM. EFSEC Resolution 332 specifies sampling from at least one milk location within the 10-mile radius of CGS and also from a control location. Broadleaf vegetation can be sampled in lieu of milk if a representative milk sample is not available.
- (n) ODCM table 6.3.1-1 (k) requires that if cesium-134 or cesium-137 is measured in an individual milk sample in excess of 30 pCi/liter, then a strontium-90 analysis will also be performed.
- (o) Station 30 is the Columbia River and station 38 is the Snake River. If an impact is indicated, sampling will be conducted semiannually per ODCM table 6.3.1-1 (i). There are no species fished commercially in the Hanford Reach of the Columbia River. The most recreationally important species in the area are anadromous, which ascend rivers from the ocean for breeding. Anadromous fish species are normally obtained from hatcheries; Snake River samples are obtained from the Lyons Ferry Fish Hatchery, and Columbia River samples are obtained at the Ringold Fish Hatchery.
- (p) Garden produce is obtained from farms or gardens that use Columbia River water for irrigation. One sample of a root crop, leafy vegetable, and a fruit is typically collected each sample period, when available. EFSEC Resolution 332 further specifies fruit and vegetable sampling from locations potentially impacted by CGS gaseous emissions.

**TABLE 4-2**  
**REMP SAMPLE STATIONS AND REQUIREMENTS**

SECTOR <sup>(a)</sup>	STATION NUMBER <sup>(b)</sup>	DISTANCE MILES <sup>(c)</sup>	ODCM <sup>(d)</sup>	STATE <sup>(e)</sup>	OTHER <sup>(f)</sup>
N (1)	52	0.07	DGW	DGW	
	71(1S)	0.28			TLD
	47	0.70		TLD	
	57	0.70	AP/AI		
	18	1.16	TLD	TLD	
	53	7.54	TLD		
NNE (2)	72(2S)	0.32			TLD
	2	1.45	TLD	TLD	
	54	6.08	TLD		
NE (3)	73(3S)	0.54			TLD
	19	1.74	TLD	TLD	
	48	4.59	AP/AI	AP/AI	
	46	4.99	TLD		
	MW-9	0.22			SGW
ENE (4)	74(4S)	0.38			TLD
	21	1.45		TLD, SO	AP/AI
	20	1.93	TLD	TLD	
	11	3.16		TLD	
	33	3.44		SE	
	45	4.45	TLD		
	44	5.90	TLD		
	101	0.22			SW
	MW-8	0.26			SGW
	MW-11	0.10			SGW
E (5)	75(5S)	0.37			TLD
	22	2.08	TLD		
	10	3.16	TLD	TLD	
	26	3.19	SW, DW	SW	
	27	3.19	SW	DIS W	
	30 <sup>(g)</sup>	3.5	FI	FI	
	43	5.63	TLD		
	151 (Site 4)	0.83			TLD
	MW-12	0.12			SGW
ESE (6)	76(6S)	0.42			TLD
	31	1.06	DGW		
	32	1.27	DGW		
	51	2.14	TLD		

TABLE 4-2 (cont.)  
REMP SAMPLE STATIONS AND REQUIREMENTS

SECTOR <sup>(a)</sup>	STATION NUMBER <sup>(b)</sup>	DISTANCE MILES <sup>(c)</sup>	ODCM <sup>(d)</sup>	STATE <sup>(e)</sup>	OTHER <sup>(f)</sup>
ESE (6)(cont.)	34	3.32	SE	SE	
	23	3.03		TLD, AP/AI, SO	
	8	4.39	TLD, AP/AI	TLD, AP/AI	
	42	5.85	TLD		
	36	7.33	MI	MI	
	5	7.72	TLD		AP/AI
	38 <sup>(g)</sup>	26	FI	FI	
	150 (Site 1)	0.90			TLD
SE (7)	77(7S)	0.57			TLD
	24	1.87	TLD	TLD	
	3	2.06		TLD	
	41	5.79	TLD		
	40	6.51	TLD, AP/AI	AP/AI	
	MW-14	0.58			SGW
SSE (8)	119C	0.28		TLD	
	120	0.32			TLD, SE
	102B	0.50		SFW	
	102G	0.56			GP/VE
	78(8S)	0.81			TLD
	25	1.50	TLD	TLD	
	55	6.05	TLD		
	4	9.57	TLD, AP/AI	TLD, AP/AI	
	29	11.57	DW	DW	
	37 <sup>(h)</sup>	16	GP	GP	
	MW-6	0.33			SGW
	MW-13	0.52			SGW
S (9)	119B	0.31		TLD, SE	
	79(9S)	0.76			TLD
	1	1.25	TLD	TLD, AP/AI, SO	
	6	7.72	TLD	TLD, AP/AI	
	65	8.87			TLD
SSW (10)	80(10S)	0.83			TLD
	50	1.26	TLD	TLD	
	56	6.65	TLD		
	13	1.26	TLD	TLD	
	MW-3	0.31			SGW

TABLE 4-2 (cont.)  
REMP SAMPLE STATIONS AND REQUIREMENTS

SECTOR <sup>(a)</sup>	STATION NUMBER <sup>(b)</sup>	DISTANCE MILES <sup>(c)</sup>	ODCM <sup>(d)</sup>	STATE <sup>(e)</sup>	OTHER <sup>(f)</sup>
SW (11)	81(11S)	0.74			TLD
	103A	0.63			VE
	90 <sup>(j)</sup>	0.62			TLD, AI/AP
	MW-5	0.43			SGW
WSW (12)	82(12S)	0.57			TLD
	14	1.26	TLD	TLD	
	9A	28.35	TLD, AP/AI	TLD, AP/AI, SO	
	9B	32.82	MI	MI	
	9C <sup>(i)</sup>	32		GP	
	89 <sup>(j)</sup>	0.23			TLD, AI/AP
	58	0.44			TLD
W (13)	83(13S)	0.52			TLD
	15	1.24	TLD	TLD	
WNW (14)	84(14S)	0.55			TLD
	16	1.21	TLD	TLD	
	7	2.83	TLD	TLD, AP/AI, SO	
	88 <sup>(j)</sup>	0.17			TLD, AI/AP
	MW-10	0.07			SGW
NW (15)	85 (15S)	0.43			TLD
	49	1.19	TLD	TLD	
	87 <sup>(j)</sup>	0.20			TLD, AI/AP
NNW (16)	121	0.12			TLD
	122	0.31			TLD
	123	0.29			TLD
	124	0.28			TLD
	125	0.28			TLD
	126	0.28			TLD
	127	0.26			TLD
	128	0.25			TLD
	129	0.17			TLD
	136A	0.29			TLD
	137A	0.24			TLD
	138A	0.17			TLD
	86 (16S)	0.31			TLD
	17	1.19	TLD	TLD	
	12	6.74		TLD	

**TABLE 4-2 (cont.)  
REMP SAMPLE STATIONS AND REQUIREMENTS**

**TABLE 4-2 SAMPLE TYPE KEY**

AP/AI - Air Particulate/Air Iodine	DW - Drinking Water
Dis W - Discharge Water	FI - Fish
GP - Garden/Orchard Produce	DGW - Deep Ground Water
MI - Milk	SE - Sediment
SFW - Sanitation Facility Water	SO - Soil
SW - Surface Water	TLD - Thermoluminescent Dosimeter
VE – Vegetation	SGW – Shallow Ground Water

**TABLE 4-2 FOOTNOTES:**

- (a) The area in the vicinity of CGS is separated into 16 sectors for reporting purposes. The 16 sectors cover 360 degrees in equal 22.5 degree sections, beginning with sector 1 (N) at 348.75 to 11.25 degrees and continuing clockwise through sector 16 (NNW).
- (b) Alternate designations for station are given in parentheses; i.e., TLD Stations 71-86 are also referred to as 1S-16S.
- (c) Distances are from GPS positions for each location as a radial distance from CGS reactor building.
- (d) ODCM - Offsite Dose Calculation Manual Table 6.3.1-1 requirement.
- (e) STATE - State of Washington EFSEC Resolution requirement.
- (f) OTHER –Special study stations. TLD Stations 121 through 129 and 136A through 138A satisfy ISFSI monitoring requirements 10CFR72.44(d)(2). Sampling at MW locations performed to meet NEI 07-07 guidelines and NPDES requirements. Stations 102G and 103A are locations near CGS where vegetation samples have been collected in the past. No samples were collected from these locations in 2014.
- (g) Station 30 is the Columbia River at the vicinity of the plant discharge. Actual distance of fish collection locations from plant are variable, distance listed is approximation. Station 38 is the Snake River. Control resident fish are typically collected at variable locations in area below Ice Harbor Dam, distance listed is approximation. Control anadromous fish are typically collected at Lyons Ferry Fish Hatchery.
- (h) Fruit and Vegetable indicator samples are typically collected from farms and gardens in the Riverview area of Pasco. Distance listed here is general distance of Riverview area to CGS. Station 37 designation is also used for any samples collected in Franklin County that could potentially be affected by CGS liquid or gaseous effluents.
- (i) Station 9C is the designation given for control fruits and vegetables. Distance listed is general distance to the Sunnyside-Grandview area where the majority of the control fruits and vegetables are obtained.
- (j) Stations 87-90 were installed at CGS initiative to monitor remediation work at the DOE 618-11 burial ground. No remediation work that affected CGS was performed in 2014 and no air samples were obtained from these locations in 2014. See Section 5.9.6 for further discussion.

TABLE 4-3  
2014 FIVE MILE LAND USE CENSUS RESULTS

SECTOR <sup>(a)</sup>	NEAREST RESIDENT <sup>(b)</sup>	GARDEN <sup>(d)</sup> (>500 ft <sup>2</sup> )	DAIRY ANIMALS	LIVESTOCK <sup>(b,c)</sup>
NE	4.50	4.63	none	4.63
ENE	3.88	none	none	4.95
E	4.64	none	none	4.64
ESE	4.26	none	none	4.49
SE	none	none	none	none

FOOTNOTES

- (a) Within a five-mile radius of the plant, only the five sectors listed above contain activities related to land use census requirements. The other eleven sectors lay fully within the federally owned Hanford Site. Only those sectors containing potential land use census activities are presented here.
- (b) Estimated distances in miles from CGS Reactor Building based on GPS readings. Actual locations are same as identified in previous years, distance values may differ from those reported in past due to updated GPS data.
- (c) 25 to 30 beef cattle were identified in a pasture in the ENE sector. The western edge of the pasture is just within the 5 mile radius. Additional feed appears to be provided at this location. 2 cows, 1 horse, and some chickens were observed at a residence in the E sector. The large animals were observed in a small enclosure and were observed to be fed hay. A single horse was observed in the ESE sector and 2 horses were observed in the NE. There is little pasture in either of these locations and the animals appear to be fed mostly hay.
- (d) A new garden > 500 ft<sup>2</sup> was identified in the NE sector. The garden is located approximately 200 yards from the ST-48 air sampler and is irrigated using water from a local spring. In addition to the garden, commercial agriculture is extensively practiced in some parts of the sectors identified in Table 4-3. Agricultural activities observed were primarily apple and soft fruit orchards, corn, alfalfa, and grape vineyards.



TABLE 4-4  
COMPARISON OF LABORATORY NOMINAL LOWER LIMITS OF DETECTION WITH  
OFFSITE DOSE CALCULATION MANUAL REQUIREMENTS

MEDIA (UNITS)	ANALYSIS	ENERGY NORTHWEST	ODCM REQUIRED
		LLDs <sup>(a)</sup>	LLDs
<b>Air</b> (pCi/m <sup>3</sup> )	Gross Beta	0.002	0.01
	Cs-134	0.001	0.05
	Cs-137	0.001	0.06
	I-131	0.03	0.07
<b>Water:</b> (pCi/liter)	Gross Beta	2.4	4
	Tritium	300	2000 <sup>(b)</sup>
	Sr-90	1	---
	Ni-63	5	---
	Fe-55	200	---
	I-131 <sup>(c)</sup>	1	---
	Mn-54	7	15
	Fe-59	10	30
	Co-58	7	15
	Co-60	7	15
	Zn-65	10	30
	Zr-Nb-95	7	15
	Cs-134	7	15
	Cs-137	7	18
	Ba-La-140	10	15
<b>Soil/Sediment:</b> (pCi/kg dry)	Mn-54	20	---
	Co-60	20	---
	Zn-65	30	---
	Cs-134	20	150
	Cs-137	20	180
	Sr-90	10	---
<b>Fish:</b> (pCi/kg wet)	Mn-54	25	130
	Fe-59	100	260
	Co-58	35	130
	Co-60	25	130
	Zn-65	50	260
	Cs-134	30	130
	Cs-137	25	150
<b>Milk:</b> (pCi/liter)	I-31 <sup>(c)</sup>	0.5	1
	Cs-134	8	15
	Cs-137	8	18
	Ba-La-140	10	15
	Sr-90	1	---
<b>Garden Produce:</b> (pCi/kg wet)	Cs-134	20	60
	Cs-137	20	80
	I-131	20	60

<sup>(a)</sup> These are the nominal target LLDs (a priori) for analyses performed in the Energy Northwest Environmental Services Laboratory and are based on conservative assumptions. These calculations included corrections for decay during the collection period and delay prior to analysis using factors that are normally encountered for the different media types. Actual LLDs (a posteriori) may be higher or lower for specific samples.

<sup>(b)</sup> If no drinking water pathway exists, a value of 3,000 pCi/liter may be used.

<sup>(c)</sup> This ENW Iodine-131 LLD achieved by anion resin separation and does not represent a direct analysis of the sample media.

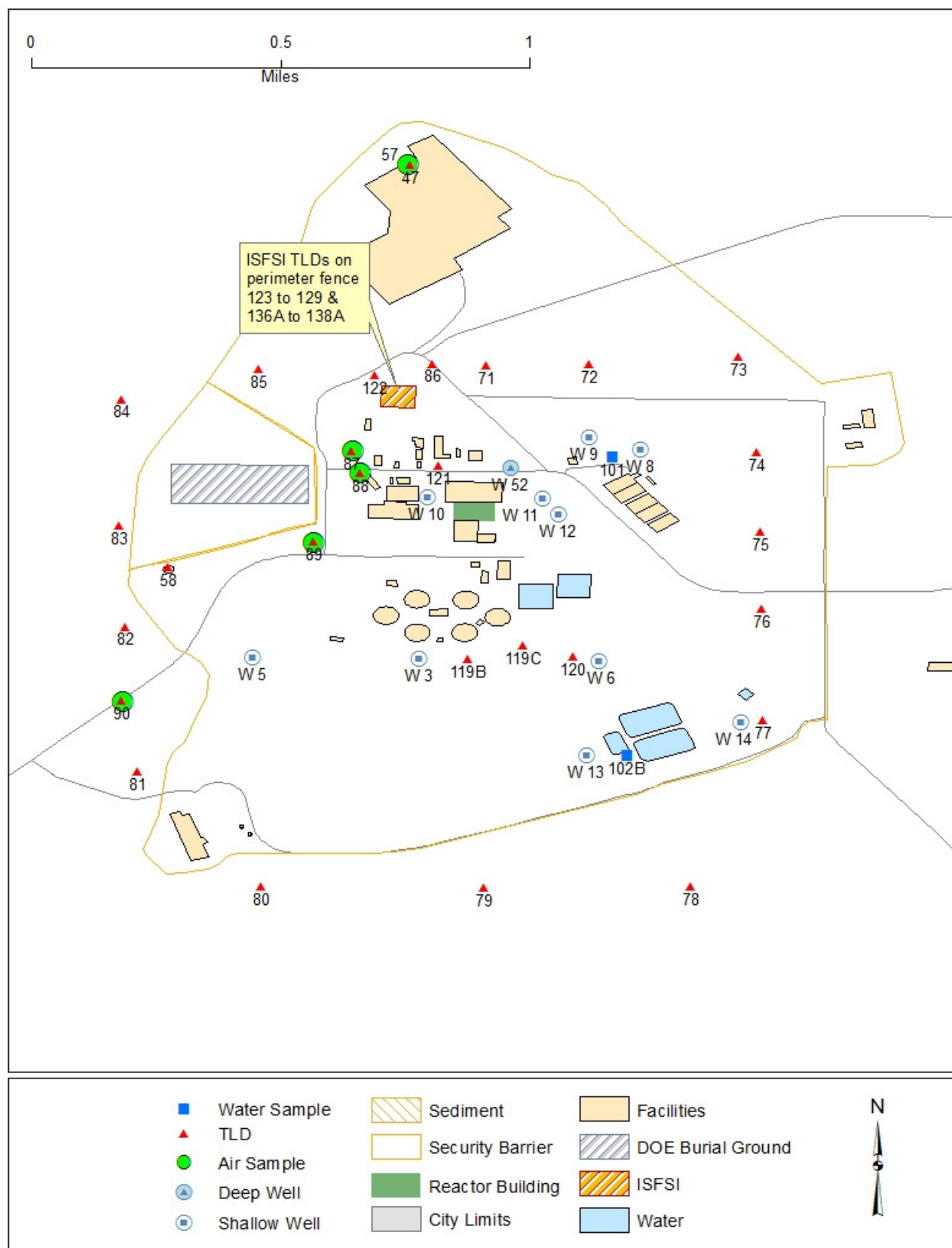
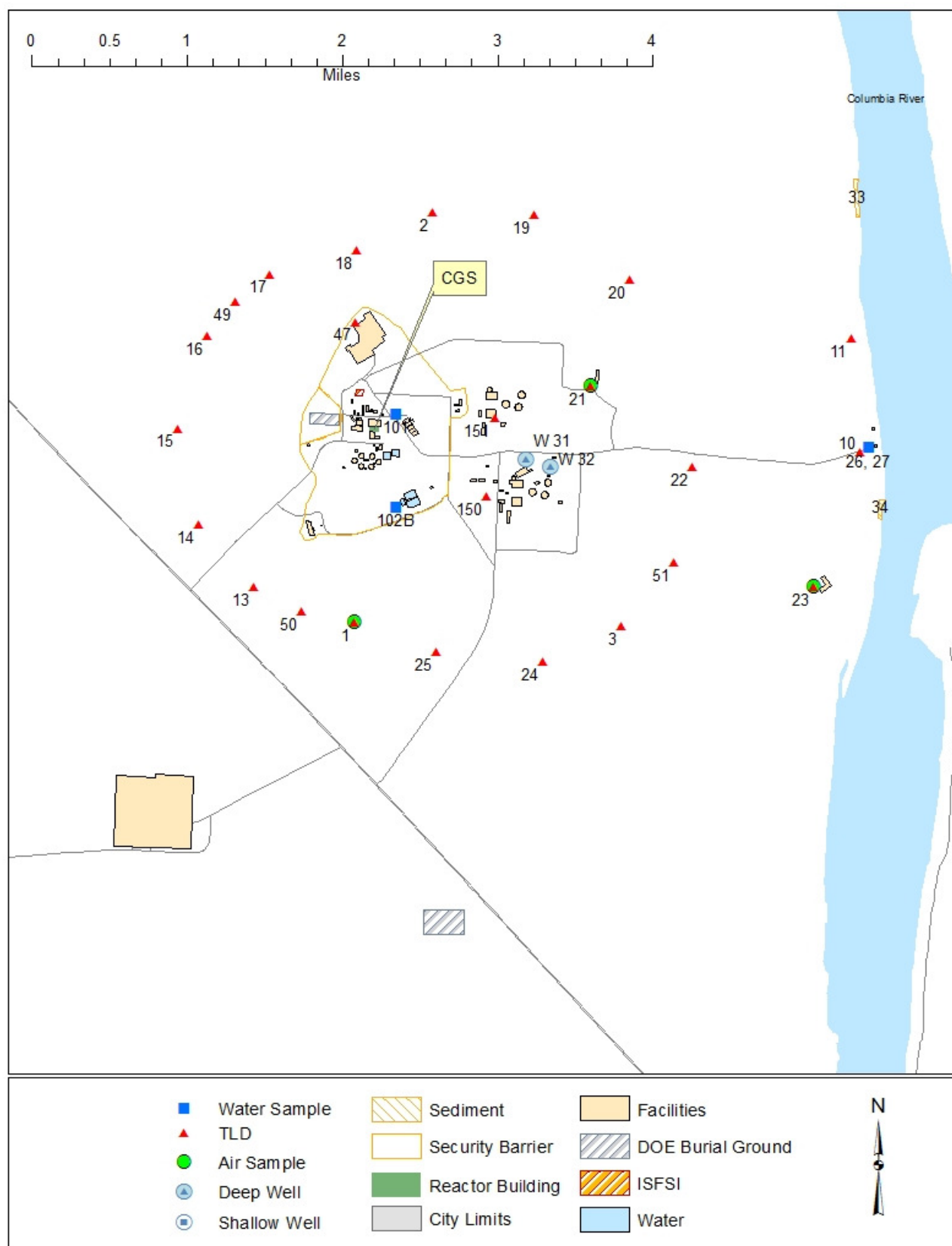


FIGURE 4-1 SELECT REMP SAMPLING LOCATIONS WITHIN 0.8 MILES OF CGS



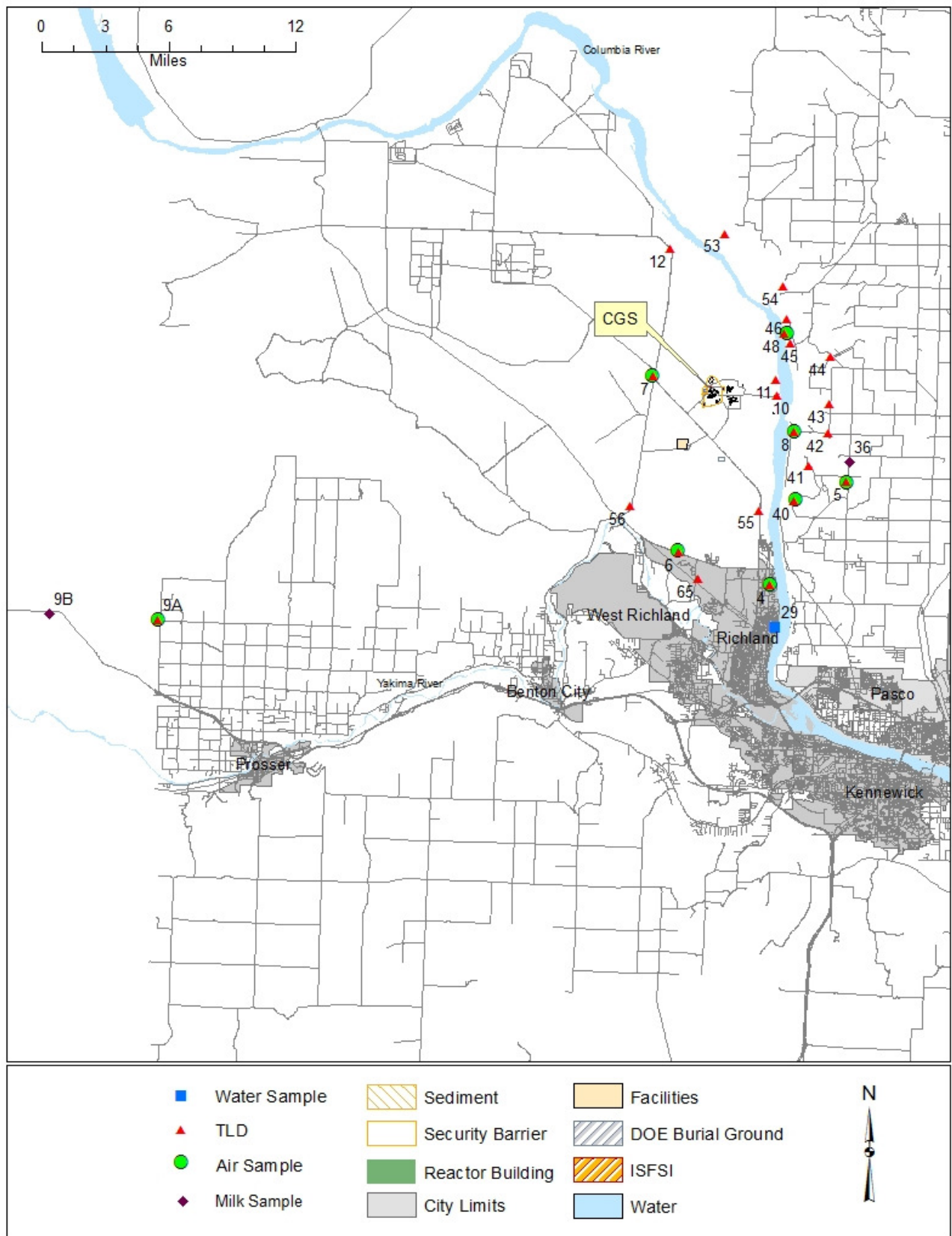


FIGURE 4-3 SELECT REMP SAMPLING LOCATIONS BEYOND 2.8 MILES

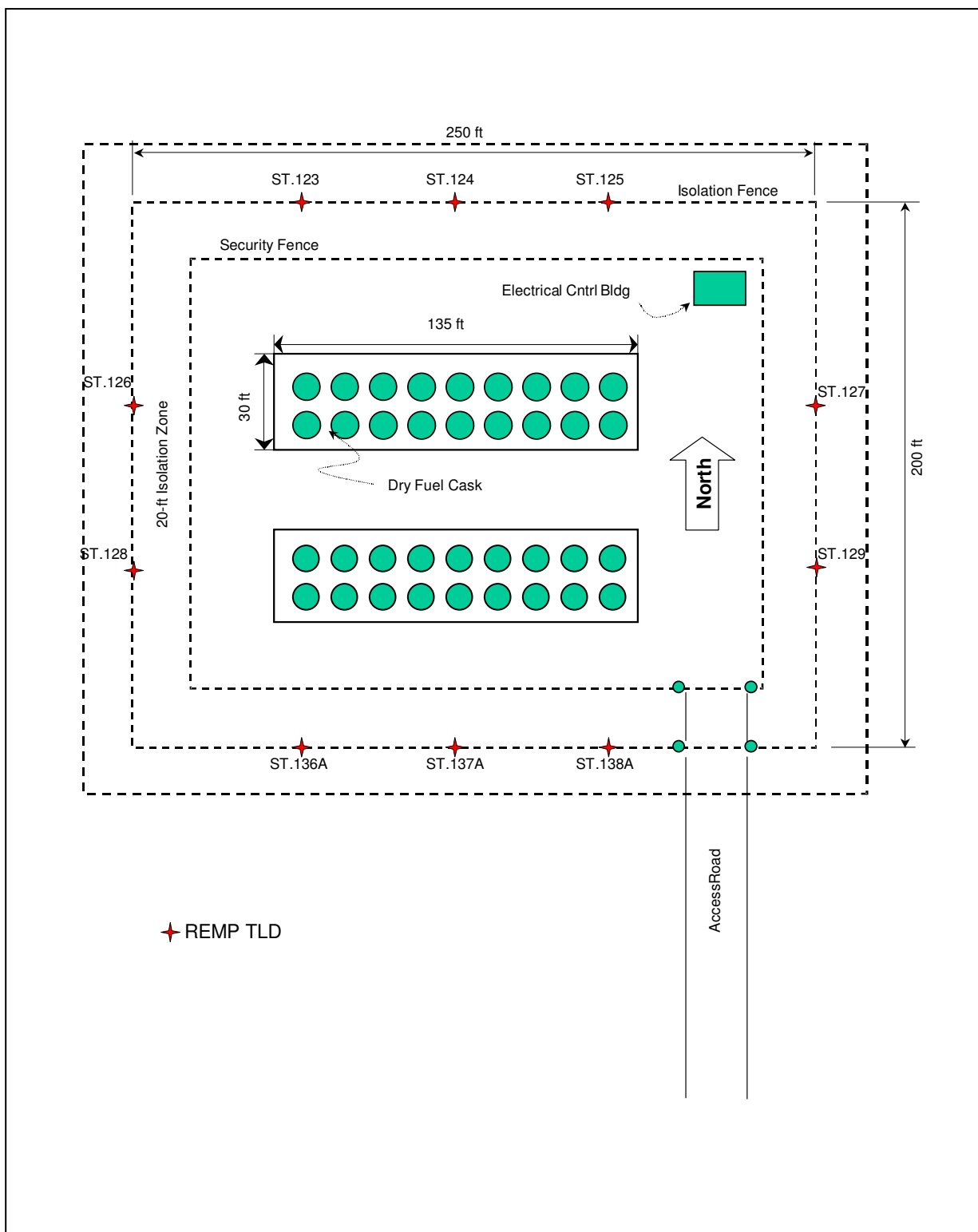


FIGURE 4-4 ISFSI TLD STATION LAYOUT

## **5.0 RESULTS AND DISCUSSION**

## 5.0 RESULTS AND DISCUSSION

The Columbia Generating Station environmental TLDs were collected by Energy Northwest Environmental Services personnel and analyzed by the Hanford External Dosimetry Program (HEDP) operated by Mission Support Alliance (MSA). All other CGS REMP samples were collected and analyzed by the Energy Northwest Environmental Services Laboratory located in Richland, WA. Table 5-2 provides a summary of the ODCM required REMP sample and CGS groundwater monitoring analysis results in the format specified by the NRC.<sup>(5,6)</sup> Results for naturally occurring radionuclides that are not related to CGS operations have not been included in the summary table. The lower limit of detection (LLD) values listed in Table 5-2 are the ODCM required detection limits and are not the method detection limits listed in Table 4-4. Analytical results for all REMP samples are presented in Appendix A of this volume.

### 5.1 Direct Radiation

Direct radiation is monitored at 79 TLD locations surrounding CGS. TLDs are exchanged on a quarterly frequency at all locations. The 16 locations designated as "S" stations are located between 0.3 and 0.8 miles from the CGS reactor building and all are inside the property boundary, see Figure 4-1 for station locations. Figure 5-1 shows the 2014 "S" station mean quarterly TLD results separated into 16 geographical sectors around the plant. Figure 5-1 also shows the pre-operational mean and the high, low, and mean results in each sector for the 1984 - 2013 operational period for comparison. The 2014 "S" station TLD results were lower than the pre-operational mean in 11 of the 16 sectors and lower than the operational mean in 6 of the 16 sectors. TLD results from the N, NNE, and NNW sectors are slightly higher than the other "S" station locations as a result of being physically closer to the ISFSI and the CGS turbine building. TLD results for the NE sector (Station 73) were observed to be higher than previous years. In October 2013 this TLD was moved 175 feet to a new location as the old location was to be used to store dirt from the evaporation pond excavation. The higher results seen in the NE sector are believed to be due to increased natural background resulting from the large amount of dirt now piled near the TLD station.

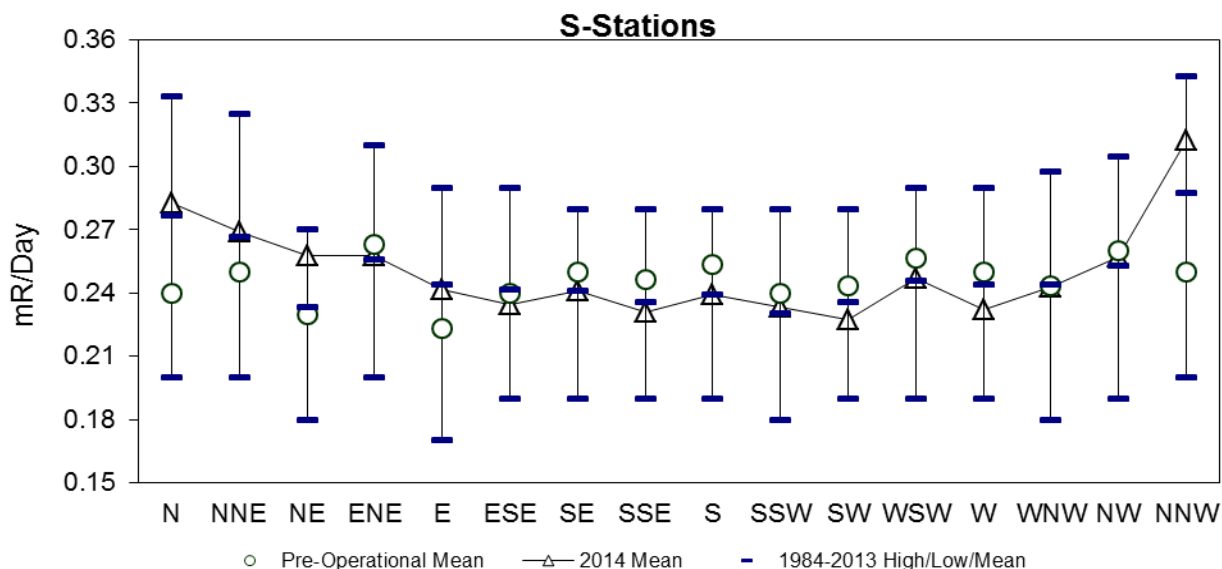


Figure 5-1 "S" Stations Quarterly TLDs 1984-2013 Hi/Low/Mean and 2014 Mean by Sector

Excluding the NNW sector, the average deviation relative to the operational period was 0.10%; in 2013 the average deviation was -1.5%. The NNW sector is the closest “S” station to the ISFSI and the higher result here is attributed to the stations close proximity to this facility.

The 19 locations designated as near plant stations are located at distances between 0.9 and 2.1 miles from the CGS reactor building, see Figure 4-2 for station locations. Figure 5-2 shows the exposure rates for the near plant TLD locations separated into sixteen geographical sectors around the plant. Figure 5-2 also shows the pre-operational mean and the high, low, and mean results in each sector for the 1984-2013 operational period for comparison. The 2014 near plant TLD results were lower than the pre-operational mean in 11 of the 16 sectors and less than the operational mean in 12 of the 16 sectors. The average deviation relative to the operational period was -1.1%, in 2013 the average deviation was -1.9%.

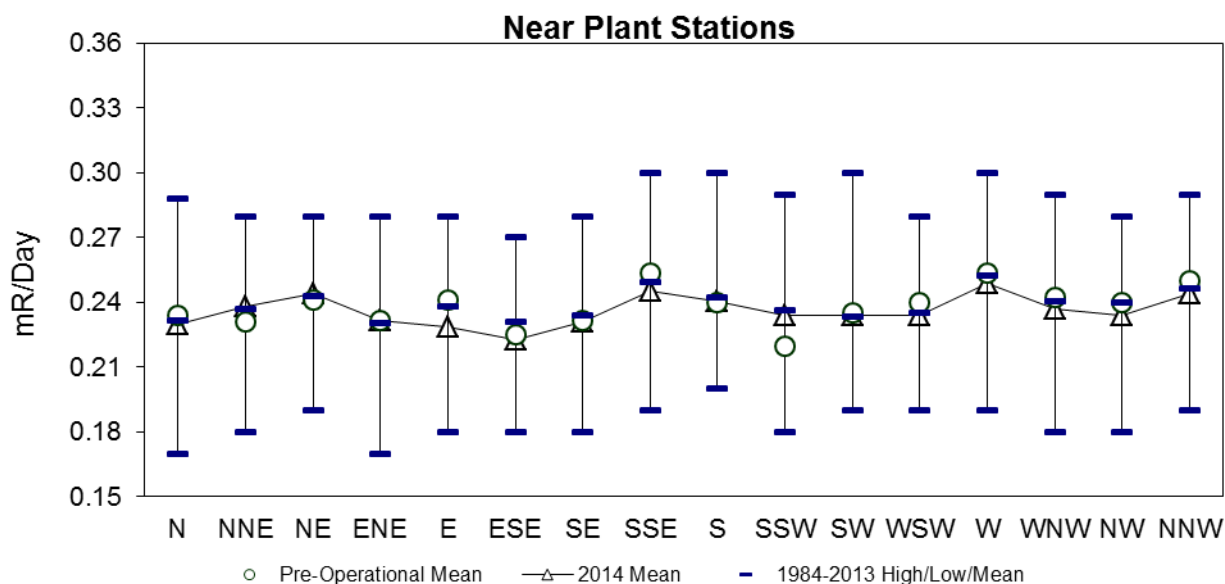


Figure 5-2 Near Plant Stations Quarterly TLDs 1984-2013 Hi/Low/Mean and 2014 Mean by Sector

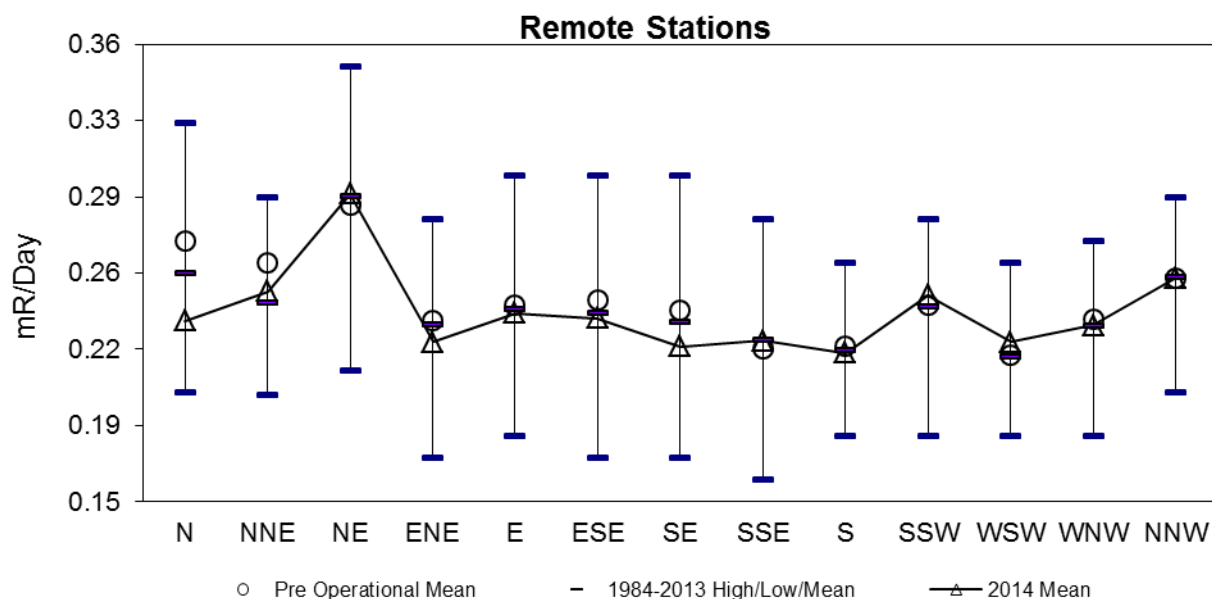


Figure 5-3 Remote Stations Quarterly TLDs 1984-2013 Hi/Low/Mean and 2014 Mean By Sector



The 22 TLD locations designated as remote locations are located between 2.83 and 28.35 miles from the CGS reactor building; see Figure 4-3 for station locations. Figure 5-3 shows the exposure rates for the remote TLD locations separated into geographical sectors around the plant. Figure 5-3 also shows the pre-operational mean and the high, low, and mean results by sector for the 1984-2013 operational period for comparison. The 2014 remote TLD results were lower than the pre-operational mean in 8 of the 13 sectors and lower than the operational mean in 9 of the 13 sectors. Station 46 in the Wahluke Reserve (NE sector) remained the remote location with the highest exposure rate. This has been the case since the pre-operational measurement phase and is attributed to differences in the underlying rock and soil composition in this area. The 2014 average deviation relative to the operational period was -1.0%; the average deviation in 2013 was -2.7%.

Offsite direct radiation monitoring results are consistent with previous years. The 2014 results indicate no observable dose contributions due to plant operations at locations outside the CGS controlled area. Dose contributions inside the CGS controlled area (but outside the protected area) are limited to those locations known to be influenced by the Independent Spent Fuel Storage Installation (ISFSI) and/or radiation from the turbine building during operation. Environmental radiation exposure rates for 2014, the pre-operational period, and the long term operational period are summarized in Table 5-3. See also Appendix A, Tables A-1.1 and B-1.1 for the 2014 quarterly TLD results. TLD results for special interest locations are discussed in further detail in Section 5.9.

## 5.2 Airborne Particulate/Iodine

Air samples are collected weekly from 11 sample stations located around CGS. Additionally, an air sample station located 28 miles WSW of CGS is used as a control for comparison. Air particulate filters are analyzed for gross beta and iodine cartridges for radioiodines on a weekly basis. Air filters are also composited and analyzed for gamma emitting radionuclides quarterly.

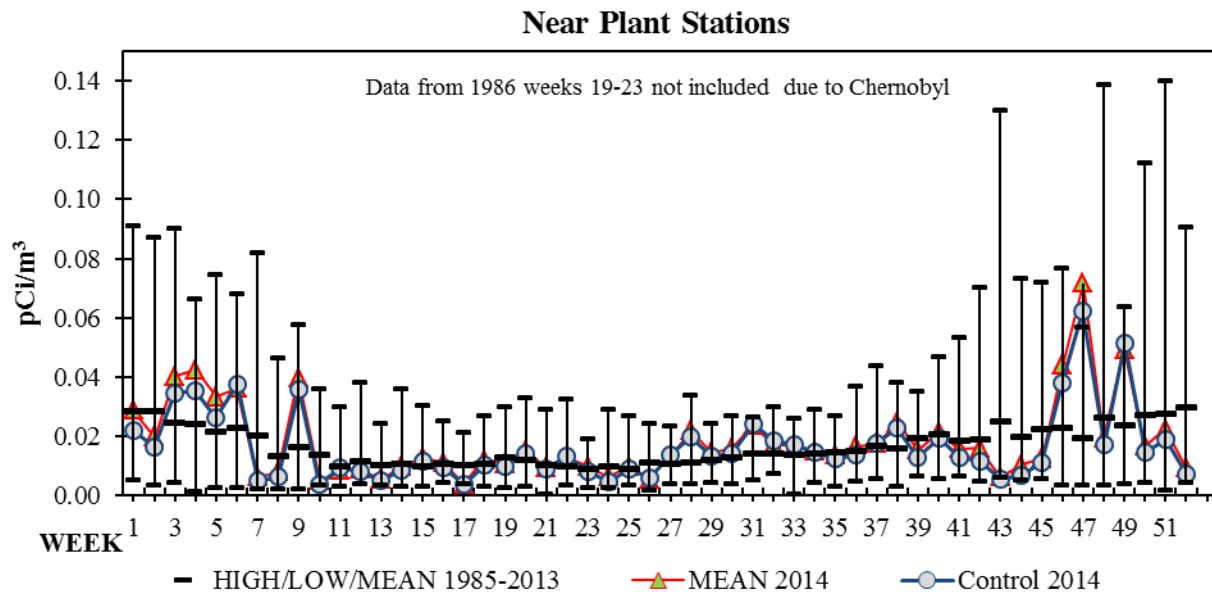


Figure 5-4 1985-2013 Weekly Hi/Low/Mean and 2014 Weekly Mean Gross Beta in Air - Near Plant Stations

The 2014 mean weekly particulate filter gross beta results for the five stations located within three miles of CGS are plotted in Figure 5-4 (See also Appendix A, Tables A-2.1, A-2.2). Results for these near plant stations are similar to results from the remote locations and closely follow the trend of the control location.

Figure 5-5 is a plot of the 2014 mean weekly particulate filter gross beta results for the 6 sample stations located between 3 and 9.6 miles from CGS (See also Appendix A, Tables A-2.1, A-2.2). Results for these remote stations are similar to results from the near plant stations and closely follow the trend of the control location. No correlation between air gross beta activity and proximity to CGS was observed.

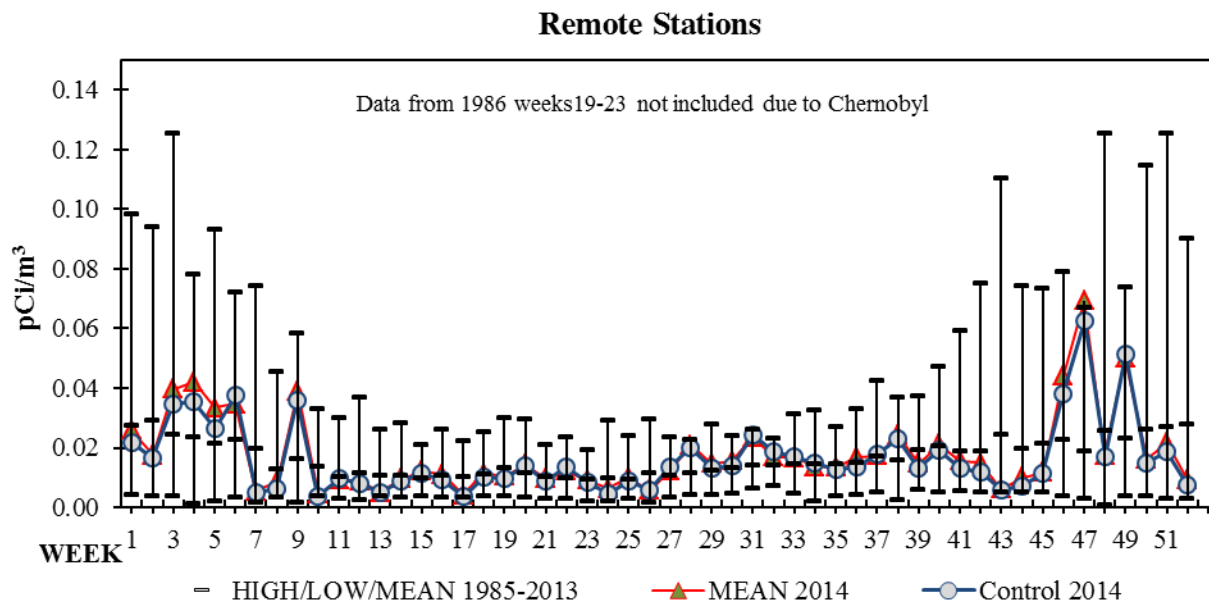


Figure 5-5 1985-2013 Weekly Hi/Low/Mean and 2014 Weekly Mean Gross Beta in Air - Remote Stations

For both near and remote air station locations, higher results and greater variability in air gross beta activity have historically been observed during fall and winter months due to weather induced background fluctuations. Gross beta levels typically increase during periods of inversion due to natural decay products being trapped near the earth surface. Gross beta results plotted over a period of several years typically show a cyclical pattern with higher results observed in the fall and winter compared to the spring and summer. Gross beta results above the normal trend range were observed in January, February, November, and December. The increases were observed at all sample locations including the control and are attributed to weather phenomena and not the result of CGS operation. The highest particulate filter gross beta results for the year occurred during week 47; weather conditions for this week were characterized by periods of fog and freezing rain, below normal temperatures, and light winds.

The quarterly particulate filter gamma isotopic results identified the presence of only naturally occurring radionuclides (See Appendix A, Tables A-3.1, A-3.2). Beryllium -7 was positively identified in all samples at both the indicator and control locations.

The 2014 weekly iodine cartridge isotopic results showed no indication of radioiodines in any of the samples. Results for iodine-131 were in all cases below the lower limit of detection. (See Appendix A, Tables A-4.1, A-4.2). The 2014 air particulate and iodine sample results show no evidence of measurable environmental radiological air quality impact that can be attributed to CGS plant operation.

## 5.3 Water

### 5.3.1 Surface Water

Composite water samples are collected from five surface water locations monthly and analyzed for tritium, gross beta, and gamma emitting radionuclides. A plot of the 2014 gross beta results for the plant intake, plant discharge, and river/drinking water stations are shown in Figure 5-6.

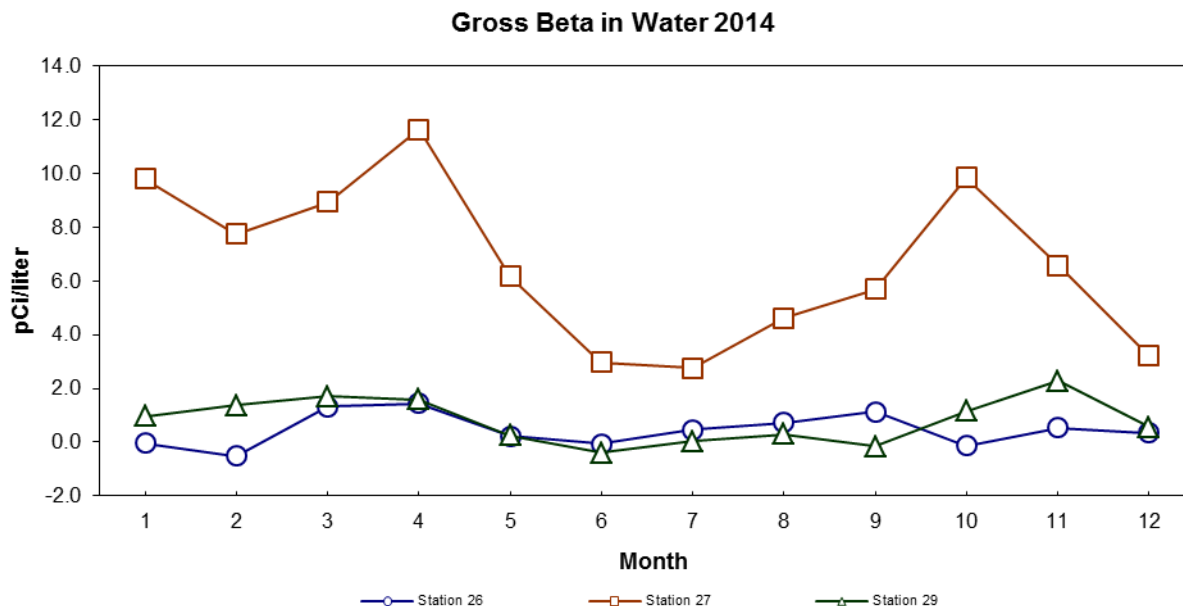


Figure 5-6 Gross Beta in River/Drinking ( Stations 26 & 29) and Plant Discharge Water (Station 27) for 2014

All drinking and river water (Stations 26 and 29) gross beta results were below the analysis detection limits (See Appendix A, Tables A-5.1, A-5.2). Gross beta levels in the plant discharge water (Station 27) were above the detection limits in eleven of the twelve samples. Positive results for this location are expected due to the scrubbing action of the cooling towers which incorporates atmospheric particulate material into the discharge water and the concentration of natural radioactivity in the water by evaporative loss. Historically, higher gross beta results at Station 27 can be correlated to the level of concentration in the CGS circulating water. The Station 27 sample results are representative of the radioactivity present in plant discharge water before any mixing with river water occurs.

Monthly tritium results for all plant intake, plant discharge, and river/drinking water samples were below the analysis method *a priori* LLD. Tritium results for the three sample locations are plotted in Figure 5-7, quarterly averages for the locations are listed in Appendix A, Tables A-6.1, A-6.2.

Gamma spectroscopy results for all plant intake, plant discharge, and river/drinking water samples identified only naturally occurring radionuclides; no gamma-emitting radionuclides related to CGS operation were positively identified in these samples. (See Appendix A, Tables A-7.1, A-7.2).

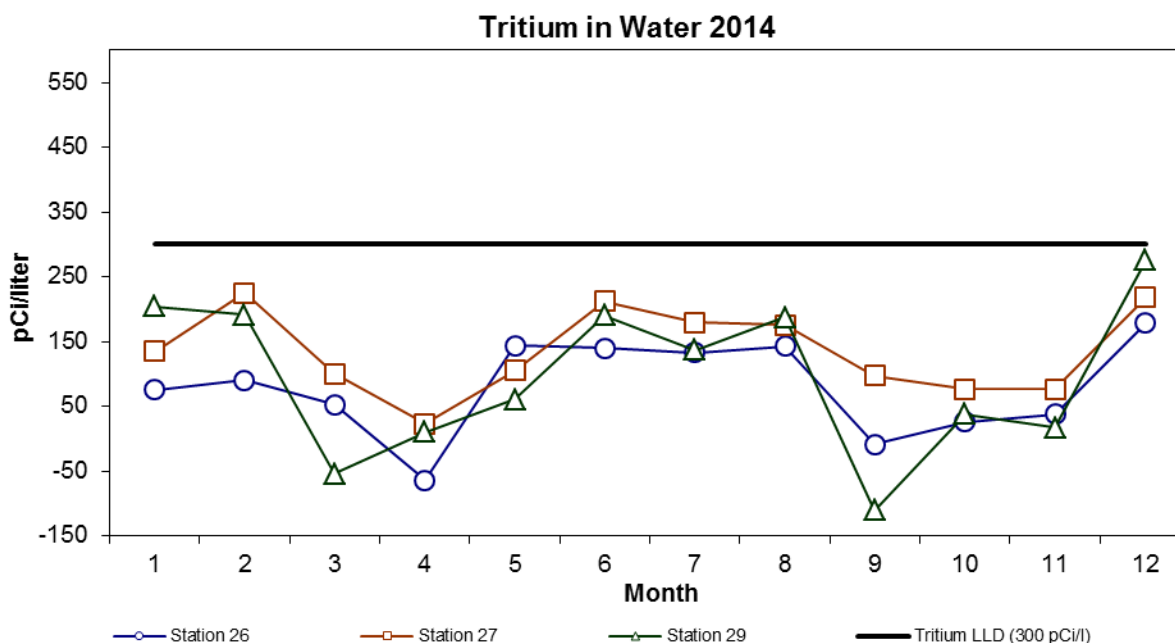


Figure 5-7 Tritium in River/Drinking ( Stations 26 & 29) and Plant Discharge Water (Station 27) for 2014

Analysis results for the plant intake, plant discharge, and river/drinking water samples showed no measurable impact to the environment due to CGS plant operations in 2014. Composite water samples are also taken from a sanitary waste and storm drain location. Analysis results for these samples are discussed in further detail in Section 5.9.

### 5.3.2 Ground Water

Samples from 3 deep wells were collected quarterly to meet ODCM and EFSEC Resolution No. 332<sup>(9)</sup> requirements. Quarterly samples were also collected from ten shallow groundwater monitoring wells located near CGS as part of the CGS groundwater monitoring program. All well samples were analyzed for tritium and gamma emitting radionuclides. Well locations sampled are shown in Figures 4-1 and 4-2.

Analytical results for the three deep water wells were consistent with results seen in previous years. Tritium results were below detection limits and no gamma emitting radionuclides related to CGS operation were identified in any of the samples (See Appendix A, Tables A-6.1, A-6.2, A-7.1, and A-7.2).

The CGS ground water monitoring program is conducted to meet the Nuclear Energy Institute (NEI) Groundwater Protection Initiative (NEI 07-07)<sup>(17)</sup> guidelines and to support NPDES requirements. Water samples from the unconfined aquifer are collected quarterly from ten shallow monitoring wells located around the CGS site. None of these monitoring wells are used as a source of drinking water. CGS is unique in the commercial nuclear power industry in that it is located in an area where the unconfined aquifer under the site is known to be contaminated with tritium as a result of past DOE activities on the Hanford Site.<sup>(19)</sup> The CGS groundwater program is intended to assess any contribution CGS may be making to the known groundwater contamination issue.

Gamma Spectroscopy results for the ten shallow monitoring wells did not identify any gamma emitting radionuclides of interest (See Appendix A, Tables B-10.1, and B-10.2). Tritium concentrations at these locations ranged from < LLD to 15,600 pCi/liter (See Appendix A, Table B-11.1). Tritium results from each well were consistent during the year and within the trend range observed in previous years. The highest tritium concentrations were consistently measured at MW-5 which is hydraulically up-gradient of CGS. In past years Energy Northwest has identified a correlation between tritium levels at Station 101 and tritium levels at nearby well locations. Tritium results for 2014 did not support the correlation as strongly as data from past years. Tritium activity in the storm drain pond is attributed to recapture of CGS effluents, see section 5.9.1 for more discussion. With the exception of the groundwater tritium near the storm drain pond, there is no evidence that CGS operation made a measurable radiological impact on groundwater.

#### **5.4 Soil**

Gamma spectroscopy analysis was performed on soil samples from 5 different locations in 2014 (See Appendix A, Tables A-8.1, A-8.2). Two of the samples were from locations near CGS, two were from locations east of CGS in Franklin County, and one was from a control location. Naturally occurring radionuclides (potassium- 40 and bismuth- 214) were identified in all samples. Cesium-137 was identified in three of the four indicator locations. The level of cesium-137 identified was within the range historically observed in local soil and within the range considered normal background in Hanford area soils.<sup>(20,21,22)</sup> The cesium-137 level was well below the level that would require strontium-90 analysis to be performed.<sup>(9)</sup> The soil sample results indicate no measurable impact from CGS plant operation.

#### **5.5 River Sediment**

Gamma spectroscopy results of river sediment identified naturally occurring radionuclides (potassium- 40, bismuth- 214) and cesium-137 (See Appendix A, Tables A-9.1, 9.2). Relative to the circulating water discharge point, cesium-137 was detected in the downstream samples (Station 34) but not in the upstream samples (Station 33). The downstream cesium-137 activity levels were similar to the levels identified in previous years and within the range known to be present in Hanford area sediment and soil.<sup>(21)</sup> Cesium-137 was not identified in any samples of plant cooling water discharged to the Columbia River. CGS has not made a radioactive discharge to the Columbia River since 1998. The sediment sample results indicate no measurable impact from CGS plant operation.

#### **5.6 Fish**

The gamma spectroscopy results of fish samples collected at both the indicator location (Columbia River) and the control location (Snake River) identified only the presence of naturally occurring radionuclides (See Appendix A, Tables A-10.1, 10.2). Only two of the three fish species collected from the control location were the same species as collected from the indicator location. See section 5.10 for further discussion.

#### **5.7 Milk**

No radioiodine activity was identified in any of the milk samples collected in 2014 (See Appendix A, Tables A-11.1, A-11.2). Gamma spectroscopy results of milk radionuclides other than radioiodine did not identify the presence of any radionuclides of interest. (See Appendix A, Tables A-12.1, A-12.2). Naturally occurring potassium-40 was identified in all milk samples.

## **5.8 Garden Produce**

Gamma analysis was performed on eleven different types of fruits and vegetables and one type of animal feed in 2014 (See Appendix A, Tables A-15.1, A-15.2, A-16.1, A-16.2, A-17.1, A-17.2). No radionuclides of interest were identified in any of the samples. Naturally occurring potassium-40 was identified in all samples.

## **5.9 Special Interest Stations**

Sampling and analysis is performed at the locations covered in this section to comply with EFSEC requirements or as a CGS initiative. The storm drain pond and the Sanitary Waste Treatment Facility (SWTF) were incorporated into the routine sampling schedule in 1992. In 1995, the cooling tower sediment disposal area was added. TLDs were placed at the spray pond drain field (Station 120) in June 1995. TLD monitoring in the vicinity of the planned Independent Spent Fuel Storage Installation (ISFSI) was first performed in 1998 to collect background data and TLD monitoring was established on the ISFSI fence line after construction was completed in 2002. Additional air monitoring and TLDs stations were established in 2008/2009 to monitor remediation work at the DOE 618-11 burial ground west of CGS. Discussion of the results from each of these locations are given in the following sections.

### **5.9.1 Storm Drain Pond (Station 101)**

The storm drain pond (NPDES Outfall 002) is located approximately 1500 feet northeast of CGS. Water is sent to the pond through an 18-inch diameter pipe that discharges into a 300-foot long earthen channel that leads to a 100-foot diameter pond. The pond is a shallow, unlined percolation/evaporation basin. Water at the storm drain outfall is sampled using a flow proportional automatic sampler to collect monthly composite samples. The storm drain pond area is fenced and access is restricted. In November 2014, storm drain water was redirected to two lined evaporation ponds located north of the storm drain pond. The storm drain pond composite sampler (Station 101) was moved to a new location in order to sample the water now discharged to these two lined evaporation ponds. Due to the construction activities implementing these changes, no Station 101 composite sample was collected from 10/23/14 to 11/22/14. As of November 2014 the water sampled at Station 101 consists of storm drain, air wash, and non-radioactive system wastewater originating from within the CGS protected area. Wastewater originating outside the CGS protected area is now typically directed to separate lined evaporation ponds that are not sampled by the Station 101 sampler.

Monthly water samples were analyzed for gamma emitting radionuclides, tritium, and gross beta. Gamma spectroscopy results did not identify the presence of any gamma emitting radionuclides of interest (See Appendix A, Tables B-2.1, B-2.2). Gross beta was positively identified in one of the monthly samples at a level near the analysis MDA (See Appendix A, Tables B-3.1, B-3.2). Tritium was detected in six of the twelve samples (See Appendix A, Tables B-4.1, B-4.2). The samples with higher tritium levels were all from colder, wetter months which is consistent with results seen in previous years. The source of the tritium in storm drain water is attributed to recapture of tritium from CGS gaseous effluents which is more likely to occur during cooler, rainier periods. The tritium concentrations identified in November and December were considerably higher than historically observed. These results were expected, however, as the water now sampled at Station 101 is no longer being diluted by non-protected area wastewater. Calculations taking into account the historic dilution volume show that the Station 101 dilution corrected tritium concentrations for November and December are within the historical trend.

Eleven soil samples were collected from the CGS storm drain pond in 2014 and analyzed for gamma emitting radionuclides. Eight surface and three sub-surface soil samples were collected from locations that were previously identified as having higher levels of activity. Analysis of the 2014 samples identified cobalt-60 in all but one sample and at levels similar to those identified in a 2011 study<sup>(23)</sup> (See Appendix A, Tables B-12.1).

### **5.9.2 Sanitary Waste Treatment Facility (Station 102)**

The Sanitary Waste Treatment Facility (SWTF) is located approximately 0.5 miles south-southeast of CGS. The facility processes sanitary waste water from CGS, the ENW Industrial Development Complex (formerly referred to as WNP-1 and WNP-4), and the Kootenai Building. Processing of sanitary waste water from the DOE 400 area was terminated in December 2013 and the composite sampler (Station 102A) that sampled waste water from this location was removed from service. The Station 102B composite sampler remains in service and collects wastewater as it enters the SWTF head works. Discharge standards and monitoring requirements for the SWTF are established in EFSEC Resolution No. 300.<sup>(16)</sup>

Low level gross beta was identified in all twelve Station 102B samples. The levels identified were consistent with levels identified in previous years. Gross alpha was not positively identified in any of the Station 102B samples. (See Appendix A, Tables B-5.1, B-5.2, B-6.1, B-6.2).

Gamma spectroscopy results of the monthly Station 102B samples identified only naturally occurring radionuclides (See Appendix A, Tables B-7.1, B-7.2).

Tritium activity was not positively identified in any of the Station 102B samples in 2014 (See Appendix A, Tables B-8.1, B-8.2). Tritium activity has been historically identified in the Station 102B samples but was attributed to be solely from the DOE 400 area which utilized well water known to be contaminated with tritium as the result of past DOE activities on the Hanford site.<sup>(17)</sup> With processing of DOE 400 area waste water terminated, the source of the tritium in the SWTF was removed. The absence of any tritium in the 2014 SWTF samples confirms that the DOE 400 area was the sole source of tritium historically observed at the SWTF.

SWTF water from stabilization pond B was discharged to ground in April 2014. Grab samples were taken at CGS initiative during discharge and analyzed for gamma isotopic and tritium content. Gamma isotopic analyses of the grab samples did not identify any radioisotopes related to CGS operation. Tritium activity of the grab samples was determined to be between 396 and 423 pCi/l. The tritium identified represents legacy tritium from the DOE 400 area that remained in the SWTF stabilization ponds. A total of 850,000 gallons of SWTF water was discharged to ground in April 2014.

### **5.9.3 Cooling System Sediment Disposal Area (Station 119)**

EFSEC Resolution No. 299<sup>(18)</sup> authorizes the onsite disposal of sediments from plant cooling systems containing low levels of radionuclides. The disposal area for these sediments is located just south of the CGS cooling towers. EFSEC Resolution No. 299<sup>(18)</sup> requires direct radiation monitoring using quarterly TLDs in the vicinity of the disposal cells and the collection and analysis of a dry composite sediment sample from the disposal cell within thirty days following each cleaning to confirm that the disposal criteria outlined in the resolution have not been exceeded.



Cleaning of the CGS cooling towers was performed in April and October 2014. Disposal of the material removed during the cleanings resulted in an estimated 22.4 cubic meters of dry sediment being added to the disposal cell. ENW also completed transfer of Standby Service Water (SSW) sediment to the disposal cell in January 2014. Material removed from the SSW ponds in 2013 had been temporarily stored in bags in a lined basin south of the SSW ponds. Transfer of the SSW sediment to the established cooling system disposal area was initiated in December 2013 and completed in January 2014. Disposal of this material resulted in an estimated 443 cubic meters of dry sediment being added to the disposal cell. Restoration of the area used to temporarily store the SSW sediment involved scrapping off the top layer of soil to remove small amounts of dried sediment that had flaked off during the liner removal. This scraped soil layer was added to the disposal cell area in May 2014. Transfer of this material resulted in an estimated 11.5 cubic meters of dry soil being added to the disposal cells.

	2014 Cooling System Sediment Disposal Data					
	Disposal Date	Jan-14	Apr-14	May-14	Oct-14	
	Pit ID:	2007 Pit	2007 Pit	2007 Pit	2007 Pit	
	Mass, kg	217,287	10,128	17,020	8,423	
	Density, g/cc	0.49	0.80	1.48	0.86	
Nuclide	Limit (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Analytical Result (pCi/kg)	Total Curies
Co-60	5.00E+03	2.72E+03	2.07E+02	8.08E+01	<4.47E+01	5.95E-04
Mn-54	3.00E+04	< 9.14E+01	<4.52E+01	<2.77E+01	<4.58E+01	2.12E-05
Zn-65	5.00E+04	<1.94E+02	<1.32E+02	<7.55E+01	<1.13E+02	4.57E-05
Cs-134	1.00E+04	<8.89E+01	<4.68E+01	< 6.02E+01	< 4.90E+01	2.12E-05
Cs-137	2.00E+04	<7.48E+01	1.34E+02	4.30E+01	9.18E+01	1.91E-05
						7.02E-04

Figure 5-8 Cooling System Sediment Activity Levels For Disposals Made In 2014

A summary of the estimated mass and radionuclide content of all transfers to the disposal cell area in 2014 is presented in Figure 5-8. For those isotopes listed in the table that were not positively identified, the MDA value obtained from the sample analysis was used in the table calculations. As such, the total activity reported is a conservative estimate.

Figure 5-8 shows that all materials transferred to the disposal cell area in 2014 were below the disposal concentration limits specified in EFSEC Resolution No. 299.<sup>(18)</sup> Cesium -137 levels identified in 2014 were similar to levels identified in previous years and within the range normally seen in Hanford area soils. The SSW sediment disposal involved a much larger volume of material with significantly higher radionuclide concentration than is typically encountered in the disposal of cooling tower sediment. The SSW material accounts for 54% of the volume, 98% of the cobalt-60 activity, and 85% of all radionuclide activity currently in the active disposal cell. Transfer of SSW water to the Circulating Water system in the fall of 2013 is believed to be the main source of the cobalt-60 activity identified in the April 2014 Circulation Water sediment.

Measurements of direct radiation at the disposal pit area were taken using TLDs. Two locations were used, an indicator location by the collection area (Station 119B) and a control location approximately 100 yards to the east (Station 119C). At the start of the second quarter (April 2014), the Station 119B TLD was



moved to a new location nearer the active disposal cell in order to better assess direct radiation from sediments in the disposal cell. The Station 119B results for the second, third and fourth quarters 2014 do not indicate an appreciable difference from the first quarter 2014 result or the Station 119B historical trend. The negligible difference between the indicator and the control TLDs indicate that there was no measureable dose contribution above background due to material in the disposal cells. (See Tables 5.3 and Appendix A, Tables B-1.1).

#### 5.9.4 Spray Pond Drain Field (Station 120)

There were no discharges to the Spray Pond Drain Field (NPDES Outfall 003) in 2014. The TLD results at Station 120 in 2014 are in agreement with those seen in previous operational years (See Table 5-3 and Appendix A, Tables B-1.1).

#### 5.9.5 Independent Spent Fuel Storage Installation

The Independent Spent Fuel Storage Installation (ISFSI) is a fenced, secured area north northwest of CGS. Ten TLDs, Stations 123-129 and Stations 136A-138A, are located on the second of three security fences that surround the ISFSI. TLD Station 122 is just north of the ISFSI between the ISFSI and the plant access road. TLD Station 121 is located approximately 0.1 mile north of the plant between the Transformer Yard and the ISFSI. Refer to Figure 4-4 for ISFSI TLD locations. Radiological exposure rates inside the ISFSI security fence line are elevated and access to the area requires radiological dosimetry and security notification. In addition to the TLD monitoring program, quarterly radiological surveys of the ISFSI are conducted by the CGS Radiation Protection Department.

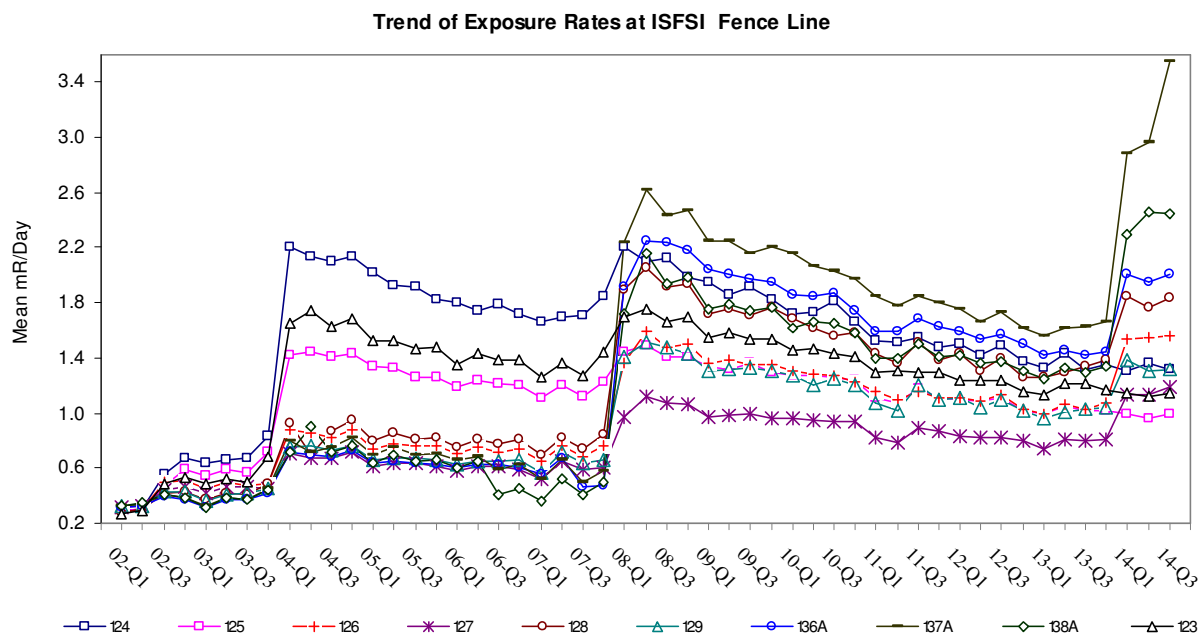


Figure 5-9 ISFSI TLD Trend at CGS

Nine new spent fuel casks were added to the ISFSI in the second quarter of 2014. As shown in Figure 5-9, exposure rates at the ISFSI fence line showed a step change increase at this time with those TLDs located closest to pad 2 showing the greatest increase. The increase seen at Station 137A during the fourth quarter is suspect; other TLDs near Station 137A (Stations 136A and 138A) did not show a

similar increase. Station 122 TLD results showed a flat trend line with only a small increase observed in 2014. This location is effectively shielded from the new fuel casks added to pad 2 by the older cask in place on pad 1. Station 121 TLD results in 2014 were within the expected range. Long term Station 121 results show large decreases during periods when CGS is shut down; this location has historically been influenced more by turbine building radiation levels than by the ISFSI (See Table 5-3 and Appendix A, Tables B-1.1, B-1.2).

#### **5.9.6 Miscellaneous Environmental Sample Results**

Four air sample locations (Stations 87-90) and 5 TLD stations (Stations 58, 87-90) were established in 2008/2009 in order to monitor air quality and direct radiation during remediation work at the DOE 618-11 burial ground located just west of CGS (See Figure 4-1). No air samples were taken from these locations in 2014 as no work was performed at the 618-11 site that had the potential of impacting CGS. Quarterly TLDs were exchanged at all five locations in 2014. Three of the TLD stations (stations 87-89) had results higher than background due to the TLD stations close proximity to the turbine building (See Appendix A, Table B-1.1).

Apple samples from both control and indicator locations were collected in the fall of 2014 and analyzed for carbon-14 content. Analysis was performed by the Washington State Department of Health, Public Health Laboratories, located in Shoreline, WA. Analysis methodology involved sample oxidation followed by Liquid Scintillation counting. Results for all samples (indicator and controls) were below the reported analysis MDA (See Appendix B, Table B-13.1).

In April 2014 a new well was drilled at a location within the CGS protected area in order to install cathodic protection devices for underground piping. Samples of soil and water slurry were collected during the drilling process and analyzed for gamma-emitting radionuclides and tritium. Only naturally occurring radionuclides were identified, all tritium results were below the analysis LLD.

## 5.10 2014 Sample Deviations

A summary of REMP sample deviations encountered in 2014 is listed below in Table 5-1a. All known deviations from the sampling schedule (i.e. sample was not obtained) or analyses where the ODCM specified lower limit of detection was not achieved are included. For locations where composite or continuous samples are collected, any known period greater than 24 hours during which samples were not collected have been included. All locations listed in Table 5-1a are required by either the ODCM or EFSEC resolutions. Table 5-1b lists information regarding air sample station sampling requirements.

**TABLE 5-1a**  
**REMP Sample Deviations for 2014**

SAMPLE MEDIA	DATE	LOCATION	CR ID	PROBLEM / COMMENTS
Air Sampler	10/28/14 to 11/04/14	Station 23	317202	Station found off with blown fuse, station run time for week < 1 hour. Fuse replaced, station returned to service on 11/04/14. No sample was collected, LLD requirements was not met.
Air Sampler	11/24/14 to 12/02/14	Station 4	318632	Station found off with blown fuse; estimate station OOS for 65 hours. Replaced pump, station returned to service. Sufficient sample volume obtained to meet LLD.
Air Sampler	11/24/14 to 12/02/14	Station 40	318632	Station found off with blown fuse; estimate station OOS for 37 hours. Fuse replaced, station returned to service. Sufficient sample volume obtained to meet LLD.
Water	2/05/14 to 2/07/14	Station 27	302282	Composite sampler OOS for ~ 31 hours due to failure of electrical transformer. Sampler returned to service when power restored and verified operable.
Water	10/23/14 to 11/22/14	Station 101	N/A	Composite sampler removed from service and relocated. Storm drain water redirected to new evaporation ponds, ST-101 operational on 11/22 in new location.
Fish	Annual	Stations 30 and 38	320309	ODCM fish collection requirements not strictly met in 2014. 3 fish species were obtained from both the control and indicator locations; however only 2 of the 3 species collected at the control location were the same species that were collected at the indicator location.
TLD	10/17/14	Stations 13, 41, and 43	316186	TLD distance or sector designation determined to be incorrect, ODCM requirements not strictly met. ST-13 was moved to correct sector, ODCM to be revised to correct ST-41 and ST-43 distance requirements.

Table 5-1b below shows the percent time in service for the 12 air sample locations. The table shows that overall availability was greater than 99% for all ODCM required locations.

<b>TABLE 5-1b</b>			
<b>CGS REMP Air Sample Percent in Service Time for 2014</b>			
Station ID	ODCM Required	EFSEC Required	Percent Time in Service
1		x	99.9%
4	x	x	99.1%
5			99.8%
6		x	99.9%
7		x	99.8%
8	x	x	99.9%
9	x	x	99.8%
21			99.8%
23		x	97.8%
40	x	x	99.4%
48	x	x	99.8%
57	x		99.8%

TABLE 5-2							
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY							
COLUMBIA GENERATING STATION Benton County, Washington				DOCKET NO. 50-397 Calendar Year 2014			
Medium: Environmental Direct Radiation (TLD)				mR/std. Units: quarter			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
TLD Quarterly	228	---	21.8 (224 / 224) (17.6-29.2)	86 NNW 0.3 miles	28.5 (4/4) (27.9-29.2)	20.4 (4/4) (19.6-21.2)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
Reference Appendix A, Tables A-1.1, A-1.2							

TABLE 5-2 (cont)							
RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY							
COLUMBIA GENERATING STATION Benton County, Washington				DOCKET NO. 50-397 Calendar Year 2014			
Medium: ISFSI Direct Radiation (TLD)				mR/std. Units: quarter			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD)	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
TLD Quarterly	40	---	143.3 (40 / 40) (73.8-324.8)	137A NNW 0.24 miles	252.5 (4 / 4) (151.4-324.5)	--- (0 / 0)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
Reference Appendix A, Tables B-1.1, B-1.2							
ISFSI TLDs are Stations 123 to 129 and 136A to 138A							

<p align="center"><b>TABLE 5-2 (cont)</b>  <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b>  <b>COLUMBIA GENERATING STATION</b>  <b>Benton County, Washington</b> <span style="float: right;"><b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b></span> </p>							
Medium: Air Particulate/Air Radioiodine				Units: pCi/m <sup>3</sup>			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
Gross Beta	623	0.01	0.0181 (571/571) (0.00298-0.0752)	21 ENE 1.45 miles	0.0188 (52/52) (0.00406 - 0.0752)	0.0165(52/52) (0.0037 - 0.0625)	0
I-131	623	0.07	--- (0 / 571)	---	---	--- (0 / 52)	0
Cs-134	48	0.05	--- (0 / 44)	---	---	--- (0 / 4)	0
Cs-137	48	0.06	--- (0 / 44)	---	---	--- (0 / 4)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-2.1, A-2.2, Tables A-3.1, A-3.2, and Tables A- 4.1, A-4.2.							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Water-River/Drinking				Units: pCi/L			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>c</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
Gross Beta	24	4.0	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
H-3	8	2000	--- (0 / 8) <sup>(b)</sup>	---	---	--- (0 / 4)	0
Mn-54	24	15	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Fe-59	24	30	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Co-58	24	15	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Co-60	24	15	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Zn-65	24	30	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Zr/Nb-95	24	15	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Cs-134	24	15	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Cs-137	24	18	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
Ba/La-140	24	15	--- (0 / 24) <sup>(b)</sup>	---	---	--- (0 / 12)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. This includes the control sample for this group; the control (Station 26) is also a drinking water sample.							
c. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-5.1, A-5.2, Tables A-6.1, A-6.2, and Tables A-7.1, A-7.2							

<p align="center"><b>TABLE 5-2 (cont)</b>  <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b>  <b>COLUMBIA GENERATING STATION</b>  <b>Benton County, Washington</b> <span style="float: right;"><b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b></span> </p>							
Medium: Water-Discharge				Units: pCi/L			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
Gross Beta	12	4.0	6.67 (11 / 12) (2.75-11.6)	27 E 3.2 miles	6.67 (11 / 12) (2.75-11.6)	---(0 / 0)	0
H-3	4	2000	--- (0 / 4)	---	---	--- (0 / 0)	0
Mn-54	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Fe-59	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-58	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-60	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Zn-65	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Zr/Nb-95	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-134	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-137	12	18	--- (0 / 12)	---	---	--- (0 / 0)	0
Ba/La-140	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-5.1,A-5.2, Tables A-6.1, A-6.2, and Tables A-7.1, A-7.2							



<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Water- Deep Ground				Units: pCi/L			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
H-3	12	2000	--- (0 / 12)	---	---	--- (0 / 0)	0
Mn-54	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Fe-59	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-58	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Co-60	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Zn-65	12	30	--- (0 / 12)	---	---	--- (0 / 0)	0
Zr/Nb-95	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-134	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
Cs-137	12	18	--- (0 / 12)	---	---	--- (0 / 0)	0
Ba/La-140	12	15	--- (0 / 12)	---	---	--- (0 / 0)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-6.1, A-6.2, and Tables A-7.1, A-7.2							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Water- Shallow Ground				Units: pCi/L			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
H-3	40	2000	3720 (34 / 40) (-21.4-15,600)	MW-5 SW 0.43 miles	15,200 (4 / 4) (14,700-15,600)	--- (0 / 0)	0
Mn-54	40	15	--- (0 / 40)	---	---	--- (0 / 0)	0
Fe-59	40	30	--- (0 / 40)	---	---	--- (0 / 0)	0
Co-58	40	15	--- (0 / 40)	---	---	--- (0 / 0)	0
Co-60	40	15	--- (0 / 40)	---	---	--- (0 / 0)	0
Zn-65	40	30	--- (0 / 40)	---	---	--- (0 / 0)	0
Zr/Nb-95	40	15	--- (0 / 40)	---	---	--- (0 / 0)	0
Cs-134	40	15	--- (0 / 40)	---	---	--- (0 / 0)	0
Cs-137	40	18	--- (0 / 40)	---	---	--- (0 / 0)	0
Ba/La-140	40	15	--- (0 / 40)	---	---	--- (0 / 0)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables B-10.1, B-10.2, and B-11.1.							

<p align="center"><b>TABLE 5-2 (cont)</b>  <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b>  <b>COLUMBIA GENERATING STATION</b>  <b>Benton County, Washington</b> <span style="float: right;"><b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b></span> </p>							
Medium: River Sediment				Units: pCi/kg			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
Cs-134	4	150	--- (0 / 2)	---	---	--- (0 / 2)	0
Cs-137	4	180	124 (2 / 2) (101-147)	34 ESE 3.32 Miles	124 (2 / 2) (101-147)	40.1 (0 / 2) (32.3-47.8)	0
Co-60	4	---	--- (0 / 2)	---	---	--- (0 / 2)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-9.1, A-9.2.							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Roots				Units: pCi/kg			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
I-131	5	60	--- (0 / 5)	---	---	---	0
Cs-134	5	60	--- (0 / 5)	---	---	---	0
Cs-137	5	80	--- (0 / 5)	---	---	---	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-15.1, A-15.2.							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Fruits				Units: pCi/kg			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
I-131	8	60	--- (0 / 7)	---	---	--- (0 / 1)	0
Cs-134	8	60	--- (0 / 7)	---	---	--- (0 / 1)	0
Cs-137	8	80	--- (0 / 7)	---	---	--- (0 / 1)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Table A-16.1, A-16.2.							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Vegetables and Vegetation				Units: pCi/kg			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
I-131	15	60	--- (0 / 14)	---	---	--- (0 / 1)	0
Cs-134	15	60	--- (0 / 14)	---	---	--- (0 / 1)	0
Cs-137	15	80	--- (0 / 14)	---	---	--- (0 / 1)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Table A-17.1, A-17.2.							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Fish				Units: pCi/kg			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
Mn-54	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Fe-59	6	260	--- (0 / 3)	---	---	--- (0 / 3)	0
Co-58	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Co-60	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Zn-65	6	260	--- (0 / 3)	---	---	--- (0 / 3)	0
Cs-134	6	130	--- (0 / 3)	---	---	--- (0 / 3)	0
Cs-137	6	150	--- (0 / 3)	---	---	--- (0 / 3)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Table A-10.1, A-10.2.							

<b>TABLE 5-2 (cont)</b> <b>RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY</b> <b>COLUMBIA GENERATING STATION</b> <b>Benton County, Washington</b>							
				<b>DOCKET NO. 50-397</b> <b>Calendar Year 2014</b>			
Medium: Milk				Units: pCi/L			
Analysis Type	Total Analyses Performed	Lower Limit of Detection (LLD) <sup>b</sup>	Indicator Locations Mean (f) <sup>a</sup> Range	Location With Highest Annual Mean		Control Locations Mean (f) <sup>a</sup> Range	Number of Nonroutine Measurements
				Location Information	Mean (f) <sup>a</sup> Range		
I-131	36	1.0	--- (0 / 18)	---	---	--- (0 / 18)	0
Cs-134	36	15	--- (0 / 18)	---	---	--- (0 / 18)	0
Cs-137	36	18	--- (0 / 18)	---	---	--- (0 / 18)	0
Ba/La-140	36	15	--- (0 / 18)	---	---	--- (0 / 18)	0
a. (f) is the number of positive measurements / total measurements at specified location.							
b. These are the ODCM specified LLDs, actual method LLDs will be lower. See Table 4-4.							
Reference Appendix A, Tables A-11.1, A-11.2, Tables A-12.1, A-12.2.							

**TABLE 5-3**  
**QUARTERLY TLD DATA SUMMARY WITH COMPARISON TO**  
**PREOPERATIONAL AND OPERATIONAL PERIODS**  
Results in mR/Standard Quarter

Station	Pre-Operational				Operational to 2013				2014 Operational			
	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean
1	19.16	23.73	2.07	21.90	18.25	27.38	1.64	22.13	21.06	22.87	0.75	21.96
2	17.34	22.81	2.09	21.10	16.43	25.55	1.54	21.63	20.26	23.25	1.26	21.74
3	18.25	21.90	1.46	20.42	16.43	24.64	1.67	20.84	19.52	21.93	1.00	20.86
4	15.51	23.73	2.65	19.96	14.60	22.81	1.64	19.54	18.52	20.27	0.74	19.53
5	18.25	22.81	1.74	20.76	16.43	23.73	1.62	20.03	18.22	21.10	1.19	19.77
6	18.25	21.90	1.50	20.19	16.43	23.73	1.55	20.14	18.42	20.38	0.83	19.59
7	19.16	22.81	1.69	21.33	16.43	24.64	1.69	21.08	19.69	22.26	1.13	21.07
8	21.90	25.55	1.50	23.84	15.51	27.38	1.92	23.26	22.83	23.81	0.54	23.31
9	15.51	21.90	2.00	19.85	16.43	23.73	1.66	19.79	19.56	21.21	0.72	20.39
10	19.16	22.81	1.38	20.99	16.43	24.64	1.63	20.94	19.51	21.81	1.06	21.01
11	19.16	22.81	1.38	21.44	16.43	24.64	1.45	21.53	20.47	22.15	0.77	21.61
12	20.99	24.64	1.60	23.04	18.25	26.46	1.68	23.12	21.74	24.58	1.16	23.08
13	19.16	22.81	1.54	21.44	17.34	27.38	1.76	21.30	19.67	22.19	1.15	21.37
14	19.16	24.64	2.07	21.90	17.34	25.55	1.48	21.45	19.54	22.63	1.36	21.37
15	20.99	25.55	1.37	23.15	17.34	27.38	1.67	23.03	20.50	23.98	1.55	22.69
16	20.08	23.73	1.52	22.13	16.43	26.46	1.78	21.93	20.06	22.38	1.07	21.64
17	19.16	23.73	1.62	22.81	17.34	26.46	1.58	22.51	20.75	23.00	1.03	22.26
18	20.08	23.73	1.27	22.13	16.43	25.55	1.64	22.02	20.89	23.29	0.99	22.12
19	20.08	23.73	1.24	22.01	17.34	25.55	1.55	22.16	20.82	23.19	1.07	22.25
20	19.16	23.73	1.76	21.44	17.34	25.55	1.62	21.79	20.89	22.91	0.92	22.25
21	19.16	21.90	1.25	20.68	15.51	23.73	1.41	20.30	17.90	21.81	1.65	20.04
22	19.16	23.73	1.58	22.01	16.43	25.55	1.48	21.71	19.61	21.69	0.95	20.84
23	20.08	23.73	1.49	21.60	17.34	25.55	1.60	21.15	19.61	23.43	1.61	21.52
24	20.99	23.73	1.09	21.90	17.34	50.50	3.14	22.07	19.38	22.26	1.34	21.33
25	20.99	24.64	1.46	23.15	17.34	27.38	1.89	22.76	20.42	23.23	1.33	22.37
40	17.34	21.90	1.70	19.94	15.51	24.64	1.73	20.01	17.58	19.91	1.06	18.76
41	20.08	25.55	2.00	23.73	17.34	27.38	2.01	22.40	20.67	22.45	0.76	21.63
42	20.08	23.73	1.61	22.36	17.34	26.46	1.91	21.94	20.01	22.06	0.87	20.91
43	20.99	24.64	1.49	23.12	16.43	27.38	2.09	22.58	21.33	23.14	0.76	22.20
44	19.16	22.81	1.34	21.12	15.51	24.64	1.92	20.76	18.30	19.79	0.68	19.07
45	19.16	22.81	1.37	21.25	16.43	25.55	1.79	21.14	19.59	20.99	0.61	20.45
46	22.81	28.29	2.10	26.10	19.16	31.94	2.11	26.48	25.97	26.93	0.43	26.60
47	17.34	20.99	1.73	19.85	15.51	26.28	1.69	20.20	19.15	21.33	1.03	19.79
49	21.90	21.90	-	21.90	16.43	25.55	1.54	21.90	19.96	22.45	1.12	21.37
50	20.08	20.08	-	20.08	16.43	26.46	1.74	21.57	19.74	22.63	1.20	21.37
51	19.16	21.90	1.18	20.53	16.43	24.64	1.61	21.06	19.31	21.45	0.97	20.32
53	24.64	24.64	-	24.64	18.25	29.57	2.06	23.27	20.03	21.83	0.84	21.26
54	23.73	23.73	-	23.73	18.18	26.46	1.96	22.05	21.26	23.98	1.22	22.51
55	20.99	20.99	-	20.99	16.43	25.55	1.47	21.44	20.24	22.52	0.93	21.35
56	21.90	21.90	-	21.90	16.43	25.55	1.72	21.90	20.81	23.65	1.30	22.34
58	-	-	-	-	18.07	21.73	0.97	19.46	19.39	21.86	1.24	20.50
65	-	-	-	-	17.73	22.72	1.18	19.88	19.09	21.69	1.12	20.27

**TABLE 5-3 (cont)**  
**QUARTERLY TLD DATA SUMMARY WITH COMPARISON TO**  
**PREOPERATIONAL AND OPERATIONAL PERIODS**  
 Results in mR/Standard Quarter

Station	Pre-Operational				Operational to 2013				2014 Operational			
	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean	Min	Max	Std Dev	Mean
71(1S)	20.08	22.81	1.58	21.90	18.25	30.39	2.43	25.25	25.12	27.04	0.91	25.82
72(2S)	21.90	23.73	0.91	22.81	18.25	29.65	1.95	24.32	22.97	26.06	1.28	24.54
73(3S)	20.08	21.90	0.91	20.99	16.43	24.64	1.55	21.27	21.84	25.15	1.38	23.49
74(4S)	23.73	24.64	0.53	24.03	18.25	28.29	1.85	23.37	22.19	24.96	1.21	23.52
75(5S)	19.16	21.90	1.39	20.38	15.51	26.46	1.83	22.29	21.21	23.46	0.98	22.06
76(6S)	20.99	22.81	0.91	21.90	17.34	26.46	1.68	22.02	18.08	23.60	2.38	21.41
77(7S)	21.90	23.73	0.91	22.81	17.34	25.55	1.57	22.00	20.65	23.69	1.26	21.99
78(8S)	21.90	23.73	1.05	22.51	17.34	25.55	1.54	21.50	19.91	22.50	1.18	21.05
79(9S)	22.81	23.73	0.53	23.12	17.34	25.55	1.61	21.83	20.76	22.95	1.07	21.85
80(10S)	20.99	22.81	0.91	21.90	16.43	25.55	1.72	21.00	20.43	22.24	0.98	21.30
81(11S)	20.08	23.73	1.90	22.20	17.34	25.55	1.50	21.49	19.72	21.93	1.12	20.74
82(12S)	21.90	24.64	1.39	23.42	17.34	26.46	1.53	22.41	21.27	23.57	1.15	22.53
83(13S)	21.90	23.73	0.91	22.81	17.34	26.46	1.82	22.26	18.08	22.40	2.07	21.17
84(14S)	20.99	22.81	1.05	22.20	16.43	27.17	1.75	22.26	19.13	23.27	2.02	22.15
85(15S)	21.90	24.64	1.58	23.73	17.34	27.83	1.85	23.08	22.53	24.69	1.09	23.49
86(16S)	21.90	23.73	0.91	22.81	18.25	31.28	2.60	26.22	27.87	29.23	0.73	28.53
87			-		19.34	34.34	4.47	28.73	26.71	29.73	1.44	28.87
88			-		17.05	31.67	3.92	25.73	21.62	27.23	2.50	24.24
89			-		19.25	29.38	2.69	25.86	25.61	28.03	1.14	26.51
90			-		17.53	20.48	0.63	18.94	17.75	21.02	1.39	19.33
119B	-	-	-	-	19.24	25.64	1.44	22.11	20.81	22.92	1.00	21.58
119Ctrl	-	-	-	-	19.53	26.55	1.37	21.85	21.10	23.41	1.11	22.02
120East	-	-	-	-	19.78	31.12	1.78	22.42	21.19	23.74	1.12	22.37
121 (ISFSI)	-	-	-	-	19.52	130.27	23.28	75.69	63.30	73.74	4.43	67.53
122 (ISFSI)	-	-	-	-	19.62	42.49	7.10	31.19	35.78	38.50	1.14	36.90
123 (ISFSI)	-	-	-	-	24.99	160.33	36.66	116.15	102.57	106.91	1.78	104.60
124 (ISFSI)	-	-	-	-	26.89	201.05	46.87	143.19	119.57	124.05	2.37	121.76
125 (ISFSI)	-	-	-	-	26.46	135.52	28.18	101.83	88.01	93.23	2.15	90.71
126 (ISFSI)	-	-	-	-	26.00	145.68	30.83	85.95	97.92	142.74	21.78	130.57
127 (ISFSI)	-	-	-	-	28.97	102.08	18.92	66.69	73.78	109.16	16.11	97.64
128 (ISFSI)	-	-	-	-	25.64	187.25	46.42	101.62	126.92	169.03	19.89	156.31
129 (ISFSI)	-	-	-	-	30.16	138.08	31.85	80.99	95.27	126.17	13.64	115.21
136A (ISFSI)	-	-	-	-	28.99	205.64	60.35	104.48	131.71	183.66	25.00	169.00
137A (ISFSI)	-	-	-	-	29.47	238.74	68.76	115.49	151.36	324.49	72.69	252.45
138A (ISFSI)	-	-	-	-	28.28	196.68	52.26	95.20	122.63	224.87	48.70	194.96
Site 1	-	-	-	-	11.92	20.19	1.36	18.20	17.78	19.44	0.81	18.68
Site 4	-	-	-	-	17.02	32.44	2.64	18.95	18.29	20.24	0.98	19.12

**Table 5-3 Notes:**

The preoperational mean is from 1982-1983 data. Station 65 was added in 1997.

Stations 119B, 119Ctrl, and 120 were added in 1995. Stations 121 and 122 were added in 1998 for the ISFSI.

Stations 123-129 and 136A-138A were added in the 2nd quarter of 2002. Stations Site 1 and Site 4 were added in 2006.

Stations 58 and 87 to 90 were added in 2008 to monitor remediation work at DOE 618-11 burial site.



## **6.0 QUALITY ASSURANCE AND QUALITY CONTROL**

## **6.0 QUALITY ASSURANCE AND QUALITY CONTROL**

The REMP is designed to meet the quality assurance (QA) and quality control (QC) criteria of the NRC Regulatory Guide 4.15<sup>(7)</sup> and 10 CFR 50 Appendix B<sup>(15)</sup>. The laboratories performing sample analysis, Energy Northwest Environmental Services and Hanford External Dosimetry Program (HEDP), maintain quality control programs to ensure that analytical results are accurate, precise, and defensible. The following sections summarize the quality assurance and quality control aspects of the TLD, sample collection, and sample analysis components of the REMP.

### **6.1 Quality Control for the Energy Northwest Environmental TLD Program**

The Quality Control program for the environmental TLD program covers the preparation, transportation, deployment, collection, storage, processing, and evaluation of the environmental TLDs and is designed to meet the requirements of NRC Regulatory Guides 4.13<sup>(8)</sup> and 4.15.<sup>(7)</sup>

From the time the TLDs are annealed to the time they are placed in the field, they are stored and transported with control TLDs. Two sets of control TLDs are used, the building controls and the transportation (trip) controls. The building controls monitor the exposure that the TLDs receive while being transported to and from the TLD vendor and while in storage awaiting deployment and analysis. The trip controls accompany the field TLDs when transported to and from the vendor and also during deployment and collection in the field. The building controls and trip controls are stored in a low background lead shield while the field TLDs are deployed. If the trip control results are greater than the building control results, the difference between the two is subtracted from the field dosimeters to account for exposure during transit.

Reader QC dosimeters serve as checks that the dosimeter reader calibration is satisfactory and that the TLDs were processed correctly. These TLDs are annealed and then given a known exposure (typically 100 mR) to a cesium-137 source. The number of QC dosimeters used during each processing is generally 10% of the number of field dosimeters. Evaluation of the 2014 reader QC dosimeter results indicated satisfactory agreement for all periods. The quarterly average reader QC results are presented in Table 6-1.

TLDs designated as spikes are prepared by the Energy Northwest Radiation Protection Department by exposing the TLDs to a calibrated source to produce a known exposure. The spiked dosimeters are submitted and processed with the field dosimeters to further verify the accuracy and precision of the environmental TLD results. Quarterly spikes receive a target exposure of 22 mR. Evaluation of the 2014 spiked dosimeter results indicated satisfactory agreement for all periods. Spiked TLD results are presented in Table 6-1.

### **6.2 Quality Control for the Environmental Sample Program**

Quality control for the environmental sample program encompasses both the sample collection and sample analysis processes. Results are reviewed for correctness, reasonableness, and data entry errors. Sample results that are suspect are normally investigated. A crosscheck program utilizing blind samples supplied by an outside vendor is maintained for all sample media routinely analyzed.

### 6.2.1 Sample Collection Quality Control

Duplicate samples are collected and submitted for analysis when practical. The duplicate samples are used to assess the repeatability of the sample collection process and the precision of the analytical method.

### 6.2.2 Laboratory Instruments Quality Control

**Analytical Balances** - Analytical balances used in the laboratory for sample preparations are calibrated every six months. Performance checks are performed prior to use and span the range of intended use. Performance check results are documented on the sample preparation forms and kept with the analytical results.

**Analytical Instruments** – Analytical instruments used for determining radioactive emissions in samples are calibrated for efficiency annually using standard reference material traceable to the National Institute of Standards and Technology (NIST). Below is a summary of the routine QC practices for the different analytical instruments.

- **Gas-flow Proportional Counter:** Background and performance checks are performed daily when in use. Control charts are maintained with two and three-sigma limits specified; the checks must fall within the two-sigma warning limits prior to use. Mid-batch QC and end of batch performance checks are typically performed.
- **Gamma Spectrometers:** Performance checked daily for efficiency, energy per channel relationship, peak resolution, and background when in use. The checks are performed and plotted for both a low and high energy peak. Efficiency checks are held within two-sigma control limits. Long duration background checks are performed quarterly. A low level batch QC check is typically analyzed with each set of samples.
- **Liquid Scintillation Counter:** Background and performance checks are performed daily when in use. A performance check standard of the same matrix as the samples is analyzed and results trended. A control chart with acceptance limits specified is maintained. A low level batch QC check is typically analyzed with each set of samples.

### 6.2.3 Sample Batch Quality Control

Sample batch analysis is normally performed with sample blanks and known-addition samples (or spiked samples) included. The type of known addition sample used is dictated by the sample media being analyzed, the primary analytes of interest, and the method being used. The following is a summary of sample batch QC activities.

**Iodine-131 Cartridges** - At least one known-addition sample is analyzed with each batch. A charcoal cartridge of the same type used for sample collection but spiked with barium-133 is used. The 356 keV peak of barium-133 serves as a proxy for the 364 keV peak of iodine-131. Samples from the control location serve as blanks.

**Gross Beta Filters** - At least one unused blank air particulate filter and at least one known-addition air particulate filter is analyzed with each batch.

**Aqueous Samples** – In most cases, samples collected from the control locations are analyzed as blanks. A known-addition sample is typically analyzed with each batch of samples.

**Gross Alpha/Beta in Water** - Blank samples were prepared from reagent grade water and analyzed with each batch of samples. One known addition sample and one replicate sample is normally analyzed with each batch.

**Tritium in Water** – A blank and a low level known addition sample is typically analyzed with each batch. A replicate sample is prepared and analyzed inside of each batch in most cases.

### **6.3 Laboratory Intercomparison Program Participation and Results**

Participation in cross check intercomparison studies is mandatory for laboratories performing analyses of CGS REMP samples. Intercomparison studies provide a consistent and effective means to evaluate the accuracy and precision of analyses performed by a laboratory. Study results should fall within specified control limits. Results that fall outside the control limits are investigated and corrective action taken.

The Energy Northwest Environmental Services Laboratory participated in three proficiency testing studies involving radioactive measurements provided by Environmental Resource Associates (ERA) during 2014. The Laboratory's intercomparison program was further supplemented by additional cross check media provided by ERA. The Laboratory's intercomparison program results for 2014 are shown in Table 6-2. All 2014 Laboratory intercomparison program results were within acceptable limits. Participation in the ERA studies serves to meet the intercomparison program requirements specified in the ODCM.

In addition to the studies noted above, the CGS REMP maintains a split sample program with the State of Washington Department of Health. Split samples are sent to a State of Washington Lab on a scheduled frequency where they are independently analyzed. This program provides an additional check on the accuracy and precision of the results reported in this document.

### **6.4 Laboratory Quality Control Program Problems and Improvements**

No issues with REMP sampling and analyses were identified by the QC and intercomparison programs in 2014.

TABLE 6-1  
2014 ENVIRONMENTAL SPIKED DOSIMETER RESULTS

PERIOD	SPIKE ID	KNOWN EXPOSURE (mR)	REPORTED EXPOSURE (mR)	BIAS (%)
1st Quarter	ENW Spike	22	21.3	-3.2%
	ENW Spike	22	22.0	0.0%
	ENW Spike	22	22.1	+0.5%
	HEDP Avg. Reader	100	98.5	-1.5%
2nd Quarter	ENW Spike	22	21.7	-1.4%
	ENW Spike	22	20.9	-5.0%
	ENW Spike	22	21.6	-1.8%
	HEDP Avg. Reader	100	99.0	-1.0%
3rd Quarter	ENW Spike	22	21.2	-3.6%
	ENW Spike	22	21.6	-1.8%
	ENW Spike	22	22.5	2.3%
	HEDP Avg. Reader	100	96.4	-3.6%
4th Quarter	ENW Spike	22	21.6	-1.8%
	ENW Spike	22	22.0	0.0%
	ENW Spike	22	21.9	-0.5%
	HEDP Avg. Reader	100	98.4	-1.6%

TABLE 6-2  
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

ERA MRAD-20 Results Spring 2014					
Standard/Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation
<b>Air Filter Radionuclides</b>					
Americium-241	pCi/Filter	61	59.7	36.8 - 80.8	Acceptable
Cesium-134	pCi/Filter	919	1010	643 - 1250	Acceptable
Cesium-137	pCi/Filter	1046	828	622 - 1090	Acceptable
Cobalt-60	pCi/Filter	1217	1120	867 - 1400	Acceptable
Manganese-54	pCi/Filter	< 10	< 50.0	0.00 - 50.0	Acceptable
Zinc-65	pCi/Filter	894.5	667	478-921	Acceptable
<b>Air Filter Gross Alpha/Beta</b>					
Gross Alpha	pCi/Filter	51	46	15.4 - 71.4	Acceptable
Gross Beta	pCi/Filter	47	53.8	34.0-78.4	Acceptable
<b>Water Radionuclides</b>					
Americium-241	pCi/L	113	114	76.8 - 153	Acceptable
Cesium-134	pCi/L	1477	1660	1220 - 1910	Acceptable
Cesium-137	pCi/L	2774	2690	2280 - 3220	Acceptable
Cobalt-60	pCi/L	1264	1270	1100 - 1490	Acceptable
Manganese-54	pCi/L	< 20	< 100	0.00 - 100	Acceptable
Zinc-65	pCi/L	1990	1800	1500-2270	Acceptable
<b>Water Gross Alpha/Beta</b>					
Gross Alpha	pCi/L	138	133	47.2 - 206	Acceptable
Gross Beta	pCi/L	128	174	99.6-258	Acceptable
<b>Water Tritium</b>					
Tritium	pCi/L	5655	5580	3740-7960	Acceptable
<b>Soil Radionuclides</b>					
Actinium-228	pCi/kg	1090	1240	795 - 1720	Acceptable
Americium-241	pCi/kg	< 1000	399	233 - 518	Acceptable
Bismuth-212	pCi/kg	893	1240	330 - 1820	Acceptable
Bismuth-214	pCi/kg	2051	1960	1180 - 2820	Acceptable
Cesium-134	pCi/kg	3417	3390	2220 - 4070	Acceptable
Cesium-137	pCi/kg	9146	8490	6510 - 10900	Acceptable
Cobalt-60	pCi/kg	7058	6830	4620 - 9400	Acceptable
Lead-212	pCi/kg	1204	1240	812 - 1730	Acceptable
Lead-214	pCi/kg	2328	2070	1210 - 3090	Acceptable
Manganese-54	pCi/kg	< 100	< 1000	0.00 - 1000	Acceptable
Potassium-40	pCi/kg	10324	10500	7660 - 14100	Acceptable
Zinc-65	pCi/kg	6171	5400	4300-7180	Acceptable

TABLE 6-2 (cont)  
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

ERA MRAD-21 Results Fall 2014					
Standard/Analyte	Units	Reported Value	Assigned Value	Acceptance Limits	Performance Evaluation
<b>Air Filter Radionuclides</b>					
Americium-241	pCi/Filter	37	38.6	23.8 - 52.2	Acceptable
Cesium-134	pCi/Filter	673	765	487 - 949	Acceptable
Cesium-137	pCi/Filter	790	647	486 - 850	Acceptable
Cobalt-60	pCi/Filter	560	523	405 - 653	Acceptable
Manganese-54	pCi/Filter	< 12	< 50.0	0.00 - 50.0	Acceptable
Zinc-65	pCi/Filter	719	547	392-755	Acceptable
<b>Air Filter Gross Alpha/Beta</b>					
Gross Alpha	pCi/Filter	40.3	36.9	12.4 - 57.3	Acceptable
Gross Beta	pCi/Filter	18.5	21.1	13.3-30.8	Acceptable
<b>Water Radionuclides</b>					
Americium-241	pCi/L	< 95	68.6	46.2 - 92.0	Acceptable
Cesium-134	pCi/L	756	850	624 - 977	Acceptable
Cesium-137	pCi/L	1303	1240	1050 - 1490	Acceptable
Cobalt-60	pCi/L	1064	1070	930 - 1250	Acceptable
Manganese-54	pCi/L	< 10	< 100	0.00 - 100	Acceptable
Zinc-65	pCi/L	1027	921	768-1160	Acceptable
<b>Water Gross Alpha/Beta</b>					
Gross Alpha	pCi/L	80.5	98.1	34.8 - 152	Acceptable
Gross Beta	pCi/L	53.8	77.5	44.4-115	Acceptable
<b>Water Tritium</b>					
Tritium	pCi/L	5541	5500	3680-7840	Acceptable
<b>Soil Radionuclides</b>					
Actinium-228	pCi/kg	1227	1240	795 - 1720	Acceptable
Americium-241	pCi/kg	862	736	431 - 956	Acceptable
Bismuth-212	pCi/kg	941	1240	330 - 1820	Acceptable
Bismuth-214	pCi/kg	2671	2810	1690 - 4040	Acceptable
Cesium-134	pCi/kg	1988	2140	1400 - 2570	Acceptable
Cesium-137	pCi/kg	6912	6550	5020 - 8430	Acceptable
Cobalt-60	pCi/kg	4352	4260	2880 - 5860	Acceptable
Lead-212	pCi/kg	1161	1240	812 - 1730	Acceptable
Lead-214	pCi/kg	2898	2750	1610 - 4100	Acceptable
Manganese-54	pCi/kg	< 60	< 1000	0.00 - 1000	Acceptable
Potassium-40	pCi/kg	10716	10700	7810 - 14400	Acceptable
Zinc-65	pCi/kg	3590	3270	2600 - 435	Acceptable

TABLE 6-2 (cont)  
ENW REMP PROGRAM CROSS CHECK PERFORMANCE RESULTS

<b>2014 ERA Crosscheck Result Iodine-131 Charcoal Cartridge</b>						
<b>Sample ID</b>	<b>Analysis</b>	<b>Units</b>	<b>Result</b>	<b>Ref Value</b>	<b>Acceptance Limits</b>	<b>Performance Evaluation</b>
03121402A	Iodine-131	pCi/Filter	193	168	129 – 221	Acceptable
09171402A	Iodine-131	pCi/Filter	331	276	212 – 364	Acceptable

<b>2014 ERA RAD Results Iodine-131 in Milk</b>						
<b>Sample ID</b>	<b>Analysis</b>	<b>Units</b>	<b>Result</b>	<b>Ref Value</b>	<b>Acceptance Limits</b>	<b>Performance Evaluation</b>
RAD-98	Iodine-131	pCi/L	25.3	26.1	21.7 – 30.8	Acceptable



## **7.0 REFERENCES**

## 7.0 REFERENCES

1. Energy Northwest, "Columbia Generating Station Final Safety Analysis Report," Section 2.3.1.1.
2. Nuclear Regulatory Commission Fact Sheet "Fact Sheet on Radiation Monitoring at Nuclear Power Plants and the "Tooth Fairy" Issue", NRC Library, [www.nrc.gov/reading-rm/doc-collections/fact-sheets/](http://www.nrc.gov/reading-rm/doc-collections/fact-sheets/).
3. The National Council on Radiation Protection and Measurements, 2006, "Cesium-137 in the Environment: Radioecology and Approaches to Assessment and Management", Report 154, NCRP, Bethesda, MD.
4. U.S. Nuclear Regulatory Commission, "Programs For Monitoring Radioactivity in the Environs of Nuclear Power Plants," Regulatory Guide 4.1, Revision 1, April 1975.
5. U.S. Nuclear Regulatory Commission, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors", NUREG-1302, 1991.
6. U.S. Nuclear Regulatory Commission, "An Acceptable Radiological Environmental Monitoring Program," Assessment Branch Technical Position Revision 1, November 1979.
7. U.S. Nuclear Regulatory Commission, "Quality Assurance For Radiological Environmental Monitoring Program (Normal Operations), Effluent Streams and the Environment," Regulatory Guide 4.15, Revision 1, February 1979.
8. U.S. Nuclear Regulatory Commission, "Performance, Testing and Procedural Specifications For Thermoluminescence Dosimetry-Environmental Applications," Regulatory Guide 4.13, Revision 1, July 1977.
9. Energy Facility Site Evaluation Council, Resolution No. 332, approved February 21, 2012.
10. Energy Northwest Nuclear Columbia Generating Station, Operating License NPF-21, "Technical Specifications" Sections 5.5.1 and 5.6.1
11. Columbia Generating Station Offsite Dose Calculation Manual (ODCM).
12. Washington Administrative Code 173-200-040, "Water Quality Standards for Ground Water of the State of Washington - Criteria."
13. Washington Administrative Code 173-201A, "Water Quality Standards for Surface Waters of the State of Washington."
14. Code of Federal Regulations, Title 10 Part 20, "Standards for Protection against Radiation."
15. Code of Federal Regulations, Title 10 Part 50, "Domestic Licensing of Production and Utilization Facilities."

16. Energy Facility Site Evaluation Council, Resolution No. 300, approved September 10, 2001.
17. Nuclear Energy Institute, “Industry Ground Water Protection Initiative – Final Guidance Document”, NEI 07-07, Nuclear Energy Institute, 1776 I Street N. W., Suite 400, Washington D.C.
18. Energy Facility Site Evaluation Council, Resolution No. 299, approved August 13, 2001.
19. PNNL, 2007, “Summary of Hydrogeology and Evaluation of Existing Groundwater Monitoring Wells for Outfalls 002 and 003 at the Columbia generating Station”, PNWD-3845, Pacific Northwest National Laboratory, Richland, WA.
20. PNNL, 2009, “Hanford Site Environmental Monitoring Report for Calendar Year 2008”, PNNL-18427, Pacific Northwest National Laboratory, Richland, WA
21. US DOE, 2014, “Hanford Site Environmental Report for Calendar Year 2013”, DOE/RL-2013-47 Rev 0, US Dept. of Energy, Richland, WA
22. US DOE, 1995, “Hanford Site Background: Evaluation of Existing Soil Radionuclide Data”, DOE/RL-95-55, US Dept. of Energy, Richland, WA.
23. Energy Northwest, 2012, “Soil and Vegetation Sampling Results of the Columbia Generating Station Storm Drain Pond For Samples Collected August 2011”.

## **8.0 ERRATA**

## **8.0     ERRATA**

Revisions to the 2013 Annual Radiological Environmental Operating Report for the Columbia Generating Station are listed below.

Two errors were identified on the Airborne Particulate graphs on page 5-4. In figure 5-4, Near Plant Stations, and figure 5-5, Remote Stations, the control data series was incorrectly identified as 'Control 2012'. The correct identification for both graphs should have been 'Control 2013'.

In Table A-6.1, Tritium in Water, the third and fourth quarter collection periods for ST-26, 27, and 29 were incorrectly indicated as 07/01/13 to 11/01/13 and 11/01/13 to 01/02/14. The correct collection periods for all three stations should have been 07/01/13 to 10/01/13 and 10/01/13 to 01/02/14.

In Table A-8.2, Gamma Spectroscopy Results of Soil – Summary, the reported average MDA values for the indicator locations were in error. The table with the corrected indicator MDA values is present on page 8-2.

TABLE A-8.2  
**GAMMA SPECTROMETRY RESULTS OF SOIL - SUMMARY**

Results in pCi/kilogram  
2013 Corrected Results

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-4.07E+00	-9.06E+00	3.47E-01	3.80E+01	4	0
BALA140	Cntl	1.50E+00	1.50E+00	1.50E+00	4.34E+01	1	0
BE-7	Ind	2.05E+02	1.11E+02	2.73E+02	2.77E+02	4	1
BE-7	Cntl	-1.86E+01	-1.86E+01	-1.86E+01	4.51E+02	1	0
BI-214	Ind	5.48E+02	4.81E+02	6.09E+02	7.89E+01	4	4
BI-214	Cntl	4.42E+02	4.42E+02	4.42E+02	9.13E+01	1	1
CO-58	Ind	-9.93E-01	-3.92E+00	3.47E-01	3.99E+01	4	0
CO-58	Cntl	1.94E-02	1.94E-02	1.94E-02	4.21E+01	1	0
CO-60	Ind	1.52E+00	-1.00E+01	1.35E+01	4.12E+01	4	0
CO-60	Cntl	-4.16E+00	-4.16E+00	-4.16E+00	5.60E+01	1	0
CR-51	Ind	3.62E+01	-7.62E+01	1.30E+02	3.09E+02	4	0
CR-51	Cntl	0.00E+00	0.00E+00	0.00E+00	4.20E+02	1	0
CS-134	Ind	2.68E+00	-4.61E-01	1.12E+01	5.31E+01	4	0
CS-134	Cntl	-1.99E+01	-1.99E+01	-1.99E+01	5.04E+01	1	0
CS-137	Ind	3.05E+01	1.77E+01	5.30E+01	4.00E+01	4	1
CS-137	Cntl	2.89E+01	2.89E+01	2.89E+01	4.35E+01	1	0
FE-59	Ind	6.00E+00	-1.97E+01	3.00E+01	9.82E+01	4	0
FE-59	Cntl	7.30E-01	7.30E-01	7.30E-01	1.29E+02	1	0
K-40	Ind	1.59E+04	1.45E+04	1.90E+04	2.89E+02	4	4
K-40	Cntl	1.31E+04	1.31E+04	1.31E+04	4.55E+02	1	1
MN-54	Ind	1.31E+00	-8.15E+00	1.34E+01	3.57E+01	4	0
MN-54	Cntl	7.61E+00	7.61E+00	7.61E+00	4.55E+01	1	0
ZN-65	Ind	-1.71E+01	-3.02E+01	-3.69E+00	9.61E+01	4	0
ZN-65	Cntl	-3.15E+01	-3.15E+01	-3.15E+01	1.30E+02	1	0
ZRNB-95	Ind	1.54E+01	1.17E+01	2.46E+01	5.72E+01	4	0
ZRNB-95	Cntl	-2.11E+00	-2.11E+00	-2.11E+00	7.34E+01	1	0



## **APPENDIX A**

### **2014 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT COLUMBIA GENERATING STATION**

#### **DATA TABLES A and B**

**Covers Sample Collection Period Starting January 2014 Through December 2014**

#### **RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

**Prepared by:**

**Energy Northwest - Environmental Services Staff  
Richland, WA**

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## FORWARD

Since mid-1984, the results of the REMP analyses have been presented as net results calculated from total counts minus the observed background counts of the detection method. Counting results for low level samples are often within the counting error of the background determination; consequently results can range from negative to positive values in these samples. Though most of the analytical results presented in this Appendix are below the detection limit, listing the actual calculated value, even when it is negative or below the detection limit, prevents positive biases and loss of individual results inherent in the use of "less than" (<) values. It is recommended practice to report radiological environmental data in this manner.

Most results listed in this Appendix are accompanied by a plus or minus ( $\pm$ ) error value. In most cases the error value represents the two sigma counting uncertainty determined for that particular analysis. These error values are in the same units as the listed activity values. The two sigma error value represents the range that a recount of the same sample would be expected to fall within 95% of the time, based on the statistics encountered in the original count.

Also included in most cases are the analysis specific, minimum detectable activity (MDA) values. Though similar in concept to the LLD, these values are based on the statistics encountered in the specific sample count itself and not a blank determination. As such, they are a *a posteriori* (after the fact) determination where the LLD is a *a priori* (before the fact) determination. These values were included as they represent the level of activity that would have needed to be present in the sample for a positive identification to be made.

TABLE A-1.1  
**2014 QUARTERLY TLD RESULTS**  
 Results in milli-Roentgen (mR) per Standard Quarter

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum
1	22.1	21.8	21.1	22.9	87.8
2	23.2	21.4	20.3	22.1	87.0
3	21.9	20.9	19.5	21.1	83.4
4	19.8	19.5	18.5	20.3	78.1
5	20.0	19.8	18.2	21.1	79.1
6	19.9	19.7	18.4	20.4	78.4
7	22.3	19.7	20.7	21.7	84.3
8	23.8	22.9	22.8	23.8	93.2
9	21.2	19.6	20.1	20.7	81.6
10	21.8	21.0	19.5	21.7	84.0
11	21.9	21.9	20.5	22.2	86.4
12	24.6	21.7	23.0	23.0	92.3
13	22.2	21.7	19.7	21.9	85.5
14	22.6	21.2	19.5	22.1	85.5
15	22.8	23.5	20.5	24.0	90.8
16	22.2	21.9	20.1	22.4	86.6
17	22.8	22.5	20.8	23.0	89.0
18	23.3	22.0	20.9	22.3	88.5
19	23.2	22.0	20.8	22.9	89.0
20	22.5	22.7	20.9	22.9	89.0
21	21.8	17.9	19.8	20.7	80.1
22	21.7	20.6	19.6	21.5	83.4
23	23.4	19.6	21.0	22.0	86.1
24	22.2	21.5	19.4	22.3	85.3
25	23.2	22.7	20.4	23.2	89.5
40	19.4	18.2	17.6	19.9	75.1
41	22.0	21.4	20.7	22.5	86.5
42	21.0	20.6	20.0	22.1	83.7
43	23.1	22.4	21.3	21.9	88.8
44	19.5	18.3	18.7	19.8	76.3
45	20.5	20.7	19.6	21.0	81.8
46	26.8	26.0	26.7	26.9	106.4
47	21.3	19.2	19.2	19.4	79.2
49	22.5	21.0	20.0	22.0	85.5
50	22.6	21.4	19.7	21.7	85.5
51	21.4	19.7	19.3	20.8	81.3
53	21.8	20.0	21.4	21.8	85.1
54	24.0	21.8	21.3	23.0	90.0
55	22.5	20.2	21.2	21.4	85.4
56	21.7	23.1	20.8	23.7	89.3
65	21.7	19.1	19.8	20.5	81.1
71	26.0	25.1	25.1	27.0	103.3
72	26.1	23.0	24.3	24.8	98.2

TABLE A-1.1  
**2014 QUARTERLY TLD RESULTS**  
 Results in milli-Roentgen (mR) per Standard Quarter

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum
73	25.2	21.8	23.1	23.9	94.0
74	25.0	22.2	22.9	24.0	94.1
75	23.5	21.2	21.7	21.9	88.2
76	23.6	18.1	21.5	22.5	85.7
77	23.7	20.6	21.8	21.8	88.0
78	22.5	19.9	20.3	21.5	84.2
79	22.9	21.1	20.8	22.6	87.4
80	22.2	20.4	20.5	22.1	85.2
81	21.5	19.8	19.7	21.9	82.9
82	23.6	21.3	21.8	23.4	90.1
83	22.4	18.1	22.1	22.0	84.7
84	23.1	19.1	23.3	23.1	88.6
85	24.1	22.5	22.6	24.7	93.9
86	29.1	27.9	27.9	29.2	114.1

TABLE A-1.2  
**2014 QUARTERLY TLD RESULTS- SUMMARY**  
 Results in milli-Roentgen (mR) per Standard Quarter

Location	Average Activity	Activity Low	Activity High	Number of Samples
Quarterly Indicator TLDs	21.8	17.6	29.2	224
Quarterly Control TLDs	20.4	19.6	21.2	4

TABLE A-2.1  
**GROSS BETA ON AIR PARTICULATE FILTERS**

Results in pCi per Cubic Meter

Collection Period	Station 01		Station 04		Station 05	
	Result	Error	Result	Error	Result	Error
12/31/13 - 01/07/14	2.94E-02	± 1.06E-03	2.84E-02	± 1.02E-03	2.30E-02	± 9.52E-04
01/07/14 - 01/14/14	1.97E-02	± 8.78E-04	1.73E-02	± 8.07E-04	1.75E-02	± 7.92E-04
01/14/14 - 01/21/14	3.92E-02	± 1.24E-03	4.14E-02	± 1.23E-03	3.77E-02	± 1.17E-03
01/21/14 - 01/28/14	4.24E-02	± 1.29E-03	4.39E-02	± 1.28E-03	3.96E-02	± 1.18E-03
01/28/14 - 02/04/14	3.37E-02	± 1.14E-03	3.63E-02	± 1.16E-03	3.18E-02	± 1.08E-03
02/04/14 - 02/11/14	3.48E-02	± 1.16E-03	3.42E-02	± 1.13E-03	3.42E-02	± 1.12E-03
02/11/14 - 02/18/14	5.43E-03	± 5.05E-04	7.93E-03	± 5.87E-04	3.81E-03	± 4.35E-04
02/18/14 - 02/25/14	7.32E-03	± 5.78E-04	8.38E-03	± 6.04E-04	9.39E-03	± 6.27E-04
02/25/14 - 03/04/14	3.88E-02	± 1.21E-03	4.03E-02	± 1.26E-03	3.63E-02	± 1.17E-03
03/04/14 - 03/11/14	4.74E-03	± 4.88E-04	4.99E-03	± 5.00E-04	3.99E-03	± 4.52E-04
03/11/14 - 03/18/14	9.04E-03	± 6.09E-04	9.53E-03	± 6.36E-04	8.99E-03	± 6.06E-04
03/18/14 - 03/25/14	9.81E-03	± 6.51E-04	9.80E-03	± 6.71E-04	8.97E-03	± 6.34E-04
03/25/14 - 04/01/14	5.06E-03	± 4.92E-04	6.04E-03	± 5.03E-04	5.21E-03	± 4.71E-04
04/01/14 - 04/08/14	1.02E-02	± 6.51E-04	9.60E-03	± 6.10E-04	8.90E-03	± 5.83E-04
04/08/14 - 04/15/14	1.29E-02	± 7.34E-04	1.39E-02	± 7.27E-04	1.04E-02	± 6.42E-04
04/15/14 - 04/22/14	1.25E-02	± 7.36E-04	1.31E-02	± 7.24E-04	1.23E-02	± 6.92E-04
04/22/14 - 04/29/14	4.25E-03	± 4.80E-04	3.67E-03	± 4.44E-04	4.78E-03	± 4.81E-04
04/29/14 - 05/06/14	1.22E-02	± 7.06E-04	1.17E-02	± 6.81E-04	1.23E-02	± 6.98E-04
05/06/14 - 05/13/14	1.03E-02	± 6.66E-04	1.03E-02	± 6.35E-04	1.05E-02	± 6.47E-04
05/13/14 - 05/20/14	1.52E-02	± 7.73E-04	1.65E-02	± 7.91E-04	1.37E-02	± 7.19E-04
05/20/14 - 05/27/14	9.61E-03	± 5.99E-04	1.12E-02	± 6.28E-04	1.01E-02	± 6.25E-04
05/27/14 - 06/03/14	1.17E-02	± 6.69E-04	1.21E-02	± 6.69E-04	1.19E-02	± 6.74E-04
06/03/14 - 06/10/14	9.24E-03	± 6.03E-04	9.26E-03	± 6.05E-04	8.95E-03	± 6.13E-04
06/10/14 - 06/17/14	6.16E-03	± 5.33E-04	6.31E-03	± 5.39E-04	6.97E-03	± 5.27E-04
06/17/14 - 06/24/14	9.41E-03	± 6.22E-04	1.10E-02	± 6.69E-04	9.84E-03	± 6.21E-04
06/24/14 - 07/01/14	6.42E-03	± 5.28E-04	7.13E-03	± 5.46E-04	5.47E-03	± 4.84E-04
07/01/14 - 07/08/14	1.41E-02	± 7.51E-04	1.17E-02	± 6.96E-04	1.10E-02	± 6.47E-04
07/08/14 - 07/15/14	2.27E-02	± 9.50E-04	1.97E-02	± 9.08E-04	2.01E-02	± 8.45E-04
07/15/14 - 07/22/14	1.47E-02	± 7.57E-04	1.52E-02	± 7.69E-04	1.40E-02	± 7.06E-04
07/22/14 - 07/29/14	1.60E-02	± 7.77E-04	1.52E-02	± 7.48E-04	1.48E-02	± 7.44E-04
07/29/14 - 08/05/14	2.37E-02	± 9.23E-04	2.46E-02	± 9.24E-04	2.23E-02	± 8.88E-04
08/05/14 - 08/12/14	1.67E-02	± 7.82E-04	1.70E-02	± 7.89E-04	1.66E-02	± 7.69E-04
08/12/14 - 08/19/14	1.76E-02	± 7.97E-04	1.71E-02	± 8.09E-04	1.66E-02	± 7.74E-04
08/19/14 - 08/26/14	1.54E-02	± 7.43E-04	1.46E-02	± 7.55E-04	1.38E-02	± 7.25E-04
08/26/14 - 09/02/14	1.27E-02	± 6.81E-04	1.26E-02	± 6.97E-04	1.22E-02	± 6.67E-04
09/02/14 - 09/09/14	1.74E-02	± 7.76E-04	1.65E-02	± 7.98E-04	1.78E-02	± 8.07E-04
09/09/14 - 09/16/14	1.66E-02	± 7.87E-04	1.66E-02	± 7.96E-04	1.93E-02	± 8.25E-04
09/16/14 - 09/23/14	2.48E-02	± 9.43E-04	2.39E-02	± 9.51E-04	2.48E-02	± 9.48E-04
09/23/14 - 09/30/14	1.53E-02	± 7.42E-04	1.58E-02	± 7.89E-04	1.47E-02	± 7.33E-04
09/30/14 - 10/07/14	2.06E-02	± 8.60E-04	2.24E-02	± 9.37E-04	2.13E-02	± 8.91E-04
10/07/14 - 10/14/14	1.49E-02	± 7.61E-04	1.86E-02	± 8.63E-04	1.24E-02	± 7.14E-04
10/14/14 - 10/21/14	1.58E-02	± 7.67E-04	1.40E-02	± 7.42E-04	1.38E-02	± 7.20E-04
10/21/14 - 10/28/14	5.24E-03	± 4.82E-04	5.06E-03	± 4.85E-04	6.26E-03	± 5.10E-04
10/28/14 - 11/04/14	1.09E-02	± 6.48E-04	9.66E-03	± 6.41E-04	1.06E-02	± 6.39E-04
11/04/14 - 11/11/14	1.30E-02	± 6.97E-04	1.07E-02	± 6.59E-04	1.21E-02	± 6.77E-04
11/11/14 - 11/18/14	4.01E-02	± 1.19E-03	4.31E-02	± 1.26E-03	4.57E-02	± 1.27E-03
11/18/14 - 11/25/14	6.31E-02	± 1.54E-03	7.24E-02	± 1.70E-03	6.54E-02	± 1.53E-03
11/25/14 - 12/02/14	2.09E-02	± 8.92E-04	8.73E-03	± 7.92E-04	2.17E-02	± 8.73E-04
12/02/14 - 12/09/14	4.82E-02	± 1.35E-03	5.11E-02	± 1.36E-03	4.66E-02	± 1.30E-03
12/09/14 - 12/16/14	1.72E-02	± 8.27E-04	1.71E-02	± 7.96E-04	1.67E-02	± 7.95E-04
12/16/14 - 12/23/14	2.21E-02	± 9.24E-04	2.33E-02	± 9.28E-04	2.07E-02	± 8.72E-04
12/23/14 - 12/30/14	8.28E-03	± 5.95E-04	8.95E-03	± 5.98E-04	8.60E-03	± 5.88E-04

TABLE A-2.1  
**GROSS BETA ON AIR PARTICULATE FILTERS**

Results in pCi per Cubic Meter

Collection Period	Station 06		Station 07		Station 08	
	Result	Error	Result	Error	Result	Error
12/31/13 - 01/07/14	2.98E-02	± 1.08E-03	3.06E-02	± 1.08E-03	2.47E-02	± 9.71E-04
01/07/14 - 01/14/14	1.74E-02	± 7.97E-04	2.04E-02	± 8.66E-04	1.83E-02	± 8.21E-04
01/14/14 - 01/21/14	3.86E-02	± 1.17E-03	4.33E-02	± 1.26E-03	4.09E-02	± 1.23E-03
01/21/14 - 01/28/14	4.48E-02	± 1.28E-03	4.35E-02	± 1.25E-03	4.20E-02	± 1.24E-03
01/28/14 - 02/04/14	3.41E-02	± 1.11E-03	3.45E-02	± 1.11E-03	3.30E-02	± 1.10E-03
02/04/14 - 02/11/14	3.45E-02	± 1.12E-03	3.69E-02	± 1.17E-03	3.54E-02	± 1.16E-03
02/11/14 - 02/18/14	6.26E-03	± 5.22E-04	7.09E-03	± 5.50E-04	5.03E-03	± 4.93E-04
02/18/14 - 02/25/14	8.10E-03	± 5.89E-04	7.51E-03	± 5.81E-04	8.15E-03	± 5.97E-04
02/25/14 - 03/04/14	4.23E-02	± 1.27E-03	3.86E-02	± 1.20E-03	3.89E-02	± 1.20E-03
03/04/14 - 03/11/14	4.20E-03	± 4.61E-04	4.50E-03	± 4.74E-04	4.07E-03	± 4.58E-04
03/11/14 - 03/18/14	9.07E-03	± 6.07E-04	8.77E-03	± 5.97E-04	8.86E-03	± 6.09E-04
03/18/14 - 03/25/14	8.61E-03	± 6.07E-04	8.82E-03	± 6.25E-04	9.41E-03	± 6.40E-04
03/25/14 - 04/01/14	5.59E-03	± 5.10E-04	4.78E-03	± 4.55E-04	4.54E-03	± 4.52E-04
04/01/14 - 04/08/14	8.91E-03	± 6.06E-04	9.46E-03	± 5.99E-04	1.06E-02	± 6.33E-04
04/08/14 - 04/15/14	1.25E-02	± 7.08E-04	1.18E-02	± 6.68E-04	1.36E-02	± 7.13E-04
04/15/14 - 04/22/14	1.10E-02	± 6.83E-04	1.16E-02	± 6.64E-04	9.93E-03	± 6.27E-04
04/22/14 - 04/29/14	4.12E-03	± 4.69E-04	4.01E-03	± 4.42E-04	4.70E-03	± 4.72E-04
04/29/14 - 05/06/14	1.17E-02	± 6.92E-04	1.12E-02	± 6.67E-04	1.11E-02	± 6.63E-04
05/06/14 - 05/13/14	1.01E-02	± 6.57E-04	1.24E-02	± 6.91E-04	1.11E-02	± 6.58E-04
05/13/14 - 05/20/14	1.39E-02	± 7.42E-04	1.61E-02	± 7.83E-04	1.32E-02	± 6.98E-04
05/20/14 - 05/27/14	8.38E-03	± 5.62E-04	1.06E-02	± 6.40E-04	9.59E-03	± 6.14E-04
05/27/14 - 06/03/14	1.20E-02	± 6.59E-04	1.34E-02	± 7.04E-04	1.30E-02	± 6.95E-04
06/03/14 - 06/10/14	1.06E-02	± 6.55E-04	1.05E-02	± 6.35E-04	9.20E-03	± 6.04E-04
06/10/14 - 06/17/14	6.55E-03	± 5.60E-04	6.39E-03	± 4.98E-04	6.20E-03	± 4.73E-04
06/17/14 - 06/24/14	9.54E-03	± 6.39E-04	1.13E-02	± 6.54E-04	9.94E-03	± 6.25E-04
06/24/14 - 07/01/14	5.84E-03	± 5.31E-04	4.77E-03	± 4.53E-04	5.41E-03	± 4.85E-04
07/01/14 - 07/08/14	1.17E-02	± 6.68E-04	1.39E-02	± 7.13E-04	1.17E-02	± 6.70E-04
07/08/14 - 07/15/14	2.22E-02	± 9.15E-04	2.24E-02	± 9.08E-04	1.96E-02	± 8.54E-04
07/15/14 - 07/22/14	1.38E-02	± 7.09E-04	1.30E-02	± 6.89E-04	1.51E-02	± 7.34E-04
07/22/14 - 07/29/14	1.52E-02	± 7.43E-04	1.69E-02	± 7.81E-04	1.53E-02	± 7.48E-04
07/29/14 - 08/05/14	2.51E-02	± 9.25E-04	2.29E-02	± 8.75E-04	2.43E-02	± 9.05E-04
08/05/14 - 08/12/14	1.76E-02	± 8.00E-04	1.88E-02	± 8.26E-04	1.64E-02	± 7.81E-04
08/12/14 - 08/19/14	1.72E-02	± 8.02E-04	1.71E-02	± 8.12E-04	1.73E-02	± 8.19E-04
08/19/14 - 08/26/14	1.40E-02	± 7.38E-04	1.46E-02	± 7.46E-04	1.36E-02	± 7.31E-04
08/26/14 - 09/02/14	1.46E-02	± 7.42E-04	1.53E-02	± 7.41E-04	1.29E-02	± 7.09E-04
09/02/14 - 09/09/14	1.66E-02	± 7.80E-04	1.51E-02	± 7.34E-04	1.76E-02	± 8.27E-04
09/09/14 - 09/16/14	1.67E-02	± 8.05E-04	1.73E-02	± 7.95E-04	1.67E-02	± 7.94E-04
09/16/14 - 09/23/14	2.63E-02	± 9.97E-04	2.28E-02	± 9.07E-04	2.25E-02	± 9.27E-04
09/23/14 - 09/30/14	1.43E-02	± 7.37E-04	1.48E-02	± 7.35E-04	1.38E-02	± 7.32E-04
09/30/14 - 10/07/14	2.22E-02	± 9.16E-04	2.17E-02	± 8.80E-04	2.11E-02	± 9.09E-04
10/07/14 - 10/14/14	1.73E-02	± 8.22E-04	1.39E-02	± 7.32E-04	1.48E-02	± 7.76E-04
10/14/14 - 10/21/14	1.54E-02	± 7.52E-04	1.55E-02	± 7.51E-04	1.55E-02	± 7.64E-04
10/21/14 - 10/28/14	6.28E-03	± 5.15E-04	6.21E-03	± 5.03E-04	6.58E-03	± 5.29E-04
10/28/14 - 11/04/14	9.70E-03	± 6.09E-04	1.09E-02	± 6.44E-04	9.75E-03	± 6.17E-04
11/04/14 - 11/11/14	1.20E-02	± 6.91E-04	1.34E-02	± 6.99E-04	1.15E-02	± 6.66E-04
11/11/14 - 11/18/14	4.32E-02	± 1.24E-03	4.25E-02	± 1.21E-03	4.43E-02	± 1.26E-03
11/18/14 - 11/25/14	7.46E-02	± 1.68E-03	7.33E-02	± 1.63E-03	6.46E-02	± 1.54E-03
11/25/14 - 12/02/14	1.98E-02	± 8.68E-04	1.79E-02	± 8.05E-04	2.08E-02	± 8.58E-04
12/02/14 - 12/09/14	4.80E-02	± 1.35E-03	4.84E-02	± 1.31E-03	5.50E-02	± 1.41E-03
12/09/14 - 12/16/14	1.54E-02	± 7.78E-04	1.59E-02	± 7.69E-04	1.55E-02	± 7.59E-04
12/16/14 - 12/23/14	2.31E-02	± 9.42E-04	2.11E-02	± 8.79E-04	2.22E-02	± 9.03E-04
12/23/14 - 12/30/14	8.58E-03	± 6.02E-04	8.68E-03	± 5.85E-04	9.24E-03	± 6.05E-04

TABLE A-2.1  
**GROSS BETA ON AIR PARTICULATE FILTERS**

Results in pCi per Cubic Meter

Collection Period	Station 09		Station 21		Station 23	
	Result	Error	Result	Error	Result	Error
12/31/13 - 01/07/14	2.18E-02	± 9.02E-04	2.82E-02	± 1.04E-03	2.84E-02	± 1.06E-03
01/07/14 - 01/14/14	1.64E-02	± 8.02E-04	1.95E-02	± 8.67E-04	2.01E-02	± 8.67E-04
01/14/14 - 01/21/14	3.46E-02	± 1.15E-03	3.85E-02	± 1.21E-03	4.07E-02	± 1.20E-03
01/21/14 - 01/28/14	3.54E-02	± 1.14E-03	4.23E-02	± 1.26E-03	4.29E-02	± 1.25E-03
01/28/14 - 02/04/14	2.64E-02	± 9.76E-04	3.18E-02	± 1.08E-03	3.32E-02	± 1.08E-03
02/04/14 - 02/11/14	3.78E-02	± 1.19E-03	3.59E-02	± 1.18E-03	3.77E-02	± 1.15E-03
02/11/14 - 02/18/14	5.20E-03	± 4.97E-04	5.37E-03	± 5.10E-04	6.44E-03	± 5.30E-04
02/18/14 - 02/25/14	6.24E-03	± 5.47E-04	9.06E-03	± 6.37E-04	8.17E-03	± 5.80E-04
02/25/14 - 03/04/14	3.60E-02	± 1.16E-03	3.92E-02	± 1.26E-03	4.20E-02	± 1.24E-03
03/04/14 - 03/11/14	3.74E-03	± 4.42E-04	6.00E-03	± 5.19E-04	5.29E-03	± 5.04E-04
03/11/14 - 03/18/14	9.64E-03	± 6.38E-04	8.72E-03	± 5.95E-04	9.33E-03	± 6.18E-04
03/18/14 - 03/25/14	8.13E-03	± 6.12E-04	9.23E-03	± 6.17E-04	8.91E-03	± 6.37E-04
03/25/14 - 04/01/14	4.94E-03	± 4.53E-04	5.59E-03	± 5.05E-04	5.80E-03	± 5.01E-04
04/01/14 - 04/08/14	8.65E-03	± 5.83E-04	9.30E-03	± 6.17E-04	1.13E-02	± 6.61E-04
04/08/14 - 04/15/14	1.16E-02	± 6.70E-04	1.36E-02	± 7.33E-04	1.31E-02	± 6.99E-04
04/15/14 - 04/22/14	9.27E-03	± 6.25E-04	1.21E-02	± 7.08E-04	1.09E-02	± 6.44E-04
04/22/14 - 04/29/14	3.70E-03	± 4.41E-04	4.06E-03	± 4.68E-04	2.98E-03	± 4.03E-04
04/29/14 - 05/06/14	1.03E-02	± 6.33E-04	1.26E-02	± 6.85E-04	1.20E-02	± 6.70E-04
05/06/14 - 05/13/14	9.76E-03	± 6.29E-04	1.03E-02	± 6.33E-04	1.09E-02	± 6.43E-04
05/13/14 - 05/20/14	1.42E-02	± 7.37E-04	1.58E-02	± 7.46E-04	1.46E-02	± 7.22E-04
05/20/14 - 05/27/14	8.96E-03	± 5.89E-04	8.68E-03	± 5.63E-04	9.75E-03	± 6.01E-04
05/27/14 - 06/03/14	1.35E-02	± 7.14E-04	1.44E-02	± 7.02E-04	1.29E-02	± 6.89E-04
06/03/14 - 06/10/14	8.33E-03	± 5.78E-04	1.06E-02	± 6.47E-04	1.00E-02	± 6.33E-04
06/10/14 - 06/17/14	4.50E-03	± 4.82E-04	6.53E-03	± 5.49E-04	6.26E-03	± 5.45E-04
06/17/14 - 06/24/14	8.98E-03	± 6.17E-04	9.47E-03	± 6.41E-04	1.01E-02	± 6.56E-04
06/24/14 - 07/01/14	5.93E-03	± 4.73E-04	6.57E-03	± 5.49E-04	5.55E-03	± 5.30E-04
07/01/14 - 07/08/14	1.37E-02	± 7.15E-04	1.49E-02	± 7.50E-04	1.13E-02	± 6.70E-04
07/08/14 - 07/15/14	1.99E-02	± 8.70E-04	2.26E-02	± 9.26E-04	2.10E-02	± 8.96E-04
07/15/14 - 07/22/14	1.33E-02	± 6.83E-04	1.39E-02	± 7.34E-04	1.58E-02	± 7.84E-04
07/22/14 - 07/29/14	1.41E-02	± 7.27E-04	1.67E-02	± 7.90E-04	1.42E-02	± 7.40E-04
07/29/14 - 08/05/14	2.43E-02	± 9.18E-04	2.39E-02	± 9.12E-04	2.24E-02	± 9.13E-04
08/05/14 - 08/12/14	1.86E-02	± 8.30E-04	1.74E-02	± 7.94E-04	1.78E-02	± 8.14E-04
08/12/14 - 08/19/14	1.71E-02	± 8.01E-04	1.70E-02	± 8.10E-04	1.61E-02	± 7.99E-04
08/19/14 - 08/26/14	1.48E-02	± 7.52E-04	1.56E-02	± 7.76E-04	1.48E-02	± 7.57E-04
08/26/14 - 09/02/14	1.26E-02	± 6.99E-04	1.24E-02	± 6.90E-04	1.31E-02	± 7.09E-04
09/02/14 - 09/09/14	1.38E-02	± 7.33E-04	1.78E-02	± 8.15E-04	1.61E-02	± 7.81E-04
09/09/14 - 09/16/14	1.79E-02	± 8.13E-04	1.90E-02	± 8.65E-04	1.73E-02	± 8.23E-04
09/16/14 - 09/23/14	2.29E-02	± 9.20E-04	2.70E-02	± 1.01E-03	2.52E-02	± 9.75E-04
09/23/14 - 09/30/14	1.31E-02	± 7.07E-04	1.60E-02	± 7.97E-04	1.44E-02	± 7.42E-04
09/30/14 - 10/07/14	1.93E-02	± 8.35E-04	2.31E-02	± 9.59E-04	2.13E-02	± 8.96E-04
10/07/14 - 10/14/14	1.30E-02	± 7.06E-04	1.68E-02	± 8.30E-04	1.68E-02	± 8.11E-04
10/14/14 - 10/21/14	1.17E-02	± 6.48E-04	1.59E-02	± 7.85E-04	1.54E-02	± 7.62E-04
10/21/14 - 10/28/14	5.70E-03	± 4.80E-04	7.11E-03	± 5.59E-04	6.60E-03	± 5.27E-04
10/28/14 - 11/04/14	6.93E-03	± 5.32E-04	1.09E-02	± 6.49E-04	NVS	
11/04/14 - 11/11/14	1.14E-02	± 6.48E-04	1.28E-02	± 6.96E-04	1.06E-02	± 6.33E-04
11/11/14 - 11/18/14	3.80E-02	± 1.18E-03	4.68E-02	± 1.29E-03	4.35E-02	± 1.24E-03
11/18/14 - 11/25/14	6.25E-02	± 1.56E-03	7.52E-02	± 1.70E-03	7.34E-02	± 1.66E-03
11/25/14 - 12/02/14	1.71E-02	± 7.93E-04	1.95E-02	± 8.64E-04	2.04E-02	± 8.74E-04
12/02/14 - 12/09/14	5.14E-02	± 1.40E-03	5.04E-02	± 1.39E-03	4.99E-02	± 1.36E-03
12/09/14 - 12/16/14	1.47E-02	± 7.70E-04	1.72E-02	± 8.29E-04	1.73E-02	± 8.15E-04
12/16/14 - 12/23/14	1.88E-02	± 8.62E-04	2.33E-02	± 9.53E-04	2.45E-02	± 9.63E-04
12/23/14 - 12/30/14	7.36E-03	± 5.72E-04	9.48E-03	± 6.45E-04	1.03E-02	± 6.41E-04

NVS = Valid sample not obtained due to sampler failure.  
Average MDA for analyses in Table A-2.1 was 8.8E-04.

TABLE A-2.1  
**GROSS BETA ON AIR PARTICULATE FILTERS**

Results in pCi per Cubic Meter

Collection Period	Station 40		Station 48		Station 57	
	Result	Error	Result	Error	Result	Error
12/31/13 - 01/07/14	2.47E-02	± 1.01E-03	2.55E-02	± 9.93E-04	2.81E-02	± 1.01E-03
01/07/14 - 01/14/14	1.53E-02	± 7.39E-04	1.95E-02	± 8.55E-04	1.94E-02	± 8.29E-04
01/14/14 - 01/21/14	3.91E-02	± 1.17E-03	4.08E-02	± 1.25E-03	4.00E-02	± 1.19E-03
01/21/14 - 01/28/14	3.96E-02	± 1.16E-03	4.19E-02	± 1.24E-03	4.13E-02	± 1.21E-03
01/28/14 - 02/04/14	3.19E-02	± 1.05E-03	3.34E-02	± 1.14E-03	3.36E-02	± 1.10E-03
02/04/14 - 02/11/14	3.22E-02	± 1.07E-03	3.80E-02	± 1.17E-03	3.54E-02	± 1.13E-03
02/11/14 - 02/18/14	4.59E-03	± 4.58E-04	5.89E-03	± 4.96E-04	7.00E-03	± 5.49E-04
02/18/14 - 02/25/14	9.02E-03	± 6.05E-04	8.57E-03	± 5.90E-04	8.55E-03	± 6.08E-04
02/25/14 - 03/04/14	3.90E-02	± 1.18E-03	3.78E-02	± 1.16E-03	4.05E-02	± 1.24E-03
03/04/14 - 03/11/14	3.49E-03	± 4.24E-04	5.44E-03	± 5.02E-04	4.36E-03	± 4.69E-04
03/11/14 - 03/18/14	9.50E-03	± 6.05E-04	8.78E-03	± 6.06E-04	8.07E-03	± 5.75E-04
03/18/14 - 03/25/14	8.32E-03	± 5.92E-04	8.65E-03	± 6.13E-04	8.39E-03	± 6.03E-04
03/25/14 - 04/01/14	5.02E-03	± 4.87E-04	3.96E-03	± 4.43E-04	5.56E-03	± 4.82E-04
04/01/14 - 04/08/14	9.52E-03	± 6.09E-04	1.06E-02	± 6.53E-04	9.26E-03	± 6.00E-04
04/08/14 - 04/15/14	1.09E-02	± 6.61E-04	1.17E-02	± 6.92E-04	1.28E-02	± 6.93E-04
04/15/14 - 04/22/14	1.02E-02	± 6.46E-04	1.02E-02	± 6.58E-04	9.07E-03	± 6.08E-04
04/22/14 - 04/29/14	4.24E-03	± 4.62E-04	3.91E-03	± 4.64E-04	4.54E-03	± 4.66E-04
04/29/14 - 05/06/14	1.09E-02	± 6.71E-04	1.12E-02	± 6.82E-04	1.27E-02	± 7.02E-04
05/06/14 - 05/13/14	1.01E-02	± 6.42E-04	1.11E-02	± 6.47E-04	1.02E-02	± 6.39E-04
05/13/14 - 05/20/14	1.47E-02	± 7.27E-04	1.39E-02	± 7.10E-04	1.48E-02	± 7.40E-04
05/20/14 - 05/27/14	8.54E-03	± 5.67E-04	9.92E-03	± 6.03E-04	8.42E-03	± 5.78E-04
05/27/14 - 06/03/14	1.27E-02	± 6.67E-04	1.18E-02	± 6.46E-04	1.20E-02	± 6.70E-04
06/03/14 - 06/10/14	9.24E-03	± 6.15E-04	8.13E-03	± 5.84E-04	9.46E-03	± 6.06E-04
06/10/14 - 06/17/14	6.44E-03	± 5.52E-04	5.94E-03	± 5.35E-04	6.20E-03	± 5.31E-04
06/17/14 - 06/24/14	9.34E-03	± 6.16E-04	9.89E-03	± 6.46E-04	9.81E-03	± 6.25E-04
06/24/14 - 07/01/14	6.03E-03	± 5.19E-04	5.05E-03	± 4.95E-04	5.59E-03	± 4.95E-04
07/01/14 - 07/08/14	1.29E-02	± 7.21E-04	1.50E-02	± 7.70E-04	1.29E-02	± 7.11E-04
07/08/14 - 07/15/14	2.15E-02	± 9.03E-04	2.25E-02	± 9.34E-04	2.06E-02	± 8.92E-04
07/15/14 - 07/22/14	1.54E-02	± 7.71E-04	1.50E-02	± 7.58E-04	1.55E-02	± 7.63E-04
07/22/14 - 07/29/14	1.64E-02	± 7.79E-04	1.69E-02	± 7.99E-04	1.70E-02	± 7.96E-04
07/29/14 - 08/05/14	2.22E-02	± 8.77E-04	2.24E-02	± 8.90E-04	2.62E-02	± 9.52E-04
08/05/14 - 08/12/14	1.68E-02	± 7.75E-04	1.67E-02	± 7.82E-04	1.52E-02	± 7.53E-04
08/12/14 - 08/19/14	1.55E-02	± 7.56E-04	1.69E-02	± 8.11E-04	1.69E-02	± 8.14E-04
08/19/14 - 08/26/14	1.38E-02	± 7.41E-04	1.26E-02	± 7.09E-04	1.45E-02	± 7.61E-04
08/26/14 - 09/02/14	1.40E-02	± 7.35E-04	1.48E-02	± 7.56E-04	1.50E-02	± 7.63E-04
09/02/14 - 09/09/14	1.65E-02	± 8.06E-04	1.63E-02	± 7.96E-04	1.68E-02	± 7.92E-04
09/09/14 - 09/16/14	1.84E-02	± 8.28E-04	1.66E-02	± 7.88E-04	1.74E-02	± 8.24E-04
09/16/14 - 09/23/14	2.47E-02	± 9.90E-04	2.26E-02	± 9.25E-04	2.41E-02	± 9.54E-04
09/23/14 - 09/30/14	1.43E-02	± 7.54E-04	1.53E-02	± 7.76E-04	1.68E-02	± 8.12E-04
09/30/14 - 10/07/14	1.90E-02	± 8.69E-04	2.14E-02	± 9.29E-04	2.07E-02	± 9.10E-04
10/07/14 - 10/14/14	1.57E-02	± 8.06E-04	1.51E-02	± 7.56E-04	1.64E-02	± 8.16E-04
10/14/14 - 10/21/14	1.60E-02	± 7.91E-04	1.55E-02	± 7.37E-04	1.82E-02	± 8.73E-04
10/21/14 - 10/28/14	6.58E-03	± 5.20E-04	6.40E-03	± 5.01E-04	6.26E-03	± 5.01E-04
10/28/14 - 11/04/14	1.07E-02	± 6.46E-04	9.87E-03	± 6.19E-04	9.40E-03	± 6.07E-04
11/04/14 - 11/11/14	1.19E-02	± 6.68E-04	1.17E-02	± 6.60E-04	1.37E-02	± 7.25E-04
11/11/14 - 11/18/14	4.30E-02	± 1.25E-03	4.62E-02	± 1.31E-03	4.69E-02	± 1.33E-03
11/18/14 - 11/25/14	6.70E-02	± 1.61E-03	7.16E-02	± 1.66E-03	7.33E-02	± 1.68E-03
11/25/14 - 12/02/14	1.28E-02	± 8.19E-04	2.14E-02	± 9.02E-04	1.93E-02	± 8.62E-04
12/02/14 - 12/09/14	4.99E-02	± 1.39E-03	4.92E-02	± 1.37E-03	4.99E-02	± 1.37E-03
12/09/14 - 12/16/14	1.71E-02	± 8.35E-04	1.55E-02	± 7.87E-04	1.66E-02	± 7.99E-04
12/16/14 - 12/23/14	1.91E-02	± 8.73E-04	2.13E-02	± 9.15E-04	2.20E-02	± 9.06E-04
12/23/14 - 12/30/14	9.37E-03	± 6.36E-04	9.78E-03	± 6.39E-04	1.07E-02	± 6.64E-04



TABLE A-2.2  
**GROSS BETA ON AIR PARTICULATE FILTERS - SUMMARY**  
 Results in pCi per cubic meter

LOCATION	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
Gross Beta Indicators	1.81E-02	2.98E-03	7.52E-02	571	571
Gross Beta Controls	1.65E-02	3.70E-03	6.25E-02	52	52

TABLE A-3.1

**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS**

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter			Station 1	1st Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	6.40E-02 ±	1.20E-02	8.52E-03
K-40		-4.97E-03 ±	1.99E-02	7.51E-03
MN-54		-1.55E-04 ±	5.04E-04	7.89E-04
FE-59		5.30E-04 ±	1.88E-03	2.83E-03
CO-60		2.10E-05 ±	4.11E-04	7.07E-04
ZN-65		0.00E+00 ±	2.09E-03	3.43E-03
ZRNB-95		-2.19E-04 ±	1.14E-03	1.81E-03
CS-134		-1.01E-04 ±	3.74E-04	5.91E-04
CS-137		1.09E-04 ±	2.50E-04	3.60E-04
BALA140		0.00E+00 ±	3.55E-03	5.84E-03
RU-106		-3.80E-04 ±	2.73E-03	4.35E-03

Location and Quarter			Station 1	2nd Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.22E-01 ±	1.83E-02	9.40E-03
K-40		-7.41E-04 ±	1.46E-02	1.39E-02
MN-54		0.00E+00 ±	4.18E-04	6.87E-04
FE-59		-9.47E-04 ±	3.25E-03	4.97E-03
CO-60		1.53E-04 ±	5.66E-04	8.71E-04
ZN-65		2.84E-04 ±	7.96E-04	1.14E-03
ZRNB-95		-4.05E-06 ±	1.20E-03	1.97E-03
CS-134		-1.45E-04 ±	5.70E-04	9.06E-04
CS-137		0.00E+00 ±	3.56E-04	5.86E-04
BALA140		5.29E-03 ±	1.23E-02	1.76E-02
RU-106		-1.60E-03 ±	5.36E-03	8.41E-03

Location and Quarter			Station 1	3rd Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.71E-01 ±	2.21E-02	1.14E-02
K-40		2.77E-03 ±	6.78E-03	1.10E-02
MN-54		-1.68E-04 ±	6.53E-04	1.03E-03
FE-59		-6.03E-04 ±	3.55E-03	5.61E-03
CO-60		0.00E+00 ±	5.90E-04	9.70E-04
ZN-65		-7.85E-04 ±	1.67E-03	2.54E-03
ZRNB-95		-1.70E-05 ±	1.57E-03	2.57E-03
CS-134		1.30E-05 ±	3.50E-04	5.71E-04
CS-137		-1.64E-04 ±	4.91E-04	7.60E-04
BALA140		0.00E+00 ±	3.14E-02	5.15E-02
RU-106		-1.11E-03 ±	4.78E-03	7.56E-03

Location and Quarter			Station 1	4th Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.94E-02 ±	1.36E-02	4.25E-03
K-40		1.09E-03 ±	5.96E-03	1.03E-02
MN-54		-1.13E-04 ±	5.79E-04	9.18E-04
FE-59		-3.84E-04 ±	3.66E-03	5.90E-03
CO-60		2.95E-05 ±	4.68E-04	7.57E-04
ZN-65		0.00E+00 ±	2.21E-03	3.63E-03
ZRNB-95		-2.72E-04 ±	1.54E-03	2.45E-03
CS-134		0.00E+00 ±	1.02E-03	1.68E-03
CS-137		1.39E-04 ±	4.43E-04	6.83E-04
BALA140		-1.63E-04 ±	1.43E-02	2.35E-02
RU-106		-1.16E-03 ±	5.08E-03	8.05E-03

Location and Quarter			Station 4	1st Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.44E-02 ±	1.24E-02	8.49E-03
K-40		3.46E-05 ±	5.05E-03	9.80E-03
MN-54		0.00E+00 ±	4.32E-04	7.11E-04
FE-59		1.07E-03 ±	2.16E-03	3.10E-03
CO-60		2.39E-04 ±	4.47E-04	6.88E-04
ZN-65		0.00E+00 ±	4.59E-03	7.54E-03
ZRNB-95		-1.18E-04 ±	1.11E-03	1.79E-03
CS-134		0.00E+00 ±	1.08E-03	1.77E-03
CS-137		0.00E+00 ±	4.53E-04	7.44E-04
BALA140		0.00E+00 ±	3.50E-03	5.76E-03
RU-106		2.34E-03 ±	3.45E-03	4.98E-03

Location and Quarter			Station 4	2nd Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.15E-01 ±	1.69E-02	8.17E-03
K-40		3.98E-03 ±	7.10E-03	1.12E-02
MN-54		-1.71E-04 ±	6.14E-04	9.61E-04
FE-59		-6.48E-05 ±	2.81E-03	4.59E-03
CO-60		-1.83E-04 ±	6.57E-04	1.02E-03
ZN-65		-7.88E-04 ±	1.99E-03	3.09E-03
ZRNB-95		-4.70E-04 ±	1.63E-03	2.55E-03
CS-134		-1.16E-05 ±	5.67E-04	9.30E-04
CS-137		2.22E-05 ±	5.28E-04	8.62E-04
BALA140		1.92E-03 ±	1.48E-02	2.37E-02
RU-106		2.09E-03 ±	4.70E-03	7.15E-03

Location and Quarter			Station 4	3rd Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.61E-01 ±	2.27E-02	1.21E-02
K-40		1.21E-03 ±	7.21E-03	1.22E-02
MN-54		2.12E-04 ±	5.33E-04	8.06E-04
FE-59		-6.50E-04 ±	3.24E-03	5.05E-03
CO-60		-1.05E-04 ±	4.74E-04	7.32E-04
ZN-65		0.00E+00 ±	3.90E-04	6.42E-04
ZRNB-95		0.00E+00 ±	1.66E-03	2.74E-03
CS-134		1.03E-04 ±	4.38E-04	6.92E-04
CS-137		-1.00E-04 ±	4.83E-04	7.63E-04
BALA140		0.00E+00 ±	7.61E-03	1.25E-02
RU-106		-1.48E-03 ±	5.10E-03	8.00E-03

Location and Quarter			Station 4	4th Q 2014
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.47E-02 ±	1.65E-02	9.93E-03
K-40		2.93E-03 ±	6.57E-03	1.07E-02
MN-54		8.20E-05 ±	5.37E-04	8.56E-04
FE-59		-3.84E-04 ±	3.39E-03	5.42E-03
CO-60		1.95E-04 ±	5.88E-04	8.94E-04
ZN-65		-4.48E-04 ±	1.55E-03	2.41E-03
ZRNB-95		0.00E+00 ±	1.61E-03	2.65E-03
CS-134		1.01E-04 ±	4.82E-04	7.66E-04
CS-137		2.24E-04 ±	4.45E-04	6.52E-04
BALA140		0.00E+00 ±	5.72E-03	9.41E-03
RU-106		-5.60E-04 ±	4.43E-03	7.12E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/31/13 to 4/1/14 - 2nd Q 4/1/14 to 7/1/14 - 3rd Q 7/1/14 to 9/30/14 - 4th Q 9/30/14 to 12/30/14

TABLE A-3.1

**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS**

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter		Station 5 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.44E-02 ±	1.25E-02	8.58E-03
K-40		-4.77E-03 ±	1.91E-02	2.34E-03
MN-54		-3.10E-05 ±	3.74E-04	6.05E-04
FE-59		0.00E+00 ±	1.96E-03	3.22E-03
CO-60		-1.09E-04 ±	1.40E-02	9.49E-04
ZN-65		0.00E+00 ±	4.57E-03	7.51E-03
ZRNB-95		0.00E+00 ±	1.45E-03	2.38E-03
CS-134		-4.58E-05 ±	1.10E-03	1.81E-03
CS-137		1.88E-06 ±	3.91E-04	6.42E-04
BALA140		-3.85E-03 ±	1.22E-02	1.88E-02
RU-106		-7.54E-04 ±	4.31E-03	6.91E-03

Location and Quarter		Station 5 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.23E-01 ±	1.85E-02	9.64E-03
K-40		-2.39E-03 ±	9.55E-03	5.89E-03
MN-54		1.76E-04 ±	5.23E-04	8.02E-04
FE-59		0.00E+00 ±	9.89E-04	1.63E-03
CO-60		-1.16E-05 ±	4.11E-04	6.69E-04
ZN-65		1.61E-04 ±	1.36E-03	2.18E-03
ZRNB-95		-7.87E-04 ±	1.68E-03	2.54E-03
CS-134		3.69E-05 ±	5.59E-04	9.11E-04
CS-137		3.62E-05 ±	5.03E-04	8.17E-04
BALA140		-1.76E-03 ±	1.45E-02	2.32E-02
RU-106		0.00E+00 ±	4.90E-03	8.06E-03

Location and Quarter		Station 5 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.64E-01 ±	2.13E-02	1.09E-02
K-40		4.13E-03 ±	6.34E-03	9.79E-03
MN-54		2.31E-04 ±	5.71E-04	8.71E-04
FE-59		0.00E+00 ±	4.07E-03	6.69E-03
CO-60		2.15E-04 ±	4.89E-04	7.12E-04
ZN-65		-6.51E-04 ±	1.60E-03	2.44E-03
ZRNB-95		-3.08E-04 ±	1.83E-03	2.93E-03
CS-134		9.50E-05 ±	3.32E-04	5.13E-04
CS-137		1.28E-04 ±	5.12E-04	8.06E-04
BALA140		-4.90E-03 ±	1.96E-02	3.01E-02
RU-106		0.00E+00 ±	4.03E-03	6.62E-03

Location and Quarter		Station 5 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.13E-02 ±	1.55E-02	8.56E-03
K-40		-9.45E-04 ±	1.64E-02	1.26E-02
MN-54		0.00E+00 ±	5.63E-04	9.25E-04
FE-59		0.00E+00 ±	1.03E-03	1.69E-03
CO-60		0.00E+00 ±	8.45E-04	1.39E-03
ZN-65		-4.73E-04 ±	1.50E-03	2.33E-03
ZRNB-95		0.00E+00 ±	2.81E-03	4.62E-03
CS-134		-9.57E-05 ±	5.06E-04	8.09E-04
CS-137		-3.30E-05 ±	4.82E-04	7.82E-04
BALA140		1.18E-03 ±	1.40E-02	2.25E-02
RU-106		7.24E-04 ±	4.75E-03	7.62E-03

Location and Quarter		Station 6 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.32E-02 ±	1.71E-02	1.16E-02
K-40		-2.44E-03 ±	9.63E-02	2.30E-02
MN-54		7.99E-05 ±	5.43E-04	8.68E-04
FE-59		7.38E-04 ±	2.91E-03	4.48E-03
CO-60		-1.36E-04 ±	7.10E-04	1.13E-03
ZN-65		-7.86E-04 ±	1.88E-03	2.91E-03
ZRNB-95		5.38E-05 ±	1.46E-03	2.39E-03
CS-134		-8.09E-05 ±	6.50E-04	1.05E-03
CS-137		-1.78E-04 ±	6.18E-04	9.74E-04
BALA140		2.04E-04 ±	1.42E-02	2.33E-02
RU-106		-2.24E-03 ±	5.58E-03	8.65E-03

Location and Quarter		Station 6 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.21E-01 ±	1.55E-02	8.90E-03
K-40		7.00E-04 ±	4.62E-03	9.00E-03
MN-54		0.00E+00 ±	1.07E-04	1.76E-04
FE-59		2.27E-04 ±	2.44E-03	3.92E-03
CO-60		-1.03E-04 ±	2.05E-03	8.19E-04
ZN-65		4.53E-04 ±	8.11E-04	1.13E-03
ZRNB-95		-4.41E-04 ±	1.31E-03	2.03E-03
CS-134		-9.04E-05 ±	3.31E-04	5.19E-04
CS-137		8.40E-05 ±	2.91E-04	4.47E-04
BALA140		0.00E+00 ±	3.71E-03	6.09E-03
RU-106		-1.05E-03 ±	3.56E-03	5.56E-03

Location and Quarter		Station 6 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.55E-01 ±	2.03E-02	7.49E-03
K-40		2.97E-04 ±	6.84E-03	1.19E-02
MN-54		5.49E-05 ±	4.79E-04	7.68E-04
FE-59		0.00E+00 ±	4.18E-03	6.88E-03
CO-60		0.00E+00 ±	1.72E-04	2.83E-04
ZN-65		0.00E+00 ±	1.81E-03	2.97E-03
ZRNB-95		0.00E+00 ±	1.99E-03	3.27E-03
CS-134		-1.11E-04 ±	4.71E-04	7.46E-04
CS-137		-8.98E-07 ±	3.97E-04	6.50E-04
BALA140		-5.68E-03 ±	2.50E-02	3.90E-02
RU-106		-8.36E-04 ±	4.46E-03	7.09E-03

Location and Quarter		Station 6 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.49E-02 ±	1.52E-02	7.82E-03
K-40		-2.44E-03 ±	9.75E-03	6.01E-03
MN-54		-1.36E-07 ±	4.88E-04	7.93E-04
FE-59		0.00E+00 ±	1.05E-03	1.73E-03
CO-60		0.00E+00 ±	6.13E-04	1.01E-03
ZN-65		8.66E-05 ±	1.61E-03	2.62E-03
ZRNB-95		-8.09E-05 ±	1.55E-03	2.53E-03
CS-134		-3.87E-05 ±	5.86E-04	9.55E-04
CS-137		-1.64E-04 ±	5.64E-04	8.85E-04
BALA140		-2.99E-03 ±	1.61E-02	2.53E-02
RU-106		-1.18E-03 ±	3.96E-03	6.12E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/31/13 to 4/1/14 - 2nd Q 4/1/14 to 7/1/14 - 3rd Q 7/1/14 to 9/30/14 - 4th Q 9/30/14 to 12/30/14

TABLE A-3.1

**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS**

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter		Station 7 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.64E-02 ±	1.20E-02	7.40E-03
K-40		-3.80E-03 ±	3.10E-02	9.03E-03
MN-54		-9.50E-05 ±	4.34E-04	6.87E-04
FE-59		0.00E+00 ±	2.66E-03	4.37E-03
CO-60		-1.01E-04 ±	4.04E-04	3.15E-04
ZN-65		-7.06E-04 ±	1.58E-03	2.46E-03
ZRNB-95		6.30E-06 ±	9.59E-04	1.57E-03
CS-134		3.59E-05 ±	3.39E-04	5.49E-04
CS-137		-6.50E-05 ±	3.40E-04	5.39E-04
BALA140		2.38E-03 ±	9.66E-03	1.49E-02
RU-106		8.62E-04 ±	3.14E-03	4.91E-03

Location and Quarter		Station 7 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.19E-01 ±	1.46E-02	7.31E-03
K-40		2.70E-03 ±	4.97E-03	8.77E-03
MN-54		8.35E-05 ±	4.10E-04	6.51E-04
FE-59		7.95E-04 ±	1.91E-03	2.78E-03
CO-60		-2.81E-05 ±	6.90E-04	6.71E-04
ZN-65		-5.52E-04 ±	1.22E-03	1.86E-03
ZRNB-95		-2.26E-05 ±	1.03E-03	1.69E-03
CS-134		0.00E+00 ±	4.98E-04	8.19E-04
CS-137		0.00E+00 ±	3.02E-04	4.97E-04
BALA140		0.00E+00 ±	1.48E-02	2.43E-02
RU-106		3.17E-04 ±	2.16E-03	3.41E-03

Location and Quarter		Station 7 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.61E-01 ±	2.20E-02	1.14E-02
K-40		-7.39E-04 ±	1.49E-02	1.35E-02
MN-54		-4.24E-05 ±	4.44E-04	7.14E-04
FE-59		1.10E-03 ±	2.98E-03	4.39E-03
CO-60		9.97E-06 ±	5.21E-04	8.53E-04
ZN-65		-3.84E-04 ±	1.54E-03	2.43E-03
ZRNB-95		5.24E-04 ±	1.75E-03	2.73E-03
CS-134		1.16E-04 ±	4.50E-04	7.09E-04
CS-137		1.11E-05 ±	4.06E-04	6.64E-04
BALA140		0.00E+00 ±	3.24E-02	5.33E-02
RU-106		-1.10E-03 ±	5.20E-03	8.28E-03

Location and Quarter		Station 7 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	6.62E-02 ±	1.35E-02	7.50E-03
K-40		2.78E-03 ±	6.89E-03	1.12E-02
MN-54		0.00E+00 ±	6.78E-04	1.11E-03
FE-59		0.00E+00 ±	3.68E-03	6.05E-03
CO-60		1.55E-04 ±	5.14E-04	7.84E-04
ZN-65		3.89E-04 ±	1.29E-03	1.99E-03
ZRNB-95		1.55E-04 ±	1.39E-03	2.23E-03
CS-134		-2.18E-04 ±	5.18E-04	8.02E-04
CS-137		-4.79E-05 ±	4.74E-04	7.65E-04
BALA140		0.00E+00 ±	3.85E-02	6.33E-02
RU-106		-5.76E-04 ±	4.07E-03	6.52E-03

Location and Quarter		Station 8 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	9.63E-02 ±	1.69E-02	1.08E-02
K-40		7.18E-06 ±	7.15E-03	1.25E-02
MN-54		-3.15E-04 ±	6.88E-04	1.05E-03
FE-59		-1.07E-03 ±	4.43E-03	6.99E-03
CO-60		0.00E+00 ±	5.42E-04	8.91E-04
ZN-65		1.68E-05 ±	1.14E-03	1.87E-03
ZRNB-95		-5.72E-04 ±	1.62E-03	2.51E-03
CS-134		-3.49E-05 ±	3.86E-04	6.24E-04
CS-137		0.00E+00 ±	4.41E-04	7.25E-04
BALA140		0.00E+00 ±	2.03E-02	3.33E-02
RU-106		-6.67E-04 ±	4.73E-03	7.59E-03

Location and Quarter		Station 8 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.40E-01 ±	1.97E-02	1.05E-02
K-40		7.53E-04 ±	7.51E-03	1.28E-02
MN-54		-8.80E-05 ±	5.70E-04	9.11E-04
FE-59		-1.51E-03 ±	4.36E-03	6.76E-03
CO-60		3.04E-05 ±	4.99E-04	8.09E-04
ZN-65		2.32E-04 ±	1.02E-03	1.58E-03
ZRNB-95		-1.97E-04 ±	1.36E-03	2.18E-03
CS-134		-2.44E-04 ±	5.77E-04	8.99E-04
CS-137		2.64E-04 ±	3.89E-04	5.39E-04
BALA140		0.00E+00 ±	4.72E-03	7.77E-03
RU-106		5.09E-04 ±	3.77E-03	6.03E-03

Location and Quarter		Station 8 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.51E-01 ±	2.07E-02	9.11E-03
K-40		-1.47E-03 ±	3.12E-02	1.34E-02
MN-54		-3.28E-05 ±	5.63E-04	9.16E-04
FE-59		0.00E+00 ±	1.15E-03	1.90E-03
CO-60		1.97E-04 ±	4.66E-04	6.76E-04
ZN-65		0.00E+00 ±	3.83E-04	6.30E-04
ZRNB-95		-3.88E-04 ±	1.75E-03	2.76E-03
CS-134		-1.17E-04 ±	4.88E-04	7.74E-04
CS-137		2.29E-04 ±	5.02E-04	7.58E-04
BALA140		0.00E+00 ±	7.83E-03	1.29E-02
RU-106		-1.39E-03 ±	5.24E-03	8.28E-03

Location and Quarter		Station 8 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.64E-02 ±	1.60E-02	1.00E-02
K-40		1.86E-03 ±	6.13E-03	1.03E-02
MN-54		0.00E+00 ±	6.51E-04	1.07E-03
FE-59		-1.47E-04 ±	3.15E-03	5.12E-03
CO-60		-3.98E-05 ±	5.07E-04	8.17E-04
ZN-65		-9.27E-06 ±	1.20E-03	1.97E-03
ZRNB-95		0.00E+00 ±	2.15E-03	3.53E-03
CS-134		-1.74E-04 ±	5.08E-04	7.95E-04
CS-137		0.00E+00 ±	6.00E-04	9.86E-04
BALA140		0.00E+00 ±	5.44E-03	8.95E-03
RU-106		0.00E+00 ±	4.91E-03	8.07E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/31/13 to 4/1/14 - 2nd Q 4/1/14 to 7/1/14 - 3rd Q 7/1/14 to 9/30/14 - 4th Q 9/30/14 to 12/30/14

TABLE A-3.1

**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS**

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter		Station 9 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.67E-02 ±	1.27E-02	6.79E-03
K-40		5.74E-04 ±	4.14E-03	8.36E-03
MN-54		-8.54E-05 ±	4.02E-04	6.34E-04
FE-59		0.00E+00 ±	7.47E-04	1.23E-03
CO-60		-1.16E-04 ±	4.86E-03	5.80E-04
ZN-65		0.00E+00 ±	2.03E-03	3.34E-03
ZRNB-95		5.28E-04 ±	1.04E-03	1.54E-03
CS-134		-9.98E-06 ±	3.34E-04	5.47E-04
CS-137		3.23E-05 ±	3.68E-04	5.96E-04
BALA140		0.00E+00 ±	1.48E-02	2.43E-02
RU-106		-4.27E-04 ±	2.83E-03	4.51E-03

Location and Quarter		Station 9 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.05E-01 ±	1.37E-02	6.85E-03
K-40		-1.10E-03 ±	6.28E-03	8.51E-03
MN-54		0.00E+00 ±	2.95E-04	4.85E-04
FE-59		-6.64E-05 ±	2.41E-03	3.93E-03
CO-60		-9.94E-05 ±	1.97E-03	7.87E-04
ZN-65		-2.79E-04 ±	1.05E-03	1.64E-03
ZRNB-95		0.00E+00 ±	1.01E-03	1.65E-03
CS-134		-4.44E-07 ±	2.41E-04	3.94E-04
CS-137		-3.95E-05 ±	3.50E-04	5.65E-04
BALA140		0.00E+00 ±	3.59E-03	5.90E-03
RU-106		-3.75E-05 ±	3.51E-03	5.75E-03

Location and Quarter		Station 9 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.66E-01 ±	2.27E-02	1.19E-02
K-40		2.32E-03 ±	7.21E-03	1.19E-02
MN-54		-1.79E-04 ±	6.28E-04	9.83E-04
FE-59		-9.11E-04 ±	4.01E-03	6.28E-03
CO-60		-9.56E-05 ±	5.45E-04	8.61E-04
ZN-65		0.00E+00 ±	1.28E-03	2.10E-03
ZRNB-95		-2.95E-04 ±	1.48E-03	2.34E-03
CS-134		-2.12E-04 ±	5.69E-04	8.91E-04
CS-137		-1.07E-05 ±	3.56E-04	5.81E-04
BALA140		3.14E-04 ±	2.73E-02	4.48E-02
RU-106		6.86E-05 ±	5.41E-03	8.88E-03

Location and Quarter		Station 9 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.69E-02 ±	1.37E-02	4.76E-03
K-40		1.55E-03 ±	6.61E-03	1.12E-02
MN-54		-9.81E-05 ±	5.76E-04	9.17E-04
FE-59		-2.16E-04 ±	3.38E-03	5.47E-03
CO-60		5.98E-05 ±	5.32E-04	8.51E-04
ZN-65		5.00E-06 ±	1.59E-03	2.61E-03
ZRNB-95		-1.74E-04 ±	1.23E-03	1.95E-03
CS-134		-5.51E-06 ±	5.24E-04	8.59E-04
CS-137		-1.37E-04 ±	5.25E-04	8.27E-04
BALA140		-8.83E-03 ±	2.38E-02	3.65E-02
RU-106		-1.65E-03 ±	5.07E-03	7.92E-03

Location and Quarter		Station 21 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.50E-02 ±	1.19E-02	6.39E-03
K-40		-4.92E-03 ±	1.23E-01	1.30E-02
MN-54		-7.99E-07 ±	3.89E-04	6.39E-04
FE-59		6.64E-04 ±	1.81E-03	2.63E-03
CO-60		7.00E-06 ±	4.99E-04	8.50E-04
ZN-65		-1.61E-04 ±	9.11E-04	1.44E-03
ZRNB-95		0.00E+00 ±	1.29E-03	2.12E-03
CS-134		-7.06E-05 ±	3.93E-04	6.30E-04
CS-137		0.00E+00 ±	2.28E-04	3.75E-04
BALA140		0.00E+00 ±	1.51E-02	2.48E-02
RU-106		-5.31E-04 ±	3.32E-03	5.30E-03

Location and Quarter		Station 21 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.16E-01 ±	1.63E-02	4.52E-03
K-40		2.67E-03 ±	7.29E-03	1.19E-02
MN-54		-1.34E-04 ±	5.97E-04	9.43E-04
FE-59		6.49E-04 ±	3.32E-03	5.21E-03
CO-60		0.00E+00 ±	8.50E-04	1.40E-03
ZN-65		-3.33E-04 ±	1.18E-03	1.82E-03
ZRNB-95		1.88E-04 ±	1.28E-03	2.04E-03
CS-134		0.00E+00 ±	7.65E-04	1.26E-03
CS-137		1.35E-04 ±	3.71E-04	5.55E-04
BALA140		-3.60E-03 ±	1.43E-02	2.20E-02
RU-106		3.89E-04 ±	4.63E-03	7.51E-03

Location and Quarter		Station 21 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.52E-01 ±	2.28E-02	1.19E-02
K-40		1.29E-03 ±	6.96E-03	1.18E-02
MN-54		-2.44E-04 ±	6.33E-04	9.72E-04
FE-59		3.25E-04 ±	3.88E-03	6.25E-03
CO-60		0.00E+00 ±	1.75E-04	2.88E-04
ZN-65		0.00E+00 ±	2.28E-03	3.75E-03
ZRNB-95		-5.03E-04 ±	1.71E-03	2.66E-03
CS-134		2.09E-05 ±	3.92E-04	6.38E-04
CS-137		0.00E+00 ±	8.24E-04	1.36E-03
BALA140		5.84E-03 ±	2.58E-02	3.98E-02
RU-106		-9.65E-04 ±	4.29E-03	6.76E-03

Location and Quarter		Station 21 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	7.46E-02 ±	1.49E-02	8.20E-03
K-40		-2.49E-03 ±	9.98E-03	6.15E-03
MN-54		2.69E-05 ±	5.45E-04	8.87E-04
FE-59		-1.19E-03 ±	3.78E-03	5.79E-03
CO-60		0.00E+00 ±	6.28E-04	1.03E-03
ZN-65		0.00E+00 ±	2.28E-03	3.74E-03
ZRNB-95		4.54E-04 ±	1.38E-03	2.11E-03
CS-134		-1.62E-04 ±	5.91E-04	9.38E-04
CS-137		2.08E-04 ±	3.32E-04	4.46E-04
BALA140		5.90E-03 ±	1.42E-02	2.01E-02
RU-106		0.00E+00 ±	5.86E-03	9.63E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/31/13 to 4/1/14 - 2nd Q 4/1/14 to 7/1/14 - 3rd Q 7/1/14 to 9/30/14 - 4th Q 9/30/14 to 12/30/14

TABLE A-3.1

**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS**

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter		Station 23 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.40E-02 ±	1.65E-02	1.05E-02
K-40		9.48E-04 ±	6.28E-03	1.08E-02
MN-54		1.97E-04 ±	5.11E-04	7.74E-04
FE-59		0.00E+00 ±	1.00E-03	1.65E-03
CO-60		2.05E-04 ±	4.70E-04	6.79E-04
ZN-65		-3.61E-04 ±	1.67E-03	2.65E-03
ZRNB-95		8.07E-04 ±	1.56E-03	2.32E-03
CS-134		1.67E-04 ±	4.16E-04	6.35E-04
CS-137		2.10E-04 ±	5.09E-04	7.76E-04
BALA140		0.00E+00 ±	1.99E-02	3.27E-02
RU-106		-9.45E-05 ±	4.10E-03	6.71E-03

Location and Quarter		Station 23 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.03E-01 ±	1.39E-02	7.75E-03
K-40		-1.16E-03 ±	7.51E-03	9.31E-03
MN-54		0.00E+00 ±	4.16E-04	6.85E-04
FE-59		-4.74E-04 ±	2.18E-03	3.40E-03
CO-60		-9.91E-05 ±	1.96E-03	7.85E-04
ZN-65		4.86E-05 ±	8.67E-04	1.41E-03
ZRNB-95		1.14E-05 ±	8.41E-04	1.38E-03
CS-134		-7.61E-05 ±	3.43E-04	5.45E-04
CS-137		-1.32E-05 ±	3.28E-04	5.35E-04
BALA140		1.75E-03 ±	7.87E-03	1.20E-02
RU-106		-9.05E-04 ±	3.46E-03	5.44E-03

Location and Quarter		Station 23 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.65E-01 ±	2.34E-02	1.18E-02
K-40		-2.45E-03 ±	9.78E-03	6.03E-03
MN-54		1.70E-04 ±	5.16E-04	7.89E-04
FE-59		7.52E-04 ±	4.17E-03	6.59E-03
CO-60		3.17E-05 ±	4.22E-04	6.77E-04
ZN-65		-5.44E-04 ±	1.59E-03	2.44E-03
ZRNB-95		-4.91E-05 ±	1.49E-03	2.43E-03
CS-134		-1.86E-04 ±	5.33E-04	8.33E-04
CS-137		1.28E-05 ±	4.28E-04	7.00E-04
BALA140		0.00E+00 ±	9.94E-03	1.63E-02
RU-106		-1.33E-03 ±	5.22E-03	8.23E-03

Location and Quarter		Station 23 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	6.73E-02 ±	1.58E-02	1.08E-02
K-40		4.76E-04 ±	7.08E-03	1.24E-02
MN-54		0.00E+00 ±	6.23E-04	1.02E-03
FE-59		-5.46E-04 ±	2.69E-03	4.13E-03
CO-60		2.37E-06 ±	6.57E-04	1.08E-03
ZN-65		-3.71E-04 ±	1.79E-03	2.84E-03
ZRNB-95		-1.74E-04 ±	1.73E-03	2.79E-03
CS-134		-1.50E-04 ±	6.11E-04	9.73E-04
CS-137		-8.67E-05 ±	5.04E-04	8.02E-04
BALA140		0.00E+00 ±	2.75E-02	4.52E-02
RU-106		-5.84E-04 ±	4.99E-03	8.03E-03

Location and Quarter		Station 40 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	9.68E-02 ±	1.48E-02	5.36E-03
K-40		2.30E-03 ±	6.65E-03	1.10E-02
MN-54		-6.43E-05 ±	5.97E-04	9.63E-04
FE-59		6.86E-04 ±	2.74E-03	4.21E-03
CO-60		0.00E+00 ±	1.71E-04	2.81E-04
ZN-65		0.00E+00 ±	3.50E-03	5.76E-03
ZRNB-95		-7.06E-05 ±	1.54E-03	2.52E-03
CS-134		-2.02E-05 ±	4.97E-04	8.13E-04
CS-137		-3.36E-05 ±	4.67E-04	7.58E-04
BALA140		4.23E-04 ±	9.84E-03	1.60E-02
RU-106		1.57E-03 ±	3.76E-03	5.64E-03

Location and Quarter		Station 40 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.37E-01 ±	1.92E-02	9.44E-03
K-40		4.06E-04 ±	7.62E-03	1.31E-02
MN-54		2.39E-04 ±	4.23E-04	5.94E-04
FE-59		2.39E-03 ±	2.59E-03	2.97E-03
CO-60		-1.71E-04 ±	5.58E-04	8.53E-04
ZN-65		3.82E-05 ±	9.55E-04	1.55E-03
ZRNB-95		-8.05E-05 ±	1.28E-03	2.08E-03
CS-134		-1.51E-04 ±	5.05E-04	7.94E-04
CS-137		-1.09E-04 ±	5.34E-04	8.49E-04
BALA140		-3.56E-03 ±	1.96E-02	3.12E-02
RU-106		-8.79E-06 ±	4.56E-03	7.49E-03

Location and Quarter		Station 40 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.62E-01 ±	2.11E-02	6.10E-03
K-40		2.20E-03 ±	6.61E-03	1.09E-02
MN-54		0.00E+00 ±	3.31E-04	5.44E-04
FE-59		-2.33E-04 ±	4.37E-03	7.10E-03
CO-60		0.00E+00 ±	1.76E-04	2.89E-04
ZN-65		-5.86E-04 ±	1.62E-03	2.49E-03
ZRNB-95		-1.58E-04 ±	1.80E-03	2.91E-03
CS-134		-1.59E-04 ±	5.57E-04	8.82E-04
CS-137		1.01E-04 ±	5.03E-04	7.97E-04
BALA140		0.00E+00 ±	9.88E-03	1.62E-02
RU-106		9.22E-04 ±	3.90E-03	6.10E-03

Location and Quarter		Station 40 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.03E-02 ±	1.85E-02	1.19E-02
K-40		1.75E-03 ±	6.88E-03	1.16E-02
MN-54		-1.34E-04 ±	6.79E-04	1.08E-03
FE-59		0.00E+00 ±	1.13E-03	1.86E-03
CO-60		-1.24E-04 ±	7.28E-04	1.16E-03
ZN-65		-3.59E-04 ±	1.26E-03	1.93E-03
ZRNB-95		-3.40E-04 ±	1.98E-03	3.17E-03
CS-134		-2.03E-04 ±	5.50E-04	8.57E-04
CS-137		-2.04E-04 ±	6.02E-04	9.38E-04
BALA140		0.00E+00 ±	6.39E-03	1.05E-02
RU-106		-8.95E-04 ±	4.95E-03	7.90E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/31/13 to 4/1/14 - 2nd Q 4/1/14 to 7/1/14 - 3rd Q 7/1/14 to 9/30/14 - 4th Q 9/30/14 to 12/30/14

TABLE A-3.1

**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS**

Results in pCi/cubic meter, results decay corrected for decay during sample collection period

Location and Quarter		Station 48 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.26E-02 ±	1.23E-02	6.16E-03
K-40		-1.57E-03 ±	7.00E-03	8.30E-03
MN-54		0.00E+00 ±	4.79E-04	7.87E-04
FE-59		7.90E-04 ±	2.34E-03	3.54E-03
CO-60		-1.70E-04 ±	1.59E-03	7.14E-04
ZN-65		4.23E-04 ±	7.29E-04	9.94E-04
ZRNB-95		0.00E+00 ±	7.45E-04	1.23E-03
CS-134		7.14E-06 ±	3.29E-04	5.39E-04
CS-137		-1.19E-04 ±	3.97E-04	6.21E-04
BALA140		2.91E-03 ±	8.26E-03	1.20E-02
RU-106		-8.39E-04 ±	3.59E-03	5.68E-03

Location and Quarter		Station 48 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.14E-01 ±	1.41E-02	5.90E-03
K-40		-1.50E-03 ±	7.11E-03	8.47E-03
MN-54		6.63E-05 ±	4.12E-04	6.57E-04
FE-59		-3.61E-04 ±	1.94E-03	3.03E-03
CO-60		1.03E-04 ±	3.34E-04	5.48E-04
ZN-65		1.35E-04 ±	8.76E-04	1.39E-03
ZRNB-95		2.72E-04 ±	1.03E-03	1.60E-03
CS-134		1.62E-04 ±	2.88E-04	4.22E-04
CS-137		1.22E-04 ±	2.79E-04	4.12E-04
BALA140		-2.28E-03 ±	9.90E-03	1.53E-02
RU-106		-6.40E-04 ±	3.31E-03	5.26E-03

Location and Quarter		Station 48 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.76E-01 ±	2.30E-02	9.79E-03
K-40		5.13E-03 ±	6.06E-03	8.90E-03
MN-54		6.53E-05 ±	6.88E-04	1.11E-03
FE-59		-9.86E-04 ±	3.40E-03	5.14E-03
CO-60		-4.57E-05 ±	5.07E-04	8.15E-04
ZN-65		-7.20E-04 ±	1.78E-03	2.73E-03
ZRNB-95		4.13E-06 ±	1.80E-03	2.96E-03
CS-134		1.59E-04 ±	4.39E-04	6.76E-04
CS-137		5.51E-05 ±	4.86E-04	7.83E-04
BALA140		-8.04E-03 ±	2.63E-02	3.94E-02
RU-106		9.91E-04 ±	4.25E-03	6.67E-03

Location and Quarter		Station 48 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.70E-02 ±	1.80E-02	1.11E-02
K-40		1.86E-03 ±	5.76E-03	9.68E-03
MN-54		-1.07E-04 ±	5.43E-04	8.59E-04
FE-59		-6.64E-04 ±	4.04E-03	6.43E-03
CO-60		-5.90E-05 ±	5.33E-04	8.53E-04
ZN-65		0.00E+00 ±	3.15E-03	5.18E-03
ZRNB-95		0.00E+00 ±	1.51E-03	2.49E-03
CS-134		-2.72E-04 ±	6.56E-04	1.03E-03
CS-137		0.00E+00 ±	5.51E-04	9.06E-04
BALA140		0.00E+00 ±	6.39E-03	1.05E-02
RU-106		1.79E-03 ±	4.62E-03	7.09E-03

Location and Quarter		Station 57 1st Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.54E-02 ±	1.49E-02	6.81E-03
K-40		-1.37E-03 ±	2.41E-02	1.21E-02
MN-54		1.69E-05 ±	3.90E-04	6.34E-04
FE-59		7.37E-04 ±	2.23E-03	3.25E-03
CO-60		0.00E+00 ±	5.99E-04	9.84E-04
ZN-65		4.90E-05 ±	1.23E-03	2.01E-03
ZRNB-95		1.19E-06 ±	1.56E-03	2.57E-03
CS-134		-4.11E-04 ±	6.49E-04	9.90E-04
CS-137		3.61E-05 ±	4.26E-04	6.89E-04
BALA140		0.00E+00 ±	2.93E-02	4.81E-02
RU-106		0.00E+00 ±	4.12E-03	6.78E-03

Location and Quarter		Station 57 2nd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.10E-01 ±	1.65E-02	6.80E-03
K-40		-4.26E-04 ±	9.13E-03	1.14E-02
MN-54		0.00E+00 ±	5.70E-04	9.37E-04
FE-59		0.00E+00 ±	1.01E-03	1.66E-03
CO-60		1.02E-04 ±	4.92E-04	7.67E-04
ZN-65		-9.63E-05 ±	1.35E-03	2.19E-03
ZRNB-95		-2.89E-05 ±	1.52E-03	2.49E-03
CS-134		3.71E-05 ±	4.05E-04	6.55E-04
CS-137		-2.05E-04 ±	5.69E-04	8.83E-04
BALA140		0.00E+00 ±	4.88E-03	8.02E-03
RU-106		0.00E+00 ±	6.42E-03	1.06E-02

Location and Quarter		Station 57 3rd Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.87E-01 ±	2.33E-02	9.31E-03
K-40		1.97E-03 ±	6.52E-03	1.09E-02
MN-54		1.00E-04 ±	4.28E-04	6.62E-04
FE-59		-1.70E-04 ±	4.50E-03	7.34E-03
CO-60		0.00E+00 ±	6.07E-04	9.97E-04
ZN-65		4.37E-05 ±	1.39E-03	2.27E-03
ZRNB-95		5.03E-04 ±	1.59E-03	2.45E-03
CS-134		1.94E-06 ±	4.82E-04	7.92E-04
CS-137		0.00E+00 ±	4.34E-04	7.13E-04
BALA140		-7.81E-03 ±	3.27E-02	5.09E-02
RU-106		-1.34E-03 ±	4.91E-03	7.71E-03

Location and Quarter		Station 57 4th Q 2014		
Nuclide	RQ	Activity	Error	MDA
BE-7	+	8.09E-02 ±	1.83E-02	1.18E-02
K-40		2.07E-03 ±	5.85E-03	9.77E-03
MN-54		-1.37E-04 ±	4.63E-04	7.09E-04
FE-59		-1.18E-03 ±	3.93E-03	6.05E-03
CO-60		0.00E+00 ±	1.78E-04	2.93E-04
ZN-65		-5.76E-04 ±	1.66E-03	2.56E-03
ZRNB-95		2.19E-04 ±	1.41E-03	2.24E-03
CS-134		2.92E-05 ±	4.37E-04	7.11E-04
CS-137		7.29E-05 ±	4.89E-04	7.83E-04
BALA140		-2.95E-03 ±	2.14E-02	3.42E-02
RU-106		6.64E-04 ±	4.21E-03	6.71E-03

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

1st Q 12/31/13 to 4/1/14 - 2nd Q 4/1/14 to 7/1/14 - 3rd Q 7/1/14 to 9/30/14 - 4th Q 9/30/14 to 12/30/14

TABLE A-3.2  
**GAMMA SPECTROMETRY RESULTS OF AIR PARTICULATE FILTERS - SUMMARY**

Results in pCi/cubic meter, results decay corrected to mid point of the sample collection period

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-4.50E-04	-8.04E-03	5.90E-03	2.41E-02	44	0
BALA140	Cntl	-2.13E-03	-8.83E-03	3.14E-04	2.79E-02	4	0
BE-7	Ind	1.11E-01	6.40E-02	1.87E-01	8.91E-03	44	44
BE-7	Cntl	1.09E-01	7.69E-02	1.66E-01	7.59E-03	4	4
CO-60	Ind	4.78E-06	-1.83E-04	2.39E-04	7.90E-04	44	0
CO-60	Cntl	-6.27E-05	-1.16E-04	5.98E-05	7.70E-04	4	0
CS-134	Ind	-5.19E-05	-4.11E-04	1.67E-04	8.37E-04	44	0
CS-134	Cntl	-5.69E-05	-2.12E-04	-4.44E-07	6.73E-04	4	0
CS-137	Ind	1.54E-05	-2.05E-04	2.64E-04	7.17E-04	44	0
CS-137	Cntl	-3.86E-05	-1.37E-04	3.23E-05	6.42E-04	4	0
FE-59	Ind	-2.52E-06	-1.51E-03	2.39E-03	4.42E-03	44	0
FE-59	Cntl	-2.98E-04	-9.11E-04	0.00E+00	4.23E-03	4	0
K-40	Ind	1.75E-04	-4.97E-03	5.13E-03	1.06E-02	44	0
K-40	Cntl	8.36E-04	-1.10E-03	2.32E-03	9.97E-03	4	0
MN-54	Ind	-5.31E-06	-3.15E-04	2.39E-04	8.17E-04	44	0
MN-54	Cntl	-9.06E-05	-1.79E-04	0.00E+00	7.55E-04	4	0
RU-106	Ind	-2.51E-04	-2.24E-03	2.34E-03	6.97E-03	44	0
RU-106	Cntl	-5.11E-04	-1.65E-03	6.86E-05	6.77E-03	4	0
ZN-65	Ind	-1.67E-04	-7.88E-04	4.53E-04	2.60E-03	44	0
ZN-65	Cntl	-6.86E-05	-2.79E-04	5.00E-06	2.42E-03	4	0
ZRNB-95	Ind	-4.78E-05	-7.87E-04	8.07E-04	2.43E-03	44	0
ZRNB-95	Cntl	1.47E-05	-2.95E-04	5.28E-04	1.87E-03	4	0



TABLE A-4.1  
**GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS**

Results in pCi/cubic meter, corrected for decay during collection period

Collection Period	Station 1				Station 9			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
12/31/2013 - 1/7/2014		-2.59E-03	± 1.00E-02	1.60E-02		-1.90E-03	± 1.10E-02	1.77E-02
1/7/2014 - 1/14/2014		3.47E-03	± 6.39E-03	9.41E-03		0.00E+00	± 9.96E-03	1.64E-02
1/14/2014 - 1/21/2014		-1.42E-03	± 7.95E-03	1.27E-02		3.63E-03	± 6.89E-03	1.03E-02
1/21/2014 - 1/28/2014		0.00E+00	± 1.42E-02	2.33E-02		-2.06E-03	± 8.91E-03	1.42E-02
1/28/2014 - 2/4/2014		-4.74E-03	± 1.08E-02	1.69E-02		5.41E-04	± 6.77E-03	1.10E-02
2/4/2014 - 2/11/2014		1.09E-04	± 7.28E-03	1.19E-02		-8.46E-04	± 9.48E-03	1.54E-02
2/11/2014 - 2/18/2014		-2.43E-03	± 7.97E-03	1.25E-02		3.69E-03	± 7.32E-03	1.10E-02
2/18/2014 - 2/25/2014		3.43E-03	± 8.13E-03	1.26E-02		2.09E-03	± 8.28E-03	1.31E-02
2/25/2014 - 3/4/2014		3.62E-04	± 7.37E-03	1.20E-02		-3.38E-04	± 7.48E-03	1.22E-02
3/4/2014 - 3/11/2014		9.57E-03	± 8.27E-03	1.12E-02		0.00E+00	± 6.55E-03	1.08E-02
3/11/2014 - 3/18/2014		-1.93E-03	± 8.62E-03	1.37E-02		-3.34E-03	± 9.07E-03	1.42E-02
3/18/2014 - 3/25/2014		1.20E-03	± 8.67E-03	1.40E-02		2.94E-03	± 9.48E-03	1.49E-02
3/25/2014 - 4/1/2014		-8.47E-04	± 8.49E-03	1.38E-02		7.68E-04	± 9.37E-03	1.53E-02
4/1/2014 - 4/8/2014		-1.10E-03	± 8.76E-03	1.42E-02		0.00E+00	± 1.01E-02	1.65E-02
4/8/2014 - 4/15/2014		-3.58E-03	± 9.41E-03	1.47E-02		-1.85E-05	± 8.10E-03	1.33E-02
4/15/2014 - 4/22/2014		2.49E-03	± 7.50E-03	1.17E-02		-1.02E-03	± 8.00E-03	1.29E-02
4/22/2014 - 4/29/2014		0.00E+00	± 1.05E-02	1.73E-02		-1.49E-03	± 8.33E-03	1.34E-02
4/29/2014 - 5/6/2014		-1.18E-03	± 8.12E-03	1.31E-02		1.44E-03	± 5.85E-03	9.17E-03
5/6/2014 - 5/13/2014		1.30E-03	± 8.26E-03	1.33E-02		-2.65E-03	± 8.49E-03	1.34E-02
5/13/2014 - 5/20/2014		5.72E-04	± 8.26E-03	1.35E-02		2.03E-03	± 8.47E-03	1.35E-02
5/20/2014 - 5/27/2014		2.26E-03	± 7.40E-03	1.16E-02		-2.42E-03	± 9.34E-03	1.49E-02
5/27/2014 - 6/3/2014		-5.06E-05	± 7.25E-03	1.19E-02		-1.94E-03	± 8.39E-03	1.34E-02
6/3/2014 - 6/10/2014		2.87E-03	± 7.11E-03	1.09E-02		9.76E-05	± 6.82E-03	1.12E-02
6/10/2014 - 6/17/2014		0.00E+00	± 8.71E-03	1.43E-02		-1.14E-04	± 7.84E-03	1.29E-02
6/17/2014 - 6/24/2014		-2.61E-03	± 8.08E-03	1.27E-02		2.70E-03	± 6.69E-03	1.01E-02
6/24/2014 - 7/1/2014		-1.65E-03	± 7.58E-03	1.20E-02		-1.49E-03	± 7.07E-03	1.13E-02
7/1/2014 - 7/8/2014		-2.45E-03	± 8.31E-03	1.31E-02		2.14E-04	± 7.29E-03	1.19E-02
7/8/2014 - 7/15/2014		-4.89E-04	± 7.67E-03	1.25E-02		-2.05E-03	± 7.86E-03	1.24E-02
7/15/2014 - 7/22/2014		3.24E-04	± 6.88E-03	1.12E-02		-2.01E-03	± 7.42E-03	1.17E-02
7/22/2014 - 7/29/2014		3.38E-03	± 8.24E-03	1.28E-02		2.20E-05	± 6.86E-03	1.13E-02
7/29/2014 - 8/5/2014		3.15E-03	± 7.23E-03	1.11E-02		5.89E-05	± 7.75E-03	1.27E-02
8/5/2014 - 8/12/2014		0.00E+00	± 8.85E-03	1.45E-02		2.63E-03	± 7.67E-03	1.20E-02
8/12/2014 - 8/19/2014		5.62E-04	± 6.24E-03	1.01E-02		-1.13E-03	± 6.62E-03	1.06E-02
8/19/2014 - 8/26/2014		-4.86E-04	± 6.45E-03	1.05E-02		-2.45E-03	± 8.73E-03	1.38E-02
8/26/2014 - 9/2/2014		-2.03E-03	± 7.98E-03	1.27E-02		0.00E+00	± 9.16E-03	1.51E-02
9/2/2014 - 9/9/2014		-1.97E-04	± 8.14E-03	1.33E-02		-2.49E-03	± 8.47E-03	1.34E-02
9/9/2014 - 9/16/2014		-1.38E-03	± 7.85E-03	1.26E-02		1.90E-03	± 7.28E-03	1.15E-02
9/16/2014 - 9/23/2014		1.02E-03	± 5.74E-03	9.13E-03		-2.00E-03	± 8.10E-03	1.29E-02
9/23/2014 - 9/30/2014		-1.03E-03	± 8.62E-03	1.40E-02		-1.01E-03	± 7.24E-03	1.16E-02
9/30/2014 - 10/7/2014		3.44E-03	± 7.71E-03	1.19E-02		-3.33E-03	± 8.69E-03	1.36E-02
10/7/2014 - 10/14/2014		8.84E-04	± 6.09E-03	9.75E-03		7.40E-05	± 6.83E-03	1.12E-02
10/14/2014 - 10/21/2014		-6.82E-04	± 8.16E-03	1.33E-02		-1.31E-03	± 7.03E-03	1.12E-02
10/21/2014 - 10/28/2014		-4.92E-03	± 1.03E-02	1.59E-02		-1.68E-03	± 8.71E-03	1.40E-02
10/28/2014 - 11/4/2014		2.11E-03	± 6.14E-03	9.46E-03		-2.15E-03	± 7.24E-03	1.14E-02
11/4/2014 - 11/11/2014		1.24E-04	± 7.08E-03	1.16E-02		-1.54E-03	± 8.02E-03	1.28E-02
11/11/2014 - 11/18/2014		5.12E-03	± 8.04E-03	1.20E-02		-1.50E-03	± 9.78E-03	1.58E-02
11/18/2014 - 11/25/2014		-1.98E-03	± 9.26E-03	1.48E-02		-3.00E-03	± 8.58E-03	1.34E-02
11/25/2014 - 12/2/2014		-8.66E-05	± 8.35E-03	1.37E-02		-5.48E-04	± 6.97E-03	1.13E-02
12/2/2014 - 12/9/2014		3.26E-03	± 7.45E-03	1.14E-02		1.38E-03	± 7.48E-03	1.19E-02
12/9/2014 - 12/16/2014		3.99E-03	± 8.50E-03	1.30E-02		0.00E+00	± 1.17E-02	1.93E-02
12/16/2014 - 12/23/2014		7.46E-04	± 8.69E-03	1.41E-02		2.00E-03	± 7.72E-03	1.22E-02
12/23/2014 - 12/30/2014		1.37E-03	± 8.43E-03	1.36E-02		-2.86E-03	± 9.28E-03	1.47E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1  
**GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS**

Results in pCi/cubic meter, corrected for decay during collection period

Collection Period	Station 4				Station 21			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
12/31/2013 - 1/7/2014		-2.51E-03	± 9.73E-03	1.55E-02		-1.98E-03	± 1.14E-02	1.85E-02
1/7/2014 - 1/14/2014		3.30E-03	± 6.07E-03	8.94E-03		0.00E+00	± 1.00E-02	1.65E-02
1/14/2014 - 1/21/2014		-1.32E-03	± 7.39E-03	1.18E-02		3.62E-03	± 6.86E-03	1.03E-02
1/21/2014 - 1/28/2014		0.00E+00	± 1.35E-02	2.21E-02		-2.11E-03	± 9.10E-03	1.45E-02
1/28/2014 - 2/4/2014		-4.55E-03	± 1.04E-02	1.63E-02		5.47E-04	± 6.83E-03	1.11E-02
2/4/2014 - 2/11/2014		1.08E-04	± 7.16E-03	1.17E-02		-8.61E-04	± 9.65E-03	1.57E-02
2/11/2014 - 2/18/2014		-2.43E-03	± 7.96E-03	1.25E-02		3.75E-03	± 7.45E-03	1.12E-02
2/18/2014 - 2/25/2014		3.39E-03	± 8.02E-03	1.24E-02		2.13E-03	± 8.45E-03	1.34E-02
2/25/2014 - 3/4/2014		3.74E-04	± 7.63E-03	1.25E-02		-3.63E-04	± 8.06E-03	1.32E-02
3/4/2014 - 3/11/2014		9.73E-03	± 8.41E-03	1.14E-02		0.00E+00	± 6.53E-03	1.07E-02
3/11/2014 - 3/18/2014		-1.99E-03	± 8.90E-03	1.42E-02		-3.18E-03	± 8.63E-03	1.35E-02
3/18/2014 - 3/25/2014		1.25E-03	± 9.01E-03	1.45E-02		2.74E-03	± 8.86E-03	1.40E-02
3/25/2014 - 4/1/2014		-7.91E-04	± 7.93E-03	1.29E-02		8.63E-04	± 1.05E-02	1.71E-02
4/1/2014 - 4/8/2014		-1.02E-03	± 8.15E-03	1.32E-02		0.00E+00	± 1.06E-02	1.74E-02
4/8/2014 - 4/15/2014		-3.34E-03	± 8.78E-03	1.37E-02		-1.93E-05	± 8.47E-03	1.39E-02
4/15/2014 - 4/22/2014		2.35E-03	± 7.08E-03	1.10E-02		-1.03E-03	± 8.13E-03	1.31E-02
4/22/2014 - 4/29/2014		0.00E+00	± 1.01E-02	1.65E-02		-1.58E-03	± 8.84E-03	1.42E-02
4/29/2014 - 5/6/2014		-1.13E-03	± 7.81E-03	1.26E-02		1.41E-03	± 5.74E-03	8.99E-03
5/6/2014 - 5/13/2014		1.21E-03	± 7.70E-03	1.24E-02		-2.54E-03	± 8.16E-03	1.28E-02
5/13/2014 - 5/20/2014		5.52E-04	± 7.98E-03	1.30E-02		1.89E-03	± 7.92E-03	1.26E-02
5/20/2014 - 5/27/2014		2.15E-03	± 7.05E-03	1.10E-02		-2.30E-03	± 8.87E-03	1.41E-02
5/27/2014 - 6/3/2014		-4.96E-05	± 7.11E-03	1.17E-02		-1.79E-03	± 7.74E-03	1.23E-02
6/3/2014 - 6/10/2014		2.87E-03	± 7.11E-03	1.09E-02		9.93E-05	± 6.94E-03	1.14E-02
6/10/2014 - 6/17/2014		0.00E+00	± 8.76E-03	1.44E-02		-1.14E-04	± 7.84E-03	1.29E-02
6/17/2014 - 6/24/2014		-3.67E-03	± 8.29E-03	1.28E-02		-3.80E-03	± 8.58E-03	1.32E-02
6/24/2014 - 7/1/2014		-1.64E-03	± 7.51E-03	1.19E-02		-1.78E-03	± 8.42E-03	1.34E-02
7/1/2014 - 7/8/2014		-2.49E-03	± 8.44E-03	1.33E-02		2.19E-04	± 7.48E-03	1.22E-02
7/8/2014 - 7/15/2014		-5.10E-04	± 7.99E-03	1.30E-02		-2.07E-03	± 7.96E-03	1.26E-02
7/15/2014 - 7/22/2014		3.23E-04	± 6.84E-03	1.12E-02		7.24E-05	± 6.79E-03	1.11E-02
7/22/2014 - 7/29/2014		3.28E-03	± 7.99E-03	1.24E-02		2.22E-05	± 6.89E-03	1.13E-02
7/29/2014 - 8/5/2014		3.04E-03	± 6.97E-03	1.07E-02		5.86E-05	± 7.72E-03	1.27E-02
8/5/2014 - 8/12/2014		0.00E+00	± 8.83E-03	1.45E-02		2.58E-03	± 7.52E-03	1.17E-02
8/12/2014 - 8/19/2014		5.91E-04	± 6.57E-03	1.06E-02		-1.15E-03	± 6.75E-03	1.08E-02
8/19/2014 - 8/26/2014		-5.19E-04	± 6.89E-03	1.12E-02		-2.49E-03	± 8.88E-03	1.41E-02
8/26/2014 - 9/2/2014		-2.14E-03	± 8.38E-03	1.33E-02		0.00E+00	± 9.12E-03	1.50E-02
9/2/2014 - 9/9/2014		-2.50E-03	± 8.52E-03	1.34E-02		-2.11E-04	± 8.70E-03	1.43E-02
9/9/2014 - 9/16/2014		-1.41E-03	± 8.05E-03	1.29E-02		2.01E-03	± 7.71E-03	1.22E-02
9/16/2014 - 9/23/2014		1.07E-03	± 6.04E-03	9.59E-03		4.47E-03	± 6.42E-03	9.17E-03
9/23/2014 - 9/30/2014		-1.13E-03	± 9.41E-03	1.52E-02		-1.08E-03	± 7.75E-03	1.25E-02
9/30/2014 - 10/7/2014		3.75E-03	± 8.41E-03	1.30E-02		-3.68E-03	± 9.61E-03	1.50E-02
10/7/2014 - 10/14/2014		9.27E-04	± 6.39E-03	1.02E-02		8.10E-05	± 7.47E-03	1.23E-02
10/14/2014 - 10/21/2014		-7.06E-04	± 8.44E-03	1.37E-02		-1.45E-03	± 7.76E-03	1.24E-02
10/21/2014 - 10/28/2014		-5.11E-03	± 1.07E-02	1.66E-02		-1.86E-03	± 9.65E-03	1.55E-02
10/28/2014 - 11/4/2014		2.27E-03	± 6.59E-03	1.02E-02		-2.18E-03	± 7.33E-03	1.15E-02
11/4/2014 - 11/11/2014		1.30E-04	± 7.40E-03	1.21E-02		-1.61E-03	± 8.39E-03	1.34E-02
11/11/2014 - 11/18/2014		5.32E-03	± 8.35E-03	1.25E-02		-1.45E-03	± 9.49E-03	1.53E-02
11/18/2014 - 11/25/2014		-2.08E-03	± 9.74E-03	1.56E-02		-2.95E-03	± 8.42E-03	1.32E-02
11/25/2014 - 12/2/2014		-1.35E-04	± 1.30E-02	2.14E-02		-5.75E-04	± 7.31E-03	1.19E-02
12/2/2014 - 12/9/2014		3.10E-03	± 7.08E-03	1.08E-02		1.38E-03	± 7.48E-03	1.19E-02
12/9/2014 - 12/16/2014		3.73E-03	± 7.94E-03	1.22E-02		0.00E+00	± 1.18E-02	1.94E-02
12/16/2014 - 12/23/2014		7.18E-04	± 8.37E-03	1.36E-02		1.99E-03	± 7.69E-03	1.21E-02
12/23/2014 - 12/30/2014		1.32E-03	± 8.14E-03	1.31E-02		-2.96E-03	± 9.61E-03	1.52E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1  
**GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS**

Results in pCi/cubic meter, corrected for decay during collection period

Collection Period	Station 5				Station 23			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
12/31/2013 - 1/7/2014		-2.67E-03	± 1.03E-02	1.65E-02		7.57E-03	± 9.07E-03	1.32E-02
1/7/2014 - 1/14/2014		3.17E-03	± 5.84E-03	8.59E-03		0.00E+00	± 9.55E-03	1.57E-02
1/14/2014 - 1/21/2014		-1.30E-03	± 7.29E-03	1.17E-02		1.97E-03	± 7.47E-03	1.18E-02
1/21/2014 - 1/28/2014		0.00E+00	± 1.27E-02	2.09E-02		-1.39E-03	± 8.05E-03	1.29E-02
1/28/2014 - 2/4/2014		-4.46E-03	± 1.02E-02	1.59E-02		-3.10E-03	± 1.01E-02	1.60E-02
2/4/2014 - 2/11/2014		1.06E-04	± 7.03E-03	1.15E-02		-3.98E-05	± 6.77E-03	1.11E-02
2/11/2014 - 2/18/2014		-2.34E-03	± 7.69E-03	1.21E-02		1.46E-03	± 7.74E-03	1.24E-02
2/18/2014 - 2/25/2014		2.01E-03	± 7.98E-03	1.26E-02		4.11E-03	± 6.87E-03	1.02E-02
2/25/2014 - 3/4/2014		3.56E-04	± 7.25E-03	1.18E-02		-1.18E-03	± 7.82E-03	1.26E-02
3/4/2014 - 3/11/2014		9.31E-03	± 8.04E-03	1.09E-02		4.51E-03	± 8.04E-03	1.21E-02
3/11/2014 - 3/18/2014		-1.92E-03	± 8.56E-03	1.37E-02		-5.34E-05	± 8.60E-03	1.41E-02
3/18/2014 - 3/25/2014		1.20E-03	± 8.65E-03	1.39E-02		-1.65E-03	± 8.88E-03	1.42E-02
3/25/2014 - 4/1/2014		-7.85E-04	± 7.88E-03	1.28E-02		-1.38E-03	± 8.23E-03	1.32E-02
4/1/2014 - 4/8/2014		-9.99E-04	± 7.95E-03	1.29E-02		-1.04E-03	± 7.37E-03	1.18E-02
4/8/2014 - 4/15/2014		-3.32E-03	± 8.74E-03	1.37E-02		4.71E-03	± 7.52E-03	1.11E-02
4/15/2014 - 4/22/2014		2.24E-03	± 6.77E-03	1.05E-02		-3.42E-03	± 7.81E-03	1.21E-02
4/22/2014 - 4/29/2014		0.00E+00	± 9.88E-03	1.62E-02		4.08E-04	± 6.10E-03	9.91E-03
4/29/2014 - 5/6/2014		-1.14E-03	± 7.90E-03	1.27E-02		0.00E+00	± 9.32E-03	1.53E-02
5/6/2014 - 5/13/2014		1.22E-03	± 7.73E-03	1.24E-02		0.00E+00	± 7.38E-03	1.21E-02
5/13/2014 - 5/20/2014		5.46E-04	± 7.89E-03	1.28E-02		2.61E-03	± 6.50E-03	9.91E-03
5/20/2014 - 5/27/2014		2.35E-03	± 7.70E-03	1.21E-02		1.47E-03	± 6.97E-03	1.11E-02
5/27/2014 - 6/3/2014		-5.11E-05	± 7.33E-03	1.20E-02		1.05E-03	± 8.17E-03	1.32E-02
6/3/2014 - 6/10/2014		3.02E-03	± 7.50E-03	1.15E-02		8.15E-05	± 6.06E-03	9.95E-03
6/10/2014 - 6/17/2014		0.00E+00	± 7.81E-03	1.28E-02		1.75E-03	± 8.06E-03	1.28E-02
6/17/2014 - 6/24/2014		-2.53E-03	± 7.81E-03	1.23E-02		-3.80E-03	± 8.59E-03	1.33E-02
6/24/2014 - 7/1/2014		-1.57E-03	± 7.21E-03	1.15E-02		5.08E-03	± 7.47E-03	1.08E-02
7/1/2014 - 7/8/2014		-2.31E-03	± 7.84E-03	1.24E-02		-6.38E-04	± 8.90E-03	1.45E-02
7/8/2014 - 7/15/2014		-4.40E-04	± 6.89E-03	1.12E-02		-2.07E-03	± 7.95E-03	1.26E-02
7/15/2014 - 7/22/2014		2.96E-04	± 6.26E-03	1.02E-02		-2.22E-03	± 8.21E-03	1.30E-02
7/22/2014 - 7/29/2014		3.30E-03	± 8.04E-03	1.25E-02		5.60E-05	± 8.18E-03	1.34E-02
7/29/2014 - 8/5/2014		3.08E-03	± 7.07E-03	1.08E-02		0.00E+00	± 8.74E-03	1.44E-02
8/5/2014 - 8/12/2014		0.00E+00	± 8.59E-03	1.41E-02		-2.02E-04	± 6.70E-03	1.10E-02
8/12/2014 - 8/19/2014		5.59E-04	± 6.21E-03	1.00E-02		-2.61E-03	± 9.05E-03	1.43E-02
8/19/2014 - 8/26/2014		-5.06E-04	± 6.72E-03	1.09E-02		9.25E-04	± 7.07E-03	1.14E-02
8/26/2014 - 9/2/2014		-2.02E-03	± 7.94E-03	1.26E-02		-4.43E-03	± 1.11E-02	1.75E-02
9/2/2014 - 9/9/2014		-2.38E-03	± 8.11E-03	1.28E-02		-2.76E-03	± 7.52E-03	1.17E-02
9/9/2014 - 9/16/2014		-1.31E-03	± 7.49E-03	1.20E-02		0.00E+00	± 1.07E-02	1.75E-02
9/16/2014 - 9/23/2014		-1.95E-03	± 7.92E-03	1.26E-02		4.48E-03	± 6.43E-03	9.17E-03
9/23/2014 - 9/30/2014		-1.05E-03	± 8.75E-03	1.42E-02		-1.49E-04	± 6.98E-03	1.14E-02
9/30/2014 - 10/7/2014		3.57E-03	± 8.00E-03	1.23E-02		1.17E-05	± 8.60E-03	1.41E-02
10/7/2014 - 10/14/2014		9.00E-04	± 6.20E-03	9.93E-03		4.78E-03	± 9.93E-03	1.54E-02
10/14/2014 - 10/21/2014		-6.70E-04	± 8.02E-03	1.30E-02		-1.61E-03	± 8.72E-03	1.40E-02
10/21/2014 - 10/28/2014		-4.81E-03	± 1.00E-02	1.56E-02		-2.35E-03	± 9.13E-03	1.45E-02
10/28/2014 - 11/4/2014		2.11E-03	± 6.13E-03	9.44E-03		NVS		
11/4/2014 - 11/11/2014		1.24E-04	± 7.04E-03	1.15E-02		9.09E-04	± 7.62E-03	1.23E-02
11/11/2014 - 11/18/2014		5.07E-03	± 7.96E-03	1.19E-02		-8.80E-05	± 7.72E-03	1.27E-02
11/18/2014 - 11/25/2014		-1.88E-03	± 8.79E-03	1.41E-02		3.81E-03	± 7.74E-03	1.18E-02
11/25/2014 - 12/2/2014		-8.02E-05	± 7.74E-03	1.27E-02		-4.84E-05	± 8.46E-03	1.39E-02
12/2/2014 - 12/9/2014		3.10E-03	± 7.08E-03	1.08E-02		-2.31E-04	± 8.06E-03	1.32E-02
12/9/2014 - 12/16/2014		3.81E-03	± 8.12E-03	1.25E-02		-1.27E-03	± 8.40E-03	1.35E-02
12/16/2014 - 12/23/2014		7.09E-04	± 8.26E-03	1.34E-02		-2.36E-03	± 8.50E-03	1.35E-02
12/23/2014 - 12/30/2014		1.32E-03	± 8.14E-03	1.31E-02		2.90E-03	± 7.29E-03	1.12E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1  
**GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS**

Results in pCi/cubic meter, corrected for decay during collection period

Collection Period	Station 6				Station 40			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
12/31/2013 - 1/7/2014		-2.65E-03	± 1.03E-02	1.64E-02		7.84E-03	± 9.39E-03	1.36E-02
1/7/2014 - 1/14/2014		3.23E-03	± 5.94E-03	8.75E-03		0.00E+00	± 9.15E-03	1.50E-02
1/14/2014 - 1/21/2014		-1.27E-03	± 7.16E-03	1.15E-02		1.94E-03	± 7.34E-03	1.16E-02
1/21/2014 - 1/28/2014		0.00E+00	± 1.30E-02	2.14E-02		-1.30E-03	± 7.50E-03	1.20E-02
1/28/2014 - 2/4/2014		-4.40E-03	± 1.01E-02	1.57E-02		-3.04E-03	± 9.92E-03	1.57E-02
2/4/2014 - 2/11/2014		1.04E-04	± 6.92E-03	1.14E-02		-4.04E-05	± 6.88E-03	1.13E-02
2/11/2014 - 2/18/2014		-2.34E-03	± 7.69E-03	1.21E-02		1.41E-03	± 7.48E-03	1.20E-02
2/18/2014 - 2/25/2014		3.33E-03	± 7.89E-03	1.22E-02		4.10E-03	± 6.85E-03	1.01E-02
2/25/2014 - 3/4/2014		3.66E-04	± 7.47E-03	1.22E-02		-1.16E-03	± 7.66E-03	1.23E-02
3/4/2014 - 3/11/2014		9.40E-03	± 8.12E-03	1.10E-02		4.39E-03	± 7.83E-03	1.17E-02
3/11/2014 - 3/18/2014		-1.89E-03	± 8.46E-03	1.35E-02		-5.04E-05	± 8.12E-03	1.33E-02
3/18/2014 - 3/25/2014		1.16E-03	± 8.37E-03	1.35E-02		-1.51E-03	± 8.12E-03	1.30E-02
3/25/2014 - 4/1/2014		-8.48E-04	± 8.50E-03	1.38E-02		-1.45E-03	± 8.63E-03	1.39E-02
4/1/2014 - 4/8/2014		-1.08E-03	± 8.58E-03	1.39E-02		-1.05E-03	± 7.42E-03	1.19E-02
4/8/2014 - 4/15/2014		-3.45E-03	± 9.09E-03	1.42E-02		4.92E-03	± 7.85E-03	1.16E-02
4/15/2014 - 4/22/2014		2.39E-03	± 7.21E-03	1.12E-02		-3.57E-03	± 8.17E-03	1.26E-02
4/22/2014 - 4/29/2014		0.00E+00	± 1.04E-02	1.71E-02		4.28E-04	± 6.39E-03	1.04E-02
4/29/2014 - 5/6/2014		-1.17E-03	± 8.08E-03	1.30E-02		0.00E+00	± 1.00E-02	1.65E-02
5/6/2014 - 5/13/2014		1.28E-03	± 8.11E-03	1.30E-02		0.00E+00	± 7.84E-03	1.29E-02
5/13/2014 - 5/20/2014		5.72E-04	± 8.26E-03	1.35E-02		2.60E-03	± 6.50E-03	9.91E-03
5/20/2014 - 5/27/2014		2.26E-03	± 7.40E-03	1.16E-02		1.46E-03	± 6.91E-03	1.10E-02
5/27/2014 - 6/3/2014		-4.88E-05	± 7.00E-03	1.15E-02		1.01E-03	± 7.86E-03	1.27E-02
6/3/2014 - 6/10/2014		2.96E-03	± 7.35E-03	1.13E-02		8.31E-05	± 6.18E-03	1.01E-02
6/10/2014 - 6/17/2014		0.00E+00	± 9.08E-03	1.49E-02		1.75E-03	± 8.03E-03	1.28E-02
6/17/2014 - 6/24/2014		-3.74E-03	± 8.46E-03	1.30E-02		2.58E-03	± 6.40E-03	9.71E-03
6/24/2014 - 7/1/2014		-1.78E-03	± 8.19E-03	1.30E-02		4.61E-03	± 6.78E-03	9.78E-03
7/1/2014 - 7/8/2014		-2.32E-03	± 7.87E-03	1.24E-02		-6.57E-04	± 9.16E-03	1.49E-02
7/8/2014 - 7/15/2014		2.09E-03	± 7.44E-03	1.18E-02		2.77E-03	± 7.25E-03	1.12E-02
7/15/2014 - 7/22/2014		3.02E-04	± 6.39E-03	1.04E-02		7.37E-05	± 6.92E-03	1.14E-02
7/22/2014 - 7/29/2014		3.22E-03	± 7.86E-03	1.22E-02		5.45E-05	± 7.96E-03	1.31E-02
7/29/2014 - 8/5/2014		2.99E-03	± 6.86E-03	1.05E-02		0.00E+00	± 8.13E-03	1.34E-02
8/5/2014 - 8/12/2014		0.00E+00	± 8.83E-03	1.45E-02		-1.91E-04	± 6.36E-03	1.04E-02
8/12/2014 - 8/19/2014		5.82E-04	± 6.46E-03	1.05E-02		-2.45E-03	± 8.48E-03	1.34E-02
8/19/2014 - 8/26/2014		-5.19E-04	± 6.89E-03	1.12E-02		9.36E-04	± 7.16E-03	1.15E-02
8/26/2014 - 9/2/2014		-2.14E-03	± 8.38E-03	1.33E-02		-4.48E-03	± 1.13E-02	1.77E-02
9/2/2014 - 9/9/2014		-2.07E-04	± 8.55E-03	1.40E-02		-2.89E-03	± 7.88E-03	1.22E-02
9/9/2014 - 9/16/2014		-1.43E-03	± 8.14E-03	1.31E-02		0.00E+00	± 1.02E-02	1.67E-02
9/16/2014 - 9/23/2014		1.07E-03	± 6.04E-03	9.60E-03		-2.13E-03	± 8.64E-03	1.37E-02
9/23/2014 - 9/30/2014		-1.09E-03	± 9.07E-03	1.47E-02		-1.53E-04	± 7.14E-03	1.17E-02
9/30/2014 - 10/7/2014		3.62E-03	± 8.13E-03	1.25E-02		1.22E-05	± 8.97E-03	1.47E-02
10/7/2014 - 10/14/2014		8.95E-04	± 6.17E-03	9.88E-03		4.99E-03	± 1.04E-02	1.61E-02
10/14/2014 - 10/21/2014		-6.69E-04	± 8.00E-03	1.30E-02		-1.66E-03	± 9.02E-03	1.45E-02
10/21/2014 - 10/28/2014		-4.85E-03	± 1.01E-02	1.57E-02		-2.31E-03	± 8.98E-03	1.42E-02
10/28/2014 - 11/4/2014		2.07E-03	± 6.02E-03	9.27E-03		2.16E-03	± 7.51E-03	1.18E-02
11/4/2014 - 11/11/2014		1.31E-04	± 7.44E-03	1.22E-02		9.16E-04	± 7.67E-03	1.24E-02
11/11/2014 - 11/18/2014		5.14E-03	± 8.07E-03	1.21E-02		-9.18E-05	± 8.06E-03	1.32E-02
11/18/2014 - 11/25/2014		-1.97E-03	± 9.23E-03	1.48E-02		4.01E-03	± 8.15E-03	1.24E-02
11/25/2014 - 12/2/2014		-8.57E-05	± 8.26E-03	1.36E-02		-6.31E-05	± 1.10E-02	1.81E-02
12/2/2014 - 12/9/2014		3.24E-03	± 7.41E-03	1.13E-02		-2.41E-04	± 8.43E-03	1.38E-02
12/9/2014 - 12/16/2014		3.92E-03	± 8.36E-03	1.28E-02		-1.36E-03	± 8.95E-03	1.44E-02
12/16/2014 - 12/23/2014		7.45E-04	± 8.68E-03	1.41E-02		-2.45E-03	± 8.81E-03	1.39E-02
12/23/2014 - 12/30/2014		1.37E-03	± 8.43E-03	1.36E-02		3.06E-03	± 7.68E-03	1.18E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1  
**GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS**

Results in pCi/cubic meter, corrected for decay during collection period

Collection Period	Station 7				Station 48			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
12/31/2013 - 1/7/2014		-1.93E-03	± 1.12E-02	1.81E-02		7.43E-03	± 8.90E-03	1.29E-02
1/7/2014 - 1/14/2014		0.00E+00	± 9.57E-03	1.57E-02		0.00E+00	± 9.79E-03	1.61E-02
1/14/2014 - 1/21/2014		3.51E-03	± 6.66E-03	9.95E-03		2.11E-03	± 7.98E-03	1.26E-02
1/21/2014 - 1/28/2014		-2.04E-03	± 8.79E-03	1.40E-02		-1.41E-03	± 8.14E-03	1.31E-02
1/28/2014 - 2/4/2014		5.39E-04	± 6.73E-03	1.09E-02		-3.42E-03	± 1.12E-02	1.77E-02
2/4/2014 - 2/11/2014		-8.31E-04	± 9.32E-03	1.52E-02		-4.05E-05	± 6.88E-03	1.13E-02
2/11/2014 - 2/18/2014		3.56E-03	± 7.07E-03	1.06E-02		1.39E-03	± 7.36E-03	1.18E-02
2/18/2014 - 2/25/2014		3.43E-03	± 8.13E-03	1.26E-02		4.10E-03	± 6.85E-03	1.01E-02
2/25/2014 - 3/4/2014		-3.41E-04	± 7.55E-03	1.23E-02		-1.14E-03	± 7.53E-03	1.21E-02
3/4/2014 - 3/11/2014		0.00E+00	± 6.64E-03	1.09E-02		4.47E-03	± 7.96E-03	1.19E-02
3/11/2014 - 3/18/2014		-3.18E-03	± 8.64E-03	1.35E-02		-5.32E-05	± 8.56E-03	1.41E-02
3/18/2014 - 3/25/2014		2.88E-03	± 9.31E-03	1.47E-02		-1.59E-03	± 8.54E-03	1.37E-02
3/25/2014 - 4/1/2014		7.96E-04	± 9.70E-03	1.58E-02		-1.47E-03	± 8.76E-03	1.41E-02
4/1/2014 - 4/8/2014		0.00E+00	± 9.90E-03	1.63E-02		-1.09E-03	± 7.67E-03	1.23E-02
4/8/2014 - 4/15/2014		-1.84E-05	± 8.06E-03	1.33E-02		5.10E-03	± 8.13E-03	1.20E-02
4/15/2014 - 4/22/2014		-9.51E-04	± 7.49E-03	1.21E-02		-3.71E-03	± 8.49E-03	1.31E-02
4/22/2014 - 4/29/2014		-1.44E-03	± 8.06E-03	1.29E-02		4.43E-04	± 6.61E-03	1.07E-02
4/29/2014 - 5/6/2014		1.46E-03	± 5.93E-03	9.30E-03		0.00E+00	± 1.02E-02	1.68E-02
5/6/2014 - 5/13/2014		-2.60E-03	± 8.36E-03	1.32E-02		0.00E+00	± 7.34E-03	1.21E-02
5/13/2014 - 5/20/2014		2.02E-03	± 8.46E-03	1.35E-02		2.61E-03	± 6.50E-03	9.91E-03
5/20/2014 - 5/27/2014		-2.46E-03	± 9.48E-03	1.51E-02		1.46E-03	± 6.90E-03	1.10E-02
5/27/2014 - 6/3/2014		-1.92E-03	± 8.28E-03	1.32E-02		1.01E-03	± 7.87E-03	1.27E-02
6/3/2014 - 6/10/2014		9.78E-05	± 6.83E-03	1.12E-02		8.30E-05	± 6.17E-03	1.01E-02
6/10/2014 - 6/17/2014		-9.95E-05	± 6.82E-03	1.12E-02		1.75E-03	± 8.03E-03	1.28E-02
6/17/2014 - 6/24/2014		-2.49E-03	± 7.70E-03	1.21E-02		2.72E-03	± 6.74E-03	1.02E-02
6/24/2014 - 7/1/2014		-1.58E-03	± 7.51E-03	1.20E-02		4.78E-03	± 7.03E-03	1.01E-02
7/1/2014 - 7/8/2014		2.13E-04	± 7.27E-03	1.19E-02		-6.57E-04	± 9.16E-03	1.49E-02
7/8/2014 - 7/15/2014		-4.57E-04	± 7.16E-03	1.17E-02		2.82E-03	± 7.38E-03	1.14E-02
7/15/2014 - 7/22/2014		-2.07E-03	± 7.64E-03	1.21E-02		7.24E-05	± 6.80E-03	1.12E-02
7/22/2014 - 7/29/2014		2.14E-05	± 6.64E-03	1.09E-02		5.54E-05	± 8.10E-03	1.33E-02
7/29/2014 - 8/5/2014		5.61E-05	± 7.39E-03	1.21E-02		0.00E+00	± 8.35E-03	1.37E-02
8/5/2014 - 8/12/2014		2.58E-03	± 7.54E-03	1.18E-02		-1.96E-04	± 6.53E-03	1.07E-02
8/12/2014 - 8/19/2014		-1.15E-03	± 6.71E-03	1.07E-02		-2.59E-03	± 8.96E-03	1.42E-02
8/19/2014 - 8/26/2014		-2.44E-03	± 8.69E-03	1.38E-02		9.27E-04	± 7.09E-03	1.14E-02
8/26/2014 - 9/2/2014		0.00E+00	± 8.69E-03	1.43E-02		-4.51E-03	± 1.13E-02	1.78E-02
9/2/2014 - 9/9/2014		-2.00E-04	± 8.27E-03	1.36E-02		-2.87E-03	± 7.82E-03	1.21E-02
9/9/2014 - 9/16/2014		1.87E-03	± 7.18E-03	1.13E-02		0.00E+00	± 1.02E-02	1.68E-02
9/16/2014 - 9/23/2014		1.02E-03	± 5.75E-03	9.14E-03		4.48E-03	± 6.43E-03	9.18E-03
9/23/2014 - 9/30/2014		-9.90E-04	± 7.08E-03	1.14E-02		-1.52E-04	± 7.11E-03	1.16E-02
9/30/2014 - 10/7/2014		-3.33E-03	± 8.69E-03	1.36E-02		1.24E-05	± 9.08E-03	1.49E-02
10/7/2014 - 10/14/2014		7.53E-05	± 6.94E-03	1.14E-02		4.55E-03	± 9.44E-03	1.46E-02
10/14/2014 - 10/21/2014		-1.35E-03	± 7.26E-03	1.16E-02		-1.50E-03	± 8.13E-03	1.30E-02
10/21/2014 - 10/28/2014		-1.71E-03	± 8.85E-03	1.42E-02		-2.20E-03	± 8.55E-03	1.36E-02
10/28/2014 - 11/4/2014		-2.16E-03	± 7.24E-03	1.14E-02		2.11E-03	± 7.34E-03	1.15E-02
11/4/2014 - 11/11/2014		-1.56E-03	± 8.12E-03	1.30E-02		9.10E-04	± 7.63E-03	1.23E-02
11/11/2014 - 11/18/2014		-1.40E-03	± 9.16E-03	1.48E-02		-9.25E-05	± 8.12E-03	1.33E-02
11/18/2014 - 11/25/2014		-2.76E-03	± 7.89E-03	1.23E-02		3.94E-03	± 8.01E-03	1.22E-02
11/25/2014 - 12/2/2014		-5.42E-04	± 6.89E-03	1.12E-02		-4.90E-05	± 8.56E-03	1.41E-02
12/2/2014 - 12/9/2014		1.27E-03	± 6.92E-03	1.10E-02		-2.39E-04	± 8.35E-03	1.37E-02
12/9/2014 - 12/16/2014		0.00E+00	± 1.10E-02	1.80E-02		-1.32E-03	± 8.71E-03	1.40E-02
12/16/2014 - 12/23/2014		1.87E-03	± 7.21E-03	1.14E-02		-2.45E-03	± 8.81E-03	1.39E-02
12/23/2014 - 12/30/2014		-2.67E-03	± 8.68E-03	1.37E-02		3.00E-03	± 7.53E-03	1.16E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.1  
**GAMMA SPECTROMETRY RESULTS OF I-131 ON CHARCOAL FILTERS**

Results in pCi/cubic meter, corrected for decay during collection period

Collection Period	Station 8				Station 57			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
12/31/2013 - 1/7/2014		-1.94E-03	± 1.12E-02	1.81E-02		6.90E-03	± 8.27E-03	1.20E-02
1/7/2014 - 1/14/2014		0.00E+00	± 9.58E-03	1.58E-02		0.00E+00	± 9.29E-03	1.53E-02
1/14/2014 - 1/21/2014		3.57E-03	± 6.77E-03	1.01E-02		1.97E-03	± 7.47E-03	1.18E-02
1/21/2014 - 1/28/2014		-2.06E-03	± 8.91E-03	1.42E-02		-1.37E-03	± 7.90E-03	1.27E-02
1/28/2014 - 2/4/2014		5.52E-04	± 6.90E-03	1.12E-02		-3.17E-03	± 1.03E-02	1.64E-02
2/4/2014 - 2/11/2014		-8.60E-04	± 9.64E-03	1.57E-02		-4.11E-05	± 7.00E-03	1.15E-02
2/11/2014 - 2/18/2014		3.69E-03	± 7.33E-03	1.10E-02		1.46E-03	± 7.74E-03	1.24E-02
2/18/2014 - 2/25/2014		2.05E-03	± 8.12E-03	1.29E-02		4.30E-03	± 7.19E-03	1.06E-02
2/25/2014 - 3/4/2014		-3.37E-04	± 7.48E-03	1.22E-02		-1.21E-03	± 7.99E-03	1.29E-02
3/4/2014 - 3/11/2014		0.00E+00	± 6.68E-03	1.10E-02		4.51E-03	± 8.04E-03	1.21E-02
3/11/2014 - 3/18/2014		-3.28E-03	± 8.91E-03	1.39E-02		-5.25E-05	± 8.45E-03	1.39E-02
3/18/2014 - 3/25/2014		2.88E-03	± 9.31E-03	1.47E-02		-1.59E-03	± 8.54E-03	1.37E-02
3/25/2014 - 4/1/2014		8.10E-04	± 9.88E-03	1.61E-02		-1.39E-03	± 8.27E-03	1.33E-02
4/1/2014 - 4/8/2014		0.00E+00	± 9.98E-03	1.64E-02		-1.04E-03	± 7.37E-03	1.18E-02
4/8/2014 - 4/15/2014		-1.83E-05	± 8.02E-03	1.32E-02		4.79E-03	± 7.64E-03	1.13E-02
4/15/2014 - 4/22/2014		-9.64E-04	± 7.59E-03	1.23E-02		-3.57E-03	± 8.17E-03	1.26E-02
4/22/2014 - 4/29/2014		-1.47E-03	± 8.19E-03	1.32E-02		4.17E-04	± 6.23E-03	1.01E-02
4/29/2014 - 5/6/2014		1.47E-03	± 5.97E-03	9.35E-03		0.00E+00	± 9.64E-03	1.58E-02
5/6/2014 - 5/13/2014		-2.59E-03	± 8.30E-03	1.31E-02		0.00E+00	± 7.70E-03	1.27E-02
5/13/2014 - 5/20/2014		1.96E-03	± 8.19E-03	1.30E-02		2.71E-03	± 6.75E-03	1.03E-02
5/20/2014 - 5/27/2014		-2.48E-03	± 9.53E-03	1.52E-02		1.55E-03	± 7.34E-03	1.17E-02
5/27/2014 - 6/3/2014		-1.91E-03	± 8.23E-03	1.31E-02		1.07E-03	± 8.30E-03	1.34E-02
6/3/2014 - 6/10/2014		9.78E-05	± 6.83E-03	1.12E-02		7.99E-05	± 5.94E-03	9.75E-03
6/10/2014 - 6/17/2014		-9.14E-05	± 6.26E-03	1.03E-02		1.69E-03	± 7.75E-03	1.23E-02
6/17/2014 - 6/24/2014		-2.53E-03	± 7.82E-03	1.23E-02		2.57E-03	± 6.36E-03	9.65E-03
6/24/2014 - 7/1/2014		-1.66E-03	± 7.85E-03	1.25E-02		4.51E-03	± 6.64E-03	9.58E-03
7/1/2014 - 7/8/2014		2.18E-04	± 7.44E-03	1.22E-02		-6.41E-04	± 8.94E-03	1.46E-02
7/8/2014 - 7/15/2014		-2.00E-03	± 7.68E-03	1.22E-02		2.81E-03	± 7.34E-03	1.13E-02
7/15/2014 - 7/22/2014		-2.05E-03	± 7.56E-03	1.20E-02		7.16E-05	± 6.72E-03	1.10E-02
7/22/2014 - 7/29/2014		2.16E-05	± 6.71E-03	1.10E-02		5.50E-05	± 8.04E-03	1.32E-02
7/29/2014 - 8/5/2014		5.70E-05	± 7.51E-03	1.23E-02		0.00E+00	± 8.18E-03	1.34E-02
8/5/2014 - 8/12/2014		2.63E-03	± 7.69E-03	1.20E-02		-1.97E-04	± 6.54E-03	1.07E-02
8/12/2014 - 8/19/2014		-1.17E-03	± 6.82E-03	1.09E-02		-2.59E-03	± 8.97E-03	1.42E-02
8/19/2014 - 8/26/2014		-2.49E-03	± 8.89E-03	1.41E-02		9.37E-04	± 7.17E-03	1.15E-02
8/26/2014 - 9/2/2014		0.00E+00	± 9.29E-03	1.53E-02		-4.51E-03	± 1.13E-02	1.78E-02
9/2/2014 - 9/9/2014		-2.53E-03	± 8.62E-03	1.36E-02		-2.76E-03	± 7.52E-03	1.17E-02
9/9/2014 - 9/16/2014		1.93E-03	± 7.39E-03	1.17E-02		0.00E+00	± 1.07E-02	1.75E-02
9/16/2014 - 9/23/2014		-2.04E-03	± 8.27E-03	1.31E-02		4.48E-03	± 6.43E-03	9.17E-03
9/23/2014 - 9/30/2014		-1.05E-03	± 7.48E-03	1.20E-02		-1.54E-04	± 7.19E-03	1.18E-02
9/30/2014 - 10/7/2014		-3.62E-03	± 9.45E-03	1.48E-02		1.23E-05	± 9.03E-03	1.48E-02
10/7/2014 - 10/14/2014		7.93E-05	± 7.31E-03	1.20E-02		4.91E-03	± 1.02E-02	1.58E-02
10/14/2014 - 10/21/2014		-1.40E-03	± 7.51E-03	1.20E-02		-1.80E-03	± 9.73E-03	1.56E-02
10/21/2014 - 10/28/2014		-1.79E-03	± 9.29E-03	1.49E-02		-2.23E-03	± 8.68E-03	1.38E-02
10/28/2014 - 11/4/2014		-2.19E-03	± 7.36E-03	1.16E-02		2.11E-03	± 7.34E-03	1.15E-02
11/4/2014 - 11/11/2014		-1.62E-03	± 8.42E-03	1.35E-02		9.46E-04	± 7.93E-03	1.28E-02
11/11/2014 - 11/18/2014		-1.45E-03	± 9.49E-03	1.53E-02		-9.40E-05	± 8.26E-03	1.36E-02
11/18/2014 - 11/25/2014		-2.81E-03	± 8.02E-03	1.25E-02		3.94E-03	± 8.01E-03	1.22E-02
11/25/2014 - 12/2/2014		-5.35E-04	± 6.80E-03	1.10E-02		-4.96E-05	± 8.68E-03	1.43E-02
12/2/2014 - 12/9/2014		1.29E-03	± 7.00E-03	1.12E-02		-2.36E-04	± 8.25E-03	1.35E-02
12/9/2014 - 12/16/2014		0.00E+00	± 1.10E-02	1.80E-02		-1.27E-03	± 8.40E-03	1.35E-02
12/16/2014 - 12/23/2014		1.87E-03	± 7.21E-03	1.14E-02		-2.32E-03	± 8.36E-03	1.32E-02
12/23/2014 - 12/30/2014		-2.72E-03	± 8.82E-03	1.39E-02		3.00E-03	± 7.55E-03	1.16E-02

NVS = Valid sample not obtained due to sampler failure.

RQ= Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.

TABLE A-4.2  
**GAMMA SPECTROMETRY RESULTS OF IODINE 131 ON CHARCOAL FILTERS - SUMMARY**

Results in pCi per cubic meter, corrected for decay during collection period

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
I-131	Ind	1.59E-04	-5.11E-03	9.73E-03	1.29E-02	571	0
I-131	Cntl	-4.33E-04	-3.34E-03	3.69E-03	1.30E-02	52	0

TABLE A-5.1  
**GROSS BETA IN WATER**  
Results in pCi per liter

Collection Period	ST 26 River/Drinking Cntl				ST 29 River/Drinking Ind			
	RQ	Activity	Error	MDA	RQ	Activity	Error	MDA
01/02/14 - 01/31/14		-4.06E-02 ±	6.42E-01	2.32E+00		9.75E-01 ±	6.98E-01	2.33E+00
01/31/14 - 03/03/14		-5.12E-01 ±	7.13E-01	2.47E+00		1.37E+00 ±	7.74E-01	2.47E+00
03/03/14 - 03/31/14		1.33E+00 ±	7.23E-01	2.24E+00		1.70E+00 ±	7.23E-01	2.24E+00
03/31/14 - 04/30/14		1.45E+00 ±	6.71E-01	2.11E+00		1.58E+00 ±	6.82E-01	2.11E+00
04/30/14 - 06/02/14		2.29E-01 ±	6.99E-01	2.47E+00		2.59E-01 ±	6.91E-01	2.46E+00
06/02/14 - 07/01/14		-5.77E-02 ±	6.77E-01	2.43E+00		-4.05E-01 ±	7.01E-01	2.43E+00
07/01/14 - 07/31/14		4.63E-01 ±	7.13E-01	2.49E+00		2.89E-02 ±	6.87E-01	2.49E+00
07/31/14 - 09/02/14		7.19E-01 ±	6.34E-01	2.13E+00		2.87E-01 ±	6.03E-01	2.13E+00
09/02/14 - 09/30/14		1.14E+00 ±	7.72E-01	2.51E+00		-1.54E-01 ±	6.96E-01	2.50E+00
09/30/14 - 10/31/14		-1.45E-01 ±	6.53E-01	2.33E+00		1.15E+00 ±	7.47E-01	2.34E+00
10/31/14 - 12/01/14		5.25E-01 ±	6.80E-01	2.31E+00		2.29E+00 ±	7.75E-01	2.32E+00
12/01/14 - 12/30/14		3.31E-01 ±	6.92E-01	2.44E+00		5.64E-01 ±	7.00E-01	2.43E+00

Collection Period	ST 27 CW Discharge			
	RQ	Activity	Error	MDA
01/02/14 - 01/31/14	+	9.80E+00 ±	1.27E+00	2.78E+00
01/31/14 - 03/03/14	+	7.75E+00 ±	1.22E+00	2.97E+00
03/03/14 - 03/31/14	+	8.94E+00 ±	1.23E+00	2.71E+00
03/31/14 - 04/30/14	+	1.16E+01 ±	1.35E+00	2.67E+00
04/30/14 - 06/02/14	+	6.18E+00 ±	1.20E+00	3.12E+00
06/02/14 - 07/01/14	+	2.98E+00 ±	9.67E-01	2.83E+00
07/01/14 - 07/31/14		2.75E+00 ±	9.49E-01	2.80E+00
07/31/14 - 09/02/14	+	4.62E+00 ±	9.41E-01	2.41E+00
09/02/14 - 09/30/14	+	5.71E+00 ±	1.16E+00	3.09E+00
09/30/14 - 10/31/14	+	9.84E+00 ±	1.29E+00	2.85E+00
10/31/14 - 12/01/14	+	6.58E+00 ±	1.13E+00	2.78E+00
12/01/14 - 12/30/14	+	3.21E+00 ±	1.00E+00	2.92E+00

TABLE A-5.2  
**GROSS BETA IN WATER - SUMMARY**  
Results in pCi per liter

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 26 Control	4.52E-01	-5.12E-01	1.45E+00	12	0
ST 29 Indicator	8.02E-01	-4.05E-01	2.29E+00	12	0
ST 27 Discharge	6.67E+00	2.75E+00	1.16E+01	12	11



TABLE A-6.1  
**TRITIUM IN WATER**

Results in pCi per liter, MDA for all samples is 300 pCi/l

Location	Description	Collection Period	RQ	Activity	Error
26	River/Drinking Control	01/02/14 - 03/31/14		7.26E+01 ±	9.59E+01
		03/31/14 - 07/01/14		7.30E+01 ±	9.67E+01
		07/01/14 - 09/30/14		8.90E+01 ±	9.47E+01
		09/30/14 - 12/30/14		8.11E+01 ±	8.45E+01
29	River/Drinking Indicator	01/02/14 - 03/31/14		1.14E+02 ±	9.87E+01
		03/31/14 - 07/01/14		8.69E+01 ±	9.91E+01
		07/01/14 - 09/30/14		7.09E+01 ±	9.19E+01
		09/30/14 - 12/30/14		1.11E+02 ±	8.56E+01
27	Plant Discharge	01/02/14 - 03/31/14		1.53E+02 ±	9.80E+01
		03/31/14 - 07/01/14		1.13E+02 ±	9.88E+01
		07/01/14 - 09/30/14		1.51E+02 ±	9.38E+01
		09/30/14 - 12/30/14		1.23E+02 ±	8.71E+01
31	Ground Water Well 1	03/05/14		6.02E+01 ±	9.48E+01
		06/16/14		9.97E+01 ±	9.55E+01
		09/03/14		2.70E+01 ±	9.98E+01
		12/03/14		-5.07E+00 ±	8.72E+01
32	Ground Water Well 2	03/05/14		1.15E+02 ±	9.65E+01
		06/16/14		7.88E+00 ±	9.51E+01
		09/03/14		3.43E+01 ±	9.88E+01
		12/03/14		1.07E+01 ±	7.94E+01
52	Ground Water Well 3	03/05/14		1.12E+02 ±	9.72E+01
		06/12/14		1.01E+02 ±	9.31E+01
		09/03/14		-3.32E+01 ±	9.91E+01
		12/03/14		3.43E+01 ±	8.57E+01

TABLE A-6.2  
**TRITIUM IN WATER - Summary**

Results in pCi per liter

Location Description	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
River/Drinking Control	7.89E+01	7.26E+01	8.90E+01	4	0
River/Drinking Indicator	9.55E+01	7.09E+01	1.14E+02	4	0
Discharge Indicator	1.35E+02	1.13E+02	1.53E+02	4	0
Ground Water Indicator	4.70E+01	-3.32E+01	1.15E+02	12	0

Quarterly tritium values reported for ST-26, 27, and 29 are average of monthly analysis values.

RQ=Results Qualifier. If blank, result is less than detection limit. If "+", result is above the detection limit.

Table A-7.1

**GAMMA SPECTROMETRY RESULTS OF WATER****STATION 26 - River/Drinking Control**

Results in pCi/liter, corrected for decay during collection period

Location 26 collected 1/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.85E+01 ±	5.18E+01	5.53E+01
CR-51		-1.07E+01 ±	2.79E+01	4.49E+01
MN-54		-1.61E-01 ±	1.86E+00	3.03E+00
CO-58		-1.44E+00 ±	2.77E+00	4.35E+00
FE-59		-7.36E-01 ±	6.24E+00	1.01E+01
CO-60		-3.14E-02 ±	2.08E+00	3.42E+00
ZN-65		-1.27E-01 ±	4.83E+00	7.92E+00
ZRNB-95		8.05E-02 ±	3.49E+00	5.73E+00
I-131		-2.35E+00 ±	7.92E+00	1.28E+01
CS-134		-1.88E+00 ±	2.91E+00	4.62E+00
CS-137		-1.85E-01 ±	2.06E+00	3.36E+00
BALA140		4.03E-01 ±	5.87E+00	9.56E+00
BI-214		3.68E-01 ±	5.60E+00	1.02E+01

Location 26 collected 3/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		4.05E+00 ±	2.78E+01	5.61E+01
CR-51		2.45E+01 ±	1.81E+01	2.63E+01
MN-54		-1.04E+00 ±	2.38E+00	3.77E+00
CO-58		3.64E-01 ±	2.14E+00	3.45E+00
FE-59		1.79E+00 ±	6.47E+00	1.03E+01
CO-60		-3.49E-01 ±	1.95E+00	3.14E+00
ZN-65		-2.47E+00 ±	5.71E+00	9.04E+00
ZRNB-95		1.27E-01 ±	4.06E+00	6.66E+00
I-131		-5.47E-01 ±	6.09E+00	9.95E+00
CS-134		-6.04E-02 ±	2.06E+00	3.38E+00
CS-137		-6.34E-01 ±	2.19E+00	3.52E+00
BALA140		-1.39E-01 ±	5.20E+00	8.52E+00
BI-214		2.11E+00 ±	5.34E+00	9.62E+00

Location 26 collected 3/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.81E+01 ±	5.43E+01	5.71E+01
CR-51		-9.59E+00 ±	2.71E+01	4.37E+01
MN-54		-6.20E-01 ±	2.19E+00	3.50E+00
CO-58		8.19E-01 ±	2.36E+00	3.75E+00
FE-59		6.75E-01 ±	6.19E+00	1.00E+01
CO-60		6.95E-01 ±	2.16E+00	3.42E+00
ZN-65		-1.52E+00 ±	5.26E+00	8.42E+00
ZRNB-95		-2.08E+00 ±	4.38E+00	6.90E+00
I-131		-3.41E+00 ±	6.63E+00	1.05E+01
CS-134		1.14E+00 ±	2.06E+00	3.24E+00
CS-137		0.00E+00 ±	2.72E+00	4.48E+00
BALA140		0.00E+00 ±	7.53E+00	1.24E+01
BI-214		2.20E+00 ±	5.32E+00	9.59E+00

Location 26 collected 4/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.63E+01 ±	5.63E+01	5.99E+01
CR-51		-2.78E+00 ±	2.46E+01	4.02E+01
MN-54		-3.60E-01 ±	2.09E+00	3.38E+00
CO-58		6.26E-02 ±	2.40E+00	3.94E+00
FE-59		-2.40E+00 ±	6.66E+00	1.05E+01
CO-60		-6.08E-02 ±	2.21E+00	3.62E+00
ZN-65		-1.55E-01 ±	4.96E+00	8.12E+00
ZRNB-95		-8.06E-01 ±	3.67E+00	5.89E+00
I-131		-1.96E+00 ±	6.56E+00	1.06E+01
CS-134		-1.18E+00 ±	2.49E+00	3.97E+00
CS-137		-8.99E-01 ±	2.47E+00	3.95E+00
BALA140		-1.67E+00 ±	5.95E+00	9.47E+00
BI-214		2.12E+00 ±	5.39E+00	9.70E+00

Location 26 collected 6/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.85E+01 ±	7.55E+01	5.85E+01
CR-51		-4.47E+00 ±	2.34E+01	3.79E+01
MN-54		-7.28E-01 ±	2.21E+00	3.53E+00
CO-58		1.02E+00 ±	1.97E+00	3.04E+00
FE-59		2.81E+00 ±	6.47E+00	1.01E+01
CO-60		5.79E-03 ±	1.47E+00	2.42E+00
ZN-65		-2.36E+00 ±	5.27E+00	8.31E+00
ZRNB-95		7.06E-01 ±	3.58E+00	5.76E+00
I-131		-2.76E-01 ±	7.62E+00	1.25E+01
CS-134		4.90E-01 ±	2.24E+00	3.63E+00
CS-137		-7.61E-01 ±	2.42E+00	3.89E+00
BALA140		-1.68E-01 ±	5.40E+00	8.83E+00
BI-214		3.32E+00 ±	5.14E+00	9.21E+00

Location 26 collected 7/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.15E+01 ±	5.76E+01	5.63E+01
CR-51		1.01E+01 ±	2.45E+01	3.94E+01
MN-54		5.56E-02 ±	2.28E+00	3.74E+00
CO-58		-2.14E-01 ±	2.44E+00	3.99E+00
FE-59		-1.35E+00 ±	6.66E+00	1.07E+01
CO-60		2.84E-01 ±	2.03E+00	3.28E+00
ZN-65		-1.34E+00 ±	4.83E+00	7.71E+00
ZRNB-95		1.17E+00 ±	3.92E+00	6.26E+00
I-131		3.03E+00 ±	5.98E+00	9.50E+00
CS-134		1.46E-01 ±	2.08E+00	3.41E+00
CS-137		-5.01E-01 ±	2.26E+00	3.65E+00
BALA140		-2.12E-01 ±	4.20E+00	6.85E+00
BI-214		7.86E+00 ±	5.37E+00	9.12E+00

Table A-7.1

**GAMMA SPECTROMETRY RESULTS OF WATER****STATION 26 - River/Drinking Control**

Results in pCi/liter, corrected for decay during collection period

Location 26 collected 7/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.54E+01 ±	5.12E+01	5.75E+01
CR-51		-1.71E+01 ±	3.17E+01	5.08E+01
MN-54		-2.60E-01 ±	2.39E+00	3.90E+00
CO-58		-6.05E-01 ±	2.56E+00	4.12E+00
FE-59		-1.85E-01 ±	6.68E+00	1.09E+01
CO-60		4.43E-01 ±	1.32E+00	2.03E+00
ZN-65		-2.02E+00 ±	5.30E+00	8.40E+00
ZRNB-95		4.78E-02 ±	4.62E+00	7.58E+00
I-131		-3.02E+00 ±	8.83E+00	1.42E+01
CS-134		9.31E-01 ±	2.39E+00	3.82E+00
CS-137		-1.13E-01 ±	2.23E+00	3.64E+00
BALA140		-5.58E-01 ±	6.10E+00	9.89E+00
BI-214		2.12E-01 ±	5.62E+00	1.02E+01

Location 26 collected 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.77E+01 ±	5.00E+01	5.50E+01
CR-51		-6.47E+00 ±	2.58E+01	4.18E+01
MN-54		4.82E-03 ±	1.97E+00	3.24E+00
CO-58		1.54E+00 ±	1.96E+00	2.92E+00
FE-59		0.00E+00 ±	5.43E+00	8.93E+00
CO-60		-4.48E-01 ±	2.11E+00	3.39E+00
ZN-65		-2.04E+00 ±	5.38E+00	8.54E+00
ZRNB-95		0.00E+00 ±	5.20E+00	8.55E+00
I-131		4.84E-02 ±	8.09E+00	1.33E+01
CS-134		-7.69E-01 ±	2.27E+00	3.64E+00
CS-137		-8.14E-01 ±	2.14E+00	3.40E+00
BALA140		7.08E-02 ±	5.66E+00	9.29E+00
BI-214		6.98E+00 ±	5.05E+00	8.70E+00

Location 26 collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.30E+01 ±	6.24E+01	5.76E+01
CR-51		7.32E-01 ±	2.16E+01	3.54E+01
MN-54		-3.58E-02 ±	1.92E+00	3.15E+00
CO-58		8.08E-02 ±	2.05E+00	3.35E+00
FE-59		2.49E+00 ±	6.91E+00	1.09E+01
CO-60		-1.22E+00 ±	9.32E+01	3.85E+00
ZN-65		-8.15E-03 ±	3.87E+00	6.36E+00
ZRNB-95		-2.44E-01 ±	3.84E+00	6.27E+00
I-131		-2.46E+00 ±	9.40E+00	1.52E+01
CS-134		3.08E-01 ±	1.93E+00	3.13E+00
CS-137		-8.99E-01 ±	2.39E+00	3.81E+00
BALA140		-1.33E+00 ±	7.09E+00	1.14E+01
BI-214	+	9.97E+00 ±	5.81E+00	9.62E+00

Location 26 collected 10/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.29E+01 ±	6.21E+01	5.74E+01
CR-51		-4.79E+00 ±	2.73E+01	4.44E+01
MN-54		5.05E-01 ±	1.94E+00	3.10E+00
CO-58		-4.43E-02 ±	2.25E+00	3.70E+00
FE-59		8.87E-01 ±	6.09E+00	9.82E+00
CO-60		3.90E-01 ±	2.21E+00	3.56E+00
ZN-65		6.55E-02 ±	4.01E+00	6.59E+00
ZRNB-95		-4.72E-01 ±	4.18E+00	6.80E+00
I-131		-2.35E+00 ±	7.74E+00	1.25E+01
CS-134		-8.01E-01 ±	1.35E+00	2.06E+00
CS-137		-1.34E-01 ±	2.09E+00	3.42E+00
BALA140		-1.69E+00 ±	6.03E+00	9.55E+00
BI-214		4.15E+00 ±	5.36E+00	9.46E+00

Location 26 collected 12/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.70E+01 ±	9.53E+01	5.72E+01
CR-51		-1.94E+00 ±	2.18E+01	3.55E+01
MN-54		6.45E-01 ±	2.01E+00	3.20E+00
CO-58		-8.22E-01 ±	2.37E+00	3.77E+00
FE-59		-9.04E-01 ±	6.54E+00	1.06E+01
CO-60		5.85E-01 ±	1.75E+00	2.75E+00
ZN-65		-5.46E-01 ±	4.86E+00	7.89E+00
ZRNB-95		0.00E+00 ±	5.32E+00	8.75E+00
I-131		-3.85E-01 ±	6.98E+00	1.14E+01
CS-134		1.58E-01 ±	3.52E+00	5.77E+00
CS-137		1.96E-01 ±	3.14E+00	5.14E+00
BALA140		0.00E+00 ±	1.03E+00	1.70E+00
BI-214		5.14E+00 ±	5.05E+00	8.90E+00

Location 26 collected 12/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.86E+01 ±	9.86E+01	5.66E+01
CR-51		7.66E+00 ±	2.75E+01	4.45E+01
MN-54		-6.97E-03 ±	2.00E+00	3.28E+00
CO-58		-7.86E-01 ±	2.55E+00	4.07E+00
FE-59		-5.50E-01 ±	7.30E+00	1.19E+01
CO-60		4.00E-02 ±	1.83E+00	3.00E+00
ZN-65		-1.32E+00 ±	4.93E+00	7.88E+00
ZRNB-95		-8.50E-02 ±	4.20E+00	6.90E+00
I-131		2.54E+00 ±	1.04E+01	1.68E+01
CS-134		-8.36E-01 ±	2.45E+00	3.94E+00
CS-137		0.00E+00 ±	2.43E+00	3.99E+00
BALA140		2.80E-01 ±	6.35E+00	1.04E+01
BI-214		4.04E+00 ±	5.62E+00	9.88E+00

Table A-7.1

**GAMMA SPECTROMETRY RESULTS OF WATER****STATION 29 - River/Drinking Indicator**

Results in pCi/liter, corrected for decay during collection period

Location 29 collected 1/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-8.62E+00 ±	3.70E+01	5.57E+01
CR-51		-3.66E+00 ±	2.28E+01	3.71E+01
MN-54		-7.23E-01 ±	2.19E+00	3.48E+00
CO-58		-4.98E-01 ±	2.07E+00	3.31E+00
FE-59		0.00E+00 ±	7.00E+00	1.15E+01
CO-60		-8.71E-01 ±	1.12E+01	3.89E+00
ZN-65		-1.51E+00 ±	4.94E+00	7.85E+00
ZRNB-95		6.88E-02 ±	3.72E+00	6.09E+00
I-131		1.89E+00 ±	8.69E+00	1.41E+01
CS-134		4.87E-01 ±	2.06E+00	3.32E+00
CS-137		5.80E-01 ±	2.03E+00	3.25E+00
BALA140		6.45E-01 ±	6.75E+00	1.09E+01
BI-214		7.94E-02 ±	4.87E+00	9.14E+00

Location 29 collected 3/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.20E+01 ±	7.95E+01	5.41E+01
CR-51		1.23E+00 ±	2.25E+01	3.69E+01
MN-54		-2.35E-02 ±	1.85E+00	3.05E+00
CO-58		-3.54E-01 ±	2.39E+00	3.87E+00
FE-59		-1.71E-01 ±	6.54E+00	1.07E+01
CO-60		-1.28E+00 ±	5.27E+04	3.85E+00
ZN-65		-1.51E+00 ±	4.81E+00	7.64E+00
ZRNB-95		5.68E-02 ±	4.17E+00	6.85E+00
I-131		1.36E+00 ±	6.09E+00	9.85E+00
CS-134		-2.80E-02 ±	1.79E+00	2.94E+00
CS-137		1.44E+00 ±	2.10E+00	3.21E+00
BALA140		-1.51E+00 ±	5.50E+00	8.69E+00
BI-214		-5.58E-01 ±	5.59E+00	9.44E+00

Location 29 collected 3/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.52E+01 ±	4.39E+01	5.45E+01
CR-51		-1.38E+00 ±	1.81E+01	2.96E+01
MN-54		-7.83E-01 ±	2.07E+00	3.27E+00
CO-58		0.00E+00 ±	2.47E+00	4.07E+00
FE-59		2.83E-01 ±	6.73E+00	1.10E+01
CO-60		-1.15E-01 ±	2.51E+00	3.71E+00
ZN-65		-6.10E-01 ±	4.37E+00	7.07E+00
ZRNB-95		0.00E+00 ±	3.54E+00	5.83E+00
I-131		-1.54E+00 ±	6.79E+00	1.10E+01
CS-134		-5.91E-02 ±	1.57E+00	2.57E+00
CS-137		-8.05E-01 ±	2.23E+00	3.54E+00
BALA140		-8.90E-01 ±	4.72E+00	7.53E+00
BI-214		-3.57E-01 ±	5.11E+00	9.06E+00

Location 29 collected 4/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.30E+01 ±	4.91E+01	5.80E+01
CR-51		-2.82E+00 ±	2.86E+01	4.67E+01
MN-54		-1.01E+00 ±	2.40E+00	3.80E+00
CO-58		-2.00E-01 ±	2.26E+00	3.68E+00
FE-59		-1.80E-01 ±	6.16E+00	1.01E+01
CO-60		0.00E+00 ±	2.05E+00	3.37E+00
ZN-65		-2.29E-03 ±	4.75E+00	7.80E+00
ZRNB-95		-1.26E+00 ±	4.61E+00	7.39E+00
I-131		2.68E-01 ±	6.73E+00	1.10E+01
CS-134		8.99E-01 ±	2.48E+00	3.98E+00
CS-137		2.01E-02 ±	2.18E+00	3.58E+00
BALA140		-1.41E+00 ±	6.60E+00	1.06E+01
BI-214		-9.98E-01 ±	6.47E+00	9.96E+00

Location 29 collected 6/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.49E+01 ±	7.16E+01	6.01E+01
CR-51		-4.49E+00 ±	2.51E+01	4.09E+01
MN-54		-1.33E-01 ±	2.04E+00	3.33E+00
CO-58		-1.95E-01 ±	2.46E+00	4.01E+00
FE-59		-2.17E+00 ±	7.54E+00	1.20E+01
CO-60		-4.85E-01 ±	2.17E+00	3.48E+00
ZN-65		-1.42E+00 ±	5.11E+00	8.18E+00
ZRNB-95		1.67E+00 ±	4.54E+00	7.21E+00
I-131		5.61E+00 ±	6.66E+00	1.03E+01
CS-134		-4.02E-02 ±	2.31E+00	3.80E+00
CS-137		2.59E-01 ±	1.77E+00	2.87E+00
BALA140		0.00E+00 ±	1.07E+00	1.76E+00
BI-214		-1.86E+00 ±	7.71E+00	1.02E+01

Location 29 collected 7/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.03E+00 ±	2.90E+01	5.29E+01
CR-51		5.39E-01 ±	2.09E+01	3.43E+01
MN-54		1.06E-01 ±	2.11E+00	3.45E+00
CO-58		-6.07E-02 ±	2.30E+00	3.77E+00
FE-59		0.00E+00 ±	5.45E+00	8.97E+00
CO-60		5.65E-01 ±	1.95E+00	3.35E+00
ZN-65		-2.39E-01 ±	3.54E+00	5.76E+00
ZRNB-95		7.09E-01 ±	3.65E+00	5.86E+00
I-131		2.33E+00 ±	7.52E+00	1.21E+01
CS-134		9.48E-01 ±	1.81E+00	2.83E+00
CS-137		4.59E-01 ±	1.91E+00	3.06E+00
BALA140		-2.21E+00 ±	6.76E+00	1.06E+01
BI-214		-1.24E+00 ±	6.07E+00	9.19E+00

Table A-7.1

**GAMMA SPECTROMETRY RESULTS OF WATER****STATION 29 - River/Drinking Indicator**

Results in pCi/liter, corrected for decay during collection period

Location 29 collected 7/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.87E+01 ±	4.98E+01	5.49E+01
CR-51		-5.40E+00 ±	2.69E+01	4.38E+01
MN-54		-9.05E-01 ±	2.13E+00	3.35E+00
CO-58		3.14E-03 ±	2.26E+00	3.69E+00
FE-59		-2.28E+00 ±	7.40E+00	1.17E+01
CO-60		5.73E-01 ±	1.98E+00	3.41E+00
ZN-65		-3.49E+00 ±	6.56E+00	1.03E+01
ZRNB-95		5.51E-02 ±	4.05E+00	6.65E+00
I-131		-4.30E+00 ±	8.41E+00	1.34E+01
CS-134		-6.44E-01 ±	2.16E+00	3.48E+00
CS-137		-4.42E-01 ±	2.10E+00	3.38E+00
BALA140		-6.27E-01 ±	6.64E+00	1.08E+01
BI-214		1.79E+00 ±	4.92E+00	9.04E+00

Location 29 collected 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.20E+01 ±	4.81E+01	5.82E+01
CR-51		1.27E+01 ±	2.51E+01	4.00E+01
MN-54		6.05E-01 ±	2.05E+00	3.28E+00
CO-58		-2.32E-02 ±	2.18E+00	3.58E+00
FE-59		2.88E+00 ±	5.73E+00	8.74E+00
CO-60		4.74E-01 ±	2.02E+00	3.23E+00
ZN-65		-2.07E-01 ±	4.43E+00	7.25E+00
ZRNB-95		5.67E-01 ±	3.96E+00	6.42E+00
I-131		-3.70E-02 ±	6.25E+00	1.03E+01
CS-134		1.58E-01 ±	4.74E+00	7.78E+00
CS-137		4.43E-01 ±	2.07E+00	3.34E+00
BALA140		1.54E+00 ±	5.62E+00	8.89E+00
BI-214	+	1.79E+01 ±	6.22E+00	9.58E+00

Location 29 collected 10/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.73E+01 ±	1.04E+02	5.47E+01
CR-51		-1.09E+01 ±	2.46E+01	3.93E+01
MN-54		-3.87E-01 ±	1.84E+00	2.96E+00
CO-58		-2.19E-01 ±	2.58E+00	4.21E+00
FE-59		1.62E+00 ±	6.97E+00	1.11E+01
CO-60		3.34E-01 ±	2.09E+00	3.61E+00
ZN-65		2.02E+00 ±	3.98E+00	6.10E+00
ZRNB-95		-1.64E-01 ±	3.83E+00	6.28E+00
I-131		7.29E+00 ±	7.60E+00	1.16E+01
CS-134		-8.55E-01 ±	2.35E+00	3.77E+00
CS-137		-2.26E-01 ±	1.98E+00	3.21E+00
BALA140		-1.48E-01 ±	6.08E+00	9.95E+00
BI-214		2.09E+00 ±	5.11E+00	9.29E+00

Location 29 collected 10/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.04E+01 ±	3.49E+01	5.65E+01
CR-51		-2.33E-02 ±	2.67E+01	4.39E+01
MN-54		0.00E+00 ±	2.59E+00	4.27E+00
CO-58		-1.12E-01 ±	2.36E+00	3.86E+00
FE-59		0.00E+00 ±	6.85E+00	1.13E+01
CO-60		3.19E-01 ±	1.39E+00	2.20E+00
ZN-65		-1.09E+00 ±	5.04E+00	8.11E+00
ZRNB-95		-1.73E+00 ±	4.60E+00	7.32E+00
I-131		-3.05E+00 ±	7.96E+00	1.28E+01
CS-134		-2.43E-01 ±	2.52E+00	4.12E+00
CS-137		0.00E+00 ±	2.11E+00	3.47E+00
BALA140		1.49E+00 ±	4.72E+00	7.34E+00
BI-214		9.02E-01 ±	5.66E+00	1.02E+01

Location 29 collected 12/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.97E+01 ±	4.27E+01	5.61E+01
CR-51		1.27E+01 ±	2.16E+01	3.41E+01
MN-54		-4.88E-01 ±	2.24E+00	3.60E+00
CO-58		0.00E+00 ±	1.72E+00	2.83E+00
FE-59		-2.29E-01 ±	5.85E+00	9.56E+00
CO-60		2.15E-01 ±	1.97E+00	3.20E+00
ZN-65		-1.88E-01 ±	4.41E+00	7.22E+00
ZRNB-95		-6.54E-01 ±	4.22E+00	6.84E+00
I-131		8.66E+00 ±	6.49E+00	9.64E+00
CS-134		-1.02E+00 ±	2.41E+00	3.86E+00
CS-137		-5.63E-01 ±	2.10E+00	3.36E+00
BALA140		-8.39E-01 ±	4.69E+00	7.49E+00
BI-214		6.47E+00 ±	5.62E+00	9.65E+00

Location 29 collected 12/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.44E+01 ±	6.36E+01	5.69E+01
CR-51		5.51E+00 ±	2.78E+01	4.51E+01
MN-54		9.16E-01 ±	2.04E+00	3.20E+00
CO-58		-2.97E-01 ±	1.93E+00	3.11E+00
FE-59		-1.81E+00 ±	7.34E+00	1.17E+01
CO-60		4.17E-01 ±	1.89E+00	3.02E+00
ZN-65		0.00E+00 ±	1.06E+01	1.75E+01
ZRNB-95		2.45E+00 ±	4.68E+00	7.33E+00
I-131		-3.98E-01 ±	1.02E+01	1.67E+01
CS-134		-4.73E-01 ±	2.17E+00	3.52E+00
CS-137		-2.23E-01 ±	2.13E+00	3.46E+00
BALA140		-2.99E+00 ±	7.66E+00	1.19E+01
BI-214		3.10E+00 ±	5.22E+00	9.36E+00

Table A-7.1

**GAMMA SPECTROMETRY RESULTS OF WATER****STATION 27 - Plant Discharge Water Indicator**

Results in pCi/liter, corrected for decay during collection period

Location 27 collected 1/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		2.72E-01 ±	2.63E+01	5.27E+01
CR-51		-4.85E+00 ±	2.79E+01	4.55E+01
MN-54		3.56E-01 ±	1.87E+00	3.02E+00
CO-58		0.00E+00 ±	2.27E+00	3.74E+00
FE-59		1.23E+00 ±	6.86E+00	1.10E+01
CO-60		-1.00E+00 ±	1.77E+01	3.95E+00
ZN-65		1.86E+00 ±	4.38E+00	6.83E+00
ZRNB-95		1.47E+00 ±	3.55E+00	5.54E+00
I-131		-4.41E+00 ±	9.31E+00	1.49E+01
CS-134		1.19E-01 ±	1.88E+00	3.08E+00
CS-137		-2.70E-01 ±	1.58E+00	2.55E+00
BALA140		2.45E-01 ±	7.26E+00	1.19E+01
BI-214		8.36E-01 ±	4.99E+00	9.24E+00

Location 27 collected 3/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.32E+01 ±	8.43E+01	5.74E+01
CR-51		1.29E+01 ±	2.32E+01	3.68E+01
MN-54		-6.38E-01 ±	2.15E+00	3.44E+00
CO-58		7.96E-02 ±	2.28E+00	3.74E+00
FE-59		-2.67E-01 ±	5.69E+00	9.29E+00
CO-60		-1.01E-01 ±	1.92E+00	3.14E+00
ZN-65		-8.61E-01 ±	4.93E+00	7.96E+00
ZRNB-95		-1.34E+00 ±	4.35E+00	6.96E+00
I-131		1.02E+00 ±	6.13E+00	9.96E+00
CS-134		7.73E-01 ±	2.28E+00	3.66E+00
CS-137		1.56E+00 ±	2.07E+00	3.15E+00
BALA140		-1.55E+00 ±	5.38E+00	8.48E+00
BI-214		1.55E-01 ±	5.31E+00	9.77E+00

Location 27 collected 3/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.53E+01 ±	9.45E+01	5.86E+01
CR-51		5.47E+00 ±	2.15E+01	3.47E+01
MN-54		1.79E+00 ±	2.07E+00	3.11E+00
CO-58		-8.51E-01 ±	2.18E+00	3.45E+00
FE-59		-1.03E+00 ±	6.68E+00	1.08E+01
CO-60		0.00E+00 ±	1.65E+00	2.71E+00
ZN-65		1.53E+00 ±	4.81E+00	7.65E+00
ZRNB-95		1.39E-01 ±	3.90E+00	6.38E+00
I-131		1.64E-03 ±	5.50E+00	8.87E+00
CS-134		4.71E-01 ±	1.69E+00	2.71E+00
CS-137		-1.10E+00 ±	2.49E+00	3.95E+00
BALA140		-4.73E-01 ±	4.85E+00	7.86E+00
BI-214		4.23E+00 ±	5.75E+00	1.01E+01

Location 27 collected 4/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.06E+01 ±	4.69E+01	5.84E+01
CR-51		2.89E-01 ±	2.85E+01	4.68E+01
MN-54		7.56E-01 ±	2.26E+00	3.60E+00
CO-58		-5.00E-02 ±	2.23E+00	3.66E+00
FE-59		0.00E+00 ±	3.43E+00	5.64E+00
CO-60		2.12E-02 ±	1.77E+00	2.90E+00
ZN-65		-1.03E-02 ±	5.16E+00	8.47E+00
ZRNB-95		-2.85E-01 ±	4.33E+00	7.08E+00
I-131		5.25E-01 ±	7.96E+00	1.30E+01
CS-134		-5.67E-01 ±	2.43E+00	3.93E+00
CS-137		-5.91E-01 ±	2.20E+00	3.53E+00
BALA140		8.59E-02 ±	4.24E+00	6.95E+00
BI-214		4.09E-01 ±	5.33E+00	9.77E+00

Location 27 collected 6/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.31E+01 ±	4.19E+01	5.51E+01
CR-51		6.99E+00 ±	2.35E+01	3.79E+01
MN-54		0.00E+00 ±	2.79E+00	4.59E+00
CO-58		4.96E-01 ±	1.83E+00	2.90E+00
FE-59		-3.35E-01 ±	5.96E+00	9.71E+00
CO-60		-4.14E-02 ±	2.35E+00	3.87E+00
ZN-65		-3.68E+00 ±	5.39E+00	8.26E+00
ZRNB-95		-4.06E-01 ±	4.37E+00	7.12E+00
I-131		2.59E+00 ±	6.97E+00	1.12E+01
CS-134		-1.88E-02 ±	2.19E+00	3.60E+00
CS-137		3.79E-01 ±	1.64E+00	2.62E+00
BALA140		-4.68E-01 ±	6.05E+00	9.85E+00
BI-214		5.99E-01 ±	4.91E+00	9.14E+00

Location 27 collected 7/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.96E+01 ±	4.84E+01	5.30E+01
CR-51		-1.16E+01 ±	2.47E+01	3.95E+01
MN-54		0.00E+00 ±	2.73E+00	4.49E+00
CO-58		-3.81E-01 ±	2.02E+00	3.26E+00
FE-59		0.00E+00 ±	8.67E+00	1.43E+01
CO-60		7.30E-01 ±	2.26E+00	3.82E+00
ZN-65		-9.09E-01 ±	4.14E+00	6.62E+00
ZRNB-95		7.09E-03 ±	3.41E+00	5.60E+00
I-131		1.68E-01 ±	4.37E+00	7.16E+00
CS-134		-5.61E-02 ±	1.76E+00	2.89E+00
CS-137		-3.00E-01 ±	1.94E+00	3.15E+00
BALA140		-1.93E+00 ±	5.57E+00	8.75E+00
BI-214		4.96E+00 ±	5.27E+00	9.25E+00

Table A-7.1

**GAMMA SPECTROMETRY RESULTS OF WATER****STATION 27 - Plant Discharge Water Indicator**

Results in pCi/liter, corrected for decay during collection period

Location 27 collected 7/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.13E+00 ±	2.58E+01	5.08E+01
CR-51		-1.43E+01 ±	2.35E+01	3.70E+01
MN-54		9.51E-01 ±	2.20E+00	3.47E+00
CO-58		9.63E-01 ±	2.17E+00	3.39E+00
FE-59		1.84E+00 ±	5.56E+00	8.65E+00
CO-60		2.03E-02 ±	2.11E+00	3.71E+00
ZN-65		6.83E-01 ±	4.15E+00	6.68E+00
ZRNB-95		3.39E-02 ±	2.58E+00	4.23E+00
I-131		5.64E-02 ±	7.86E+00	1.29E+01
CS-134		6.65E-02 ±	2.08E+00	3.41E+00
CS-137		-1.18E-01 ±	2.00E+00	3.27E+00
BALA140		0.00E+00 ±	5.84E+00	9.61E+00
BI-214		-1.54E+00 ±	6.77E+00	9.58E+00

Location 27 collected 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.22E+01 ±	3.88E+01	5.34E+01
CR-51		1.07E+00 ±	2.90E+01	4.77E+01
MN-54		3.05E-02 ±	1.99E+00	3.26E+00
CO-58		3.16E-01 ±	2.07E+00	3.35E+00
FE-59		-4.52E-01 ±	6.08E+00	9.89E+00
CO-60		-3.19E-01 ±	3.58E+00	3.84E+00
ZN-65		0.00E+00 ±	7.85E+00	1.29E+01
ZRNB-95		2.26E+00 ±	3.94E+00	6.08E+00
I-131		-5.70E+00 ±	8.19E+00	1.29E+01
CS-134		4.47E-01 ±	1.33E+00	2.09E+00
CS-137		-1.27E+00 ±	2.42E+00	3.81E+00
BALA140		-3.20E+00 ±	7.25E+00	1.13E+01
BI-214		1.37E+00 ±	4.87E+00	9.02E+00

Location 27 collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.48E+01 ±	8.52E+01	5.34E+01
CR-51		8.77E+00 ±	1.99E+01	3.20E+01
MN-54		4.97E-01 ±	1.88E+00	3.03E+00
CO-58		1.26E+00 ±	1.97E+00	3.06E+00
FE-59		-3.21E-01 ±	6.56E+00	1.07E+01
CO-60		1.33E+00 ±	2.00E+00	3.09E+00
ZN-65		-1.81E+00 ±	4.40E+00	6.99E+00
ZRNB-95		-3.23E-01 ±	3.21E+00	5.22E+00
I-131		-1.59E+00 ±	8.98E+00	1.46E+01
CS-134		-4.02E-01 ±	1.94E+00	3.15E+00
CS-137		-6.12E-02 ±	1.91E+00	3.13E+00
BALA140		-2.20E+00 ±	6.77E+00	1.08E+01
BI-214		4.74E-02 ±	4.67E+00	8.61E+00

Location 27 collected 10/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		8.92E+00 ±	3.01E+01	5.67E+01
CR-51		4.23E+00 ±	2.47E+01	4.03E+01
MN-54		-4.74E-01 ±	1.81E+00	2.88E+00
CO-58		6.63E-01 ±	1.94E+00	3.05E+00
FE-59		6.73E-01 ±	6.32E+00	1.02E+01
CO-60		2.05E-01 ±	2.07E+00	3.61E+00
ZN-65		1.77E+00 ±	4.15E+00	6.45E+00
ZRNB-95		1.87E-01 ±	3.77E+00	6.16E+00
I-131		-1.07E+00 ±	6.58E+00	1.07E+01
CS-134		-7.56E-01 ±	2.35E+00	3.78E+00
CS-137		0.00E+00 ±	2.29E+00	3.77E+00
BALA140		-4.22E-01 ±	5.89E+00	9.58E+00
BI-214		-8.56E-02 ±	5.46E+00	9.88E+00

Location 27 collected 12/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.08E+01 ±	6.27E+01	5.95E+01
CR-51		-8.90E+00 ±	2.70E+01	4.35E+01
MN-54		1.48E+00 ±	2.15E+00	3.30E+00
CO-58		3.29E-02 ±	2.21E+00	3.64E+00
FE-59		5.39E-01 ±	6.26E+00	1.02E+01
CO-60		7.00E-01 ±	1.90E+00	2.97E+00
ZN-65		-1.46E+00 ±	5.26E+00	8.42E+00
ZRNB-95		-1.55E+00 ±	3.89E+00	6.14E+00
I-131		4.71E+00 ±	6.11E+00	9.52E+00
CS-134		3.67E-01 ±	2.22E+00	3.60E+00
CS-137		3.19E-01 ±	2.19E+00	3.56E+00
BALA140		-1.78E+00 ±	5.77E+00	9.12E+00
BI-214		4.32E+00 ±	5.80E+00	1.01E+01

Location 27 collected 12/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.81E+01 ±	4.62E+01	5.31E+01
CR-51		0.00E+00 ±	3.07E+01	5.06E+01
MN-54		0.00E+00 ±	1.91E+00	3.14E+00
CO-58		5.82E-01 ±	2.12E+00	3.38E+00
FE-59		1.64E+00 ±	6.61E+00	1.05E+01
CO-60		-1.15E+00 ±	4.26E+01	4.07E+00
ZN-65		-2.17E+00 ±	5.28E+00	8.33E+00
ZRNB-95		5.09E-02 ±	3.88E+00	6.37E+00
I-131		-8.14E+00 ±	1.24E+01	1.96E+01
CS-134		-9.20E-01 ±	2.49E+00	3.99E+00
CS-137		5.01E-01 ±	2.17E+00	3.49E+00
BALA140		2.33E+00 ±	6.96E+00	1.08E+01
BI-214		1.19E+00 ±	5.29E+00	9.65E+00

Table A-7.1  
**GAMMA SPECTROMETRY RESULTS OF WATER**  
**Deep Ground Water Wells - Stations 31, 32, 52**  
 Results in pCi/liter

Location 31 collected 3/5/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		1.80E+01 ±	5.69E+01	1.09E+02
CR-51		3.08E+00 ±	4.16E+01	6.81E+01
MN-54		1.32E-01 ±	4.40E+00	7.22E+00
CO-58		-1.55E+00 ±	4.67E+00	7.47E+00
FE-59		3.99E+00 ±	1.04E+01	1.62E+01
CO-60		-1.53E+00 ±	1.60E+01	8.07E+00
ZN-65		0.00E+00 ±	3.27E+01	5.38E+01
ZRNB-95		4.12E-01 ±	8.87E+00	1.45E+01
I-131		3.63E-01 ±	5.28E+00	8.65E+00
CS-134		0.00E+00 ±	1.04E+01	1.72E+01
CS-137		1.15E+00 ±	4.95E+00	7.99E+00
BALA140		-1.99E-01 ±	5.38E+00	8.81E+00
BI-214	+	2.37E+02 ±	2.24E+01	2.03E+01

Location 31 collected 6/16/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.44E+01 ±	7.01E+01	1.21E+02
CR-51		2.12E+01 ±	5.36E+01	8.67E+01
MN-54		3.61E-02 ±	5.37E+00	8.83E+00
CO-58		-1.06E-01 ±	5.21E+00	8.55E+00
FE-59		7.01E-01 ±	7.26E+00	1.18E+01
CO-60		-8.96E-02 ±	4.87E+00	8.00E+00
ZN-65		-1.40E+01 ±	1.58E+01	2.46E+01
ZRNB-95		1.52E+00 ±	9.78E+00	1.59E+01
I-131		1.43E+00 ±	6.01E+00	9.76E+00
CS-134		-7.18E+00 ±	7.73E+00	1.22E+01
CS-137		2.52E+00 ±	5.04E+00	7.98E+00
BALA140		1.01E+00 ±	5.59E+00	9.00E+00
BI-214	+	3.99E+02 ±	2.94E+01	2.48E+01

Location 31 collected 9/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.86E+01 ±	7.57E+01	1.12E+02
CR-51		5.36E+00 ±	4.44E+01	7.26E+01
MN-54		-1.81E+00 ±	4.88E+00	7.78E+00
CO-58		1.86E+00 ±	4.09E+00	6.43E+00
FE-59		6.26E-02 ±	1.11E+01	1.82E+01
CO-60		1.93E+00 ±	4.56E+00	7.63E+00
ZN-65		0.00E+00 ±	4.37E+01	7.19E+01
ZRNB-95		4.14E+00 ±	8.45E+00	1.33E+01
I-131		1.13E+00 ±	5.76E+00	9.38E+00
CS-134		1.12E+00 ±	5.39E+00	8.76E+00
CS-137		-4.15E+00 ±	6.06E+00	9.52E+00
BALA140		-1.23E+00 ±	6.75E+00	1.09E+01
BI-214	+	3.31E+02 ±	2.55E+01	2.13E+01

Location 31 collected 12/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.28E+01 ±	1.07E+02	1.40E+02
CR-51		2.69E+01 ±	5.46E+01	8.75E+01
MN-54		-2.37E+00 ±	5.29E+00	8.39E+00
CO-58		-9.54E-01 ±	4.55E+00	7.34E+00
FE-59		5.92E-01 ±	1.18E+01	1.93E+01
CO-60		1.33E-01 ±	4.89E+00	8.02E+00
ZN-65		0.00E+00 ±	1.63E+01	2.69E+01
ZRNB-95		-4.18E+00 ±	1.04E+01	1.65E+01
I-131		-2.39E-01 ±	9.90E+00	1.63E+01
CS-134		6.98E-01 ±	1.12E+01	1.84E+01
CS-137		-1.58E+00 ±	6.17E+00	9.96E+00
BALA140		0.00E+00 ±	1.05E+01	1.73E+01
BI-214	+	4.91E+01 ±	1.61E+01	2.49E+01

Location 32 collected 3/5/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-5.80E+00 ±	6.52E+01	1.22E+02
CR-51		-1.65E+01 ±	5.57E+01	9.06E+01
MN-54		-3.16E+00 ±	6.03E+00	9.59E+00
CO-58		1.10E+00 ±	3.91E+00	6.41E+00
FE-59		8.78E-01 ±	1.30E+01	2.13E+01
CO-60		8.04E-01 ±	5.14E+00	8.33E+00
ZN-65		-2.15E+00 ±	5.05E+01	8.29E+01
ZRNB-95		2.86E-01 ±	7.34E+00	1.20E+01
I-131		2.54E-01 ±	7.35E+00	1.21E+01
CS-134		3.12E-01 ±	2.27E+01	3.73E+01
CS-137		-2.14E+00 ±	6.59E+00	1.06E+01
BALA140		-1.02E+00 ±	6.30E+00	1.02E+01
BI-214	+	6.52E+02 ±	3.57E+01	2.57E+01

Location 32 collected 6/16/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		4.09E+01 ±	6.31E+01	1.20E+02
CR-51		-8.69E-02 ±	5.22E+01	8.58E+01
MN-54		4.18E+00 ±	4.51E+00	6.84E+00
CO-58		-1.45E+00 ±	5.81E+00	9.40E+00
FE-59		4.57E-01 ±	1.26E+01	2.06E+01
CO-60		-4.79E-03 ±	4.65E+00	7.65E+00
ZN-65		-3.23E+00 ±	4.68E+01	1.55E+01
ZRNB-95		-2.11E+00 ±	9.49E+00	1.54E+01
I-131		-1.94E+00 ±	7.23E+00	1.17E+01
CS-134		1.25E+00 ±	2.09E+01	3.44E+01
CS-137		-1.49E-01 ±	5.34E+00	8.75E+00
BALA140		2.12E+00 ±	5.70E+00	8.99E+00
BI-214	+	5.21E+02 ±	3.19E+01	2.44E+01



Table A-7.1  
**GAMMA SPECTROMETRY RESULTS OF WATER**  
**Deep Ground Water Wells - Stations 31, 32, 52**  
 Results in pCi/liter

Location 32 collected 9/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		3.80E+01 ±	5.73E+01	1.07E+02
CR-51		7.88E-01 ±	5.04E+01	8.29E+01
MN-54		1.64E-01 ±	4.18E+00	6.84E+00
CO-58		2.42E+00 ±	4.80E+00	7.54E+00
FE-59		1.79E+00 ±	1.10E+01	1.77E+01
CO-60		6.03E-01 ±	4.45E+00	7.68E+00
ZN-65		0.00E+00 ±	3.78E+01	6.22E+01
ZRNB-95		1.60E+00 ±	8.17E+00	1.32E+01
I-131		4.17E+00 ±	6.52E+00	1.03E+01
CS-134		1.70E+00 ±	5.15E+00	8.30E+00
CS-137		1.82E+00 ±	4.99E+00	7.96E+00
BALA140		0.00E+00 ±	8.65E+00	1.42E+01
BI-214	+	2.50E+02 ±	2.27E+01	2.09E+01

Location 32 collected 12/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.50E+01 ±	7.81E+01	1.15E+02
CR-51		-2.54E+01 ±	5.45E+01	8.75E+01
MN-54		1.03E+00 ±	4.98E+00	8.03E+00
CO-58		1.28E+00 ±	5.37E+00	8.65E+00
FE-59		1.81E-01 ±	1.17E+01	1.92E+01
CO-60		-2.18E+00 ±	3.42E+01	9.90E+00
ZN-65		2.33E+00 ±	1.01E+01	1.62E+01
ZRNB-95		6.10E+00 ±	9.35E+00	1.45E+01
I-131		1.68E+00 ±	1.05E+01	1.71E+01
CS-134		7.32E-01 ±	4.22E+00	6.83E+00
CS-137		-1.23E+00 ±	5.34E+00	8.62E+00
BALA140		1.88E+00 ±	7.96E+00	1.27E+01
BI-214	+	1.13E+02 ±	2.02E+01	2.30E+01

Location 52 collected 3/5/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.75E+01 ±	7.40E+01	1.02E+02
CR-51		6.57E+00 ±	3.61E+01	5.88E+01
MN-54		7.38E-02 ±	3.98E+00	6.53E+00
CO-58		-5.52E-01 ±	4.16E+00	6.75E+00
FE-59		0.00E+00 ±	1.60E+01	2.63E+01
CO-60		-2.05E-01 ±	5.01E+00	7.60E+00
ZN-65		0.00E+00 ±	1.46E+01	2.41E+01
ZRNB-95		2.78E+00 ±	6.85E+00	1.08E+01
I-131		1.28E-03 ±	4.70E+00	7.72E+00
CS-134		1.84E+00 ±	4.02E+00	6.37E+00
CS-137		8.15E-02 ±	3.81E+00	6.24E+00
BALA140		-3.28E+00 ±	6.68E+00	1.04E+01
BI-214		-4.67E-01 ±	1.13E+01	2.02E+01

Location 52 collected 6/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-8.19E+01 ±	1.30E+02	1.13E+02
CR-51		-2.03E+01 ±	5.08E+01	8.19E+01
MN-54		2.35E-01 ±	3.72E+00	6.08E+00
CO-58		-1.50E+00 ±	4.91E+00	7.88E+00
FE-59		6.36E+00 ±	1.06E+01	1.61E+01
CO-60		2.29E+00 ±	4.52E+00	7.05E+00
ZN-65		-1.05E+01 ±	1.39E+01	2.18E+01
ZRNB-95		-1.02E-01 ±	8.32E+00	1.37E+01
I-131		-4.13E+00 ±	8.80E+00	1.41E+01
CS-134		-4.39E+00 ±	6.45E+00	1.02E+01
CS-137		3.92E-01 ±	5.06E+00	8.28E+00
BALA140		1.58E+00 ±	6.42E+00	1.02E+01
BI-214	+	1.22E+02 ±	2.05E+01	2.21E+01

Location 52 collected 9/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.59E+01 ±	6.95E+01	1.12E+02
CR-51		2.42E+01 ±	4.35E+01	6.94E+01
MN-54		-2.73E+00 ±	5.01E+00	7.91E+00
CO-58		6.81E-01 ±	4.21E+00	6.82E+00
FE-59		5.92E+00 ±	1.07E+01	1.64E+01
CO-60		-1.07E-01 ±	4.42E+00	7.25E+00
ZN-65		-7.19E+00 ±	1.20E+01	1.88E+01
ZRNB-95		-3.26E+00 ±	8.23E+00	1.31E+01
I-131		-1.02E+00 ±	7.44E+00	1.21E+01
CS-134		-5.74E-02 ±	5.20E+00	8.54E+00
CS-137		0.00E+00 ±	5.56E+00	9.14E+00
BALA140		-2.45E+00 ±	7.18E+00	1.14E+01
BI-214		1.25E+01 ±	1.39E+01	2.39E+01

Location 52 collected 12/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-6.12E+01 ±	1.18E+02	1.23E+02
CR-51		3.28E+01 ±	3.63E+01	5.57E+01
MN-54		-1.14E+00 ±	4.63E+00	7.45E+00
CO-58		1.72E-01 ±	4.70E+00	7.70E+00
FE-59		1.15E+00 ±	1.19E+01	1.94E+01
CO-60		1.19E+00 ±	4.34E+00	6.92E+00
ZN-65		-1.40E+00 ±	8.59E+00	1.39E+01
ZRNB-95		-2.76E+00 ±	9.19E+00	1.48E+01
I-131		3.38E+00 ±	1.12E+01	1.81E+01
CS-134		-2.10E+00 ±	5.68E+00	9.15E+00
CS-137		-1.51E+00 ±	5.61E+00	9.06E+00
BALA140		2.50E-01 ±	6.69E+00	1.09E+01
BI-214	+	1.10E+02 ±	1.72E+01	2.24E+01

TABLE A-7.2  
**GAMMA SPECTROMETRY RESULTS OF WATER - SUMMARY**  
**RIVER/DRINKING WATER**

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-5.79E-01	-2.99E+00	1.54E+00	8.87E+00	12	0
BALA140	Cntl	-4.18E-01	-1.69E+00	4.03E-01	8.98E+00	12	0
BI-214	Ind	2.28E+00	-1.86E+00	1.79E+01	9.51E+00	12	1
BI-214	Cntl	4.04E+00	2.12E-01	9.97E+00	9.52E+00	12	1
CO-58	Ind	-1.63E-01	-4.98E-01	3.14E-03	3.67E+00	12	0
CO-58	Cntl	-2.76E-03	-1.44E+00	1.54E+00	3.70E+00	12	0
CO-60	Ind	1.26E-02	-1.28E+00	5.73E-01	3.36E+00	12	0
CO-60	Cntl	2.78E-02	-1.22E+00	6.95E-01	3.16E+00	12	0
CR-51	Ind	3.36E-01	-1.09E+01	1.27E+01	3.93E+01	12	0
CR-51	Cntl	-1.25E+00	-1.71E+01	2.45E+01	4.04E+01	12	0
CS-134	Ind	-7.27E-02	-1.02E+00	9.48E-01	3.83E+00	12	0
CS-134	Cntl	-1.95E-01	-1.88E+00	1.14E+00	3.72E+00	12	0
CS-137	Ind	7.89E-02	-8.05E-01	1.44E+00	3.31E+00	12	0
CS-137	Cntl	-3.95E-01	-8.99E-01	1.96E-01	3.85E+00	12	0
FE-59	Ind	-1.71E-01	-2.28E+00	2.88E+00	1.07E+01	12	0
FE-59	Cntl	2.10E-01	-2.40E+00	2.81E+00	1.04E+01	12	0
I-131	Ind	1.51E+00	-4.30E+00	8.66E+00	1.19E+01	12	0
I-131	Cntl	-9.28E-01	-3.41E+00	3.03E+00	1.24E+01	12	0
K-40	Ind	-2.16E+01	-3.73E+01	-3.03E+00	5.60E+01	12	0
K-40	Cntl	-2.95E+01	-4.86E+01	4.05E+00	5.71E+01	12	0
MN-54	Ind	-2.35E-01	-1.01E+00	9.16E-01	3.42E+00	12	0
MN-54	Cntl	-1.67E-01	-1.04E+00	6.45E-01	3.40E+00	12	0
ZN-65	Ind	-6.87E-01	-3.49E+00	2.02E+00	8.40E+00	12	0
ZN-65	Cntl	-1.15E+00	-2.47E+00	6.55E-02	7.93E+00	12	0
ZRNB-95	Ind	3.30E-01	-1.73E+00	2.45E+00	6.66E+00	12	0
ZRNB-95	Cntl	-1.09E-01	-2.08E+00	1.17E+00	6.84E+00	12	0

TABLE A-7.2  
**GAMMA SPECTROMETRY RESULTS OF WATER - SUMMARY**  
**PLANT DISCHARGE WATER**

<b>Nuclide</b>		<b>Average Activity</b>	<b>Activity Low</b>	<b>Activity High</b>	<b>Average MDA</b>	<b>Number of Samples</b>	<b>Number of Positive IDs</b>
K-40	Ind	-2.00E+01	-4.53E+01	8.92E+00	5.52E+01	12	0
CR-51	Ind	6.01E-03	-1.43E+01	1.29E+01	4.10E+01	12	0
MN-54	Ind	3.95E-01	-6.38E-01	1.79E+00	3.44E+00	12	0
CO-58	Ind	2.59E-01	-8.51E-01	1.26E+00	3.38E+00	12	0
FE-59	Ind	2.93E-01	-1.03E+00	1.84E+00	1.01E+01	12	0
CO-60	Ind	3.28E-02	-1.15E+00	1.33E+00	3.47E+00	12	0
ZN-65	Ind	-4.22E-01	-3.68E+00	1.86E+00	7.96E+00	12	0
ZRNB-95	Ind	-1.04E-01	-1.81E+00	2.26E+00	6.22E+00	12	0
I-131	Ind	-9.86E-01	-8.14E+00	4.71E+00	1.21E+01	12	0
CS-134	Ind	-3.98E-02	-9.20E-01	7.73E-01	3.32E+00	12	0
CS-137	Ind	-7.86E-02	-1.27E+00	1.56E+00	3.33E+00	12	0
BALA140	Ind	-7.80E-01	-3.20E+00	2.33E+00	9.58E+00	12	0
BI-214	Ind	1.37E+00	-1.54E+00	4.96E+00	9.51E+00	12	0

**GAMMA SPECTROMETRY RESULTS OF WATER- SUMMERY**  
**DEEP GROUNDWATER**

<b>Nuclide</b>		<b>Average Activity</b>	<b>Activity Low</b>	<b>Activity High</b>	<b>Average MDA</b>	<b>Number of Samples</b>	<b>Number of Positive IDs</b>
K-40		-1.72E+01	-8.19E+01	4.09E+01	1.16E+02	12	0
CR-51		4.88E+00	-2.54E+01	3.28E+01	7.73E+01	12	0
MN-54		-4.47E-01	-3.16E+00	4.18E+00	7.62E+00	12	0
CO-58		1.17E-01	-1.55E+00	2.42E+00	7.58E+00	12	0
FE-59		1.84E+00	0.00E+00	6.36E+00	1.86E+01	12	0
CO-60		2.37E-01	-2.18E+00	2.29E+00	7.84E+00	12	0
ZN-65		-3.02E+00	-1.40E+01	2.33E+00	3.61E+01	12	0
ZRNB-95		1.38E-01	-4.18E+00	6.10E+00	1.51E+01	12	0
I-131		4.23E-01	-4.13E+00	4.17E+00	1.23E+01	12	0
CS-134		-5.06E-01	-7.18E+00	1.84E+00	1.48E+01	12	0
CS-137		-4.00E-01	-4.15E+00	2.52E+00	8.68E+00	12	0
BALA140		-1.11E-01	-3.28E+00	2.12E+00	1.13E+01	12	0
BI-214		2.33E+02	-4.67E-01	6.52E+02	2.28E+01	12	10

TABLE A-8.1  
**GAMMA SPECTROMETRY RESULTS OF SOIL**

Results in pCi/kilogram

Location & Date			Station 1	6/17/2014
Nuclide	RQ	Activity	Error	MDA
BE-7		3.13E+00 ±	2.01E+02	3.29E+02
K-40	+	1.63E+04 ±	1.01E+03	2.67E+02
CR-51		2.22E+01 ±	2.42E+02	3.95E+02
MN-54		-1.20E+01 ±	2.52E+01	3.96E+01
CO-58		-2.78E+00 ±	2.16E+01	3.51E+01
FE-59		1.18E+00 ±	5.91E+01	9.69E+01
CO-60		1.80E+01 ±	2.18E+01	3.26E+01
ZN-65		4.14E+00 ±	4.29E+01	6.97E+01
ZRNB-95		1.91E+01 ±	4.16E+01	6.51E+01
CS-134		1.42E+01 ±	1.82E+01	2.75E+01
CS-137	+	7.33E+01 ±	2.42E+01	2.13E+01
BALA140		-4.38E-01 ±	4.11E+01	6.74E+01
BI-214	+	5.28E+02 ±	9.68E+01	7.57E+01

Location & Date			Station 9a	6/17/2014
Nuclide	RQ	Activity	Error	MDA
BE-7		3.03E+02 ±	2.45E+02	3.59E+02
K-40	+	1.20E+04 ±	9.27E+02	4.04E+02
CR-51		-4.99E+00 ±	2.01E+02	3.30E+02
MN-54		1.55E+01 ±	2.32E+01	3.52E+01
CO-58		-1.46E-01 ±	2.55E+01	4.19E+01
FE-59		1.26E+01 ±	7.20E+01	1.16E+02
CO-60		-6.71E+00 ±	2.84E+01	4.54E+01
ZN-65		-2.45E+01 ±	6.51E+01	1.03E+02
ZRNB-95		-6.88E-01 ±	4.21E+01	6.91E+01
CS-134		1.11E+01 ±	2.29E+01	3.58E+01
CS-137		-8.68E-01 ±	2.60E+01	4.26E+01
BALA140		0.00E+00 ±	8.86E+01	1.48E+02
BI-214	+	5.18E+02 ±	8.30E+01	8.27E+01

Location & Date			Station 21	6/17/2014
Nuclide	RQ	Activity	Error	MDA
BE-7		8.86E+01 ±	1.62E+02	2.53E+02
K-40	+	1.48E+04 ±	8.62E+02	3.37E+02
CR-51		-3.20E+00 ±	1.94E+02	3.18E+02
MN-54		1.43E+01 ±	1.74E+01	2.59E+01
CO-58		-3.16E-01 ±	1.75E+01	2.87E+01
FE-59		-4.14E+00 ±	6.06E+01	9.89E+01
CO-60		-4.44E+00 ±	2.32E+01	3.75E+01
ZN-65		-7.12E-02 ±	3.80E+01	6.25E+01
ZRNB-95		8.16E+00 ±	3.57E+01	5.73E+01
CS-134		0.00E+00 ±	3.74E+01	6.23E+01
CS-137		1.89E+00 ±	2.59E+01	4.23E+01
BALA140		-9.73E+00 ±	3.56E+01	5.59E+01
BI-214	+	4.22E+02 ±	6.68E+01	6.93E+01

Location & Date			Station 5	6/17/2014
Nuclide	RQ	Activity	Error	MDA
BE-7		1.65E+02 ±	2.06E+02	3.13E+02
K-40	+	1.50E+04 ±	1.00E+03	2.39E+02
CR-51		5.00E+01 ±	2.74E+02	4.45E+02
MN-54		2.46E+00 ±	3.50E+01	5.73E+01
CO-58		8.33E+00 ±	2.33E+01	3.66E+01
FE-59		-1.61E+01 ±	7.11E+01	1.13E+02
CO-60		-3.62E+00 ±	9.73E+02	4.77E+01
ZN-65		-4.88E+01 ±	7.81E+01	1.22E+02
ZRNB-95		2.87E+01 ±	3.83E+01	5.69E+01
CS-134		-1.98E+00 ±	2.03E+00	4.71E+00
CS-137	+	5.60E+01 ±	2.79E+01	3.69E+01
BALA140		-1.76E+01 ±	5.68E+01	8.92E+01
BI-214	+	6.26E+02 ±	8.65E+01	7.53E+01

Location & Date			Station 42	6/17/2014
Nuclide	RQ	Activity	Error	MDA
BE-7		1.12E+02 ±	2.83E+02	4.46E+02
K-40	+	1.70E+04 ±	1.32E+03	4.25E+02
CR-51		1.55E+02 ±	3.13E+02	4.92E+02
MN-54		1.91E+01 ±	2.62E+01	3.85E+01
CO-58		8.28E+00 ±	2.93E+01	4.63E+01
FE-59		-1.86E+01 ±	1.01E+02	1.62E+02
CO-60		-5.02E+00 ±	3.04E+04	6.84E+01
ZN-65		0.00E+00 ±	6.72E+01	1.12E+02
ZRNB-95		0.00E+00 ±	6.64E+01	1.11E+02
CS-134		-1.25E+01 ±	2.79E+01	4.36E+01
CS-137	+	5.79E+01 ±	3.50E+01	4.67E+01
BALA140		-1.80E+01 ±	6.75E+01	1.06E+02
BI-214	+	6.50E+02 ±	1.06E+02	9.86E+01

TABLE A-8.2  
**GAMMA SPECTROMETRY RESULTS OF SOIL - SUMMARY**  
 Results in pCi/kilogram

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-1.14E+01	-1.80E+01	-4.38E-01	7.95E+01	4	0
BALA140	Cntl	0.00E+00	0.00E+00	0.00E+00	1.48E+02	1	0
BE-7	Ind	9.23E+01	3.13E+00	1.65E+02	3.35E+02	4	0
BE-7	Cntl	3.03E+02	3.03E+02	3.03E+02	3.59E+02	1	0
BI-214	Ind	5.56E+02	4.22E+02	6.50E+02	7.97E+01	4	4
BI-214	Cntl	5.18E+02	5.18E+02	5.18E+02	8.27E+01	1	1
CO-58	Ind	3.38E+00	-2.78E+00	8.33E+00	3.67E+01	4	0
CO-58	Cntl	-1.46E-01	-1.46E-01	-1.46E-01	4.19E+01	1	0
CO-60	Ind	1.24E+00	-5.02E+00	1.80E+01	4.66E+01	4	0
CO-60	Cntl	-6.71E+00	-6.71E+00	-6.71E+00	4.54E+01	1	0
CR-51	Ind	5.61E+01	-3.20E+00	1.55E+02	4.13E+02	4	0
CR-51	Cntl	-4.99E+00	-4.99E+00	-4.99E+00	3.30E+02	1	0
CS-134	Ind	-5.81E-02	-1.25E+01	1.42E+01	3.45E+01	4	0
CS-134	Cntl	1.11E+01	1.11E+01	1.11E+01	3.58E+01	1	0
CS-137	Ind	4.73E+01	1.89E+00	7.33E+01	3.68E+01	4	3
CS-137	Cntl	-8.68E-01	-8.68E-01	-8.68E-01	4.26E+01	1	0
FE-59	Ind	-9.42E+00	-1.86E+01	1.18E+00	1.18E+02	4	0
FE-59	Cntl	1.26E+01	1.26E+01	1.26E+01	1.16E+02	1	0
K-40	Ind	1.57E+04	1.48E+04	1.70E+04	3.17E+02	4	4
K-40	Cntl	1.20E+04	1.20E+04	1.20E+04	4.04E+02	1	1
MN-54	Ind	5.95E+00	-1.20E+01	1.91E+01	4.03E+01	4	0
MN-54	Cntl	1.55E+01	1.55E+01	1.55E+01	3.52E+01	1	0
ZN-65	Ind	-1.12E+01	-4.88E+01	4.14E+00	9.16E+01	4	0
ZN-65	Cntl	-2.45E+01	-2.45E+01	-2.45E+01	1.03E+02	1	0
ZRNB-95	Ind	1.40E+01	0.00E+00	2.87E+01	7.25E+01	4	0
ZRNB-95	Cntl	-6.88E-01	-6.88E-01	-6.88E-01	6.91E+01	1	0

TABLE A-9.1  
**GAMMA SPECTROMETRY RESULTS OF SEDIMENT**

Results in pCi/kilogram dry material

**Station 33 Upstream Control**

Location & Date Station 33 3/26/2014					Location & Date Station 33 10/23/2014				
Nuclide	RQ	Activity	Error	MDA	Nuclide	RQ	Activity	Error	MDA
BE-7		2.45E+02 ±	2.41E+02	3.67E+02	BE-7		1.28E+02 ±	2.49E+02	3.98E+02
K-40	+	9.28E+03 ±	1.10E+03	1.35E+03	K-40	+	1.34E+04 ±	8.68E+02	2.73E+02
CR-51		-1.28E+02 ±	3.27E+02	5.27E+02	CR-51		-1.40E+02 ±	2.95E+02	4.75E+02
MN-54		1.39E+01 ±	2.81E+01	4.43E+01	MN-54		1.80E+00 ±	2.80E+01	4.68E+01
CO-58		-1.48E+01 ±	3.10E+01	4.90E+01	CO-58		-9.75E-01 ±	1.82E+01	2.98E+01
FE-59		-4.96E+00 ±	7.84E+01	1.28E+02	FE-59		3.91E+01 ±	5.97E+01	9.08E+01
CO-60		1.57E+00 ±	2.03E+01	3.30E+01	CO-60		-3.98E+00 ±	1.17E+02	3.84E+01
ZN-65		-5.93E+01 ±	8.01E+01	1.25E+02	ZN-65		-7.00E+01 ±	8.25E+01	1.29E+02
ZRNB-95		2.35E+00 ±	4.97E+01	8.14E+01	ZRNB-95		6.20E+01 ±	4.84E+01	7.19E+01
CS-134		-2.40E+01 ±	3.40E+01	5.38E+01	CS-134		4.05E-01 ±	2.41E+01	3.96E+01
CS-137		4.78E+01 ±	3.25E+01	4.78E+01	CS-137		3.23E+01 ±	3.12E+01	4.79E+01
BALA140		-2.16E+01 ±	5.36E+01	8.35E+01	BALA140		-1.52E+01 ±	3.88E+01	6.09E+01
BI-214	+	9.56E+02 ±	1.08E+02	7.30E+01	BI-214	+	1.48E+03 ±	1.24E+02	7.97E+01

**Station 34 Downstream Indicator**

Location & Date Station 34 3/26/2014					Location & Date Station 34 10/8/2014				
Nuclide	RQ	Activity	Error	MDA	Nuclide	RQ	Activity	Error	MDA
BE-7		1.21E+02 ±	4.10E+02	6.56E+02	BE-7		-2.55E+01 ±	1.86E+02	3.03E+02
K-40	+	1.72E+04 ±	1.45E+03	5.44E+02	K-40	+	1.73E+04 ±	1.07E+03	2.78E+02
CR-51		2.28E+02 ±	4.68E+02	7.40E+02	CR-51		-1.59E+00 ±	2.31E+02	3.80E+02
MN-54		2.03E+01 ±	4.04E+01	6.27E+01	MN-54		1.18E+01 ±	2.53E+01	3.98E+01
CO-58		-6.57E+00 ±	4.28E+01	6.90E+01	CO-58		-6.85E-01 ±	2.31E+01	3.78E+01
FE-59		3.51E+01 ±	1.19E+02	1.87E+02	FE-59		-1.29E+01 ±	6.64E+01	1.07E+02
CO-60		-1.04E+01 ±	4.47E+01	7.15E+01	CO-60		1.43E+00 ±	2.34E+01	3.88E+01
ZN-65		-3.23E+01 ±	1.04E+02	1.65E+02	ZN-65		-2.85E+01 ±	6.96E+01	1.11E+02
ZRNB-95		2.78E+01 ±	7.92E+01	1.25E+02	ZRNB-95		-1.72E+01 ±	4.80E+01	7.64E+01
CS-134		1.07E+00 ±	4.44E+01	7.29E+01	CS-134		3.01E-01 ±	2.21E+01	3.62E+01
CS-137	+	1.01E+02 ±	4.91E+01	6.48E+01	CS-137	+	1.47E+02 ±	3.59E+01	2.77E+01
BALA140		-5.09E+01 ±	1.39E+02	2.15E+02	BALA140		-9.01E+00 ±	2.86E+01	4.44E+01
BI-214	+	9.36E+02 ±	1.35E+02	1.19E+02	BI-214	+	5.61E+02 ±	7.77E+01	6.80E+01

TABLE A-9.2  
**GAMMA SPECTROMETRY RESULTS OF SEDIMENT - SUMMARY**

Results in pCi/kilogram dry material

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-2.99E+01	-5.09E+01	-9.01E+00	1.30E+02	2	0
BALA140	Cntl	-1.84E+01	-2.16E+01	-1.52E+01	7.22E+01	2	0
BE-7	Ind	4.80E+01	-2.55E+01	1.21E+02	4.80E+02	2	0
BE-7	Cntl	1.87E+02	1.28E+02	2.45E+02	3.82E+02	2	0
BI-214	Ind	7.48E+02	5.61E+02	9.36E+02	9.36E+01	2	2
BI-214	Cntl	1.22E+03	9.56E+02	1.48E+03	7.63E+01	2	2
CO-58	Ind	-3.63E+00	-6.57E+00	-6.85E-01	5.34E+01	2	0
CO-58	Cntl	-7.89E+00	-1.48E+01	-9.75E-01	3.94E+01	2	0
CO-60	Ind	-4.50E+00	-1.04E+01	1.43E+00	5.51E+01	2	0
CO-60	Cntl	-1.21E+00	-3.98E+00	1.57E+00	3.57E+01	2	0
CR-51	Ind	1.13E+02	-1.59E+00	2.28E+02	5.60E+02	2	0
CR-51	Cntl	-1.34E+02	-1.40E+02	-1.28E+02	5.01E+02	2	0
CS-134	Ind	6.83E-01	3.01E-01	1.07E+00	5.46E+01	2	0
CS-134	Cntl	-1.18E+01	-2.40E+01	4.05E-01	4.67E+01	2	0
CS-137	Ind	1.24E+02	1.01E+02	1.47E+02	4.62E+01	2	2
CS-137	Cntl	4.01E+01	3.23E+01	4.78E+01	4.78E+01	2	0
FE-59	Ind	1.11E+01	-1.29E+01	3.51E+01	1.47E+02	2	0
FE-59	Cntl	1.71E+01	-4.96E+00	3.91E+01	1.09E+02	2	0
K-40	Ind	1.73E+04	1.72E+04	1.73E+04	4.11E+02	2	2
K-40	Cntl	1.13E+04	9.28E+03	1.34E+04	8.14E+02	2	2
MN-54	Ind	1.60E+01	1.18E+01	2.03E+01	5.13E+01	2	0
MN-54	Cntl	7.84E+00	1.80E+00	1.39E+01	4.55E+01	2	0
ZN-65	Ind	-3.04E+01	-3.23E+01	-2.85E+01	1.38E+02	2	0
ZN-65	Cntl	-6.47E+01	-7.00E+01	-5.93E+01	1.27E+02	2	0
ZRNB-95	Ind	5.33E+00	-1.72E+01	2.78E+01	1.01E+02	2	0
ZRNB-95	Cntl	3.22E+01	2.35E+00	6.20E+01	7.67E+01	2	0

TABLE A-10.1  
**GAMMA SPECTROMETRY RESULTS OF FISH**  
Station 30 Columbia River - Station 38 Snake River  
Results in pCi/kilogram (wet)

Location & Species	Collection Date	Nuclide	RQ	Activity	Error	MDA
Salmon Station 30 Indicator	10/02/14	K-40	+	3.14E+03	±	4.00E+02
		MN-54		-8.20E-01	±	1.29E+01
		CO-58		0.00E+00	±	2.84E+01
		FE-59		-9.04E-01	±	7.00E+01
		CO-60		5.72E+00	±	1.49E+01
		ZN-65		-9.74E+00	±	3.86E+01
		ZRNB-95		-2.29E+00	±	3.08E+01
		CS-134		-2.84E+00	±	1.18E+01
		CS-137		4.84E+00	±	1.13E+01
White Fish Station 30 Indicator	12/13/14	Bi-214		3.96E+01	±	3.03E+01
		K-40	+	3.45E+03	±	3.84E+02
		MN-54		4.59E+00	±	1.07E+01
		CO-58		6.71E-02	±	1.19E+01
		FE-59		-1.41E+00	±	4.03E+01
		CO-60		7.68E+00	±	1.22E+01
		ZN-65		-3.37E+00	±	2.53E+01
		ZRNB-95		-3.97E+00	±	2.54E+01
		CS-134		-4.16E-01	±	1.12E+01
Sucker Station 30 Indicator	12/24/14	CS-137		8.29E+00	±	1.19E+01
		Bi-214		1.98E+01	±	2.50E+01
		K-40	+	4.07E+03	±	5.49E+02
		MN-54		6.84E+00	±	1.78E+01
		CO-58		-1.32E+00	±	1.97E+01
		FE-59		2.49E+01	±	6.03E+01
		CO-60		-2.02E+00	±	2.75E+01
		ZN-65		-4.13E+00	±	3.76E+01
		ZRNB-95		2.66E+00	±	3.33E+01
		CS-134		2.00E+01	±	1.79E+01
		CS-137		5.99E+00	±	1.96E+01
		Bi-214		-1.41E+01	±	6.70E+01



TABLE A-10.1  
**GAMMA SPECTROMETRY RESULTS OF FISH**  
 Station 30 Columbia River - Station 38 Snake River  
 Results in pCi/kilogram (wet)

Location & Species	Collection Date	Nuclide	RQ	Activity	Error	MDA
Salmon Station 38 Control	09/23/14	K-40	+	3.05E+03	±	4.18E+02
		MN-54		5.05E-02	±	1.05E+01
		CO-58		1.38E+00	±	1.67E+01
		FE-59		0.00E+00	±	1.96E+01
		CO-60		-2.70E+00	±	7.53E+01
		ZN-65		7.13E-01	±	3.25E+01
		ZRNB-95		5.85E+00	±	3.74E+01
		CS-134		5.13E+00	±	1.18E+01
		CS-137		-2.45E+00	±	1.48E+01
		Bi-214		-4.96E+00	±	3.83E+01
Sucker Station 38 Control	05/12/14	K-40	+	3.13E+03	±	3.20E+02
		MN-54		-5.36E-01	±	8.87E+00
		CO-58		-3.76E+00	±	1.33E+01
		FE-59		-5.74E+00	±	4.52E+01
		CO-60		-1.08E+00	±	1.63E+01
		ZN-65		4.01E+00	±	2.67E+01
		ZRNB-95		-3.00E+00	±	2.59E+01
		CS-134		-1.68E+00	±	9.46E+00
		CS-137		5.43E+00	±	9.45E+00
		Bi-214		-1.10E+01	±	4.11E+01
Squaw Fish Station 38 Control	12/23/14	K-40	+	3.80E+03	±	4.00E+02
		MN-54		-5.14E+00	±	1.39E+01
		CO-58		-5.39E+00	±	1.41E+01
		FE-59		-5.44E+00	±	3.96E+01
		CO-60		-3.16E-01	±	1.41E+01
		ZN-65		0.00E+00	±	4.16E+01
		ZRNB-95		0.00E+00	±	2.14E+01
		CS-134		-3.09E+00	±	1.40E+01
		CS-137		6.42E+00	±	1.53E+01
		Bi-214		1.60E+01	±	3.15E+01

TABLE A-10.2  
**GAMMA SPECTROMETRY RESULTS OF FISH - SUMMARY**

Results in pCi/kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
Bi-214	Ind	1.51E+01	-1.41E+01	3.96E+01	6.11E+01	3	0
Bi-214	Cntl	1.21E-02	-1.10E+01	1.60E+01	5.11E+01	3	0
CO-58	Ind	-4.16E-01	-1.32E+00	6.71E-02	3.28E+01	3	0
CO-58	Cntl	-2.59E+00	-5.39E+00	1.38E+00	2.35E+01	3	0
CO-60	Ind	3.79E+00	-2.02E+00	7.68E+00	2.53E+01	3	0
CO-60	Cntl	-1.37E+00	-2.70E+00	-3.16E-01	2.18E+01	3	0
CS-134	Ind	5.57E+00	-2.84E+00	2.00E+01	2.10E+01	3	0
CS-134	Cntl	1.20E-01	-3.09E+00	5.13E+00	1.87E+01	3	0
CS-137	Ind	6.37E+00	4.84E+00	8.29E+00	2.21E+01	3	0
CS-137	Cntl	3.13E+00	-2.45E+00	6.42E+00	2.08E+01	3	0
FE-59	Ind	7.52E+00	-1.41E+00	2.49E+01	9.12E+01	3	0
FE-59	Cntl	-3.73E+00	-5.74E+00	0.00E+00	5.63E+01	3	0
K-40	Ind	3.56E+03	3.14E+03	4.07E+03	2.84E+02	3	3
K-40	Cntl	3.33E+03	3.05E+03	3.80E+03	2.43E+02	3	3
MN-54	Ind	3.54E+00	-8.20E-01	6.84E+00	2.17E+01	3	0
MN-54	Cntl	-1.88E+00	-5.14E+00	5.05E-02	1.79E+01	3	0
ZN-65	Ind	-5.74E+00	-9.74E+00	-3.37E+00	5.43E+01	3	0
ZN-65	Cntl	1.58E+00	0.00E+00	4.01E+00	5.49E+01	3	0
ZRNB-95	Ind	-1.20E+00	-3.97E+00	2.66E+00	4.84E+01	3	0
ZRNB-95	Cntl	9.49E-01	-3.00E+00	5.85E+00	4.57E+01	3	0

TABLE A-11.1  
**IODINE 131 IN MILK**

Results in pCi/liter, decay corrected to sample collection time

Collection Date	Station 9b Control				Station 36 Indicator			
	RQ	I-131 Activity	Error	I-131 MDA	RQ	I-131 Activity	Error	I-131 MDA
01/07/14		-7.31E-02 ±	2.09E-01	3.40E-01		-9.82E-02 ±	2.11E-01	3.41E-01
02/04/14		5.61E-02 ±	1.73E-01	2.81E-01		3.51E-02 ±	1.73E-01	2.82E-01
03/11/14		1.31E-02 ±	1.62E-01	2.65E-01		1.00E-01 ±	2.10E-01	3.40E-01
04/01/14		8.69E-02 ±	1.75E-01	2.83E-01		-1.19E-01 ±	2.17E-01	3.51E-01
04/15/14		1.24E-01 ±	2.04E-01	3.29E-01		-5.70E-03 ±	1.77E-01	2.90E-01
05/06/14		-4.64E-02 ±	1.86E-01	3.03E-01		-5.17E-02 ±	2.18E-01	3.56E-01
05/27/14		5.99E-02 ±	2.00E-01	3.25E-01		5.51E-02 ±	2.00E-01	3.26E-01
06/10/14		-2.04E-02 ±	1.96E-01	3.21E-01		-4.73E-03 ±	2.16E-01	3.55E-01
06/24/14		-2.41E-02 ±	1.95E-01	3.19E-01		5.34E-03 ±	2.27E-01	3.73E-01
07/08/14		3.22E-02 ±	1.89E-01	3.09E-01		-6.23E-03 ±	1.67E-01	2.74E-01
07/22/14		1.21E-01 ±	2.08E-01	3.36E-01		6.56E-02 ±	1.98E-01	3.21E-01
08/05/14		4.50E-02 ±	2.06E-01	3.36E-01		1.10E-01 ±	2.19E-01	3.55E-01
08/19/14		-3.67E-02 ±	1.97E-01	3.22E-01		1.03E-01 ±	2.16E-01	3.50E-01
09/02/14		-3.01E-03 ±	1.99E-01	3.27E-01		-5.67E-02 ±	1.71E-01	2.77E-01
09/16/14		-7.26E-02 ±	1.87E-01	3.03E-01		-6.03E-03 ±	2.26E-01	3.71E-01
10/07/14		-1.51E-01 ±	3.06E-01	4.95E-01		5.79E-02 ±	1.97E-01	3.21E-01
11/11/14		-1.31E-02 ±	1.42E-01	2.32E-01		1.29E-01 ±	1.69E-01	2.70E-01
12/09/14		-1.17E-02 ±	2.03E-01	3.34E-01		1.81E-03 ±	1.86E-01	3.06E-01

TABLE A-11.2  
**IODINE 131 IN MILK - SUMMARY**

Results in pCi/liter, decay corrected to sample collection time

Location	Average Activity	Activity Low	Activity High	Average MDA	Number Samples	Number Positive IDs
Indicator- St 36	1.75E-02	-1.19E-01	1.29E-01	3.25E-01	18	0
Control - St 9b	4.79E-03	-1.51E-01	1.24E-01	3.20E-01	18	0

TABLE A-12.1  
**GAMMA SPECTROMETRY RESULTS OF MILK**  
**STATION 9b - CONTROL**

Results in pCi per liter

Collection Date: 1/7/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.53E+00 ±	3.46E+00	5.41E+00
CO-60		-5.55E-01 ±	1.03E+01	6.98E+00
ZN-65		6.98E-01 ±	7.88E+00	1.28E+01
MN-54		-3.94E-01 ±	3.71E+00	6.02E+00
CS-134		-5.65E-01 ±	3.55E+00	5.74E+00
CS-137		-9.20E-01 ±	3.85E+00	6.15E+00
BALA140		1.49E-01 ±	4.49E+00	7.34E+00
K-40	+	1.45E+03 ±	1.41E+02	7.30E+01
FE-59		2.34E-01 ±	8.28E+00	1.35E+01
ZRNB-95		7.12E-01 ±	4.81E+00	7.73E+00
BE-7		5.10E-01 ±	1.80E+01	2.94E+01

Collection Date: 2/4/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.34E+00 ±	3.74E+00	5.94E+00
CO-60		-1.27E+00 ±	5.27E+01	9.26E+00
ZN-65		-3.08E+00 ±	9.75E+00	1.55E+01
MN-54		-3.72E-01 ±	3.16E+00	5.12E+00
CS-134		7.53E-01 ±	3.29E+00	5.28E+00
CS-137		-1.05E+00 ±	3.31E+00	5.23E+00
BALA140		-1.59E+00 ±	4.61E+00	7.16E+00
K-40	+	1.53E+03 ±	1.38E+02	6.96E+01
FE-59		-1.99E+00 ±	8.59E+00	1.36E+01
ZRNB-95		1.65E-01 ±	5.06E+00	8.28E+00
BE-7		1.18E+01 ±	2.57E+01	4.02E+01

Collection Date: 3/11/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.10E+00 ±	4.26E+00	6.85E+00
CO-60		-1.49E+00 ±	5.10E+01	7.37E+00
ZN-65		-3.63E+00 ±	9.32E+00	1.46E+01
MN-54		1.57E-01 ±	2.86E+00	4.66E+00
CS-134		-5.55E-02 ±	3.24E+00	5.32E+00
CS-137		-3.81E-01 ±	3.51E+00	5.68E+00
BALA140		4.11E-01 ±	4.00E+00	6.45E+00
K-40	+	1.29E+03 ±	1.35E+02	7.78E+01
FE-59		9.37E-01 ±	8.83E+00	1.43E+01
ZRNB-95		2.61E+00 ±	5.99E+00	9.30E+00
BE-7		0.00E+00 ±	1.44E+01	2.37E+01

Collection Date: 4/1/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.40E+00 ±	3.67E+00	5.80E+00
CO-60		-9.23E-01 ±	2.47E+01	6.91E+00
ZN-65		0.00E+00 ±	1.11E+01	1.83E+01
MN-54		-7.14E-03 ±	3.48E+00	5.73E+00
CS-134		-6.66E-01 ±	2.83E+00	4.51E+00
CS-137		-8.71E-02 ±	3.34E+00	5.48E+00
BALA140		-1.36E+00 ±	4.49E+00	6.95E+00
K-40	+	1.37E+03 ±	1.38E+02	7.36E+01
FE-59		-1.79E+00 ±	1.15E+01	1.85E+01
ZRNB-95		-1.00E+00 ±	6.12E+00	9.86E+00
BE-7		-5.15E-02 ±	2.27E+01	3.73E+01

Collection Date: 4/15/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-3.46E-02 ±	2.75E+00	4.51E+00
CO-60		1.14E+00 ±	3.78E+00	5.92E+00
ZN-65		-2.37E+00 ±	9.48E+00	1.51E+01
MN-54		5.78E-01 ±	3.63E+00	5.85E+00
CS-134		-2.06E+00 ±	4.17E+00	6.54E+00
CS-137		2.16E+00 ±	3.55E+00	5.36E+00
BALA140		-1.44E+00 ±	4.91E+00	7.67E+00
K-40	+	1.39E+03 ±	1.42E+02	8.30E+01
FE-59		-5.42E-01 ±	1.07E+01	1.74E+01
ZRNB-95		2.07E+00 ±	5.65E+00	8.80E+00
BE-7		-1.76E+00 ±	2.55E+01	4.16E+01

Collection Date: 5/6/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.88E+00 ±	3.62E+00	5.63E+00
CO-60		-1.27E+00 ±	2.93E+03	8.00E+00
ZN-65		-2.56E+00 ±	8.91E+00	1.41E+01
MN-54		-2.62E-02 ±	3.09E+00	5.07E+00
CS-134		1.47E-01 ±	3.07E+00	5.01E+00
CS-137		-2.59E-01 ±	3.34E+00	5.43E+00
BALA140		0.00E+00 ±	4.73E+00	7.78E+00
K-40	+	1.43E+03 ±	1.41E+02	7.57E+01
FE-59		-1.69E+00 ±	8.90E+00	1.42E+01
ZRNB-95		-1.98E-01 ±	6.24E+00	1.02E+01
BE-7		1.30E+01 ±	2.31E+01	3.53E+01

TABLE A-12.1  
**GAMMA SPECTROMETRY RESULTS OF MILK**  
**STATION 9b - CONTROL**

Results in pCi per liter

Collection Date: 5/27/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.03E+00 ±	3.63E+00	5.79E+00
CO-60		-6.46E-01 ±	1.26E+01	7.14E+00
ZN-65		0.00E+00 ±	1.41E+01	2.32E+01
MN-54		-5.09E-01 ±	4.03E+00	6.53E+00
CS-134		-4.21E-01 ±	3.01E+00	4.87E+00
CS-137		1.89E+00 ±	3.18E+00	4.79E+00
BALA140		-6.77E-01 ±	3.65E+00	5.74E+00
K-40	+	1.43E+03 ±	1.39E+02	7.19E+01
FE-59		-3.62E+00 ±	1.08E+01	1.70E+01
ZRNB-95		2.24E-01 ±	5.57E+00	9.11E+00
BE-7		-8.77E-02 ±	2.33E+01	3.83E+01

Collection Date: 6/10/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-3.98E-01 ±	3.53E+00	5.74E+00
CO-60		8.87E-01 ±	3.88E+00	6.47E+00
ZN-65		0.00E+00 ±	1.41E+01	2.32E+01
MN-54		-2.19E-01 ±	2.20E+00	3.54E+00
CS-134		5.27E-01 ±	3.23E+00	5.21E+00
CS-137		-6.34E-02 ±	3.17E+00	5.19E+00
BALA140		2.31E-01 ±	3.64E+00	5.90E+00
K-40	+	1.38E+03 ±	1.40E+02	7.82E+01
FE-59		-7.59E-01 ±	7.54E+00	1.22E+01
ZRNB-95		-1.50E+00 ±	5.72E+00	9.07E+00
BE-7		-2.95E+00 ±	2.52E+01	4.09E+01

Collection Date: 6/24/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.23E+00 ±	4.29E+00	6.86E+00
CO-60		-2.75E-02 ±	4.60E+00	7.55E+00
ZN-65		-2.61E+00 ±	9.96E+00	1.59E+01
MN-54		-3.57E-01 ±	3.66E+00	5.94E+00
CS-134		0.00E+00 ±	5.33E+00	8.77E+00
CS-137		-1.05E+00 ±	3.97E+00	6.33E+00
BALA140		-2.53E-01 ±	4.24E+00	6.89E+00
K-40	+	1.51E+03 ±	1.42E+02	7.31E+01
FE-59		2.13E-01 ±	1.09E+01	1.79E+01
ZRNB-95		2.31E-01 ±	5.08E+00	8.29E+00
BE-7		0.00E+00 ±	3.18E+01	5.23E+01

Collection Date: 7/8/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.45E+00 ±	3.33E+00	5.21E+00
CO-60		-1.37E+00 ±	1.04E+02	7.38E+00
ZN-65		7.84E-01 ±	8.24E+00	1.34E+01
MN-54		-7.02E-01 ±	3.55E+00	5.70E+00
CS-134		-1.18E+00 ±	3.58E+00	5.69E+00
CS-137		-1.08E+00 ±	3.37E+00	5.31E+00
BALA140		-1.05E+00 ±	4.37E+00	6.86E+00
K-40	+	1.36E+03 ±	1.37E+02	7.33E+01
FE-59		-2.29E+00 ±	9.87E+00	1.57E+01
ZRNB-95		0.00E+00 ±	5.53E+00	9.10E+00
BE-7		1.84E+00 ±	2.52E+01	4.11E+01

Collection Date: 7/22/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.25E+00 ±	4.31E+00	6.89E+00
CO-60		1.52E+00 ±	4.33E+00	6.77E+00
ZN-65		3.24E-01 ±	8.85E+00	1.45E+01
MN-54		4.97E-01 ±	3.44E+00	5.55E+00
CS-134		-1.96E+00 ±	4.18E+00	6.58E+00
CS-137		-1.13E+00 ±	4.31E+00	6.88E+00
BALA140		0.00E+00 ±	1.14E+00	1.88E+00
K-40	+	1.33E+03 ±	1.39E+02	8.32E+01
FE-59		-1.50E+00 ±	1.04E+01	1.68E+01
ZRNB-95		-3.72E-02 ±	5.52E+00	9.06E+00
BE-7		0.00E+00 ±	4.31E+01	7.10E+01

Collection Date: 8/5/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.57E+00 ±	4.95E+00	7.93E+00
CO-60		5.47E-01 ±	4.55E+00	7.36E+00
ZN-65		-3.99E+00 ±	1.03E+01	1.62E+01
MN-54		1.72E+00 ±	3.76E+00	5.82E+00
CS-134		1.69E-01 ±	3.65E+00	5.96E+00
CS-137		-5.57E-02 ±	3.99E+00	6.56E+00
BALA140		2.27E+00 ±	3.65E+00	5.11E+00
K-40	+	1.55E+03 ±	1.51E+02	8.98E+01
FE-59		-1.18E-02 ±	1.04E+01	1.70E+01
ZRNB-95		0.00E+00 ±	6.23E+00	1.02E+01
BE-7		-1.26E+01 ±	3.11E+01	4.90E+01

TABLE A-12.1  
**GAMMA SPECTROMETRY RESULTS OF MILK**  
**STATION 9b - CONTROL**

Results in pCi per liter

Collection Date: 8/19/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.01E+00 ±	3.14E+00	4.96E+00
CO-60		-1.53E+00 ±	4.93E+01	8.16E+00
ZN-65		4.51E-01 ±	7.24E+00	1.18E+01
MN-54		-1.72E-01 ±	3.53E+00	5.76E+00
CS-134		-6.75E-01 ±	3.48E+00	5.61E+00
CS-137		2.20E-01 ±	3.30E+00	5.38E+00
BALA140		-2.48E-01 ±	3.55E+00	5.75E+00
K-40	+	1.37E+03 ±	1.37E+02	7.30E+01
FE-59		-2.63E+00 ±	1.04E+01	1.64E+01
ZRNB-95		-2.10E+00 ±	5.95E+00	9.33E+00
BE-7		-3.33E+00 ±	2.24E+01	3.62E+01

Collection Date: 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.93E+00 ±	4.25E+00	6.71E+00
CO-60		-1.88E+00 ±	2.19E+01	7.46E+00
ZN-65		-2.17E+00 ±	8.62E+00	1.37E+01
MN-54		0.00E+00 ±	3.89E+00	6.40E+00
CS-134		2.35E-01 ±	2.99E+00	4.87E+00
CS-137		-6.91E-01 ±	3.09E+00	4.91E+00
BALA140		-1.38E+00 ±	5.03E+00	7.90E+00
K-40	+	1.40E+03 ±	1.39E+02	7.36E+01
FE-59		-2.61E+00 ±	1.16E+01	1.86E+01
ZRNB-95		3.23E+00 ±	5.64E+00	8.53E+00
BE-7		-1.07E+01 ±	2.32E+01	3.60E+01

Collection Date: 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.29E+00 ±	3.95E+00	6.28E+00
CO-60		-5.50E-01 ±	4.46E+00	7.21E+00
ZN-65		-5.83E-01 ±	8.70E+00	1.42E+01
MN-54		4.43E-01 ±	3.14E+00	5.05E+00
CS-134		1.66E-01 ±	2.07E+00	3.35E+00
CS-137		5.71E-01 ±	3.58E+00	5.76E+00
BALA140		3.69E-02 ±	3.52E+00	5.77E+00
K-40	+	1.55E+03 ±	1.57E+02	1.01E+02
FE-59		2.16E+00 ±	9.82E+00	1.56E+01
ZRNB-95		-1.94E+00 ±	6.93E+00	1.10E+01
BE-7		-9.39E+00 ±	2.98E+01	4.74E+01

Collection Date: 10/7/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		2.77E+00 ±	3.47E+00	5.21E+00
CO-60		2.73E-01 ±	4.55E+00	7.68E+00
ZN-65		-2.92E+00 ±	9.28E+00	1.47E+01
MN-54		1.63E+00 ±	3.16E+00	4.80E+00
CS-134		1.07E+00 ±	2.40E+00	3.68E+00
CS-137		0.00E+00 ±	4.04E+00	6.65E+00
BALA140		-3.45E-01 ±	4.36E+00	7.07E+00
K-40	+	1.32E+03 ±	1.31E+02	6.34E+01
FE-59		-1.11E+00 ±	9.80E+00	1.58E+01
ZRNB-95		-1.11E+00 ±	5.09E+00	8.10E+00
BE-7		-2.48E-01 ±	2.27E+01	3.73E+01

Collection Date: 11/11/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.08E+00 ±	3.76E+00	6.01E+00
CO-60		-9.36E-01 ±	2.76E+01	7.31E+00
ZN-65		1.38E+00 ±	7.42E+00	1.19E+01
MN-54		0.00E+00 ±	3.24E+00	5.33E+00
CS-134		-5.94E-01 ±	3.09E+00	4.97E+00
CS-137		-1.64E-01 ±	3.31E+00	5.41E+00
BALA140		-1.29E+00 ±	4.32E+00	6.70E+00
K-40	+	1.49E+03 ±	1.42E+02	6.95E+01
FE-59		5.60E-01 ±	8.27E+00	1.34E+01
ZRNB-95		-2.06E+00 ±	6.36E+00	1.00E+01
BE-7		5.78E-01 ±	2.59E+01	4.25E+01

Collection Date: 12/9/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		3.41E-02 ±	3.96E+00	6.51E+00
CO-60		1.21E+00 ±	4.49E+00	7.12E+00
ZN-65		-3.54E+00 ±	1.00E+01	1.58E+01
MN-54		5.92E-01 ±	3.31E+00	5.30E+00
CS-134		-9.34E-01 ±	3.38E+00	5.38E+00
CS-137		-9.88E-01 ±	3.95E+00	6.31E+00
BALA140		0.00E+00 ±	7.19E+00	1.18E+01
K-40	+	1.56E+03 ±	1.56E+02	9.64E+01
FE-59		9.64E-02 ±	9.56E+00	1.57E+01
ZRNB-95		-1.24E+00 ±	6.43E+00	1.03E+01
BE-7		-9.62E+00 ±	3.20E+01	5.11E+01

TABLE A-12.1  
**GAMMA SPECTROMETRY RESULTS OF MILK**  
**STATION 36 - INDICATOR**

Results in pCi per liter

Collection Date: 1/7/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-3.12E-01 ±	3.58E+00	5.83E+00
CO-60		-3.06E+00 ±	1.03E+01	7.19E+00
ZN-65		-8.95E-02 ±	7.41E+00	1.22E+01
MN-54		-7.39E-01 ±	3.67E+00	5.88E+00
CS-134		6.17E-01 ±	3.19E+00	5.13E+00
CS-137		6.08E-01 ±	3.30E+00	5.29E+00
BALA140		1.18E-01 ±	3.49E+00	5.70E+00
K-40	+	1.38E+03 ±	1.36E+02	6.87E+01
FE-59		-7.63E-01 ±	9.62E+00	1.56E+01
ZRNB-95		1.31E+00 ±	4.70E+00	7.38E+00
BE-7		2.62E+00 ±	2.36E+01	3.83E+01

Collection Date: 2/4/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.29E+00 ±	4.39E+00	7.03E+00
CO-60		1.00E+00 ±	3.91E+00	6.18E+00
ZN-65		9.89E-02 ±	7.56E+00	1.24E+01
MN-54		-4.69E-01 ±	3.87E+00	6.27E+00
CS-134		9.84E-01 ±	3.31E+00	5.26E+00
CS-137		-8.62E-01 ±	3.52E+00	5.59E+00
BALA140		7.15E-01 ±	3.33E+00	5.19E+00
K-40	+	1.48E+03 ±	1.44E+02	8.13E+01
FE-59		-3.05E+00 ±	9.82E+00	1.54E+01
ZRNB-95		2.57E-02 ±	5.60E+00	9.20E+00
BE-7		-7.61E+00 ±	2.59E+01	4.11E+01

Collection Date: 3/11/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.47E-01 ±	5.07E+00	8.31E+00
CO-60		2.93E+00 ±	4.51E+00	6.76E+00
ZN-65		-3.58E+00 ±	8.86E+00	1.38E+01
MN-54		5.42E-01 ±	3.45E+00	5.54E+00
CS-134		-1.35E+00 ±	3.72E+00	5.89E+00
CS-137		0.00E+00 ±	3.50E+00	5.76E+00
BALA140		-1.15E+00 ±	4.52E+00	7.09E+00
K-40	+	1.42E+03 ±	1.47E+02	9.13E+01
FE-59		-2.57E+00 ±	1.05E+01	1.66E+01
ZRNB-95		-2.43E+00 ±	6.50E+00	1.02E+01
BE-7		3.85E-01 ±	3.04E+01	5.00E+01

Collection Date: 4/1/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		3.57E+00 ±	4.06E+00	6.08E+00
CO-60		3.00E-01 ±	4.19E+00	6.82E+00
ZN-65		-2.00E+00 ±	9.96E+00	1.60E+01
MN-54		-6.98E-01 ±	3.92E+00	6.31E+00
CS-134		-8.46E-01 ±	3.46E+00	5.54E+00
CS-137		-2.68E-03 ±	3.75E+00	6.18E+00
BALA140		-2.17E+00 ±	5.31E+00	8.17E+00
K-40	+	1.48E+03 ±	1.46E+02	8.32E+01
FE-59		2.77E+00 ±	1.00E+01	1.58E+01
ZRNB-95		1.95E-01 ±	5.63E+00	9.22E+00
BE-7		1.10E+01 ±	2.41E+01	3.74E+01

Collection Date: 4/15/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-4.65E-01 ±	4.03E+00	6.55E+00
CO-60		-3.01E-02 ±	3.74E+00	6.14E+00
ZN-65		-1.07E+00 ±	8.52E+00	1.38E+01
MN-54		-5.10E-01 ±	3.46E+00	5.58E+00
CS-134		-4.99E-01 ±	4.07E+00	6.61E+00
CS-137		-2.62E-01 ±	3.88E+00	6.34E+00
BALA140		-5.74E-03 ±	3.87E+00	6.35E+00
K-40	+	1.57E+03 ±	1.47E+02	7.81E+01
FE-59		-3.58E+00 ±	1.16E+01	1.83E+01
ZRNB-95		9.25E-01 ±	6.38E+00	1.03E+01
BE-7		3.93E+00 ±	2.93E+01	4.75E+01

Collection Date: 5/6/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.52E+00 ±	4.54E+00	7.24E+00
CO-60		4.34E-02 ±	4.11E+00	6.74E+00
ZN-65		2.60E+00 ±	7.77E+00	1.21E+01
MN-54		-3.88E-02 ±	2.92E+00	4.80E+00
CS-134		-3.59E-02 ±	3.19E+00	5.24E+00
CS-137		-1.35E+00 ±	3.60E+00	5.63E+00
BALA140		0.00E+00 ±	6.85E+00	1.13E+01
K-40	+	1.48E+03 ±	1.41E+02	7.31E+01
FE-59		7.05E+00 ±	7.91E+00	1.06E+01
ZRNB-95		5.48E-01 ±	5.03E+00	8.12E+00
BE-7		8.89E-01 ±	2.46E+01	4.02E+01

TABLE A-12.1  
**GAMMA SPECTROMETRY RESULTS OF MILK**  
**STATION 36 - INDICATOR**

Results in pCi per liter

Collection Date: 5/27/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-7.17E-01 ±	3.77E+00	6.09E+00
CO-60		1.11E+00 ±	4.32E+00	7.14E+00
ZN-65		-3.44E+00 ±	9.28E+00	1.46E+01
MN-54		0.00E+00 ±	4.58E+00	7.54E+00
CS-134		1.99E+00 ±	3.14E+00	4.77E+00
CS-137		-8.77E-01 ±	3.51E+00	5.59E+00
BALA140		-1.21E+00 ±	4.11E+00	6.36E+00
K-40	+	1.52E+03 ±	1.43E+02	6.87E+01
FE-59		-3.77E-01 ±	9.57E+00	1.56E+01
ZRNB-95		-8.05E-01 ±	5.58E+00	8.99E+00
BE-7		-7.68E+00 ±	2.43E+01	3.84E+01

Collection Date: 6/10/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-6.55E-01 ±	4.48E+00	7.27E+00
CO-60		-3.48E-01 ±	4.73E+00	7.71E+00
ZN-65		1.33E-01 ±	7.52E+00	1.23E+01
MN-54		-9.19E-01 ±	3.86E+00	6.16E+00
CS-134		-2.27E-01 ±	3.71E+00	6.07E+00
CS-137		1.08E-01 ±	3.77E+00	6.17E+00
BALA140		-1.17E-01 ±	1.40E+00	2.18E+00
K-40	+	1.54E+03 ±	1.44E+02	7.31E+01
FE-59		0.00E+00 ±	2.07E+00	3.41E+00
ZRNB-95		0.00E+00 ±	6.94E+00	1.14E+01
BE-7		3.44E+00 ±	2.29E+01	3.69E+01

Collection Date: 6/24/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		4.90E-01 ±	3.40E+00	5.50E+00
CO-60		-1.27E+00 ±	6.29E+01	1.19E+01
ZN-65		3.03E+00 ±	8.07E+00	1.26E+01
MN-54		3.55E-01 ±	3.26E+00	5.28E+00
CS-134		-1.92E-01 ±	3.37E+00	5.51E+00
CS-137		-9.47E-02 ±	3.01E+00	4.93E+00
BALA140		-9.84E-01 ±	4.16E+00	6.51E+00
K-40	+	1.40E+03 ±	1.41E+02	7.59E+01
FE-59		0.00E+00 ±	1.04E+01	1.72E+01
ZRNB-95		0.00E+00 ±	6.94E+00	1.14E+01
BE-7		1.19E+01 ±	2.38E+01	3.67E+01

Collection Date: 7/8/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.31E+00 ±	4.83E+00	7.76E+00
CO-60		1.30E-01 ±	3.92E+00	6.42E+00
ZN-65		4.55E-02 ±	8.17E+00	1.34E+01
MN-54		-1.60E-01 ±	3.47E+00	5.66E+00
CS-134		4.00E-01 ±	3.58E+00	5.82E+00
CS-137		3.31E+00 ±	3.66E+00	5.29E+00
BALA140		0.00E+00 ±	4.82E+00	7.93E+00
K-40	+	1.33E+03 ±	1.42E+02	9.13E+01
FE-59		-3.52E+00 ±	1.15E+01	1.82E+01
ZRNB-95		-2.27E+00 ±	6.51E+00	1.02E+01
BE-7		-3.74E+00 ±	2.70E+01	4.37E+01

Collection Date: 7/22/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.31E+00 ±	3.64E+00	5.76E+00
CO-60		9.44E-01 ±	3.71E+00	6.18E+00
ZN-65		-3.55E+00 ±	9.29E+00	1.46E+01
MN-54		-1.17E+00 ±	3.40E+00	5.34E+00
CS-134		-7.32E-01 ±	3.10E+00	4.95E+00
CS-137		-9.70E-03 ±	3.81E+00	6.26E+00
BALA140		0.00E+00 ±	1.13E+00	1.85E+00
K-40	+	1.53E+03 ±	1.46E+02	7.83E+01
FE-59		-4.06E+00 ±	1.13E+01	1.77E+01
ZRNB-95		2.80E-01 ±	5.37E+00	8.77E+00
BE-7		-9.05E+00 ±	2.95E+01	4.70E+01

Collection Date: 8/5/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-1.42E+00 ±	4.35E+00	6.93E+00
CO-60		1.02E+00 ±	4.24E+00	6.73E+00
ZN-65		-3.44E+00 ±	9.13E+00	1.43E+01
MN-54		0.00E+00 ±	4.38E+00	7.20E+00
CS-134		2.13E+00 ±	3.03E+00	4.53E+00
CS-137		4.31E-01 ±	3.31E+00	5.35E+00
BALA140		2.99E-01 ±	4.29E+00	6.95E+00
K-40	+	1.29E+03 ±	1.35E+02	8.08E+01
FE-59		2.39E-01 ±	8.28E+00	1.35E+01
ZRNB-95		-2.65E+00 ±	8.10E+00	1.29E+01
BE-7		1.47E+01 ±	2.77E+01	4.28E+01



TABLE A-12.1  
**GAMMA SPECTROMETRY RESULTS OF MILK**  
**STATION 36 - INDICATOR**

Results in pCi per liter

Collection Date: 8/19/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-2.52E+00 ±	5.04E+00	7.94E+00
CO-60		1.25E+00 ±	4.25E+00	6.70E+00
ZN-65		6.79E-01 ±	8.10E+00	1.32E+01
MN-54		4.94E-02 ±	3.59E+00	5.89E+00
CS-134		3.30E-01 ±	3.82E+00	6.23E+00
CS-137		2.46E-01 ±	3.12E+00	5.07E+00
BALA140		1.12E-02 ±	3.78E+00	6.20E+00
K-40	+	1.42E+03 ±	1.38E+02	7.31E+01
FE-59		1.01E+00 ±	8.41E+00	1.35E+01
ZRNB-95		-2.71E-01 ±	6.79E+00	1.11E+01
BE-7		-7.47E+00 ±	2.92E+01	4.68E+01

Collection Date: 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-7.89E-01 ±	4.31E+00	6.97E+00
CO-60		-2.04E-01 ±	5.27E+00	8.63E+00
ZN-65		-1.47E+00 ±	9.09E+00	1.46E+01
MN-54		-3.10E-01 ±	3.60E+00	5.85E+00
CS-134		-2.26E-02 ±	3.21E+00	5.27E+00
CS-137		3.69E-01 ±	3.65E+00	5.93E+00
BALA140		-4.24E-02 ±	4.25E+00	6.98E+00
K-40	+	1.44E+03 ±	1.46E+02	8.75E+01
FE-59		2.47E+00 ±	9.78E+00	1.55E+01
ZRNB-95		-1.97E+00 ±	7.13E+00	1.14E+01
BE-7		0.00E+00 ±	2.82E+01	4.63E+01

Collection Date: 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		1.36E-01 ±	3.46E+00	5.67E+00
CO-60		2.81E+00 ±	4.31E+00	6.75E+00
ZN-65		-2.14E+00 ±	9.15E+00	1.46E+01
MN-54		-6.80E-01 ±	3.71E+00	5.96E+00
CS-134		1.41E+00 ±	2.75E+00	4.21E+00
CS-137		-7.57E-04 ±	3.41E+00	5.62E+00
BALA140		0.00E+00 ±	6.70E+00	1.10E+01
K-40	+	1.37E+03 ±	1.36E+02	7.10E+01
FE-59		4.53E-01 ±	6.99E+00	1.13E+01
ZRNB-95		-1.48E+00 ±	6.04E+00	9.62E+00
BE-7		-9.92E+00 ±	2.52E+01	3.96E+01

Collection Date: 10/7/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-5.05E-01 ±	3.86E+00	6.27E+00
CO-60		-1.80E+00 ±	2.80E+01	8.42E+00
ZN-65		0.00E+00 ±	1.32E+01	2.17E+01
MN-54		1.29E-01 ±	2.94E+00	4.80E+00
CS-134		1.43E+00 ±	3.15E+00	4.90E+00
CS-137		-4.57E-01 ±	3.14E+00	5.06E+00
BALA140		-1.42E+00 ±	4.30E+00	6.63E+00
K-40	+	1.33E+03 ±	1.40E+02	8.42E+01
FE-59		-6.16E-01 ±	9.91E+00	1.61E+01
ZRNB-95		-1.62E+00 ±	5.67E+00	8.97E+00
BE-7		-1.15E+01 ±	3.24E+01	5.17E+01

Collection Date: 11/11/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		-5.17E-02 ±	4.82E+00	7.91E+00
CO-60		-6.76E-01 ±	4.12E+00	6.62E+00
ZN-65		1.55E+00 ±	7.79E+00	1.24E+01
MN-54		1.09E+00 ±	3.34E+00	5.23E+00
CS-134		0.00E+00 ±	6.68E+00	1.10E+01
CS-137		1.28E+00 ±	3.35E+00	5.20E+00
BALA140		0.00E+00 ±	1.14E+00	1.88E+00
K-40	+	1.35E+03 ±	1.38E+02	7.84E+01
FE-59		1.97E+00 ±	9.17E+00	1.46E+01
ZRNB-95		-1.78E+00 ±	6.33E+00	1.00E+01
BE-7		-2.23E+00 ±	2.34E+01	3.80E+01

Collection Date: 12/9/2014				
Nuclide	RQ	Activity	Error	MDA
BA-133		6.30E-02 ±	3.32E+00	5.45E+00
CO-60		-2.05E+00 ±	2.03E+01	8.17E+00
ZN-65		1.93E+00 ±	8.48E+00	1.35E+01
MN-54		1.70E+00 ±	3.08E+00	4.65E+00
CS-134		-5.04E-01 ±	3.04E+00	4.90E+00
CS-137		1.84E-01 ±	3.60E+00	5.88E+00
BALA140		2.90E-01 ±	3.90E+00	6.31E+00
K-40	+	1.45E+03 ±	1.41E+02	7.33E+01
FE-59		1.65E+00 ±	9.32E+00	1.49E+01
ZRNB-95		0.00E+00 ±	6.87E+00	1.13E+01
BE-7		7.49E+00 ±	2.46E+01	3.91E+01

TABLE A-12.2  
**GAMMA SPECTROMETRY RESULTS OF MILK - SUMMARY**  
 Results in pCi per liter

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BA-133	Ind	-1.56E-01	-2.52E+00	3.57E+00	6.35E+00	18	0
BA-133	Cntl	2.51E-01	-1.93E+00	2.77E+00	5.70E+00	18	0
BALA140	Ind	-3.15E-01	-2.17E+00	7.15E-01	6.03E+00	18	0
BALA140	Cntl	-3.63E-01	-1.59E+00	2.27E+00	6.35E+00	18	0
BE-7	Ind	-1.55E-01	-1.15E+01	1.47E+01	4.01E+01	18	0
BE-7	Cntl	-1.28E+00	-1.26E+01	1.30E+01	3.95E+01	18	0
CO-60	Ind	1.17E-01	-3.06E+00	2.93E+00	6.90E+00	18	0
CO-60	Cntl	-3.82E-01	-1.88E+00	1.52E+00	6.95E+00	18	0
CS-134	Ind	2.72E-01	-1.35E+00	2.13E+00	5.36E+00	18	0
CS-134	Cntl	-3.36E-01	-2.06E+00	1.07E+00	5.12E+00	18	0
CS-137	Ind	1.46E-01	-1.35E+00	3.31E+00	5.32E+00	18	0
CS-137	Cntl	-1.70E-01	-1.13E+00	2.16E+00	5.41E+00	18	0
FE-59	Ind	-5.13E-02	-4.06E+00	7.05E+00	1.39E+01	18	0
FE-59	Cntl	-9.08E-01	-3.62E+00	2.16E+00	1.49E+01	18	0
K-40	Ind	1.43E+03	1.29E+03	1.57E+03	7.43E+01	18	18
K-40	Cntl	1.43E+03	1.29E+03	1.56E+03	7.37E+01	18	18
MN-54	Ind	-1.02E-01	-1.17E+00	1.70E+00	5.47E+00	18	0
MN-54	Cntl	1.59E-01	-7.02E-01	1.72E+00	5.17E+00	18	0
ZN-65	Ind	-5.95E-01	-3.58E+00	3.03E+00	1.33E+01	18	0
ZN-65	Cntl	-1.32E+00	-3.99E+00	1.38E+00	1.47E+01	18	0
ZRNB-95	Ind	-6.67E-01	-2.65E+00	1.31E+00	9.50E+00	18	0
ZRNB-95	Cntl	-1.08E-01	-2.10E+00	3.23E+00	8.76E+00	18	0

TABLE A-15.1  
**GAMMA SPECTROMETRY RESULTS OF ROOT CROPS**

Results in pCi/ kilogram (wet)

**Station 37 is Indicator - Station 9c is Control**

Station 37 Potato collected 7/8/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	3.60E+03 ±	3.36E+02	2.55E+02
MN-54		-7.43E-02 ±	1.06E+01	1.75E+01
CO-58		-1.03E+00 ±	1.03E+01	1.68E+01
FE-59		6.16E+00 ±	2.50E+01	3.99E+01
CO-60		5.23E+00 ±	1.11E+01	1.73E+01
ZN-65		-1.43E+01 ±	2.74E+01	4.32E+01
ZRNB-95		7.88E+00 ±	1.55E+01	2.41E+01
I-131		-5.08E+00 ±	1.11E+01	1.76E+01
CS-134		-3.26E-01 ±	1.16E+01	1.90E+01
CS-137		1.09E+01 ±	8.11E+00	1.11E+01
BALA140		3.32E-01 ±	1.26E+01	2.07E+01

Station 37 Onion collected 8/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	9.29E+02 ±	1.61E+02	1.82E+02
MN-54		2.93E+00 ±	6.49E+00	1.01E+01
CO-58		4.45E+00 ±	6.28E+00	9.45E+00
FE-59		-4.06E+00 ±	2.10E+01	3.38E+01
CO-60		3.50E+00 ±	7.31E+00	1.13E+01
ZN-65		2.75E+00 ±	1.09E+01	1.72E+01
ZRNB-95		8.65E+00 ±	1.25E+01	1.92E+01
I-131		3.69E-01 ±	9.07E+00	1.49E+01
CS-134		-6.18E+00 ±	9.78E+00	1.54E+01
CS-137		1.25E+00 ±	8.40E+00	1.36E+01
BALA140		-1.24E+00 ±	1.02E+01	1.65E+01

Station 37 Potato collected 7/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	3.73E+03 ±	2.96E+02	1.19E+02
MN-54		-7.40E-01 ±	5.92E+00	9.57E+00
CO-58		1.41E-01 ±	4.46E+00	7.29E+00
FE-59		-7.27E-03 ±	1.38E+01	2.27E+01
CO-60		-2.71E+00 ±	9.39E+00	1.49E+01
ZN-65		3.35E+00 ±	1.50E+01	2.40E+01
ZRNB-95		0.00E+00 ±	1.31E+01	2.16E+01
I-131		-2.16E-01 ±	4.40E+00	7.19E+00
CS-134		8.14E-01 ±	4.67E+00	7.50E+00
CS-137		2.03E+00 ±	4.54E+00	6.86E+00
BALA140		1.92E+00 ±	4.35E+00	6.06E+00

Station 37 Onion collected 8/26/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.54E+03 ±	2.12E+02	1.22E+02
MN-54		1.03E-02 ±	5.92E+00	9.72E+00
CO-58		-7.88E-01 ±	6.84E+00	1.11E+01
FE-59		-3.42E+00 ±	1.76E+01	2.79E+01
CO-60		2.25E-01 ±	3.88E+00	6.26E+00
ZN-65		-3.13E+00 ±	1.58E+01	2.51E+01
ZRNB-95		2.34E+00 ±	9.29E+00	1.46E+01
I-131		1.08E+00 ±	4.49E+00	7.11E+00
CS-134		-1.28E+00 ±	6.59E+00	1.06E+01
CS-137		-1.58E+00 ±	5.79E+00	9.06E+00
BALA140		0.00E+00 ±	2.35E+00	3.86E+00

Station 37 Potato collected 9/9/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	3.20E+03 ±	2.77E+02	2.01E+02
MN-54		-3.17E-01 ±	7.28E+00	1.19E+01
CO-58		0.00E+00 ±	8.43E+00	1.39E+01
FE-59		8.14E-01 ±	1.86E+01	3.05E+01
CO-60		-1.85E+00 ±	8.66E+00	1.39E+01
ZN-65		-5.74E+00 ±	2.16E+01	3.47E+01
ZRNB-95		3.99E+00 ±	9.40E+00	1.46E+01
I-131		-2.47E+00 ±	9.08E+00	1.47E+01
CS-134		3.45E-01 ±	7.56E+00	1.24E+01
CS-137		-5.28E+00 ±	9.74E+00	1.54E+01
BALA140		0.00E+00 ±	1.48E+01	2.44E+01

TABLE A - 15.2  
**GAMMA SPECTROMETRY RESULTS OF ROOT CROPS- SUMMARY**

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	2.01E-01	-1.24E+00	1.92E+00	1.43E+01	5	0
CO-58	Ind	5.54E-01	-1.03E+00	4.45E+00	1.17E+01	5	0
CO-60	Ind	8.78E-01	-2.71E+00	5.23E+00	1.27E+01	5	0
CS-134	Ind	-1.32E+00	-6.18E+00	8.14E-01	1.30E+01	5	0
CS-137	Ind	1.46E+00	-5.28E+00	1.09E+01	1.12E+01	5	0
FE-59	Ind	-1.01E-01	-4.06E+00	6.16E+00	3.10E+01	5	0
I-131	Ind	-1.26E+00	-5.08E+00	1.08E+00	1.23E+01	5	0
K-40	Ind	2.60E+03	9.29E+02	3.73E+03	1.76E+02	5	5
MN-54	Ind	3.61E-01	-7.40E-01	2.93E+00	1.18E+01	5	0
ZN-65	Ind	-3.42E+00	-1.43E+01	3.35E+00	2.88E+01	5	0
ZRNB-95	Ind	4.57E+00	0.00E+00	8.65E+00	1.88E+01	5	0

TABLE A-16.1  
**GAMMA SPECTROMETRY RESULTS OF FRUITS**

Results in pCi/ kilogram (wet)

**Station 37 is Indicator - Station 9c is Control**

Station 37 Peaches collected 7/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.84E+03 ±	2.25E+02	1.78E+02
MN-54		1.67E+00 ±	7.77E+00	1.25E+01
CO-58		2.10E+00 ±	7.22E+00	1.15E+01
FE-59		1.01E+00 ±	1.56E+01	2.54E+01
CO-60		-5.91E-01 ±	1.16E+01	1.58E+01
ZN-65		9.47E+00 ±	1.68E+01	2.57E+01
ZRNB-95		2.17E-01 ±	1.45E+01	2.38E+01
I-131		-2.28E-01 ±	8.04E+00	1.32E+01
CS-134		3.63E+00 ±	9.06E+00	1.44E+01
CS-137		2.92E+00 ±	8.72E+00	1.39E+01
BALA140		-3.28E+00 ±	1.10E+01	1.73E+01

Station 37 red wine grapes collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.19E+03 ±	3.12E+02	1.57E+02
MN-54		1.75E+00 ±	8.09E+00	1.27E+01
CO-58		3.70E+00 ±	9.18E+00	1.41E+01
FE-59		-9.01E-01 ±	2.85E+01	4.66E+01
CO-60		0.00E+00 ±	2.73E+00	4.49E+00
ZN-65		2.34E+00 ±	1.95E+01	3.13E+01
ZRNB-95		4.18E+00 ±	1.22E+01	1.86E+01
I-131		4.71E-02 ±	8.47E+00	1.39E+01
CS-134		3.42E-01 ±	7.53E+00	1.23E+01
CS-137		4.17E+00 ±	8.23E+00	1.22E+01
BALA140		-4.30E-01 ±	1.22E+01	1.99E+01

Station 37 Apples collected 8/26/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.59E+03 ±	2.24E+02	1.56E+02
MN-54		1.59E+00 ±	5.83E+00	9.12E+00
CO-58		1.04E+00 ±	6.28E+00	1.01E+01
FE-59		2.66E+00 ±	1.63E+01	2.59E+01
CO-60		-6.17E-01 ±	8.17E+00	1.33E+01
ZN-65		-1.01E+00 ±	1.67E+01	2.72E+01
ZRNB-95		-4.53E+00 ±	1.33E+01	2.09E+01
I-131		7.17E-01 ±	4.78E+00	7.69E+00
CS-134		-1.60E+00 ±	6.06E+00	9.60E+00
CS-137		-5.53E-02 ±	4.95E+00	8.12E+00
BALA140		0.00E+00 ±	1.01E+01	1.66E+01

Station 37 wine grapes collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	3.15E+03 ±	3.71E+02	1.56E+02
MN-54		-2.57E+00 ±	8.53E+00	1.33E+01
CO-58		-6.14E-02 ±	8.10E+00	1.33E+01
FE-59		-3.52E+00 ±	2.82E+01	4.54E+01
CO-60		-1.90E-01 ±	1.04E+01	1.71E+01
ZN-65		5.23E+00 ±	2.03E+01	3.18E+01
ZRNB-95		-5.54E+00 ±	1.81E+01	2.84E+01
I-131		-6.35E-02 ±	9.09E+00	1.49E+01
CS-134		3.67E-02 ±	7.67E+00	1.26E+01
CS-137		2.48E+00 ±	7.35E+00	1.12E+01
BALA140		0.00E+00 ±	4.22E+00	6.95E+00

Station 37 Apples collected 9/16/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	9.98E+02 ±	2.05E+02	1.81E+02
MN-54		3.58E-01 ±	7.09E+00	1.15E+01
CO-58		-1.38E+00 ±	5.65E+00	8.79E+00
FE-59		3.15E+00 ±	1.65E+01	2.58E+01
CO-60		2.78E+00 ±	7.80E+00	1.19E+01
ZN-65		6.78E+00 ±	1.46E+01	2.16E+01
ZRNB-95		-3.98E-01 ±	1.10E+01	1.80E+01
I-131		-2.05E+00 ±	7.59E+00	1.20E+01
CS-134		-9.21E-01 ±	5.90E+00	9.45E+00
CS-137		-1.84E+00 ±	6.34E+00	9.84E+00
BALA140		-3.17E+00 ±	1.11E+01	1.71E+01

Station 37 Apples collected 10/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.72E+03 ±	2.42E+02	1.35E+02
MN-54		2.10E+00 ±	5.29E+00	7.92E+00
CO-58		-2.36E+00 ±	7.97E+00	1.25E+01
FE-59		5.73E+00 ±	1.93E+01	2.98E+01
CO-60		-2.23E-01 ±	9.66E+00	1.58E+01
ZN-65		6.68E+00 ±	1.57E+01	2.38E+01
ZRNB-95		6.42E-01 ±	1.05E+01	1.70E+01
I-131		7.65E-01 ±	6.51E+00	1.05E+01
CS-134		-1.11E-01 ±	5.65E+00	9.26E+00
CS-137		-2.46E-01 ±	6.78E+00	1.11E+01
BALA140		-2.28E+00 ±	1.06E+01	1.66E+01

Station 37 Apples collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	7.84E+02 ±	2.13E+02	2.21E+02
MN-54		3.22E+00 ±	7.59E+00	1.14E+01
CO-58		9.55E-01 ±	6.27E+00	9.95E+00
FE-59		-3.30E+00 ±	2.11E+01	3.35E+01
CO-60		1.15E+00 ±	7.23E+00	1.14E+01
ZN-65		-1.91E-01 ±	1.38E+01	2.27E+01
ZRNB-95		6.76E-01 ±	1.23E+01	2.00E+01
I-131		-1.87E+00 ±	8.39E+00	1.34E+01
CS-134		-2.64E-02 ±	7.16E+00	1.18E+01
CS-137		1.19E-01 ±	8.15E+00	1.34E+01
BALA140		0.00E+00 ±	2.35E+01	3.86E+01

Station 9c Apples collected 10/3/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.37E+03 ±	2.60E+02	2.01E+02
MN-54		-3.94E+00 ±	9.47E+00	1.45E+01
CO-58		1.04E+00 ±	7.06E+00	1.12E+01
FE-59		0.00E+00 ±	1.96E+01	3.22E+01
CO-60		2.13E+00 ±	8.45E+00	1.31E+01
ZN-65		1.29E+00 ±	1.80E+01	2.91E+01
ZRNB-95		-1.38E+00 ±	1.67E+01	2.70E+01
I-131		-4.20E+00 ±	1.23E+01	1.94E+01
CS-134		6.73E-01 ±	7.32E+00	1.19E+01
CS-137		1.43E+00 ±	7.73E+00	1.23E+01
BALA140		-4.01E+00 ±	1.41E+01	2.16E+01

TABLE A - 16.2  
**GAMMA SPECTROMETRY RESULTS OF FRUITS- SUMMARY**

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-1.31E+00	-3.28E+00	0.00E+00	1.90E+01	7	0
BALA140	Cntl	-4.01E+00	-4.01E+00	-4.01E+00	2.16E+01	1	0
CO-58	Ind	5.69E-01	-2.36E+00	3.70E+00	1.15E+01	7	0
CO-58	Cntl	1.04E+00	1.04E+00	1.04E+00	1.12E+01	1	0
CO-60	Ind	3.29E-01	-6.17E-01	2.78E+00	1.28E+01	7	0
CO-60	Cntl	2.13E+00	2.13E+00	2.13E+00	1.31E+01	1	0
CS-134	Ind	1.93E-01	-1.60E+00	3.63E+00	1.13E+01	7	0
CS-134	Cntl	6.73E-01	6.73E-01	6.73E-01	1.19E+01	1	0
CS-137	Ind	1.08E+00	-1.84E+00	4.17E+00	1.14E+01	7	0
CS-137	Cntl	1.43E+00	1.43E+00	1.43E+00	1.23E+01	1	0
FE-59	Ind	6.90E-01	-3.52E+00	5.73E+00	3.32E+01	7	0
FE-59	Cntl	0.00E+00	0.00E+00	0.00E+00	3.22E+01	1	0
I-131	Ind	-3.84E-01	-2.05E+00	7.65E-01	1.22E+01	7	0
I-131	Cntl	-4.20E+00	-4.20E+00	-4.20E+00	1.94E+01	1	0
K-40	Ind	1.75E+03	7.84E+02	3.15E+03	1.69E+02	7	7
K-40	Cntl	1.37E+03	1.37E+03	1.37E+03	2.01E+02	1	1
MN-54	Ind	1.16E+00	-2.57E+00	3.22E+00	1.12E+01	7	0
MN-54	Cntl	-3.94E+00	-3.94E+00	-3.94E+00	1.45E+01	1	0
ZN-65	Ind	4.19E+00	-1.01E+00	9.47E+00	2.63E+01	7	0
ZN-65	Cntl	1.29E+00	1.29E+00	1.29E+00	2.91E+01	1	0

TABLE A-17.1  
**GAMMA SPECTROMETRY RESULTS OF VEGETABLES**

Results in pCi/ kilogram (wet)

**Station 37 is Indicator - Station 9c is Control**

Station 37 Asparagus collected 4/15/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.73E+03 ±	3.10E+02	2.35E+02
MN-54		1.68E+00 ±	9.27E+00	1.49E+01
CO-58		-1.49E+00 ±	9.66E+00	1.56E+01
FE-59		5.10E+00 ±	2.11E+01	3.33E+01
CO-60		2.42E+00 ±	1.14E+01	1.93E+01
ZN-65		8.31E+00 ±	1.86E+01	2.87E+01
ZRNB-95		1.00E+01 ±	1.86E+01	2.89E+01
I-131		2.21E+00 ±	1.56E+01	2.54E+01
CS-134		-7.20E-01 ±	1.00E+01	1.64E+01
CS-137		-1.13E+00 ±	1.07E+01	1.74E+01
BALA140		0.00E+00 ±	3.31E+00	5.45E+00

Station 37 Corn collected 7/8/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.41E+03 ±	2.54E+02	1.83E+02
MN-54		3.69E-01 ±	7.38E+00	1.21E+01
CO-58		9.66E-01 ±	8.96E+00	1.46E+01
FE-59		-5.61E+00 ±	2.06E+01	3.27E+01
CO-60		-3.61E+00 ±	8.23E+01	1.67E+01
ZN-65		4.39E+00 ±	1.48E+01	2.33E+01
ZRNB-95		-1.70E+00 ±	1.26E+01	2.04E+01
I-131		2.51E+00 ±	7.73E+00	1.23E+01
CS-134		2.64E+00 ±	8.44E+00	1.35E+01
CS-137		1.38E-01 ±	5.41E+00	8.87E+00
BALA140		-2.74E+00 ±	1.17E+01	1.86E+01

Station 37 Asparagus collected 5/6/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.74E+03 ±	3.34E+02	2.67E+02
MN-54		-2.90E+00 ±	1.13E+01	1.82E+01
CO-58		-5.39E-01 ±	1.04E+01	1.70E+01
FE-59		8.29E+00 ±	2.75E+01	4.34E+01
CO-60		-3.29E+00 ±	4.01E+01	2.25E+01
ZN-65		-2.16E+00 ±	2.33E+01	3.80E+01
ZRNB-95		4.16E+00 ±	1.85E+01	2.96E+01
I-131		-3.59E+00 ±	1.31E+01	2.11E+01
CS-134		1.01E+00 ±	1.11E+01	1.81E+01
CS-137		0.00E+00 ±	1.36E+01	2.24E+01
BALA140		0.00E+00 ±	1.24E+01	2.03E+01

Station 37 Cucumber collected 7/8/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.05E+03 ±	1.85E+02	1.87E+02
MN-54		-2.26E-01 ±	7.12E+00	1.17E+01
CO-58		3.17E+00 ±	6.03E+00	9.18E+00
FE-59		-3.48E+00 ±	1.86E+01	2.98E+01
CO-60		-3.84E+00 ±	1.08E+02	1.66E+01
ZN-65		-2.13E-02 ±	1.62E+01	2.67E+01
ZRNB-95		-5.54E+00 ±	1.53E+01	2.42E+01
I-131		-5.76E-01 ±	6.94E+00	1.13E+01
CS-134		2.44E+00 ±	9.00E+00	1.45E+01
CS-137		4.75E+00 ±	8.29E+00	1.28E+01
BALA140		-4.10E+00 ±	1.18E+01	1.85E+01

Station 37 Broad Leaf Vegetable collected 5/21/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	4.31E+03 ±	5.13E+02	2.45E+02
MN-54		1.67E+00 ±	1.22E+01	1.96E+01
CO-58		9.37E-01 ±	1.27E+01	2.06E+01
FE-59		4.71E-01 ±	2.03E+01	3.31E+01
CO-60		6.08E+00 ±	1.62E+01	2.49E+01
ZN-65		2.72E+00 ±	2.58E+01	4.16E+01
ZRNB-95		6.59E+00 ±	2.28E+01	3.56E+01
I-131		-4.13E+00 ±	1.73E+01	2.74E+01
CS-134		1.89E+00 ±	1.10E+01	1.76E+01
CS-137		0.00E+00 ±	1.41E+01	2.32E+01
BALA140		0.00E+00 ±	7.55E+00	1.24E+01

Station 37 Alfalfa collected 7/21/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	3.39E+03 ±	4.98E+02	2.89E+02
MN-54		5.35E+00 ±	1.41E+01	2.16E+01
CO-58		1.01E+00 ±	1.14E+01	1.83E+01
FE-59		0.00E+00 ±	2.93E+01	4.83E+01
CO-60		-3.57E-01 ±	1.61E+01	2.64E+01
ZN-65		0.00E+00 ±	8.36E+00	1.38E+01
ZRNB-95		1.08E+01 ±	3.58E+00	3.66E+01
I-131		0.00E+00 ±	1.91E+01	3.14E+01
CS-134		1.09E+01 ±	1.54E+01	2.29E+01
CS-137		7.68E+00 ±	1.51E+01	2.27E+01
BALA140		-9.38E+00 ±	2.77E+01	4.31E+01

Station 37 Broad Leaf Vegetable collected 6/13/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.81E+03 ±	2.78E+02	1.71E+02
MN-54		8.65E-01 ±	7.98E+00	1.30E+01
CO-58		-2.89E-01 ±	6.98E+00	1.14E+01
FE-59		-7.14E+00 ±	2.43E+01	3.84E+01
CO-60		-3.80E+00 ±	1.03E+01	1.62E+01
ZN-65		2.49E-01 ±	1.85E+01	3.04E+01
ZRNB-95		3.17E+00 ±	1.25E+01	1.99E+01
I-131		-3.33E-01 ±	8.97E+00	1.47E+01
CS-134		-1.39E-01 ±	7.30E+00	1.20E+01
CS-137		6.54E-01 ±	7.47E+00	1.22E+01
BALA140		0.00E+00 ±	1.15E+01	1.89E+01

Station 37 Broad Leaf Vegetable collected 8/8/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	5.69E+03 ±	6.06E+02	3.35E+02
MN-54		-3.38E+00 ±	1.44E+01	2.29E+01
CO-58		2.89E+00 ±	1.08E+01	1.68E+01
FE-59		-1.58E+01 ±	4.73E+01	7.40E+01
CO-60		5.68E+00 ±	1.70E+01	2.65E+01
ZN-65		-2.08E+01 ±	4.31E+01	6.68E+01
ZRNB-95		5.88E-01 ±	1.74E+01	2.85E+01
I-131		-4.28E+00 ±	1.49E+01	2.36E+01
CS-134		-3.51E-01 ±	1.16E+01	1.89E+01
CS-137		-6.67E-01 ±	1.36E+01	2.22E+01
BALA140		-3.66E+00 ±	1.68E+01	2.61E+01

TABLE A-17.1  
**GAMMA SPECTROMETRY RESULTS OF VEGETABLES**

Results in pCi/ kilogram (wet)

**Station 37 is Indicator - Station 9c is Control**

Station 37 cucumber collected 8/13/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.48E+03 ±	1.89E+02	1.07E+02
MN-54		-2.33E+00 ±	5.40E+00	8.31E+00
CO-58		3.41E-01 ±	4.45E+00	7.22E+00
FE-59		5.91E+00 ±	9.99E+00	1.38E+01
CO-60		-1.17E+00 ±	6.07E+00	9.67E+00
ZN-65		-2.04E+00 ±	1.32E+01	2.12E+01
ZRNB-95		1.30E-01 ±	7.10E+00	1.16E+01
I-131		0.00E+00 ±	6.31E+00	1.04E+01
CS-134		-1.13E+00 ±	5.54E+00	8.90E+00
CS-137		-1.64E+00 ±	5.66E+00	8.94E+00
BALA140		0.00E+00 ±	8.05E+00	1.32E+01

Station 37 Bell Peppers collected 9/9/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.13E+03 ±	3.03E+02	2.59E+02
MN-54		3.47E+00 ±	8.74E+00	1.37E+01
CO-58		2.68E+00 ±	8.89E+00	1.41E+01
FE-59		8.81E-01 ±	2.34E+01	3.83E+01
CO-60		-5.29E+00 ±	2.78E+02	1.58E+01
ZN-65		-1.07E+01 ±	2.34E+01	3.66E+01
ZRNB-95		2.24E+00 ±	1.53E+01	2.47E+01
I-131		7.67E+00 ±	9.63E+00	1.48E+01
CS-134		-1.98E+00 ±	1.01E+01	1.63E+01
CS-137		-1.85E+00 ±	1.01E+01	1.62E+01
BALA140		1.13E+00 ±	1.17E+01	1.90E+01

Station 37 Corn collected 8/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.30E+03 ±	2.87E+02	2.35E+02
MN-54		4.52E+00 ±	8.35E+00	1.28E+01
CO-58		2.38E+00 ±	7.86E+00	1.24E+01
FE-59		8.46E+00 ±	2.29E+01	3.56E+01
CO-60		-3.06E+00 ±	3.84E+01	1.96E+01
ZN-65		6.88E+00 ±	2.13E+01	3.38E+01
ZRNB-95		2.58E+00 ±	1.70E+01	2.75E+01
I-131		-3.50E+00 ±	1.16E+01	1.86E+01
CS-134		3.26E+00 ±	1.08E+01	1.73E+01
CS-137		3.68E+00 ±	1.02E+01	1.61E+01
BALA140		3.43E+00 ±	1.21E+01	1.91E+01

Station 37 Broad Leaf Vegetable collected 9/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	4.64E+03 ±	5.65E+02	2.91E+02
MN-54		-7.43E+00 ±	1.82E+01	2.83E+01
CO-58		-2.37E+00 ±	1.42E+01	2.27E+01
FE-59		-1.14E+01 ±	4.67E+01	7.34E+01
CO-60		5.18E+00 ±	1.96E+01	3.08E+01
ZN-65		0.00E+00 ±	3.96E+01	6.52E+01
ZRNB-95		1.08E+01 ±	2.59E+01	3.94E+01
I-131		4.89E+00 ±	2.25E+01	3.59E+01
CS-134		-5.77E+00 ±	1.72E+01	2.73E+01
CS-137		-3.59E+00 ±	1.66E+01	2.64E+01
BALA140		-8.01E-01 ±	5.72E+00	1.33E+01

Station 37 Watermelon collected 8/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	1.07E+03 ±	1.86E+02	1.29E+02
MN-54		-1.56E+00 ±	4.36E+00	6.57E+00
CO-58		0.00E+00 ±	3.05E+00	5.01E+00
FE-59		-1.73E+00 ±	1.50E+01	2.41E+01
CO-60		-8.32E-02 ±	6.52E+00	1.07E+01
ZN-65		-2.43E+00 ±	1.38E+01	2.21E+01
ZRNB-95		0.00E+00 ±	8.38E+00	1.38E+01
I-131		-1.83E-01 ±	3.75E+00	6.11E+00
CS-134		-5.05E-01 ±	4.75E+00	7.67E+00
CS-137		0.00E+00 ±	5.92E+00	9.73E+00
BALA140		-1.73E-01 ±	7.29E+00	1.19E+01

Station 9c Broad Leaf Vegetable collected 8/8/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	6.29E+03 ±	6.41E+02	2.65E+02
MN-54		-6.45E+00 ±	1.63E+01	2.53E+01
CO-58		2.39E+00 ±	1.26E+01	2.00E+01
FE-59		2.19E+01 ±	3.83E+01	5.55E+01
CO-60		3.54E+00 ±	1.55E+01	2.43E+01
ZN-65		2.05E-01 ±	3.47E+01	5.69E+01
ZRNB-95		5.72E+00 ±	2.14E+01	3.34E+01
I-131		2.34E+00 ±	1.42E+01	2.27E+01
CS-134		1.62E+00 ±	1.24E+01	2.00E+01
CS-137		-4.17E+00 ±	1.23E+01	1.89E+01
BALA140		-3.22E+00 ±	2.05E+01	3.25E+01

Station 37 Corn collected 8/19/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	2.65E+03 ±	2.92E+02	2.15E+02
MN-54		-1.10E+00 ±	9.72E+00	1.58E+01
CO-58		0.00E+00 ±	1.11E+01	1.82E+01
FE-59		-5.80E+00 ±	2.69E+01	4.32E+01
CO-60		-1.64E-01 ±	1.04E+01	1.70E+01
ZN-65		4.66E+00 ±	2.19E+01	3.52E+01
ZRNB-95		6.25E+00 ±	1.49E+01	2.33E+01
I-131		-4.20E+00 ±	1.26E+01	2.03E+01
CS-134		-4.36E+00 ±	1.06E+01	1.69E+01
CS-137		5.03E+00 ±	9.30E+00	1.44E+01
BALA140		0.00E+00 ±	1.07E+01	1.75E+01



TABLE A - 17.2  
**GAMMA SPECTROMETRY RESULTS OF VEGETABLES- SUMMARY**

Results in pCi/ kilogram (wet)

Nuclide		Average Activity	Activity Low	Activity High	Average MDA	Number of Samples	Number of Positive IDs
BALA140	Ind	-1.16E+00	-9.38E+00	3.43E+00	1.84E+01	14	0
BALA140	Cntl	-3.22E+00	-3.22E+00	-3.22E+00	3.25E+01	1	0
CO-58	Ind	6.92E-01	-2.37E+00	3.17E+00	1.45E+01	14	0
CO-58	Cntl	2.39E+00	2.39E+00	2.39E+00	2.00E+01	1	0
CO-60	Ind	-3.78E-01	-5.29E+00	6.08E+00	1.95E+01	14	0
CO-60	Cntl	3.54E+00	3.54E+00	3.54E+00	2.43E+01	1	0
CS-134	Ind	5.13E-01	-5.77E+00	1.09E+01	1.63E+01	14	0
CS-134	Cntl	1.62E+00	1.62E+00	1.62E+00	2.00E+01	1	0
CS-137	Ind	9.32E-01	-3.59E+00	7.68E+00	1.67E+01	14	0
CS-137	Cntl	-4.17E+00	-4.17E+00	-4.17E+00	1.89E+01	1	0
FE-59	Ind	-1.56E+00	-1.58E+01	8.46E+00	4.01E+01	14	0
FE-59	Cntl	2.19E+01	2.19E+01	2.19E+01	5.55E+01	1	0
I-131	Ind	-2.51E-01	-4.28E+00	7.67E+00	1.95E+01	14	0
I-131	Cntl	2.34E+00	2.34E+00	2.34E+00	2.27E+01	1	0
K-40	Ind	2.81E+03	1.05E+03	5.69E+03	2.25E+02	14	14
K-40	Cntl	6.29E+03	6.29E+03	6.29E+03	2.65E+02	1	1
MN-54	Ind	-7.07E-02	-7.43E+00	5.35E+00	1.57E+01	14	0
MN-54	Cntl	-6.45E+00	-6.45E+00	-6.45E+00	2.53E+01	1	0
ZN-65	Ind	-7.87E-01	-2.08E+01	8.31E+00	3.45E+01	14	0
ZN-65	Cntl	2.05E-01	2.05E-01	2.05E-01	5.69E+01	1	0
ZRNB-95	Ind	3.58E+00	-5.54E+00	1.08E+01	2.60E+01	14	0
ZRNB-95	Cntl	5.72E+00	5.72E+00	5.72E+00	3.34E+01	1	0

TABLE B-1.1  
**2014 QUARTERLY SPECIAL INTEREST TLD RESULTS**  
 Results in milli-Roentgen (mR) per Standard Quarter

Station ID	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Quarterly Sum
58	21.2	19.5	19.4	21.9	82.0
87	29.7	26.7	29.6	29.4	115.5
88	27.2	21.6	22.8	25.2	96.9
89	26.7	25.7	25.6	28.0	106.0
90	21.0	17.8	18.8	19.7	77.3
119B	22.9	20.8	20.8	21.8	86.3
119C	23.4	21.2	21.1	22.4	88.1
120 (East)	23.7	21.2	21.8	22.8	89.5
121	67.0	66.1	63.3	73.7	270.1
122	35.8	36.6	36.7	38.5	147.6
123	106.9	104.3	102.6	104.6	418.4
124	123.6	119.6	124.1	119.9	487.0
125	93.2	90.4	88.0	91.2	362.8
126	97.9	140.7	140.9	142.7	522.3
127	73.8	103.9	103.7	109.2	390.6
128	126.9	169.0	161.4	167.9	625.2
129	95.3	126.2	119.2	120.2	460.8
136A	131.7	183.7	177.7	182.9	676.0
137A	151.4	263.7	270.3	324.5	1009.8
138A	122.6	209.5	224.9	222.8	779.8
150 (Site 1)	19.4	18.2	17.8	19.3	74.7
151 (Site 4)	20.2	18.3	18.3	19.6	76.5

TABLE B-1.2  
**2014 QUARTERLY SPECIAL INTEREST TLD RESULTS- SUMMARY**  
 Results in milli-Roentgen (mR) per Standard Quarter

Location	Average Activity	Activity Low	Activity High	Number of Samples
ISFSI Quarterly Ind	143.3	73.8	324.5	40
SITE 1 & 4 Quarterly Ind	18.9	17.8	20.2	8
Quarterly Control TLDs	20.4	19.6	21.2	4

Ind = Indicator Station Cntl = Control Station

Stations 123 through 138A are located on the middle ISFSI fence.

Stations 58 and 87 to 90 were established in 2009 to monitor exposure from remediation work at the DOE 618-11 burial site.

Station 121 results high due to location being near transformer yard. Station 122 results influenced by ISFSI.

Quarterly Control TLD location is ST-9. See Table A-1.1

Table B-2.1

**GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER**  
**STATION 101**

Results in pCi/liter, corrected for decay during collection period

		Location 101 collected		2/3/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-2.99E+01 ±	5.49E+01	5.59E+01
CR-51		8.39E+00 ±	2.37E+01	3.81E+01
MN-54		-5.45E-01 ±	2.29E+00	3.69E+00
CO-58		-9.79E-01 ±	2.53E+00	4.01E+00
FE-59		-3.52E-01 ±	5.58E+00	9.09E+00
CO-60		-3.01E-01 ±	2.09E+00	3.37E+00
ZN-65		-2.09E+00 ±	5.06E+00	7.98E+00
ZRNB-95		-2.65E-01 ±	3.58E+00	5.84E+00
I-131		0.00E+00 ±	7.25E+00	1.19E+01
CS-134		0.00E+00 ±	3.84E+00	6.32E+00
CS-137		-9.15E-01 ±	2.29E+00	3.64E+00
BALA140		-4.88E-01 ±	4.84E+00	7.83E+00
BI-214		5.56E+00 ±	5.18E+00	9.05E+00

		Location 101 collected		3/3/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-3.04E+01 ±	7.79E+01	5.54E+01
CR-51		4.76E+00 ±	2.47E+01	4.02E+01
MN-54		-5.19E-01 ±	2.04E+00	3.27E+00
CO-58		-1.03E+00 ±	2.28E+00	3.58E+00
FE-59		0.00E+00 ±	5.11E+00	8.40E+00
CO-60		4.43E-01 ±	2.00E+00	3.45E+00
ZN-65		9.19E-01 ±	4.27E+00	6.85E+00
ZRNB-95		-1.57E+00 ±	4.65E+00	7.42E+00
I-131		-1.90E+00 ±	6.01E+00	9.66E+00
CS-134		6.43E-01 ±	2.25E+00	3.62E+00
CS-137		6.42E-01 ±	1.91E+00	3.03E+00
BALA140		-4.98E-01 ±	5.95E+00	9.69E+00
BI-214		2.30E+00 ±	5.28E+00	9.53E+00

		Location 101 collected		4/1/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-1.49E+00 ±	2.67E+01	5.17E+01
CR-51		-7.55E-02 ±	2.16E+01	3.55E+01
MN-54		4.47E-01 ±	1.73E+00	2.75E+00
CO-58		1.12E+00 ±	2.38E+00	3.73E+00
FE-59		-1.51E+00 ±	6.31E+00	1.00E+01
CO-60		-2.90E-01 ±	3.21E+00	3.63E+00
ZN-65		-6.94E-03 ±	3.39E+00	5.57E+00
ZRNB-95		8.52E-01 ±	3.49E+00	5.57E+00
I-131		3.83E+00 ±	6.35E+00	1.00E+01
CS-134		-1.18E+00 ±	2.23E+00	3.52E+00
CS-137		-2.92E-03 ±	2.09E+00	3.44E+00
BALA140		0.00E+00 ±	4.66E+00	7.66E+00
BI-214		1.25E+00 ±	5.00E+00	9.22E+00

		Location 101 collected		5/1/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-3.39E+01 ±	6.59E+01	5.84E+01
CR-51		-1.03E+01 ±	2.70E+01	4.35E+01
MN-54		-7.68E-01 ±	2.23E+00	3.55E+00
CO-58		5.19E-01 ±	2.30E+00	3.70E+00
FE-59		-5.69E-01 ±	7.10E+00	1.16E+01
CO-60		5.47E-01 ±	1.80E+00	2.83E+00
ZN-65		2.54E+00 ±	4.90E+00	7.64E+00
ZRNB-95		-8.28E-01 ±	4.14E+00	6.67E+00
I-131		-3.01E+00 ±	8.17E+00	1.31E+01
CS-134		-2.04E-01 ±	2.51E+00	4.10E+00
CS-137		1.24E-01 ±	1.88E+00	3.07E+00
BALA140		2.47E+00 ±	5.56E+00	8.53E+00
BI-214		1.87E+00 ±	5.40E+00	9.75E+00

		Location 101 collected		6/2/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-4.02E+01 ±	8.61E+01	6.09E+01
CR-51		1.58E-01 ±	2.25E+01	3.70E+01
MN-54		-1.11E+00 ±	2.19E+00	3.44E+00
CO-58		-3.11E-01 ±	2.30E+00	3.73E+00
FE-59		-1.37E+00 ±	6.95E+00	1.12E+01
CO-60		-5.05E-01 ±	2.37E+00	3.81E+00
ZN-65		0.00E+00 ±	9.64E+00	1.59E+01
ZRNB-95		-1.30E+00 ±	4.19E+00	6.69E+00
I-131		-5.48E-03 ±	6.39E+00	1.05E+01
CS-134		-8.60E-01 ±	2.32E+00	3.71E+00
CS-137		-5.75E-01 ±	2.45E+00	3.95E+00
BALA140		-6.08E-03 ±	5.01E+00	8.20E+00
BI-214		5.50E+00 ±	5.57E+00	9.67E+00

		Location 101 collected		7/1/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-1.50E+01 ±	3.98E+01	5.74E+01
CR-51		-6.92E+00 ±	2.83E+01	4.59E+01
MN-54		7.18E-01 ±	2.07E+00	3.28E+00
CO-58		1.13E+00 ±	2.23E+00	3.47E+00
FE-59		3.15E+00 ±	6.34E+00	9.73E+00
CO-60		9.59E-01 ±	2.03E+00	3.14E+00
ZN-65		-4.18E+00 ±	6.23E+00	9.69E+00
ZRNB-95		-1.14E+00 ±	4.18E+00	6.68E+00
I-131		2.92E+00 ±	9.19E+00	1.48E+01
CS-134		-1.28E-01 ±	2.31E+00	3.78E+00
CS-137		-2.26E-01 ±	2.27E+00	3.70E+00
BALA140		2.15E-01 ±	6.23E+00	1.02E+01
BI-214		3.47E+00 ±	5.00E+00	8.99E+00

Table B-2.1

**GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER**  
**STATION 101**

Results in pCi/liter, corrected for decay during collection period

Location 101 collected 7/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.60E+01 ±	4.18E+01	5.82E+01
CR-51		-6.38E+00 ±	2.67E+01	4.33E+01
MN-54		1.07E+00 ±	2.06E+00	3.21E+00
CO-58		-6.06E-01 ±	2.33E+00	3.74E+00
FE-59		7.27E-01 ±	4.95E+00	7.94E+00
CO-60		1.12E+00 ±	2.00E+00	3.06E+00
ZN-65		2.01E-01 ±	4.04E+00	6.60E+00
ZRNB-95		3.99E-01 ±	4.01E+00	6.53E+00
I-131		5.21E+00 ±	8.54E+00	1.35E+01
CS-134		-1.09E+00 ±	2.41E+00	3.84E+00
CS-137		-6.77E-01 ±	2.58E+00	4.16E+00
BALA140		1.39E+00 ±	6.05E+00	9.62E+00
BI-214		3.95E+00 ±	5.04E+00	9.01E+00

Location 101 collected 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-5.85E+00 ±	2.81E+01	4.94E+01
CR-51		7.18E+00 ±	2.26E+01	3.64E+01
MN-54		-2.65E-01 ±	2.09E+00	3.39E+00
CO-58		4.40E-01 ±	1.96E+00	3.14E+00
FE-59		-8.36E-01 ±	7.28E+00	1.18E+01
CO-60		1.68E+00 ±	2.15E+00	3.45E+00
ZN-65		-4.75E-01 ±	4.66E+00	7.58E+00
ZRNB-95		0.00E+00 ±	4.94E+00	8.13E+00
I-131		-2.54E-01 ±	6.85E+00	1.12E+01
CS-134		3.91E-01 ±	1.64E+00	2.63E+00
CS-137		4.96E-01 ±	1.97E+00	3.15E+00
BALA140		-1.47E+00 ±	5.86E+00	9.29E+00
BI-214	+	9.15E+00 ±	5.43E+00	9.09E+00

Location 101 collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.34E+01 ±	3.92E+01	5.26E+01
CR-51		-1.17E+00 ±	2.01E+01	3.30E+01
MN-54		0.00E+00 ±	1.81E+00	2.98E+00
CO-58		-1.94E-01 ±	2.33E+00	3.80E+00
FE-59		-2.55E+00 ±	6.56E+00	1.02E+01
CO-60		-2.25E-01 ±	2.93E+00	3.67E+00
ZN-65		-1.70E+00 ±	4.88E+00	7.73E+00
ZRNB-95		-1.07E-01 ±	3.52E+00	5.77E+00
I-131		-1.68E+00 ±	5.89E+00	9.48E+00
CS-134		1.12E+00 ±	2.10E+00	3.31E+00
CS-137		-5.14E-01 ±	1.91E+00	3.05E+00
BALA140		-1.93E+00 ±	5.63E+00	8.82E+00
BI-214	+	9.35E+00 ±	5.31E+00	8.86E+00

Location 101 collected 10/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.02E+01 ±	3.51E+01	5.22E+01
CR-51		-2.48E-01 ±	2.55E+01	4.19E+01
MN-54		9.41E-01 ±	1.62E+00	2.46E+00
CO-58		2.05E+00 ±	1.93E+00	2.72E+00
FE-59		0.00E+00 ±	5.66E+00	9.31E+00
CO-60		-5.36E-02 ±	2.47E+00	3.97E+00
ZN-65		0.00E+00 ±	7.55E+00	1.24E+01
ZRNB-95		6.23E-01 ±	4.36E+00	7.07E+00
I-131		5.60E-01 ±	1.17E+01	1.91E+01
CS-134		0.00E+00 ±	2.53E+00	4.16E+00
CS-137		4.52E-01 ±	1.93E+00	3.10E+00
BALA140		9.14E-01 ±	7.28E+00	1.17E+01
BI-214		1.14E+00 ±	4.97E+00	9.18E+00

Location 101 collected 12/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.07E+01 ±	5.03E+01	5.30E+01
CR-51		-4.86E+00 ±	2.51E+01	4.08E+01
MN-54		-3.27E-01 ±	2.28E+00	3.70E+00
CO-58		1.09E+00 ±	1.96E+00	3.00E+00
FE-59		7.84E-01 ±	6.33E+00	1.02E+01
CO-60		-6.22E-01 ±	6.20E+00	3.87E+00
ZN-65		-1.65E+00 ±	4.80E+00	7.59E+00
ZRNB-95		1.56E+00 ±	4.03E+00	6.36E+00
I-131		6.93E+00 ±	7.26E+00	1.11E+01
CS-134		6.62E-01 ±	2.27E+00	3.66E+00
CS-137		7.84E-01 ±	1.85E+00	2.91E+00
BALA140		0.00E+00 ±	7.62E+00	1.25E+01
BI-214		3.52E+00 ±	5.62E+00	9.93E+00

Location 101 collected 12/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.81E+01 ±	5.16E+01	5.57E+01
CR-51		-1.90E+01 ±	3.05E+01	4.85E+01
MN-54		-8.74E-02 ±	1.99E+00	3.26E+00
CO-58		-5.50E-01 ±	2.50E+00	4.02E+00
FE-59		-1.63E+00 ±	7.31E+00	1.17E+01
CO-60		9.92E-01 ±	1.44E+00	2.06E+00
ZN-65		1.69E+00 ±	3.52E+00	5.38E+00
ZRNB-95		-9.84E-01 ±	4.37E+00	7.02E+00
I-131		-4.52E+00 ±	9.19E+00	1.46E+01
CS-134		-8.22E-01 ±	2.34E+00	3.76E+00
CS-137		-1.20E+00 ±	2.32E+00	3.65E+00
BALA140		-1.53E+00 ±	6.71E+00	1.07E+01
BI-214		2.61E+00 ±	5.28E+00	9.49E+00

TABLE B-2.2  
**GAMMA SPECTROMETRY RESULTS OF STORM DRAIN WATER - SUMMARY**  
**STATION 101**

Results in pCi/liter, corrected for decay during collection period

<b>Nuclide</b>	<b>Average Activity</b>	<b>Activity Low</b>	<b>Activity High</b>	<b>Average MDA</b>	<b>Number of Samples</b>	<b>Number of Positive IDs</b>
K-40	-2.04E+01	-4.02E+01	-1.49E+00	5.51E+01	12	0
CR-51	-2.37E+00	-1.90E+01	8.39E+00	4.03E+01	12	0
MN-54	-3.68E-02	-1.11E+00	1.07E+00	3.25E+00	12	0
CO-58	2.23E-01	-1.03E+00	2.05E+00	3.55E+00	12	0
FE-59	-3.46E-01	-2.55E+00	3.15E+00	1.01E+01	12	0
CO-60	3.12E-01	-6.22E-01	1.68E+00	3.36E+00	12	0
ZN-65	-3.96E-01	-4.18E+00	2.54E+00	8.41E+00	12	0
ZRNB-95	-3.62E-01	-1.70E+00	1.56E+00	6.81E+00	12	0
I-131	6.73E-01	-4.52E+00	6.93E+00	1.24E+01	12	0
CS-134	-1.23E-01	-1.18E+00	1.12E+00	3.87E+00	12	0
CS-137	-1.35E-01	-1.20E+00	7.84E-01	3.40E+00	12	0
BALA140	-7.81E-02	-1.93E+00	2.47E+00	9.57E+00	12	0
BI-214	4.14E+00	1.14E+00	9.35E+00	9.31E+00	12	2

TABLE B-3.1  
**GROSS BETA IN STORM DRAIN WATER**

Results in pCi per liter

Location	Collection Period	RQ	Activity	Error	MDA
ST-101	12/31/13 - 02/03/14		2.09E+00 ±	7.84E-01	2.38E+00
	02/03/14 - 03/03/14		1.22E+00 ±	7.72E-01	2.52E+00
	03/03/14 - 04/01/14		1.02E+00 ±	7.19E-01	2.28E+00
	04/01/14 - 05/01/14		1.59E+00 ±	7.24E-01	2.17E+00
	05/01/14 - 06/02/14		1.64E+00 ±	8.07E-01	2.51E+00
	06/02/14 - 07/01/14		1.79E+00 ±	7.94E-01	2.48E+00
	07/01/14 - 07/31/14		1.11E+00 ±	7.78E-01	2.59E+00
	07/31/14 - 09/02/14	+	3.17E+00 ±	8.21E-01	2.22E+00
	09/02/14 - 09/30/14		6.38E-01 ±	7.71E-01	2.58E+00
	09/30/14 - 10/23/14		1.95E+00 ±	7.76E-01	2.39E+00
	11/01/14 - 12/01/14		2.95E-01 ±	6.60E-01	2.31E+00
	12/01/14 - 12/30/14		1.67E-02 ±	6.70E-01	2.44E+00

TABLE B-3.2  
**GROSS BETA IN STORM DRAIN WATER - SUMMARY**

Results in pCi per liter

Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
1.38E+00	1.67E-02	3.17E+00	12	1

TABLE B-4.1  
**TRITIUM IN STORM DRAIN WATER**

Results in pCi per liter

Location	Collection Period	RQ	Activity	Error
ST-101	12/31/13 - 02/03/14	+	1.06E+03 ±	1.22E+02
	02/03/14 - 03/03/14	+	1.67E+03 ±	1.37E+02
	03/03/14 - 04/01/14	+	6.53E+02 ±	1.22E+02
	04/01/14 - 05/01/14	+	3.58E+02 ±	1.13E+02
	05/01/14 - 06/02/14		1.98E+02 ±	9.88E+01
	06/02/14 - 07/01/14		2.56E+02 ±	9.56E+01
	07/01/14 - 07/31/14		2.72E+02 ±	1.01E+02
	07/31/14 - 09/02/14		2.87E+02 ±	9.52E+01
	09/02/14 - 09/30/14		2.59E+01 ±	9.05E+01
	09/30/14 - 10/23/14		2.55E+02 ±	9.38E+01
	11/01/14 - 12/01/14	+	2.37E+04 ±	3.65E+02
	12/01/14 - 12/30/14	+	2.55E+04 ±	3.75E+02

TABLE B-4.2  
**TRITIUM IN STORM DRAIN WATER - SUMMARY**

Results in pCi per liter

Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
4.52E+03	2.59E+01	2.55E+04	12	6

TABLE B-5.1  
**GROSS ALPHA IN SANITARY WASTE TREATMENT WATER**

Results in pCi per liter  
**ST 102B - SWTF Headworks**

Collection Period	RQ	Activity	Error	MDA
12/31/13 - 02/03/14		-3.61E-01 ±	1.23E+00	5.38E+00
02/03/14 - 03/03/14		-2.11E-01 ±	1.54E+00	6.82E+00
03/03/14 - 04/01/14		1.80E+00 ±	1.96E+00	7.13E+00
04/01/14 - 05/01/14		-2.47E+00 ±	2.28E+00	8.19E+00
05/01/14 - 06/02/14		6.03E-01 ±	1.67E+00	6.94E+00
06/02/14 - 07/01/14		-3.83E+00 ±	2.52E+00	8.44E+00
07/01/14 - 07/31/14		-1.02E+00 ±	1.89E+00	7.48E+00
07/31/14 - 09/02/14		-4.51E-01 ±	1.49E+00	6.04E+00
09/02/14 - 09/30/14		2.63E+00 ±	1.80E+00	6.02E+00
09/30/14 - 11/01/14		2.47E+00 ±	2.57E+00	9.26E+00
11/01/14 - 12/01/14		1.87E-01 ±	1.01E+00	4.07E+00
12/01/14 - 12/30/14		5.01E-01 ±	9.04E-01	3.74E+00

TABLE B-5.2  
**GROSS ALPHA IN SANITARY WASTE TREATMENT WATER - SUMMARY**

Results in pCi per liter

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 102B	-1.34E-02	-3.83E+00	2.63E+00	12	0

TABLE B-6.1  
**GROSS BETA IN SANITARY WASTE TREATMENT WATER**

Results in pCi per liter  
**ST 102B - SWTF Headworks**

Collection Period	RQ	Activity	Error	MDA
12/31/13 - 02/03/14	+	2.25E+01 ±	1.65E+00	2.63E+00
02/03/14 - 03/03/14	+	2.59E+01 ±	1.79E+00	2.85E+00
03/03/14 - 04/01/14	+	2.54E+01 ±	1.93E+00	3.06E+00
04/01/14 - 05/01/14	+	2.30E+01 ±	1.86E+00	2.99E+00
05/01/14 - 06/02/14	+	2.52E+01 ±	1.99E+00	3.44E+00
06/02/14 - 07/01/14	+	1.80E+01 ±	1.72E+00	3.30E+00
07/01/14 - 07/31/14	+	1.61E+01 ±	1.69E+00	3.48E+00
07/31/14 - 09/02/14	+	1.99E+01 ±	1.61E+00	2.59E+00
09/02/14 - 09/30/14	+	2.36E+01 ±	1.73E+00	2.88E+00
09/30/14 - 11/01/14	+	2.57E+01 ±	1.77E+00	2.69E+00
11/01/14 - 12/01/14	+	1.86E+01 ±	1.45E+00	2.41E+00
12/01/14 - 12/30/14	+	1.32E+01 ±	1.34E+00	2.68E+00

TABLE B-6.2  
**GROSS BETA IN SANITARY WASTE TREATMENT WATER - SUMMARY**

Results in pCi per liter

Location	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
ST 102B	2.14E+01	1.32E+01	2.59E+01	12	12

Table B-7.1

**GAMMA SPECTROMETRY RESULTS OF SANITARY WASTE TREATMENT WATER  
STATION 102B**

Results in pCi/liter, corrected for decay during collection period

		Location 102b collected		2/3/2014
Nuclide	RQ	Activity	Error	MDA
K-40		4.00E+01 ±	3.29E+01	6.16E+01
CR-51		-9.33E+00 ±	3.27E+01	5.33E+01
MN-54		8.37E-01 ±	2.78E+00	4.50E+00
CO-58		-3.11E-01 ±	2.84E+00	4.64E+00
FE-59		4.23E+00 ±	7.13E+00	1.12E+01
CO-60		1.13E+00 ±	2.50E+00	4.28E+00
ZN-65		4.49E+00 ±	4.06E+00	6.02E+00
ZRNB-95		2.66E-01 ±	4.85E+00	7.94E+00
I-131		-4.38E+00 ±	8.76E+00	1.42E+01
CS-134		-1.26E+00 ±	3.08E+00	4.98E+00
CS-137		1.15E+00 ±	2.67E+00	4.29E+00
BALA140		-1.57E+00 ±	5.60E+00	8.98E+00
BI-214		1.05E+01 ±	7.18E+00	1.25E+01

		Location 102b collected		3/3/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-5.29E+00 ±	3.72E+01	7.07E+01
CR-51		-7.86E+00 ±	3.53E+01	5.76E+01
MN-54		-2.89E-01 ±	2.77E+00	4.53E+00
CO-58		-8.30E-01 ±	3.16E+00	5.14E+00
FE-59		-3.76E+00 ±	7.95E+00	1.27E+01
CO-60		-1.26E-01 ±	2.55E+00	4.17E+00
ZN-65		3.94E+00 ±	5.64E+00	8.90E+00
ZRNB-95		-1.38E+00 ±	5.54E+00	9.00E+00
I-131		4.72E+00 ±	7.71E+00	1.24E+01
CS-134		-2.08E+00 ±	3.56E+00	5.75E+00
CS-137		9.40E-01 ±	3.17E+00	5.15E+00
BALA140		-1.10E-01 ±	5.32E+00	8.74E+00
BI-214		5.44E+00 ±	7.86E+00	1.39E+01

		Location 102b collected		4/1/2014
Nuclide	RQ	Activity	Error	MDA
K-40		-2.31E+00 ±	3.55E+01	7.00E+01
CR-51		2.48E+00 ±	3.49E+01	5.72E+01
MN-54		1.52E-01 ±	3.16E+00	5.19E+00
CO-58		3.56E-01 ±	2.22E+00	3.61E+00
FE-59		-2.27E+00 ±	7.45E+00	1.20E+01
CO-60		3.09E+00 ±	2.94E+00	4.55E+00
ZN-65		-2.84E-01 ±	6.05E+00	9.92E+00
ZRNB-95		1.09E-01 ±	5.67E+00	9.31E+00
I-131		-2.30E+00 ±	9.39E+00	1.53E+01
CS-134		9.98E-01 ±	2.65E+00	4.28E+00
CS-137		-9.32E-01 ±	2.97E+00	4.82E+00
BALA140		-3.33E+00 ±	7.04E+00	1.12E+01
BI-214		1.08E+01 ±	7.91E+00	1.38E+01

		Location 102b collected		5/1/2014
Nuclide	RQ	Activity	Error	MDA
K-40		7.93E+00 ±	3.21E+01	6.30E+01
CR-51		-7.20E+00 ±	3.11E+01	5.07E+01
MN-54		1.10E+00 ±	2.65E+00	4.26E+00
CO-58		1.30E+00 ±	2.84E+00	4.56E+00
FE-59		-2.55E+00 ±	7.53E+00	1.21E+01
CO-60		-1.42E-01 ±	2.98E+00	4.71E+00
ZN-65		-1.12E+00 ±	5.51E+00	8.95E+00
ZRNB-95		2.09E+00 ±	4.33E+00	6.89E+00
I-131		-2.68E+00 ±	7.90E+00	1.28E+01
CS-134		-2.81E+00 ±	3.08E+00	4.88E+00
CS-137		2.57E-01 ±	2.83E+00	4.63E+00
BALA140		-5.38E-01 ±	5.57E+00	9.08E+00
BI-214	+	1.94E+01 ±	7.33E+00	1.23E+01

		Location 102b collected		6/2/2014
Nuclide	RQ	Activity	Error	MDA
K-40		2.68E+01 ±	3.25E+01	6.20E+01
CR-51		1.37E+01 ±	2.90E+01	4.68E+01
MN-54		1.41E-01 ±	3.05E+00	5.01E+00
CO-58		-1.02E+00 ±	3.10E+00	5.00E+00
FE-59		4.18E-02 ±	7.19E+00	1.18E+01
CO-60		1.40E+00 ±	2.39E+00	4.08E+00
ZN-65		-3.88E-01 ±	9.45E+00	1.55E+01
ZRNB-95		7.67E-02 ±	5.25E+00	8.63E+00
I-131		5.60E-01 ±	7.29E+00	1.19E+01
CS-134		-1.50E-01 ±	2.99E+00	4.91E+00
CS-137		-1.24E+00 ±	3.05E+00	4.91E+00
BALA140		-7.10E-02 ±	5.83E+00	9.57E+00
BI-214		-3.16E-01 ±	7.05E+00	1.26E+01

		Location 102b collected		7/1/2014
Nuclide	RQ	Activity	Error	MDA
K-40		1.07E+01 ±	3.44E+01	6.88E+01
CR-51		-1.48E+00 ±	3.74E+01	6.14E+01
MN-54		-5.94E-02 ±	2.84E+00	4.66E+00
CO-58		4.90E-01 ±	3.16E+00	5.15E+00
FE-59		-1.47E+00 ±	8.12E+00	1.32E+01
CO-60		8.28E-02 ±	2.58E+00	4.23E+00
ZN-65		-4.03E+00 ±	6.48E+00	1.03E+01
ZRNB-95		1.69E+00 ±	6.13E+00	9.96E+00
I-131		1.13E+00 ±	9.74E+00	1.59E+01
CS-134		-1.89E+00 ±	3.55E+00	5.74E+00
CS-137		-1.47E+00 ±	3.32E+00	5.36E+00
BALA140		1.21E+00 ±	6.52E+00	1.05E+01
BI-214		1.27E+01 ±	7.86E+00	1.36E+01



Table B-7.1

**GAMMA SPECTROMETRY RESULTS OF SANITARY WASTE TREATMENT WATER  
STATION 102B**

Results in pCi/liter, corrected for decay during collection period

Location 102b collected 7/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40	+	9.20E+01 ±	3.80E+01	5.81E+01
CR-51		4.25E+00 ±	3.45E+01	5.65E+01
MN-54		-7.33E-04 ±	2.60E+00	4.30E+00
CO-58		4.62E-03 ±	2.99E+00	4.90E+00
FE-59		3.02E+00 ±	7.04E+00	1.12E+01
CO-60		1.65E+00 ±	2.79E+00	4.69E+00
ZN-65		-1.90E+00 ±	5.56E+00	8.94E+00
ZRNB-95		-1.82E-02 ±	4.69E+00	7.71E+00
I-131		-5.16E+00 ±	1.14E+01	1.85E+01
CS-134		-3.71E-02 ±	3.09E+00	5.09E+00
CS-137		1.11E-01 ±	2.97E+00	4.88E+00
BALA140		-1.45E+00 ±	6.37E+00	1.03E+01
BI-214		6.19E+00 ±	6.90E+00	1.23E+01

Location 102b collected 9/2/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-6.38E+00 ±	3.68E+01	6.98E+01
CR-51		1.48E+01 ±	3.77E+01	6.12E+01
MN-54		1.09E+00 ±	2.90E+00	4.68E+00
CO-58		-7.41E-01 ±	3.22E+00	5.23E+00
FE-59		-2.58E+00 ±	8.26E+00	1.33E+01
CO-60		6.77E-01 ±	2.66E+00	4.31E+00
ZN-65		-3.17E+00 ±	6.75E+00	1.08E+01
ZRNB-95		2.34E+00 ±	5.43E+00	8.73E+00
I-131		5.65E+00 ±	1.06E+01	1.71E+01
CS-134		-1.37E+00 ±	3.50E+00	5.69E+00
CS-137		-1.30E+00 ±	3.34E+00	5.40E+00
BALA140		-1.17E+00 ±	6.74E+00	1.09E+01
BI-214		6.74E+00 ±	7.72E+00	1.37E+01

Location 102b collected 9/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		3.88E+01 ±	3.24E+01	6.10E+01
CR-51		1.38E+01 ±	3.15E+01	5.10E+01
MN-54		-2.34E-02 ±	2.63E+00	4.32E+00
CO-58		1.33E+00 ±	2.61E+00	4.16E+00
FE-59		1.44E+00 ±	6.29E+00	1.01E+01
CO-60		-6.86E-01 ±	4.22E+00	4.52E+00
ZN-65		-5.20E+00 ±	6.55E+00	1.03E+01
ZRNB-95		-2.32E+00 ±	5.12E+00	8.21E+00
I-131		1.85E+00 ±	8.27E+00	1.35E+01
CS-134		-1.73E+00 ±	3.31E+00	5.34E+00
CS-137		9.00E-01 ±	2.13E+00	3.41E+00
BALA140		2.69E+00 ±	5.59E+00	8.79E+00
BI-214		7.11E+00 ±	7.10E+00	1.26E+01

Location 102b collected 10/31/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		5.20E-01 ±	3.28E+01	6.74E+01
CR-51		6.57E-02 ±	3.13E+01	5.14E+01
MN-54		4.77E-01 ±	3.03E+00	4.95E+00
CO-58		1.81E+00 ±	3.04E+00	4.85E+00
FE-59		3.64E+00 ±	7.20E+00	1.14E+01
CO-60		1.21E+00 ±	2.36E+00	3.74E+00
ZN-65		0.00E+00 ±	1.01E+01	1.66E+01
ZRNB-95		4.60E+00 ±	5.54E+00	8.73E+00
I-131		-3.21E-01 ±	1.11E+01	1.83E+01
CS-134		-3.00E+00 ±	3.60E+00	5.75E+00
CS-137		-2.27E-02 ±	2.45E+00	4.02E+00
BALA140		-1.79E+00 ±	6.60E+00	1.06E+01
BI-214		9.43E+00 ±	7.63E+00	1.34E+01

Location 102b collected 12/1/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.57E+01 ±	4.29E+01	6.82E+01
CR-51		2.22E-01 ±	3.66E+01	6.02E+01
MN-54		9.09E-03 ±	2.90E+00	4.76E+00
CO-58		-2.10E+00 ±	3.47E+00	5.55E+00
FE-59		-7.79E-01 ±	6.94E+00	1.13E+01
CO-60		-2.87E-01 ±	2.62E+00	4.28E+00
ZN-65		4.02E-01 ±	1.11E+01	1.82E+01
ZRNB-95		-1.97E-01 ±	5.02E+00	8.23E+00
I-131		5.42E-01 ±	1.03E+01	1.69E+01
CS-134		-3.75E+00 ±	3.76E+00	5.99E+00
CS-137		-7.41E-02 ±	2.90E+00	4.76E+00
BALA140		-3.35E+00 ±	6.94E+00	1.10E+01
BI-214		1.29E+01 ±	8.22E+00	1.42E+01

Location 102b collected 12/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		1.23E+01 ±	3.20E+01	6.26E+01
CR-51		-2.27E+01 ±	3.93E+01	6.35E+01
MN-54		5.50E-01 ±	2.75E+00	4.48E+00
CO-58		1.41E+00 ±	2.75E+00	4.37E+00
FE-59		-3.59E-02 ±	8.20E+00	1.35E+01
CO-60		7.05E-01 ±	2.59E+00	4.48E+00
ZN-65		9.54E-01 ±	5.85E+00	9.53E+00
ZRNB-95		3.98E+00 ±	5.22E+00	8.20E+00
I-131		4.46E-01 ±	1.17E+01	1.93E+01
CS-134		-1.08E+00 ±	3.06E+00	4.97E+00
CS-137		-5.16E-01 ±	2.13E+00	3.44E+00
BALA140		4.01E+00 ±	6.26E+00	9.61E+00
BI-214		6.10E+00 ±	6.86E+00	1.23E+01

TABLE B-7.2  
**GAMMA SPECTROMETRY RESULTS OF SANITARY WASTE TREATMENT WATER SUMMARY**  
**STATION 102B**

Results in pCi/liter, corrected for decay during collection period

<b>Nuclide</b>	<b>Average Activity</b>	<b>Activity Low</b>	<b>Activity High</b>	<b>Average MDA</b>	<b>Number of Samples</b>	<b>Number of Positive IDs</b>
K-40	1.58E+01	-2.57E+01	9.20E+01	6.53E+01	12	1
CR-51	6.94E-02	-2.27E+01	1.48E+01	5.59E+01	12	0
MN-54	3.31E-01	-2.89E-01	1.10E+00	4.64E+00	12	0
CO-58	1.40E-01	-2.10E+00	1.81E+00	4.76E+00	12	0
FE-59	-8.97E-02	-3.76E+00	4.23E+00	1.20E+01	12	0
CO-60	7.25E-01	-6.86E-01	3.09E+00	4.34E+00	12	0
ZN-65	-5.25E-01	-5.20E+00	4.49E+00	1.12E+01	12	0
ZRNB-95	6.96E-01	-5.20E+00	4.60E+00	8.64E+00	12	0
I-131	4.45E-03	-5.16E+00	5.65E+00	1.55E+01	12	0
CS-134	-1.51E+00	-3.75E+00	9.98E-01	5.28E+00	12	0
CS-137	-1.83E-01	-1.47E+00	1.15E+00	4.59E+00	12	0
BALA140	-4.55E-01	-3.35E+00	4.01E+00	9.95E+00	12	0
BI-214	8.91E+00	-3.16E-01	1.94E+01	1.31E+01	12	1

TABLE B-8.1  
**TRITIUM IN SANITARY WASTE TREATMENT WATER**

Results in pCi per liter, MDA for all samples is 300 pCi/l

Location	Description	Collection Period	RQ	Activity	Error
102B	SWTF Headworks	12/31/13 - 02/03/14		5.07E+01	± 9.31E+01
		02/03/14 - 03/03/14		1.80E+02	± 9.79E+01
		03/03/14 - 04/01/14		2.59E+01	± 9.59E+01
		04/01/14 - 05/01/14		1.23E+02	± 9.89E+01
		05/01/14 - 06/02/14		1.18E+02	± 9.59E+01
		06/02/14 - 07/01/14		2.61E+02	± 9.68E+01
		07/01/14 - 07/31/14		2.38E+02	± 9.84E+01
		07/31/14 - 09/02/14		1.78E+02	± 9.24E+01
		09/02/14 - 09/30/14		-3.10E+01	± 8.95E+01
		09/30/14 - 10/31/14		3.49E+01	± 8.67E+01
		10/31/14 - 12/01/14		2.59E+01	± 8.45E+01
		12/01/14 - 12/30/14		2.31E+02	± 8.62E+01

TABLE B-8.2  
**TRITIUM IN SANITARY WASTE TREATMENT WATER - SUMMARY**

Results in pCi per liter

Location	Description	Average Activity	Activity Low	Activity High	Number of Samples	Number of Positive IDs
102B	SWTF Headworks	1.20E+02	-3.10E+01	2.61E+02	12	0

TABLE B-10.1

**GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES**

Results in pCi per liter

Station MW-3 collected 1/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-5.93E+01 ±	1.30E+02	1.32E+02
MN-54		-4.13E-01 ±	5.73E+00	9.37E+00
CO-58		-2.45E+00 ±	6.09E+00	9.76E+00
FE-59		0.00E+00 ±	1.47E+01	2.42E+01
CO-60		6.25E-01 ±	5.21E+00	8.48E+00
ZN-65		1.06E+00 ±	4.91E+01	8.08E+01
ZRNB-95		4.45E+00 ±	9.78E+00	1.56E+01
I-131		3.57E-01 ±	6.87E+00	1.13E+01
CS-134		0.00E+00 ±	2.78E+01	4.57E+01
CS-137		-9.18E-02 ±	6.68E+00	1.10E+01
BALA140		-1.12E-02 ±	6.70E+00	1.10E+01
BI-214	+	5.99E+02 ±	3.37E+01	2.54E+01

Station MW-9 collected 2/19/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		7.19E+00 ±	6.56E+01	1.27E+02
MN-54		-2.42E+00 ±	5.96E+00	9.55E+00
CO-58		2.76E-01 ±	6.11E+00	1.00E+01
FE-59		-4.19E+00 ±	1.40E+01	2.25E+01
CO-60		4.43E-02 ±	5.10E+00	8.38E+00
ZN-65		-7.23E+00 ±	1.33E+01	2.11E+01
ZRNB-95		-5.59E+00 ±	1.09E+01	1.73E+01
I-131		8.96E-02 ±	6.71E+00	1.10E+01
CS-134		1.56E+00 ±	2.15E+01	3.53E+01
CS-137		-7.55E-01 ±	3.45E+00	5.54E+00
BALA140		0.00E+00 ±	6.12E+00	1.01E+01
BI-214	+	6.09E+02 ±	3.48E+01	2.55E+01

Station MW-5 collected 1/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		3.18E+00 ±	5.75E+01	1.11E+02
MN-54		0.00E+00 ±	6.12E+00	1.01E+01
CO-58		5.05E-02 ±	4.60E+00	7.55E+00
FE-59		-1.42E-01 ±	9.17E+00	1.51E+01
CO-60		4.16E-01 ±	5.15E+00	8.82E+00
ZN-65		0.00E+00 ±	4.58E+01	7.53E+01
ZRNB-95		6.30E+00 ±	7.06E+00	1.06E+01
I-131		3.16E+00 ±	4.77E+00	7.53E+00
CS-134		7.88E-02 ±	5.74E+00	9.44E+00
CS-137		-3.10E+00 ±	6.37E+00	1.02E+01
BALA140		0.00E+00 ±	3.91E+00	6.43E+00
BI-214	+	3.45E+02 ±	2.66E+01	2.25E+01

Station MW-10 collected 2/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.33E+01 ±	8.29E+01	1.19E+02
MN-54		-1.52E-01 ±	4.82E+00	7.91E+00
CO-58		1.06E+00 ±	4.99E+00	8.08E+00
FE-59		1.15E+00 ±	1.14E+01	1.85E+01
CO-60		0.00E+00 ±	4.82E+00	7.92E+00
ZN-65		0.00E+00 ±	3.62E+01	5.96E+01
ZRNB-95		-4.90E+00 ±	1.00E+01	1.60E+01
I-131		-2.59E-01 ±	6.52E+00	1.07E+01
CS-134		0.00E+00 ±	1.79E+01	2.94E+01
CS-137		4.25E-01 ±	5.55E+00	9.08E+00
BALA140		0.00E+00 ±	8.93E+00	1.47E+01
BI-214	+	2.55E+02 ±	2.40E+01	2.29E+01

Station MW-6 collected 1/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.00E+01 ±	1.22E+02	1.24E+02
MN-54		-2.72E+00 ±	5.66E+00	8.99E+00
CO-58		1.98E+00 ±	4.79E+00	7.61E+00
FE-59		-2.40E+00 ±	1.12E+01	1.79E+01
CO-60		4.38E-01 ±	5.22E+00	8.93E+00
ZN-65		1.04E+00 ±	5.74E+01	9.44E+01
ZRNB-95		7.62E-01 ±	9.03E+00	1.48E+01
I-131		0.00E+00 ±	7.09E+00	1.17E+01
CS-134		2.75E-01 ±	1.61E+01	2.64E+01
CS-137		-3.24E+00 ±	6.45E+00	1.03E+01
BALA140		1.43E-01 ±	6.48E+00	1.06E+01
BI-214	+	6.03E+02 ±	3.29E+01	2.21E+01

Station MW-11 collected 2/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.54E+01 ±	7.38E+01	1.16E+02
MN-54		-1.40E+00 ±	5.20E+00	8.38E+00
CO-58		0.00E+00 ±	5.23E+00	8.61E+00
FE-59		-1.51E+00 ±	1.20E+01	1.96E+01
CO-60		1.14E-01 ±	4.70E+00	7.71E+00
ZN-65		-6.87E+00 ±	1.21E+01	1.90E+01
ZRNB-95		-1.53E+00 ±	8.12E+00	1.31E+01
I-131		-2.41E+00 ±	8.39E+00	1.36E+01
CS-134		-5.59E+00 ±	6.31E+00	9.91E+00
CS-137		-1.67E+00 ±	5.73E+00	9.24E+00
BALA140		-1.57E-01 ±	7.00E+00	1.15E+01
BI-214	+	1.12E+02 ±	1.72E+01	2.24E+01

Station MW-8 collected 2/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		2.05E+00 ±	6.02E+01	1.15E+02
MN-54		4.30E+00 ±	4.90E+00	7.48E+00
CO-58		2.91E+00 ±	4.95E+00	7.76E+00
FE-59		3.21E+00 ±	1.06E+01	1.68E+01
CO-60		-2.59E+00 ±	2.22E+02	8.92E+00
ZN-65		-1.61E+01 ±	1.92E+01	3.02E+01
ZRNB-95		4.70E+00 ±	8.53E+00	1.34E+01
I-131		-1.44E+00 ±	5.82E+00	9.44E+00
CS-134		-8.24E-01 ±	1.40E+01	2.31E+01
CS-137		-5.55E-01 ±	4.88E+00	7.95E+00
BALA140		8.33E-01 ±	5.93E+00	9.59E+00
BI-214	+	4.09E+02 ±	2.68E+01	2.01E+01

Station MW-12 collected 2/12/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-5.41E+01 ±	1.03E+02	1.19E+02
MN-54		1.52E+00 ±	4.56E+00	7.29E+00
CO-58		-2.80E+00 ±	5.54E+00	8.79E+00
FE-59		1.32E-01 ±	1.12E+01	1.84E+01
CO-60		-8.76E-01 ±	4.62E+00	7.46E+00
ZN-65		1.54E+00 ±	8.03E+00	1.29E+01
ZRNB-95		2.00E+00 ±	8.66E+00	1.40E+01
I-131		5.35E+00 ±	8.99E+00	1.43E+01
CS-134		2.30E+00 ±	4.73E+00	7.52E+00
CS-137		-2.38E+00 ±	5.99E+00	9.59E+00
BALA140		5.71E-01 ±	5.63E+00	9.12E+00
BI-214	+	1.05E+02 ±	1.69E+01	2.32E+01

TABLE B-10.1

**GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES**

Results in pCi per liter

Station MW-13 collected 1/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-5.34E+01 ±	1.05E+02	1.21E+02
MN-54		1.04E+00 ±	5.77E+00	9.38E+00
CO-58		1.05E+00 ±	5.13E+00	8.31E+00
FE-59		3.60E-01 ±	1.14E+01	1.87E+01
CO-60		1.15E+00 ±	4.77E+00	7.65E+00
ZN-65		7.00E-01 ±	5.72E+00	9.24E+00
ZRNB-95		1.75E-01 ±	9.46E+00	1.55E+01
I-131		-1.99E-01 ±	6.23E+00	1.02E+01
CS-134		6.14E-01 ±	2.32E+01	3.81E+01
CS-137		-1.38E+00 ±	6.42E+00	1.04E+01
BALA140		-4.99E-01 ±	5.55E+00	9.04E+00
BI-214	+	3.59E+02 ±	2.76E+01	2.40E+01

Station MW-6 collected 4/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-7.08E+01 ±	1.22E+02	1.17E+02
MN-54		-2.93E+00 ±	5.47E+00	8.66E+00
CO-58		1.12E+00 ±	4.59E+00	7.40E+00
FE-59		-3.85E-01 ±	1.00E+01	1.64E+01
CO-60		-6.94E-01 ±	4.37E+00	7.06E+00
ZN-65		-4.46E+00 ±	1.26E+01	2.02E+01
ZRNB-95		1.80E+00 ±	8.13E+00	1.31E+01
I-131		6.62E+00 ±	8.02E+00	1.26E+01
CS-134		-4.11E+00 ±	6.85E+00	1.10E+01
CS-137		-6.09E-01 ±	5.08E+00	8.28E+00
BALA140		-4.53E-01 ±	4.76E+00	7.71E+00
BI-214	+	1.75E+02 ±	2.44E+01	2.52E+01

Station MW-14 collected 1/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-8.87E+00 ±	5.80E+01	1.03E+02
MN-54		1.71E+00 ±	4.15E+00	6.55E+00
CO-58		-1.60E+00 ±	4.65E+00	7.42E+00
FE-59		2.57E+00 ±	1.08E+01	1.73E+01
CO-60		5.34E-02 ±	5.15E+00	8.87E+00
ZN-65		1.27E+00 ±	7.91E+00	1.28E+01
ZRNB-95		-2.61E+00 ±	8.69E+00	1.39E+01
I-131		2.07E-01 ±	5.51E+00	9.03E+00
CS-134		-4.13E+00 ±	5.85E+00	9.23E+00
CS-137		2.02E+00 ±	3.87E+00	6.01E+00
BALA140		-8.99E-01 ±	6.21E+00	1.00E+01
BI-214	+	1.58E+02 ±	2.07E+01	2.06E+01

Station MW-8 collected 5/7/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.28E+01 ±	6.93E+01	1.21E+02
MN-54		9.37E-01 ±	5.01E+00	8.12E+00
CO-58		-1.35E-01 ±	5.47E+00	8.98E+00
FE-59		-3.60E+00 ±	1.26E+01	2.02E+01
CO-60		0.00E+00 ±	5.31E+00	8.73E+00
ZN-65		-3.27E+00 ±	4.37E+01	7.17E+01
ZRNB-95		6.17E-02 ±	9.17E+00	1.51E+01
I-131		4.60E+00 ±	9.33E+00	1.50E+01
CS-134		-7.39E+00 ±	7.08E+00	1.11E+01
CS-137		2.94E+00 ±	5.30E+00	8.36E+00
BALA140		-7.90E-02 ±	4.89E+00	8.01E+00
BI-214	+	3.14E+02 ±	2.48E+01	2.15E+01

Station MW-3 collected 4/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.42E+01 ±	7.00E+01	1.21E+02
MN-54		-2.53E+00 ±	5.64E+00	8.99E+00
CO-58		-4.10E-01 ±	5.34E+00	8.72E+00
FE-59		-1.52E-01 ±	1.23E+01	2.03E+01
CO-60		4.72E-01 ±	4.78E+00	7.79E+00
ZN-65		-1.22E+01 ±	1.63E+01	2.57E+01
ZRNB-95		-3.18E-01 ±	7.49E+00	1.23E+01
I-131		2.48E-01 ±	9.08E+00	1.49E+01
CS-134		-3.13E-01 ±	1.99E+01	3.27E+01
CS-137		-1.75E+00 ±	6.81E+00	1.10E+01
BALA140		-1.04E-01 ±	7.36E+00	1.21E+01
BI-214	+	3.98E+02 ±	2.91E+01	2.43E+01

Station MW-9 collected 5/7/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.99E+01 ±	6.85E+01	1.15E+02
MN-54		-1.66E+00 ±	5.54E+00	8.93E+00
CO-58		1.12E+00 ±	4.69E+00	7.56E+00
FE-59		-2.34E+00 ±	1.05E+01	1.69E+01
CO-60		1.12E+00 ±	4.24E+00	6.77E+00
ZN-65		-1.17E+01 ±	1.52E+01	2.39E+01
ZRNB-95		7.51E-02 ±	7.83E+00	1.29E+01
I-131		1.58E+00 ±	7.79E+00	1.27E+01
CS-134		1.25E+00 ±	1.38E+01	2.27E+01
CS-137		2.75E+00 ±	4.65E+00	7.26E+00
BALA140		-1.17E+00 ±	7.04E+00	1.14E+01
BI-214	+	1.42E+02 ±	2.07E+01	2.18E+01

Station MW-5 collected 4/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		3.03E+01 ±	5.50E+01	1.04E+02
MN-54		4.92E-02 ±	3.28E+00	5.39E+00
CO-58		0.00E+00 ±	5.35E+00	8.79E+00
FE-59		0.00E+00 ±	1.42E+01	2.33E+01
CO-60		-1.90E-01 ±	4.44E+00	6.92E+00
ZN-65		0.00E+00 ±	2.66E+01	4.37E+01
ZRNB-95		2.80E+00 ±	7.82E+00	1.24E+01
I-131		-4.39E-01 ±	6.51E+00	1.07E+01
CS-134		9.97E-03 ±	4.57E+00	7.50E+00
CS-137		-1.83E+00 ±	4.74E+00	7.54E+00
BALA140		7.91E-02 ±	6.19E+00	1.02E+01
BI-214	+	8.33E+01 ±	1.48E+01	1.94E+01

Station MW-10 collected 5/7/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-5.42E+01 ±	1.06E+02	1.21E+02
MN-54		-4.31E-01 ±	4.59E+00	7.48E+00
CO-58		-1.32E+00 ±	4.97E+00	8.01E+00
FE-59		-1.12E+00 ±	1.14E+01	1.85E+01
CO-60		4.14E-01 ±	4.53E+00	7.38E+00
ZN-65		-9.75E+00 ±	1.29E+01	2.00E+01
ZRNB-95		1.90E+00 ±	8.92E+00	1.44E+01
I-131		-3.04E-01 ±	5.80E+00	9.52E+00
CS-134		0.00E+00 ±	1.49E+01	2.45E+01
CS-137		-1.83E+00 ±	6.65E+00	1.08E+01
BALA140		-1.52E+00 ±	5.36E+00	8.53E+00
BI-214	+	2.19E+02 ±	2.24E+01	2.21E+01

TABLE B-10.1

**GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES**

Results in pCi per liter

Station MW-11 collected 5/7/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.66E+01 ±	7.32E+01	1.15E+02
MN-54		-1.15E+00 ±	5.07E+00	8.19E+00
CO-58		-1.20E+00 ±	4.68E+00	7.54E+00
FE-59		0.00E+00 ±	1.59E+01	2.61E+01
CO-60		1.78E+00 ±	5.26E+00	8.38E+00
ZN-65		1.55E+00 ±	9.67E+00	1.57E+01
ZRNB-95		2.59E-01 ±	8.60E+00	1.41E+01
I-131		2.99E+00 ±	8.05E+00	1.30E+01
CS-134		9.39E-01 ±	1.26E+01	2.06E+01
CS-137		-6.59E-01 ±	4.86E+00	7.91E+00
BALA140		-2.07E+00 ±	6.79E+00	1.08E+01
BI-214	+	1.25E+02 ±	2.08E+01	2.23E+01

Station MW-3 collected 7/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.29E+01 ±	1.04E+02	1.20E+02
MN-54		3.66E-01 ±	5.36E+00	8.77E+00
CO-58		-8.66E-02 ±	4.46E+00	7.32E+00
FE-59		-2.66E+00 ±	1.26E+01	2.02E+01
CO-60		3.20E+00 ±	5.81E+00	9.48E+00
ZN-65		-2.07E+00 ±	5.12E+01	8.41E+01
ZRNB-95		4.36E+00 ±	8.61E+00	1.36E+01
I-131		-6.66E-01 ±	5.93E+00	9.70E+00
CS-134		2.75E-01 ±	1.35E+01	2.21E+01
CS-137		-1.83E+00 ±	6.22E+00	1.00E+01
BALA140		6.54E-01 ±	4.87E+00	7.87E+00
BI-214	+	4.81E+02 ±	3.09E+01	2.45E+01

Station MW-12 collected 5/7/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.84E+01 ±	8.50E+01	1.17E+02
MN-54		-4.83E-02 ±	4.47E+00	7.34E+00
CO-58		-1.20E+00 ±	4.57E+00	7.35E+00
FE-59		4.88E+00 ±	1.22E+01	1.92E+01
CO-60		-2.08E-01 ±	4.25E+00	6.95E+00
ZN-65		0.00E+00 ±	2.11E+01	3.47E+01
ZRNB-95		2.79E+00 ±	8.06E+00	1.29E+01
I-131		-2.65E+00 ±	8.11E+00	1.31E+01
CS-134		-4.88E+00 ±	6.81E+00	1.08E+01
CS-137		-1.25E+00 ±	5.19E+00	8.39E+00
BALA140		-3.81E-01 ±	3.84E+00	6.19E+00
BI-214	+	9.96E+01 ±	1.65E+01	2.22E+01

Station MW-5 collected 7/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-8.50E+01 ±	1.56E+02	1.22E+02
MN-54		2.15E+00 ±	5.08E+00	8.10E+00
CO-58		-1.34E+00 ±	4.79E+00	7.71E+00
FE-59		6.82E+00 ±	1.08E+01	1.65E+01
CO-60		6.95E-01 ±	4.25E+00	6.87E+00
ZN-65		0.00E+00 ±	3.85E+01	6.34E+01
ZRNB-95		2.25E+00 ±	7.76E+00	1.24E+01
I-131		1.48E+00 ±	5.87E+00	9.52E+00
CS-134		-1.25E+00 ±	1.79E+01	2.93E+01
CS-137		3.82E-02 ±	4.67E+00	7.67E+00
BALA140		-1.45E+00 ±	5.60E+00	8.94E+00
BI-214	+	2.41E+02 ±	2.50E+01	2.32E+01

Station MW-13 collected 4/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.06E+01 ±	8.75E+01	1.10E+02
MN-54		7.34E-01 ±	4.38E+00	7.09E+00
CO-58		-2.68E-01 ±	3.92E+00	6.40E+00
FE-59		1.09E+00 ±	8.12E+00	1.31E+01
CO-60		-1.98E+00 ±	3.04E+01	8.59E+00
ZN-65		-6.41E+00 ±	1.08E+01	1.69E+01
ZRNB-95		-1.56E+00 ±	7.11E+00	1.14E+01
I-131		-9.80E-01 ±	7.30E+00	1.19E+01
CS-134		9.41E-01 ±	3.61E+00	5.80E+00
CS-137		1.75E+00 ±	4.33E+00	6.85E+00
BALA140		-1.78E-01 ±	5.32E+00	8.70E+00
BI-214	+	1.41E+02 ±	1.86E+01	1.98E+01

Station MW-6 collected 7/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-1.01E+01 ±	6.66E+01	1.12E+02
MN-54		7.82E-01 ±	4.44E+00	7.18E+00
CO-58		7.94E-01 ±	4.60E+00	7.46E+00
FE-59		3.59E-02 ±	1.10E+01	1.80E+01
CO-60		-1.88E+00 ±	2.42E+01	7.96E+00
ZN-65		-1.04E+00 ±	4.29E+01	7.05E+01
ZRNB-95		4.90E-02 ±	7.52E+00	1.24E+01
I-131		-1.52E-01 ±	5.47E+00	8.98E+00
CS-134		-2.98E+00 ±	5.46E+00	8.68E+00
CS-137		4.18E-02 ±	5.91E+00	9.71E+00
BALA140		1.83E+00 ±	4.83E+00	7.52E+00
BI-214	+	3.19E+02 ±	2.47E+01	2.08E+01

Station MW-14 collected 4/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		1.05E+00 ±	6.00E+01	1.20E+02
MN-54		-1.81E+00 ±	5.10E+00	8.17E+00
CO-58		-1.28E+00 ±	4.69E+00	7.53E+00
FE-59		8.07E+00 ±	1.17E+01	1.78E+01
CO-60		-1.22E+00 ±	4.27E+00	6.80E+00
ZN-65		-5.93E+00 ±	1.16E+01	1.83E+01
ZRNB-95		4.69E-01 ±	8.30E+00	1.36E+01
I-131		-2.87E+00 ±	8.72E+00	1.41E+01
CS-134		8.74E-01 ±	5.01E+00	8.14E+00
CS-137		4.93E-01 ±	5.30E+00	8.65E+00
BALA140		-2.90E+00 ±	7.37E+00	1.16E+01
BI-214	+	1.63E+02 ±	2.15E+01	2.20E+01

Station MW-8 collected 7/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.96E+01 ±	9.53E+01	1.17E+02
MN-54		-1.21E+00 ±	4.63E+00	7.46E+00
CO-58		-1.85E+00 ±	5.31E+00	8.50E+00
FE-59		4.99E-01 ±	1.18E+01	1.94E+01
CO-60		6.57E-01 ±	4.62E+00	7.49E+00
ZN-65		-5.49E+00 ±	1.29E+01	2.06E+01
ZRNB-95		3.44E+00 ±	7.13E+00	1.12E+01
I-131		1.57E+00 ±	7.73E+00	1.26E+01
CS-134		-2.68E+00 ±	5.86E+00	9.40E+00
CS-137		-3.07E+00 ±	5.61E+00	8.89E+00
BALA140		0.00E+00 ±	2.00E+00	3.29E+00
BI-214	+	1.01E+02 ±	1.83E+01	2.17E+01

TABLE B-10.1

**GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES**

Results in pCi per liter

Station MW-9 collected 7/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.03E+01 ±	7.73E+01	1.16E+02
MN-54		5.99E-01 ±	4.57E+00	7.44E+00
CO-58		-1.83E+00 ±	4.94E+00	7.89E+00
FE-59		0.00E+00 ±	1.31E+01	2.16E+01
CO-60		-2.53E+00 ±	5.40E+00	8.53E+00
ZN-65		-2.84E+01 ±	1.83E+01	2.78E+01
ZRNB-95		6.32E+00 ±	9.67E+00	1.52E+01
I-131		-2.79E+00 ±	8.07E+00	1.30E+01
CS-134		-3.73E+00 ±	6.52E+00	1.04E+01
CS-137		-3.51E+00 ±	5.61E+00	8.82E+00
BALA140		-9.35E-01 ±	6.58E+00	1.06E+01
BI-214	+	1.08E+02 ±	1.72E+01	2.27E+01

Station MW-13 collected 7/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.64E+01 ±	8.08E+01	1.09E+02
MN-54		1.07E+00 ±	4.81E+00	7.76E+00
CO-58		2.53E-01 ±	5.21E+00	8.54E+00
FE-59		-2.43E+00 ±	1.13E+01	1.81E+01
CO-60		-1.53E-01 ±	5.65E+00	8.73E+00
ZN-65		-3.11E+00 ±	4.19E+01	6.88E+01
ZRNB-95		1.17E+00 ±	7.49E+00	1.21E+01
I-131		2.31E+00 ±	5.86E+00	9.43E+00
CS-134		4.38E-02 ±	6.60E+00	1.08E+01
CS-137		-1.06E+00 ±	5.83E+00	9.47E+00
BALA140		1.26E+00 ±	5.94E+00	9.52E+00
BI-214	+	3.30E+02 ±	2.65E+01	2.15E+01

Station MW-10 collected 7/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-9.38E-01 ±	4.97E+01	1.00E+02
MN-54		6.99E-01 ±	3.49E+00	5.61E+00
CO-58		-5.12E-01 ±	3.92E+00	6.36E+00
FE-59		-1.55E+00 ±	1.15E+01	1.85E+01
CO-60		6.17E-01 ±	4.24E+00	7.35E+00
ZN-65		1.08E+00 ±	6.11E+00	9.76E+00
ZRNB-95		-7.18E-01 ±	6.85E+00	1.11E+01
I-131		8.28E+00 ±	6.32E+00	9.16E+00
CS-134		-1.96E+00 ±	4.92E+00	7.87E+00
CS-137		1.37E+00 ±	4.63E+00	7.43E+00
BALA140		9.20E-01 ±	7.30E+00	1.18E+01
BI-214	+	4.05E+01 ±	1.34E+01	2.06E+01

Station MW-14 collected 7/23/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-7.64E+01 ±	1.42E+02	1.23E+02
MN-54		-1.08E-01 ±	5.29E+00	8.68E+00
CO-58		-1.49E+00 ±	4.38E+00	6.99E+00
FE-59		6.44E-01 ±	8.12E+00	1.32E+01
CO-60		1.98E-02 ±	4.06E+00	6.67E+00
ZN-65		-1.31E+01 ±	1.49E+01	2.32E+01
ZRNB-95		1.21E+00 ±	8.40E+00	1.36E+01
I-131		-2.88E-01 ±	7.30E+00	1.20E+01
CS-134		-9.39E-01 ±	1.43E+01	2.34E+01
CS-137		2.62E-02 ±	5.75E+00	9.44E+00
BALA140		-3.12E+00 ±	6.93E+00	1.08E+01
BI-214	+	1.42E+02 ±	2.10E+01	2.22E+01

Station MW-11 collected 7/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-8.12E-01 ±	4.90E+01	9.95E+01
MN-54		9.20E-01 ±	4.15E+00	6.68E+00
CO-58		-1.54E+00 ±	4.64E+00	7.40E+00
FE-59		1.42E-01 ±	1.02E+01	1.68E+01
CO-60		-2.88E-01 ±	5.22E+00	7.49E+00
ZN-65		-2.22E-02 ±	1.12E+01	1.84E+01
ZRNB-95		3.36E+00 ±	7.24E+00	1.13E+01
I-131		-4.90E-02 ±	8.45E+00	1.39E+01
CS-134		-8.61E-02 ±	3.74E+00	6.14E+00
CS-137		1.41E+00 ±	4.33E+00	6.90E+00
BALA140		2.93E+00 ±	6.76E+00	1.04E+01
BI-214	+	4.99E+01 ±	1.33E+01	1.96E+01

Station MW-3 collected 10/22/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.20E+01 ±	9.13E+01	1.27E+02
MN-54		2.47E+00 ±	5.64E+00	9.00E+00
CO-58		-2.78E+00 ±	5.93E+00	9.46E+00
FE-59		-2.99E+00 ±	1.23E+01	1.98E+01
CO-60		1.30E-01 ±	4.56E+00	7.48E+00
ZN-65		-1.70E+01 ±	1.70E+01	2.66E+01
ZRNB-95		4.04E+00 ±	9.32E+00	1.49E+01
I-131		-3.62E-01 ±	5.13E+00	8.39E+00
CS-134		1.25E+00 ±	2.47E+01	4.05E+01
CS-137		-6.30E+00 ±	8.04E+00	1.27E+01
BALA140		-5.11E-01 ±	5.40E+00	8.79E+00
BI-214	+	6.23E+02 ±	3.55E+01	2.70E+01

Station MW-12 collected 7/30/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-6.69E+01 ±	1.10E+02	1.14E+02
MN-54		1.85E+00 ±	4.94E+00	7.89E+00
CO-58		-4.91E-02 ±	4.55E+00	7.46E+00
FE-59		-6.53E-01 ±	1.07E+01	1.75E+01
CO-60		6.15E-03 ±	3.99E+00	6.57E+00
ZN-65		-2.49E+00 ±	1.06E+01	1.71E+01
ZRNB-95		0.00E+00 ±	1.18E+01	1.95E+01
I-131		-2.79E+00 ±	1.04E+01	1.69E+01
CS-134		-5.08E+00 ±	6.04E+00	9.49E+00
CS-137		-1.53E+00 ±	5.41E+00	8.73E+00
BALA140		-7.58E-01 ±	7.37E+00	1.20E+01
BI-214	+	9.16E+01 ±	1.62E+01	2.18E+01

Station MW-5 collected 10/22/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		6.03E+01 ±	5.74E+01	1.04E+02
MN-54		2.59E+00 ±	4.68E+00	7.33E+00
CO-58		1.18E+00 ±	4.08E+00	6.52E+00
FE-59		0.00E+00 ±	1.16E+01	1.90E+01
CO-60		5.02E-01 ±	4.89E+00	8.39E+00
ZN-65		-5.14E-01 ±	8.21E+00	1.34E+01
ZRNB-95		1.33E+00 ±	5.99E+00	9.61E+00
I-131		-1.06E-02 ±	4.87E+00	8.02E+00
CS-134		2.15E+00 ±	4.72E+00	7.51E+00
CS-137		-1.50E+00 ±	5.26E+00	8.46E+00
BALA140		-7.89E-01 ±	5.71E+00	9.25E+00
BI-214	+	2.76E+02 ±	2.53E+01	2.27E+01

TABLE B-10.1

**GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES**

Results in pCi per liter

Station MW-6 collected 10/22/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.52E+00 ±	6.40E+01	1.22E+02
MN-54		-2.72E+00 ±	6.23E+00	9.97E+00
CO-58		-1.08E+00 ±	5.02E+00	8.13E+00
FE-59		3.23E+00 ±	1.18E+01	1.89E+01
CO-60		3.62E-01 ±	4.71E+00	7.68E+00
ZN-65		-1.65E+01 ±	1.67E+01	2.60E+01
ZRNB-95		3.29E-01 ±	7.67E+00	1.26E+01
I-131		-7.27E-01 ±	5.89E+00	9.63E+00
CS-134		2.18E+00 ±	2.09E+01	3.43E+01
CS-137		-4.04E+00 ±	6.24E+00	9.85E+00
BALA140		0.00E+00 ±	5.30E+00	8.72E+00
BI-214	+	4.16E+02 ±	3.05E+01	2.47E+01

Station MW-11 collected 10/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.75E+01 ±	8.50E+01	1.25E+02
MN-54		-2.91E+00 ±	6.28E+00	1.00E+01
CO-58		-3.66E+00 ±	5.82E+00	9.18E+00
FE-59		3.44E+00 ±	1.16E+01	1.86E+01
CO-60		1.95E+00 ±	4.87E+00	7.70E+00
ZN-65		-1.64E+01 ±	1.70E+01	2.65E+01
ZRNB-95		-2.12E-02 ±	8.96E+00	1.47E+01
I-131		2.69E+00 ±	6.00E+00	9.65E+00
CS-134		2.67E-01 ±	1.13E+01	1.86E+01
CS-137		-3.48E+00 ±	6.90E+00	1.10E+01
BALA140		2.03E+00 ±	5.60E+00	8.85E+00
BI-214	+	4.80E+02 ±	3.18E+01	2.51E+01

Station MW-8 collected 10/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-4.55E+01 ±	1.19E+02	1.15E+02
MN-54		1.58E+00 ±	4.76E+00	7.61E+00
CO-58		1.35E+00 ±	4.55E+00	7.28E+00
FE-59		-2.07E+00 ±	1.04E+01	1.67E+01
CO-60		-6.98E-02 ±	4.87E+00	8.08E+00
ZN-65		4.13E+00 ±	5.57E+01	8.86E+00
ZRNB-95		3.33E+00 ±	7.30E+00	1.15E+01
I-131		2.55E+00 ±	5.67E+00	9.11E+00
CS-134		5.49E-01 ±	1.45E+01	2.38E+01
CS-137		1.83E-01 ±	5.77E+00	9.46E+00
BALA140		-1.43E+00 ±	5.97E+00	9.56E+00
BI-214	+	4.80E+02 ±	2.97E+01	2.13E+01

Station MW-12 collected 10/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		2.06E+01 ±	5.90E+01	1.11E+02
MN-54		3.80E-01 ±	6.24E+00	1.02E+01
CO-58		8.25E-03 ±	4.54E+00	7.46E+00
FE-59		-2.78E+00 ±	1.14E+01	1.82E+01
CO-60		-5.77E-01 ±	7.30E+00	8.33E+00
ZN-65		3.69E-01 ±	9.82E+00	1.61E+01
ZRNB-95		-3.37E+00 ±	9.22E+00	1.47E+01
I-131		-1.03E+00 ±	5.87E+00	9.56E+00
CS-134		-3.06E+00 ±	6.62E+00	1.06E+01
CS-137		-1.06E+00 ±	6.30E+00	1.03E+01
BALA140		-8.30E-01 ±	5.74E+00	9.28E+00
BI-214	+	3.51E+02 ±	2.70E+01	2.25E+01

Station MW-9 collected 10/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.90E+01 ±	8.87E+01	1.28E+02
MN-54		2.20E+00 ±	4.39E+00	6.91E+00
CO-58		-1.77E+00 ±	5.93E+00	9.57E+00
FE-59		3.85E+00 ±	1.22E+01	1.95E+01
CO-60		-1.51E+00 ±	5.17E+00	8.28E+00
ZN-65		5.37E+00 ±	5.27E+01	8.66E+01
ZRNB-95		1.14E-01 ±	8.61E+00	1.41E+01
I-131		-1.09E+00 ±	6.57E+00	1.07E+01
CS-134		2.60E+00 ±	4.92E+00	7.74E+00
CS-137		-3.55E+00 ±	7.90E+00	1.27E+01
BALA140		0.00E+00 ±	2.66E+00	4.37E+00
BI-214	+	6.15E+02 ±	3.43E+01	2.49E+01

Station MW-13 collected 10/22/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		1.74E+01 ±	5.56E+01	1.07E+02
MN-54		-1.54E+00 ±	5.48E+00	8.84E+00
CO-58		2.45E+00 ±	4.71E+00	7.40E+00
FE-59		4.42E+00 ±	9.58E+00	1.48E+01
CO-60		-1.41E+00 ±	1.45E+01	8.24E+00
ZN-65		-2.07E+00 ±	4.71E+01	1.26E+01
ZRNB-95		3.30E+00 ±	8.68E+00	1.38E+01
I-131		2.38E-02 ±	5.37E+00	8.84E+00
CS-134		-1.10E+00 ±	1.31E+01	2.15E+01
CS-137		3.73E+00 ±	5.36E+00	8.35E+00
BALA140		1.20E+00 ±	5.18E+00	8.26E+00
BI-214	+	4.02E+02 ±	2.80E+01	2.28E+01

Station MW-10 collected 10/29/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-3.91E+01 ±	9.49E+01	1.07E+02
MN-54		1.34E+00 ±	4.55E+00	7.29E+00
CO-58		2.27E+00 ±	4.77E+00	7.53E+00
FE-59		-3.26E-01 ±	1.08E+01	1.77E+01
CO-60		3.47E-01 ±	5.22E+00	8.93E+00
ZN-65		3.10E+00 ±	5.10E+01	1.22E+01
ZRNB-95		4.72E+00 ±	7.83E+00	1.22E+01
I-131		2.29E+00 ±	5.89E+00	9.49E+00
CS-134		-4.92E+00 ±	6.42E+00	1.01E+01
CS-137		-6.85E-01 ±	4.10E+00	6.63E+00
BALA140		-1.99E+00 ±	6.40E+00	1.02E+01
BI-214	+	4.69E+02 ±	2.88E+01	2.05E+01

Station MW-14 collected 10/22/2014				
Nuclide	RQ	Activity	Error	MDA
K-40		-2.52E+00 ±	5.80E+01	1.10E+02
MN-54		-1.09E-01 ±	3.74E+00	6.13E+00
CO-58		-3.01E+00 ±	5.62E+00	8.88E+00
FE-59		4.23E-02 ±	9.64E+00	1.58E+01
CO-60		-2.34E-02 ±	4.75E+00	8.13E+00
ZN-65		-7.55E+00 ±	1.14E+01	1.78E+01
ZRNB-95		-2.67E+00 ±	7.90E+00	1.26E+01
I-131		2.09E+00 ±	7.09E+00	1.15E+01
CS-134		-1.75E+00 ±	5.22E+00	8.40E+00
CS-137		-1.76E+00 ±	5.26E+00	8.42E+00
BALA140		-1.35E+00 ±	6.59E+00	1.06E+01
BI-214	+	1.39E+02 ±	1.80E+01	2.12E+01



Table B-10.2

**GAMMA SPECTROMETRY RESULTS OF GROUNDWATER MONITORING WELL SAMPLES - SUMMARY**

Results in pCi/liter

<b>Nuclide</b>	<b>Average Activity</b>	<b>Activity Low</b>	<b>Activity High</b>	<b>Average MDA</b>	<b>Number of Samples</b>	<b>Number of Positive IDs</b>
BALA140	-2.78E-01	-3.12E+00	2.93E+00	9.44E+00	40	0
BI-214	2.89E+02	4.05E+01	6.23E+02	2.25E+01	40	40
CO-58	-3.95E-01	-3.66E+00	2.91E+00	7.98E+00	40	0
CO-60	-2.74E-02	-2.59E+00	3.20E+00	7.92E+00	40	0
CS-134	-9.66E-01	-7.39E+00	2.60E+00	1.77E+01	40	0
CS-137	-9.33E-01	-6.30E+00	3.73E+00	8.98E+00	40	0
FE-59	3.33E-01	-4.19E+00	8.07E+00	1.85E+01	40	0
I-131	6.74E-01	-2.87E+00	8.28E+00	1.12E+01	40	0
K-40	-2.40E+01	-8.50E+01	6.03E+01	1.16E+02	40	0
MN-54	7.58E-02	-2.93E+00	4.30E+00	8.06E+00	40	0
ZN-65	-4.46E+00	-2.84E+01	5.37E+00	3.39E+01	40	0
ZRNB-95	1.11E+00	-5.59E+00	6.32E+00	1.35E+01	40	0

TABLE B-11.1  
**TRITIUM IN GROUNDWATER MONITORING WELL SAMPLES**

Results in pCi per liter

Location	Collection Date	RQ	Activity	Error
MW-3	01/29/14	+	1.39E+03	± 1.30E+02
	04/23/14	+	1.47E+03	± 1.30E+02
	07/23/14	+	1.38E+03	± 1.28E+02
	10/22/14	+	1.33E+03	± 1.20E+02
MW-5	01/29/14	+	1.54E+04	± 3.17E+02
	04/23/14	+	1.51E+04	± 3.15E+02
	07/23/14	+	1.47E+04	± 3.10E+02
	10/22/14	+	1.56E+04	± 2.95E+02
MW-6	01/29/14	+	5.25E+03	± 2.00E+02
	04/23/14	+	5.53E+03	± 2.04E+02
	07/23/14	+	5.39E+03	± 2.00E+02
	10/22/14	+	5.23E+03	± 1.85E+02
MW-8	02/12/14	+	1.46E+03	± 1.33E+02
	05/07/14	+	8.59E+02	± 1.16E+02
	07/30/14	+	1.16E+03	± 1.21E+02
	10/29/14	+	3.92E+02	± 9.63E+01
MW-9	02/19/14		-2.14E+01	± 1.01E+02
	05/07/14		1.59E+02	± 1.01E+02
	07/30/14	+	3.05E+02	± 9.75E+01
	10/29/14		2.57E+02	± 9.24E+01
MW-10	02/12/14	+	5.78E+02	± 1.11E+02
	05/07/14	+	4.31E+02	± 1.03E+02
	07/30/14	+	3.19E+02	± 9.80E+01
	10/29/14	+	3.55E+02	± 9.37E+01
MW-11	02/12/14	+	1.21E+03	± 1.28E+02
	05/07/14	+	1.12E+03	± 1.22E+02
	07/30/14	+	1.00E+03	± 1.17E+02
	10/29/14	+	1.03E+03	± 1.12E+02
MW-12	02/12/14	+	7.50E+02	± 1.18E+02
	05/07/14	+	7.67E+02	± 1.13E+02
	07/30/14	+	6.10E+02	± 1.07E+02
	10/29/14	+	7.14E+02	± 1.05E+02
MW-13	01/29/14	+	1.20E+04	± 2.82E+02
	04/23/14	+	1.18E+04	± 2.82E+02
	07/23/14	+	1.15E+04	± 2.77E+02
	10/22/14	+	1.14E+04	± 2.57E+02
MW-14	01/29/14		1.96E+02	± 9.79E+01
	04/23/14		1.21E+02	± 9.86E+01
	07/23/14	+	3.16E+02	± 9.76E+01
	10/22/14		2.47E+02	± 9.19E+01

**TABLE B-12.1**  
**GAMMA SPECTROMETRY RESULTS OF STORM DRAIN POND SOIL**

Results in pCi/kilogram dry mass

SDP Location A Surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	2.75E+02 ±	7.61E+01	1.10E+02
K-40	+	8.82E+03 ±	2.95E+02	1.03E+02
CR-51		2.72E+01 ±	7.47E+01	1.22E+02
MN-54		0.00E+00 ±	9.21E+00	1.54E+01
CO-58		1.12E+00 ±	7.70E+00	1.26E+01
FE-59		6.52E-02 ±	1.66E+01	2.73E+01
CO-60	+	1.26E+02 ±	1.23E+01	1.48E+01
ZN-65		9.03E-01 ±	4.50E+01	7.40E+01
ZRNB-95		1.26E+01 ±	1.33E+01	2.08E+01
CS-134		-5.75E-01 ±	8.38E+00	1.38E+01
CS-137	+	3.98E+01 ±	1.08E+01	1.12E+01
BALA140		-2.58E-01 ±	8.19E+00	1.34E+01
BI-214	+	4.29E+02 ±	2.96E+01	2.57E+01

SDP Location K Surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	3.64E+02 ±	2.26E+02	3.47E+02
K-40	+	1.24E+04 ±	7.41E+02	4.63E+02
CR-51		7.54E+01 ±	2.02E+02	3.27E+02
MN-54		2.10E+01 ±	2.27E+01	3.53E+01
CO-58		-1.34E+01 ±	2.61E+01	4.18E+01
FE-59		0.00E+00 ±	7.43E+01	1.24E+02
CO-60	+	2.15E+02 ±	2.41E+01	3.77E+01
ZN-65		1.36E+01 ±	4.55E+01	7.33E+01
ZRNB-95		0.00E+00 ±	4.27E+01	7.12E+01
CS-134		-2.94E+00 ±	4.70E+01	7.72E+01
CS-137	+	1.07E+02 ±	3.08E+01	3.54E+01
BALA140		-8.07E+00 ±	3.16E+01	5.08E+01
BI-214	+	5.15E+02 ±	7.14E+01	8.91E+01

SDP Location A 8-12" 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7		5.40E+01 ±	1.51E+02	2.45E+02
K-40	+	3.68E+03 ±	3.54E+02	2.84E+02
CR-51		-3.36E+01 ±	1.57E+02	2.56E+02
MN-54		8.55E+00 ±	1.77E+01	2.83E+01
CO-58		-7.71E+00 ±	1.73E+01	2.78E+01
FE-59		1.17E+01 ±	2.98E+01	4.72E+01
CO-60	+	6.13E+02 ±	2.94E+01	2.47E+01
ZN-65		-4.52E+01 ±	4.91E+01	7.75E+01
ZRNB-95		2.18E+01 ±	3.05E+01	4.82E+01
CS-134		5.48E-01 ±	1.50E+01	2.45E+01
CS-137	+	3.96E+01 ±	1.86E+01	2.74E+01
BALA140		-4.21E+00 ±	2.10E+01	3.39E+01
BI-214	+	5.64E+02 ±	5.76E+01	5.62E+01

SDP Location B Surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.34E+03 ±	2.53E+02	2.89E+02
K-40	+	1.27E+04 ±	6.86E+02	3.79E+02
CR-51		-1.10E+01 ±	2.12E+02	3.48E+02
MN-54		2.73E+01 ±	2.65E+01	4.16E+01
CO-58		2.91E+00 ±	2.25E+01	3.68E+01
FE-59		-2.20E+01 ±	5.95E+01	9.54E+01
CO-60	+	8.86E+02 ±	4.23E+01	4.22E+01
ZN-65		-3.96E+01 ±	7.16E+01	1.15E+02
ZRNB-95		9.05E+00 ±	3.52E+01	5.70E+01
CS-134		4.30E-01 ±	2.15E+01	3.54E+01
CS-137	+	1.12E+02 ±	3.16E+01	3.59E+01
BALA140		9.27E+00 ±	2.44E+01	3.84E+01
BI-214	+	5.01E+02 ±	6.72E+01	8.70E+01

SDP Location L Surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	2.93E+02 ±	1.11E+02	1.44E+02
K-40	+	1.19E+04 ±	4.46E+02	1.96E+02
CR-51		-1.29E+01 ±	1.11E+02	1.82E+02
MN-54		-2.61E-01 ±	1.20E+01	1.96E+01
CO-58		-2.85E+00 ±	1.11E+01	1.80E+01
FE-59		8.32E-01 ±	3.21E+01	5.26E+01
CO-60	+	1.81E+02 ±	1.57E+01	2.01E+01
ZN-65		-3.59E+01 ±	3.61E+01	5.71E+01
ZRNB-95		2.14E+01 ±	1.95E+01	3.02E+01
CS-134		4.69E-01 ±	3.80E+00	6.15E+00
CS-137	+	2.51E+01 ±	1.42E+01	2.17E+01
BALA140		-4.29E+00 ±	1.39E+01	2.22E+01
BI-214	+	4.38E+02 ±	4.13E+01	4.01E+01

SDP Location B 8-12" 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7		-1.79E+01 ±	8.34E+01	1.36E+02
K-40	+	1.46E+04 ±	3.71E+02	1.26E+02
CR-51		-2.61E+01 ±	9.55E+01	1.56E+02
MN-54		-1.65E-01 ±	9.33E+00	1.53E+01
CO-58		2.06E-01 ±	7.63E+00	1.25E+01
FE-59		-5.76E+00 ±	2.52E+01	4.11E+01
CO-60		1.60E+01 ±	1.21E+01	1.90E+01
ZN-65		-2.60E+01 ±	2.73E+01	4.36E+01
ZRNB-95		1.44E+01 ±	1.66E+01	2.64E+01
CS-134		5.43E-01 ±	2.30E+01	3.78E+01
CS-137		6.87E+00 ±	1.05E+01	1.69E+01
BALA140		3.58E-01 ±	1.14E+01	1.87E+01
BI-214	+	5.85E+02 ±	3.92E+01	3.32E+01

TABLE B-12.1  
**GAMMA SPECTROMETRY RESULTS OF STORM DRAIN POND SOIL**

Results in pCi/kilogram dry mass

SDP Location J surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	1.37E+03 ±	2.68E+02	2.93E+02
K-40	+	1.25E+04 ±	6.31E+02	3.65E+02
CR-51		1.59E+01 ±	1.90E+02	3.11E+02
MN-54		3.47E+01 ±	2.41E+01	3.73E+01
CO-58		1.02E+00 ±	2.27E+01	3.72E+01
FE-59		5.27E+01 ±	5.03E+01	7.68E+01
CO-60	+	1.02E+03 ±	4.20E+01	3.55E+01
ZN-65		-8.05E+01 ±	6.89E+01	1.09E+02
ZRNB-95		-3.74E+00 ±	4.03E+01	6.60E+01
CS-134		-9.91E+00 ±	2.16E+01	3.49E+01
CS-137	+	8.38E+01 ±	2.54E+01	3.11E+01
BALA140		-1.23E+01 ±	2.92E+01	4.64E+01
BI-214	+	5.57E+02 ±	6.71E+01	7.10E+01

SDP Location E surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	2.84E+03 ±	3.09E+02	2.46E+02
K-40	+	4.94E+03 ±	5.64E+02	5.25E+02
CR-51		1.12E+01 ±	1.66E+02	2.73E+02
MN-54		1.69E+01 ±	2.21E+01	3.53E+01
CO-58		9.83E-01 ±	1.98E+01	3.25E+01
FE-59		8.30E+00 ±	5.07E+01	8.27E+01
CO-60	+	1.25E+02 ±	1.89E+01	3.61E+01
ZN-65		2.04E+01 ±	3.75E+01	5.98E+01
ZRNB-95		5.06E-01 ±	3.60E+01	5.91E+01
CS-134		-4.18E+01 ±	2.78E+01	4.41E+01
CS-137	+	4.86E+01 ±	2.44E+01	3.75E+01
BALA140		1.17E+01 ±	2.76E+01	4.40E+01
BI-214	+	3.90E+02 ±	6.33E+01	9.37E+01

SDP Location I surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	3.36E+03 ±	3.66E+02	3.01E+02
K-40	+	6.99E+03 ±	5.39E+02	4.88E+02
CR-51		8.59E+01 ±	1.83E+02	2.98E+02
MN-54		2.91E+01 ±	2.62E+01	4.16E+01
CO-58		-5.62E+00 ±	2.50E+01	4.07E+01
FE-59		-1.15E+01 ±	5.10E+01	8.28E+01
CO-60	+	1.13E+03 ±	4.67E+01	4.05E+01
ZN-65		-3.84E+01 ±	6.84E+01	1.11E+02
ZRNB-95		-1.13E+01 ±	4.25E+01	6.93E+01
CS-134		-3.24E+00 ±	4.72E+01	7.75E+01
CS-137	+	8.39E+01 ±	2.86E+01	3.26E+01
BALA140		-3.10E+00 ±	2.86E+01	4.67E+01
BI-214	+	5.67E+02 ±	6.86E+01	8.28E+01

SDP Location G Surface 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7	+	2.06E+03 ±	2.97E+02	2.64E+02
K-40	+	8.53E+03 ±	5.63E+02	3.69E+02
CR-51		4.74E+01 ±	1.91E+02	3.12E+02
MN-54		1.81E+01 ±	1.98E+01	3.08E+01
CO-58		-1.07E+01 ±	2.00E+01	3.19E+01
FE-59		5.93E+00 ±	3.65E+01	5.91E+01
CO-60	+	1.50E+02 ±	1.93E+01	3.27E+01
ZN-65		-1.10E+00 ±	4.68E+01	7.69E+01
ZRNB-95		3.40E+01 ±	3.38E+01	5.21E+01
CS-134		1.25E+01 ±	1.47E+01	2.29E+01
CS-137	+	4.68E+01 ±	2.36E+01	3.51E+01
BALA140		-9.63E+00 ±	2.69E+01	4.28E+01
BI-214	+	5.29E+02 ±	7.71E+01	7.74E+01

SDP Location I 8-12" 12/10/2014				
Nuclide	RQ	Activity	Error	MDA
BE-7		7.51E+01 ±	1.51E+02	2.43E+02
K-40	+	6.52E+03 ±	4.30E+02	2.86E+02
CR-51		3.16E+01 ±	1.67E+02	2.72E+02
MN-54		-1.57E+01 ±	1.99E+01	3.16E+01
CO-58		-1.32E+00 ±	1.92E+01	3.15E+01
FE-59		-7.10E+00 ±	3.95E+01	6.40E+01
CO-60	+	4.90E+02 ±	2.87E+01	2.55E+01
ZN-65		-3.90E+01 ±	4.45E+01	7.00E+01
ZRNB-95		2.41E+01 ±	3.33E+01	5.28E+01
CS-134		-2.65E+01 ±	2.29E+01	3.62E+01
CS-137	+	1.15E+02 ±	2.92E+01	2.91E+01
BALA140		-5.19E+00 ±	2.10E+01	3.37E+01
BI-214	+	4.28E+02 ±	5.75E+01	7.73E+01

TABLE B-13.1  
**CARBON 14 IN APPLES**  
 Results in pCi per Kg wet mass

Location	Distance from CGS, miles	Sector from CGS	Sample Type	Collection Date	RQ	Activity	Error	MDA
Naches, WA	>65	WNW	Cntl	10/12/14		2.16E+02	± 6.20E+01	6.00E+02
Kennewick, WA	23	SSE	Cntl	10/10/14		1.50E+02	± 5.70E+01	6.00E+02
Sunnyside, WA	>33	WSW	Cntl	10/10/14		2.51E+02	± 7.10E+01	6.00E+02
Ellensburg, WA	>65	WNW	Cntl	08/31/14		2.00E+02	± 5.40E+01	6.00E+02
St-37	4.50	E	Ind	09/30/14		2.10E+02	± 6.00E+01	6.00E+02
St-37	5.50	ESE	Ind	10/03/14		1.94E+02	± 5.40E+01	6.00E+02
St-37	4.30	ESE	Ind	09/16/14		1.53E+02	± 5.20E+01	6.00E+02

Ind = Indicator Location Cntl= Control Location

RQ = Results Qualifier. If blank, result is less than detection limit. If "+", result is above detection limit.